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ADDRESSING THE UNMET CONTRACEPTIVE
NEED OF ADOLESCENTS AND UNMARRIED
YOUTH: ACT OR INTERACT?

Learning from Comprehensive Interventions in
China and Latin America

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Cover photo: *Pregnant adolescent, Managua 2010*, Liesbet Christiaen

*I dedicate this work to Griet, Sarah, Johannes,
Lotte, Simon and Marie.*

*I dedicate this work to all young people who are
fighting for their sexual health and rights.*

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Lexicon and abbreviations

Adolescent fertility rate	The number of births per 1,000 women ages 15-19
Adolescent pregnancy	Pregnancy among girls aged 10 to 19 (WHO definition). Synonym used in text: teenage pregnancy
Adolescents	People aged 10 to 19 (WHO definition). The study population of the CERCA project belongs to this category. Synonyms used in text: teenagers and teens
AIDS	Acquired Immunodeficiency Syndrome
ASRH	Adolescents Sexual and Reproductive Health
CERCA	Community Embedded Reproductive Health Care for Adolescents
FoY	Friends of Youth. FOY are young adults intensively trained in SRH who serve as mentors to adolescents.
IUD	Intrauterine Device
HIV	Human Immunodeficiency Virus
LARC	Long Acting Reversible Contraception
NGO	Non-Governmental Organization
SHD	Social Health Determinants
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infections
UNFPA	United Nations Population Fund
Unmarried people	People in all ages who are neither married nor cohabiting (working definition). Synonym used in the text: singles
Unmarried youth	People, aged 18 to 28, who are neither married nor cohabiting (working definition). The study population of the YOLAMI project belongs to this category. Other terms used in the text referring to this population: young unmarried people\adults\individuals\migrants
YOLAMI	Young Labour Migrants in Chinese cities
YUR-migrants	Young Unmarried Rural-to-urban (or internal) migrants

Chapter 1

Background

1.1 Problem statement

1.1.1 Early age, unintended and unmarried: a threefold threat to a healthy pregnancy

Early age Adolescent pregnancies are a worldwide challenge. Every year, 7.3 million girls under the age of 19 give birth [1]. About 95% of those births occur in developing countries where 19% of young women become pregnant before the age of 18. The frequency of adolescent pregnancies varies between regions and countries. West and Central Africa have the largest percentage (28%) of women between the ages of 20 and 24 who reported a birth before age 18, followed by Eastern and Southern Africa (25%), South Asia (22%) and Latin America (18%). Girls under age 15 account for 2 million births every year [1]. About 3% of women in developing countries become pregnant in early adolescence (before 15 years of age). In West and Central Africa this figure is 6%. Latin America is the only region where the number of births in early adolescence rose between 1997 and 2011 and is projected to rise slightly through 2030.

Teenage pregnancies often happen outside marriage, are more frequently unintended [2][3] and have poorer outcomes than those among adult women [1]. The impact of adolescent pregnancy on the well-being of mother and child is well described in literature [4][5][6]: 1) teenage pregnancies are linked to a higher incidence of maternal complications during pregnancy and delivery; 2) children of teenage mothers are at increased risk of preterm birth, low birth weight and neonatal mortality; 3) early pregnancy may have a dislocating effect on girls'

socio-economic situation, as many are forced to drop out of school, have to face rejection from their family and community, and, in some cases, are forced to marry; and 4) in cases of an artificial termination of the pregnancy, teens are more vulnerable to physical and mental repercussions than adult women.

Unintended Negative consequences of unintended pregnancy¹ for mother, child and families are well established [7][8][9]. Children who result from unintended pregnancies are at increased risk of low birth weight, malnutrition, abuse and infant death. Parents of unplanned pregnancies more frequently suffer from depression and anxiety, which leads to a higher risk of suicide [10]. Furthermore, unplanned pregnancies are coupled with abortion-related risks. In countries with restrictive abortion laws pregnancy termination is often carried out in unsafe conditions, which is a serious threat to women's health [11].

Unmarried Unmarried women are more at risk of unintended pregnancy and suffer more from the negative consequences of such pregnancy [12][13][14]. An overview of recent studies shows that the incidence of unintended pregnancy is higher among unmarried than married women. In **North America** 49.3% of single women aged 20–44 are at risk of unintended pregnancy, while the risk among married women is 46.1% [15]. In a study among Hispanic women in Texas unmarried women had a prevalence odds ratio of 1.5 (CI = 1.04–2.0) for unintended birth compared to women who were married at the time of birth [16]. A study among never-married youth in **Shanghai (China)** showed that 13.8% of female and 17.7% of male sexually active singles (15–27 years old) had been involved at least once in an unintended pregnancy in their lives [17]. Recent studies in **sub-Saharan Africa** have demonstrated that women experiencing unintended pregnancies are more likely to be unmarried than women who have not experienced an unintended pregnancy [18][19][20]. Also in **Europe** single women are at higher risk of having an unintended pregnancy and induced abortion [21][22].

1.1.2 The way to go: delaying sexual intercourse or increasing contraceptive use?

Given the recurrence of unintended pregnancy among young unmarried people and the significant negative impact on their well-being, there is an urgent need

¹A woman is at risk of unintended pregnancy if she is sexually active, fecund, not pregnant or postpartum, not trying to get pregnant and not using contraceptive sterilization.

for effective public health interventions. The incidence of unintended pregnancy can be reduced by delaying sexual intercourse and increasing contraceptive use among sexually active singles.

It is difficult to delay or stop sexual intercourse, as sexual activity among unmarried youth and adolescents is very common and even increasing worldwide, mainly due to the trend of later marriage [23] [24]. Furthermore, imposing abstinence is not desirable from a human rights perspective, as sexuality is a positive human potential [25]. Lastly, there is scientific evidence that sexuality education programmes based on the abstinence-only principle are not effective in reducing adolescent sexual risk behaviour [26][27][25]. The high prevalence of sexual activity among youth is demonstrated by a recent article that provides a global summary of sexual behaviours among unmarried teens aged 15–19 [28]. In most countries more than 40% of the boys are sexually active. In the developed world and sub-Saharan Africa a third or more of unmarried adolescent girls have had sexual intercourse. In Latin America about 20% of unmarried girls have sexual experience.

Reducing the unmet contraceptive need of young unmarried people is likely to be more achievable [27]. The concept “unmet contraceptive need” is used to describe the gap between women’s reproductive intentions and their contraceptive behaviour. According to the definition used in the Millennium Development Goals (MDGs), women with unmet need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child [29]. The official MDG indicator for monitoring the unmet need for family planning only considers women who are married or in a consensual union. Consequently, official data on the unmet contraceptive need among unmarried women are not always available. Data regarding the sexual activity and contraceptive practices of single women are routinely collected in demographic surveys in Latin America and sub-Saharan Africa, but not in Asia or Northern Africa. However, Cleland et al. made estimates by examining local studies and compared unmet need among married and unmarried women in different regions [14].

In developing countries an estimated 52% of sexually active unmarried women are using a modern contraceptive, compared to 62% of married women [14]. The unmet need among unmarried women is 22%, compared to 12% among married women. Those differences suggest that other mechanisms play a part and that

Table 1.1: Sexually active unmarried and married women aged 15-49 with unmet contraceptive need in developing countries

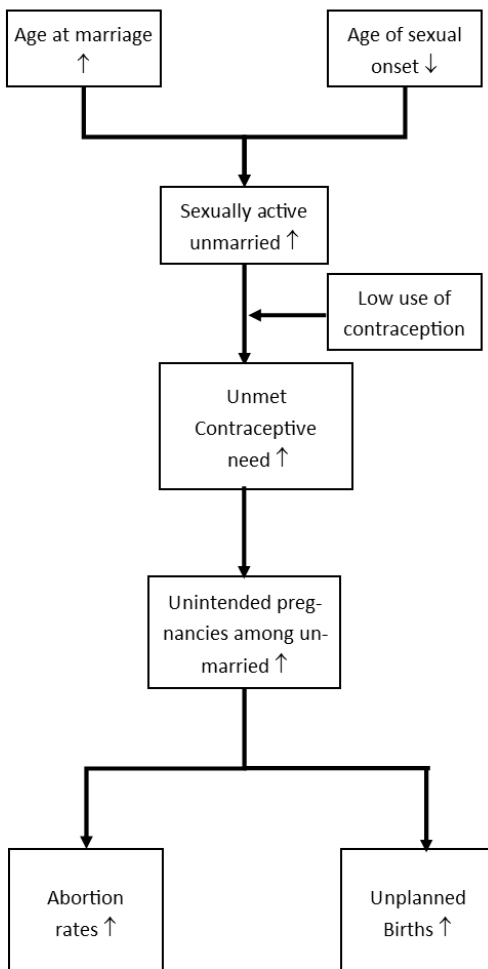
	Women having unmet need		Unmarried women among those with unmet need
	Unmarried	Married	
All developing countries	21.9	12.4	18.4
Africa	23.4	22.7	27.4
Eastern	25.4	25.5	32.6
Middle	25.0	25.7	35.0
Northern	18.9	15.3	23.6
Southern	12.8	15.2	35.0
Western	29.8	24.4	19.4
Asia	22.4	10.8	13.2
Central	22.6	13.5	24.9
Eastern	28.0	2.5	22.9
Southeastern	24.2	13.5	15.5
Southern	15.7	15.3	9.5
Western	12.7	14.7	15.1
Latin America and the Caribbean	19.1	11.9	22.7
Caribbean	26.2	17.8	22.0
Central America	17.2	12.6	26.6
South America	18.7	10.8	21.4

Source: Tabulations by the Guttmacher Institute [30].

a differentiated approach is needed when addressing the unmet contraceptive needs of singles and people in a union. The two regions with the largest differences in unmet contraceptive need between unmarried and married people (table 1.1) are Eastern Asia (China) and Latin America. In both regions many efforts have been made to make contraception available to married couples, resulting in a marked rise in the use of contraception by married couples. The unmet need for contraception among unmarried people, however, remains high. The research done for this doctoral dissertation focuses on these regions.

Figure 1.1 summarizes causes and consequences of the worldwide increase of unmet contraceptive need among singles. Larger proportions of unmarried populations are becoming sexually active due to 1) older age at marriage and 2) earlier onset of sexual activity. Many of the sexually active singles do not use a contraceptive method which leads to an increase in unintended pregnancies, abortions and unplanned births. The high unmet need for contraception among

Figure 1.1: Adolescents and unmarried youth: at risk of unmet contraceptive need



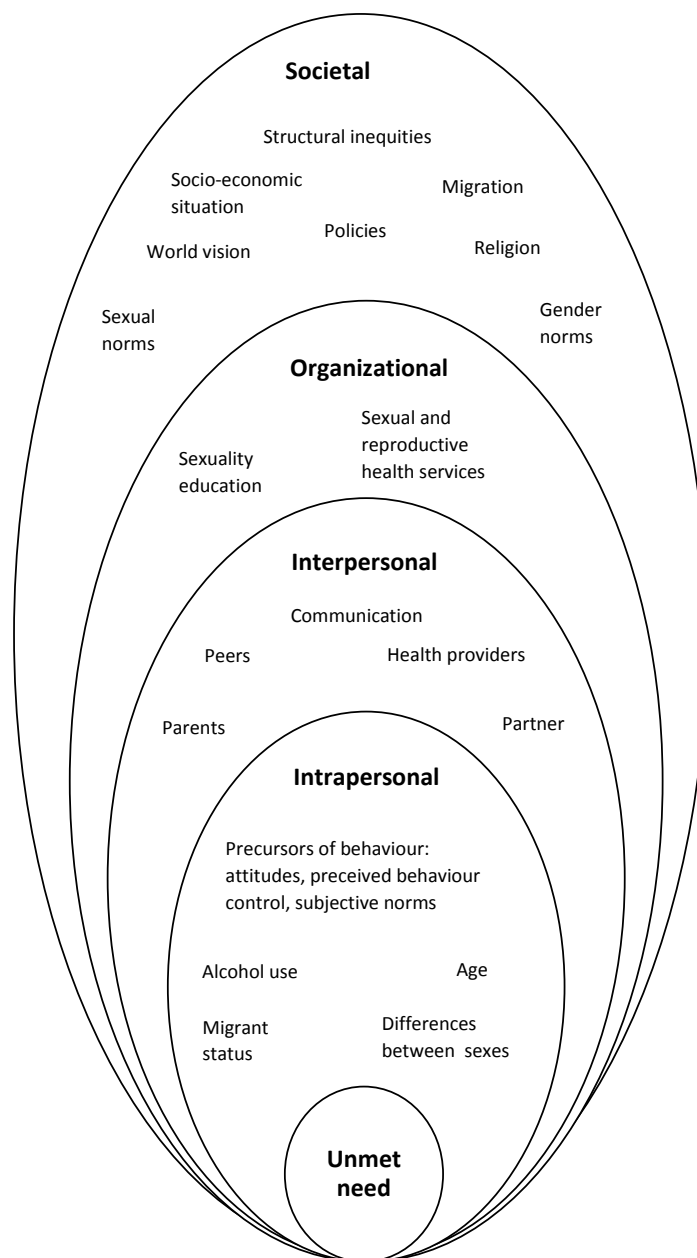
unmarried people should be a priority for future sexual and reproductive health (SRH) policies. In the first place a sound knowledge of the determinants of the sexual behaviours and contraceptive use of unmarried youth and adolescents is required to be able to develop efficient interventions.

1.2 Determinants of sexual activity and contraceptive use among unmarried people

In this chapter I will expand on the existing knowledge about the unmet contraceptive need among unmarried youth and adolescents. The pivotal behaviours that determine this need are sexual activity and contraceptive use. First, I will provide the available data on those behaviours among the study populations in China (young unmarried rural-to-urban migrants) and Latin America (adolescents from low-income families). Then I will describe some determinants of those behaviours. The socio-ecological model will be used as a framework for the classification of the determinants [31]. The model distinguishes five levels: intrapersonal, interpersonal, community and organizational, societal. The socio-ecological model is intrinsically dynamic. Determinants are interrelated and interdependent. Factors interact in manifold and complex ways.

Figure 1.2 and the following sections provide an overview of the most prominent determinants of unmet contraceptive need among singles in China and Latin America. The picture is not complete and only serves as an indication of the complexity of sexual behaviours. I will focus in this dissertation on those factors that are prominent in literature, relevant for programmes aiming at reducing unplanned pregnancies and applicable for the context of our research.

Figure 1.2: Determinants of unmet contraceptive need among unmarried youth and adolescents



1.2.1 Unmet contraceptive need of young unmarried rural-to-urban migrants in Chinese cities

In China, an estimated 147 million people have migrated from rural to urban areas over the last two decades in search of gainful employment [32]. Most of these internal migrants are employed in manual labour, including construction, manufacturing and service industries. Migration seems to have a negative effect on the SRH of the Chinese population and is considered a contributing factor to HIV in China [33]. Studies noted worse SRH indicators among internal migrants than among residents, with higher rates of induced abortions and HIV and sexually transmitted infections [32][34]. The poor SRH situation among rural-to-urban migrants can be explained by the fact that, compared to urban residents, they are more likely to engage in risky sexual behaviours (sex trade and multiple sexual partners) and have less access to SRH services [35][36]. One barrier to access is the high cost of health care for internal migrants in the city [37]. Most rural-to-urban migrants are not covered by health insurance, which implies greater out-of-pocket expense [38]. Similarly, studies from other contexts confirm that a migrant status entails SRH risks. Keygnaert et al. focused their research on the prevalence of sexual and gender-based violence among migrants in Europe and Morocco [39] [40] [41]. Other studies have shown that migrants access less SRH services [42] and have poorer pregnancy outcomes compared to non-migrants [43].

However, SRH vulnerability varies among rural-to-urban migrants in China. First, female internal migrants have fewer opportunities than their male peers to benefit from welfare provisions, as women mainly work in small, privately run factories and workshops or in the commercial sector. These workplaces are characterized by less social support, fewer services and limited union representation compared to the manufacturing and construction industries, which are traditionally employing men. Second, young unmarried rural-to-urban (YUR) migrants are more at risk of being involved in unintended pregnancies than their married peers. Studies show that a substantial proportion of singles are sexually active but that they use modern contraception less frequently than married people [44].

A recent survey provided data about reported sexual behaviours among 4389 migrant adolescents in three Chinese cities: 27.5% of the unmarried teens were sexually active (37.8% of males and 20.7% of females); the contraception rate among all married and unmarried sexually active migrant teenagers was 44.8%;

31.1% of the sexually active unmarried adolescents reported pregnancy; and 29.7% of the unmarried teens had a history of abortion [45].

The increased vulnerability of YUR-migrants to unintended pregnancy has particular implications concerning social inequity in a country with strict regulations on family size [46]. In Chinese society abortion is commonly accepted as a solution for unwanted pregnancies. However, the psychological impacts of abortion appear to be more considerable for unmarried women. As premarital sex is still censured by society, and virginity among brides highly valued, unmarried women undergoing abortions are often shunned and criticized [47]. Consequently, for a single woman an abortion may lead to social isolation, psychological distress and sexual dysfunction [48].

1.2.2 Unmet contraceptive need of adolescents in Latin America

The unmet contraceptive need of adolescents is increasing in Latin America. This trend is confirmed by a study comparing sexual behaviours of young single women in eight countries [49], using data from Demographic and Health Surveys conducted between 1990 and 2000. The authors found that the prevalence of virginity is declining and that the uptake of contraceptives by teenagers is increasing concomitantly. They concluded that this increase is not sufficient to compensate for the decline in virginity over time, leading to a growing unmet contraceptive need. Recent and reliable data on contraceptive use among unmarried adolescents in Latin America are scarce. According to national survey data from Nicaragua (2001) and Ecuador (2004), the prevalence of contraceptive use among sexually active youth aged 15–24 years was 63% in Nicaragua (married and unmarried) and 64% in Ecuador (married or cohabiting) [50]. Sources from grey literature stated that in Latin America fewer than 30% of teens use a contraceptive method in the first six months after sexual onset [51] and that about 40% of adolescents do not use contraception with a new partner because they do not have a contraceptive method available at the time of sexual intercourse [52].

Logically, the prevalence of teenage pregnancies in Latin America remains high. In 2012, Latin America had an adolescent fertility rate (births per 1000 females aged 15–19) of 69 births, compared to 110 in sub-Saharan Africa and 50 worldwide [1]. The birth rate among adolescents varies within the region,

ranging from 54 in Chile to 109 in Nicaragua. Latin America is the only region in the world where the number of births to girls under age 15 is increasing and is projected to rise through 2030 [1].

In many cases, the context in which teenage pregnancy occurs makes it difficult for the young mother to complete school and leads to adverse socio-economic consequences. As abortion remains highly restricted in most countries in Latin America, a young girl faced with an unwanted or unplanned pregnancy often chooses an illegal termination of the gestation. The rate of unsafe abortions in Latin America is 25 per 1000 girls aged 15–19 [53].

1.2.3 Determinants at intrapersonal level

Differences between sexes

Generally, boys are more sexually active than girls [28]. However, the difference in sexual activity between boys and girls is becoming smaller. A recent Demographic and Health Survey report shows that the proportion of sexually active adolescent women has grown in more than half of the countries surveyed, while the proportion of adolescent men reporting recent sexual intercourse has decreased slightly in the majority of countries [54].

We found data on differences between girls and boys in condom use. Generally, boys are more likely to engage in unprotected sexual activity [55]. Girls, however, tend to use condoms less frequently when they are in a stable relationship. This influence of partnership on condom use is not seen among boys [56]. There is also evidence that a state of sexual arousal decreases the intention to use condoms among girls, similarly as among boys [57][58][59]. Therefore, it is likely that women and men, when sexually aroused, are more similar in their sexual decision-making [60][61].

Alcohol use

The association of alcohol use with increased sexual risk behaviours is well documented [58][62]. Experimental research has generated knowledge on how alcohol consumption influences sexual decision-making.

According to the myopia theory, alcohol intoxication restricts attentional capacity so that people are highly influenced by the most cues in their environment

[63]. Sexual arousal is a powerful internal cue that might be intensified by the effect of alcohol. Intoxicated individuals are likely to focus mainly on their feelings of arousal, which limit their ability to consider potential risks [64].

Alcohol has a biphasic effect on sexual behaviour [65]. In the ascending phase, when the alcohol concentration in the blood is increasing, people feel euphoric and cognitively stimulated. The descending effects (lowering level of alcohol in blood) are characterized by reduced cognition and motor impairment, dysphoric mood, and fatigue. Sexual decision-making will depend on the phase of alcohol intoxication (ascending or descending). Individuals in the descending phase may thus be less prone to engage in sexual risk-taking than their ascending counterparts.

Precursors of behaviour

In his theory of planned behaviour [66] Ajzen identified internal precursors of human conduct, namely attitudes, subjective norms and perceived behavioural control (PBC). PBC is defined as ‘a person’s belief as to how easy or difficult performance of the behaviour is likely to be’. PBC reflects perceptions of one’s knowledge, skills and will-power. In literature, knowledge is traditionally considered as the crucial factor for adolescents’ and young adults’ sexual risk-taking [67][68]. However, knowledge about contraception has increased substantially over time in most countries. This increase has been demonstrated by a recent review showing that lack of knowledge is a key reason for non-use for only 2% of Latin American and Asian women aged 15–49 [69]. It seems that, globally, knowledge is becoming a less important determinant in unmet contraceptive need compared to other intra-personal factors [70].

1.2.4 Determinants at interpersonal level

Communication about sexuality and interactions with important others contribute to how individuals think and behave regarding sexuality [71]. **Parents** are key agents for teens’ sexual behaviour [72]. The relationships between adolescents and their parents and communication about sexuality have been associated with decreases in adolescent sexual activity and improved condom use [73][74]. Communication between teens and their parents mediates the effects of peers on adolescents’ sexual risk-taking [72]. To date, most studies have focused on how mothers influence adolescents’ sexual behaviour. Adolescents who talk with their mothers about sex-related topics are less likely to engage in

early sexual intercourse, report fewer lifetime sex partners, talk more often with their partners and use more condoms and other contraceptives [72][75]. Recent research suggests that fathers also influence the sexual behaviour of their adolescent children [76]. **Peers** are important providers of sexuality information [77], and peer-to-peer interaction influences attitudes and behaviours both positively and negatively [78]. Communication with **health care providers** on sexuality issues is often perceived as troublesome for both young and slightly older unmarried individuals, which negatively impacts the accessibility and use of contraceptive methods [79][80]. **Partner** communication predicts safe-sex practice [81]. However, it is often seen that women have a subordinate position, which weakens their negotiating power regarding condom use [82].

1.2.5 Determinants at community and organizational level

Sexual and reproductive health services

In many places, including in China and Latin America, health services only address married couples or mothers who already have a child [83] [84][50][85][86]. The reluctance to provide reproductive health services to unmarried people is noticeable at all levels of health systems: policymakers do not undertake legal and supportive measures to address the reproductive health needs of young unmarried people; at managerial level, local health authorities and service directors do not create the necessary organizational and structural conditions in health districts and health care facilities; and individual health care providers ignore or refuse requests for reproductive health services for unmarried people.

Sexuality education in schools

Comprehensive and developmentally appropriate sexuality education is the bedrock for decision-making regarding sexuality [27][87][88]. Experts and scientists agree on what entails good sexuality education [89][90][88][91]. However, conservative forces globally resist the provision of comprehensive sexuality education in schools that acknowledges the fact that adolescents are sexually active [92]. This is also the case in Europe: witness the opposition to the European Standards for Sexuality Education recently published by the World Health Organization [93].

Currently, secondary schools provide sexuality education in China and Latin America [94][95]. The Chinese Ministry of Education released new guidelines

for health education in primary and secondary schools in 2008 which aims at promoting adolescent sexual health and countering the associated social and public health problems [96]. Also in 2008, Latin American Ministers of Health and Education formulated a commitment to provide age-appropriate, accurate and sensitive sexuality education equipping young people and adolescents to make informed decisions [88][95].

The global trend to include sexuality education in the curricula of secondary schools is encouraging. However, as in many other regions, Chinese and Latin American governments still have a way to go to fulfil the recommendation of the Programme of Action of the 1994 International Conference on Population and Development regarding sexuality education. The so-called Cairo agenda explicitly prompts governments to provide comprehensive sexuality education to promote the well-being of adolescent. Such education should take place both in schools and at the community level, be age appropriate, begin as early as possible, and foster mature decision making [88]. In China sexuality education is mainly abstinence-based and limited to *ex cathedra* teaching on anatomical, physiological and hygienic aspects of human reproduction [95]. An evaluation of the sexuality education programmes of 27 Latin American countries showed that not all the important sexuality education topics were covered in secondary schools [94]. Issues related to differences in sexual orientation and sexual identity in particular are lacking. Furthermore, efforts are needed to assess the programmes' effectiveness and to periodically update content and materials according to the latest standards.

1.2.6 Determinants at societal level

Sexual norms

In many cultures sexual activity among unmarried people is still stigmatized as immoral and considered taboo. Moreover, the occurrence of non-marital sex is often denied or minimized. This denial can be seen in the incompleteness of official data on the sexual behaviour of unmarried people. Some national surveys do not include this population in their samples, and some surveys do not ask unmarried women the questions necessary to ascertain their sexual behaviour. To illustrate, a recent comparative Demographic and Health Survey report could not consistently provide data on trends of sexual behaviours of adolescents [54]. Eight of the 41 countries, situated in North Africa and Asia, did not collect data from unmarried women and men. The neglect of sexuality outside marriage is

also demonstrated by the fact that the MDG indicators assessing the use of contraceptives do not consider unmarried people in the definitions of unmet contraceptive need [97] and contraceptive prevalence.

The attempt to ignore premarital sex is probably inspired by the assumption that denying the existence of non-marital sex is a good strategy for avoiding it. Overall, conservative and religious groups exert pressure at all levels of society to impose their restrictive sexual norms [98][99]. The tendency to negate the existence of sex outside marriage not only contrasts sharply with the reality of singles' sexual behaviour but is also pernicious for the sexual well-being of a large and vulnerable population group, as they are denied access to information and services.

Gender norms

Societal gender norms shape the environment for individuals' sexual decision-making [100][101]. Findings from more than 10 studies in Asia, Africa and Latin America show that men with more gender-equitable norms were less likely to engage in risky sexual behaviour [102]. Other studies demonstrated that machismo and marianismo² are still hegemonic patterns within Chinese and Latin American societies and determine the unsafe sexual behaviour of young people and adolescents [85][101][103]. The link between gender inequity and unsafe sex might be explained by the fact that power imbalances complicates women's position when negotiating condom use [104].

World vision

Ethics, values and norms within communities are shaped by underlying philosophical structures and paradigms [105][106]. The world vision of many Chinese and Latin American citizens is determined by, respectively, Confucian and Christian principles.

Confucianism The Confucian philosophy can be considered the pillar of Chinese society and hence influences the sexual decision-making of Chinese citizens, including unmarried youth [107].

² veneration of feminine virtues such as purity and moral strength

The central principle of Confucianism is **harmony**, with an important focus on ethics and morality. Accordingly, people should be self-motivated and self-controlled and assume responsibilities which lead to a harmonious society [108].

The Confucian tradition follows a clear moral code regarding **sexual norms**: women should be passive and sexually innocent in relationships with men; and, in terms of sexuality, men and women should conduct themselves properly from an emotional distance at all times and not have any contact before marriage [107].

Another important principle of the Confucian ethos is **conformity** [109]. Individuals should conform to the benefits or expectations of the family and/or class to which they belong throughout their lives. Chinese people are socialized to adhere to the norms, rules and disciplines. They are conditioned to consider groups more than individuals. Individual needs are secondary to family and community needs, and communal decision-making is understood as important in maintaining harmony.

Gradually, aspects of Western culture are gaining ground in China [107]. China is at a **cultural crossroads**, with vast numbers of its population living in rural areas with minimal exposure to Western notions of individualism, while a substantial and growing population in urban areas is exposed to Western ideas of individualism. Among China's populations, young internal migrants are at the centre of this crossroads. Reared in rural families and communities adhering to traditional Chinese values, the young internal migrants are exposed to new values when migrating to the city, which challenges their views and attitudes on sexuality.

Religion Religiosity has a prominent influence on the world vision of many Latin Americans. The prevalence of religious affiliation, mostly to the Catholic and Evangelic Church, is high in the whole region, and a lot of people consider religion important in their lives [110].

Several studies have investigated whether **religion influences sexual behaviours** such as sexual onset and contraceptive use [111][112][113]. Most of them found associations between religiosity and sexual behaviours and attitudes. However, imputing non-use of contraception to Catholicism or another religion

is jumping to conclusions [113]. The patterns that shape religion's impact on sexual behaviour and contraceptive practice are complex and multidimensional.

Differences in religiosity determine differences in sexual behaviours and attitudes. In other words, the level of religiosity is the strongest predictor of sexual behaviour [112]. Literature data are not consistent on differences in sexual onset or condom use by religious group affiliation. Conversely, several studies have shown that individuals who adhere to their religion are more likely to report sexual abstinence and tend to perceive more barriers to condom use [114] [112] [115]. Individuals who follow their religions more closely are less likely to believe that condoms can prevent negative outcomes such as pregnancy or sexually transmitted infections and tend to have more conservative sexual attitudes [112].

Ethnographic fieldwork in Mexico concluded that cultural beliefs and **social contexts modify** the effect of religion on sexual decision-making [111]. People take theology into their own hands, interpreting Churches' dictates and regulations in ways that justify their reproductive practices. People seem to use religious frameworks creatively and flexibly.

A study among unmarried women in the USA illustrates that **differences in religious affiliation** might influence contraceptive behaviours. The results showed that Protestants were more likely to practise *ad hoc* methods than Catholics [116]. Followers of the Catholic faith more frequently used long-term methods which allowed them to conceal or mask their sexual engagement.

Policies

Governments and authorities play a significant role in creating the societal context for the sexual health of unmarried citizens. Knowing the drivers and attractors of policymakers might help to understand the (hidden or explicit) policy goals.

Chinese policies focus on the construction and maintenance of harmony within society and on the control of ethical principles [108]. The repudiation of sex outside the context of marriage is one of those principles that is reflected in the implementation of policies and might explain why policymakers are reluctant to provide SRH services to unmarried people and why sexuality

education programmes mainly focus on abstinence. Maintenance of harmony is also a driver for the one-child policy, meant to avoid societal imbalances as a threatening result of overpopulation. As there are no moral impediments to artificial pregnancy termination in China, it is logical that the government promotes induced abortion as the best option for pregnant singles.

Although all Latin American countries are secular, the Catholic Church still maintains close links with politics [117]. The influence of religion on political decision-making in the region is clearly noticeably in the restrictive laws regarding abortion. Nicaragua, the Dominican Republic and El Salvador have some of the toughest abortion laws in the world: artificial pregnancy termination is completely prohibited, even when the mother's life is in danger [118]. Despite these restrictions, 4 million abortions take place in Latin America each year [119]. Many of them are teenagers seeking unsafe and risky backstreet abortions.

1.3 Addressing the unmet contraceptive need of unmarried people

Reviews show that sexual health promotion programmes aiming to reduce unintended pregnancy among singles should go **beyond delaying sexual activity and address instead unmarried people's sexual health**³, including their unmet contraceptive need [89][27][87].

However, how to address the needs of unmarried individuals is unclear. Several studies tested single interventions aiming to increase the contraceptive use among adolescents [79][121][28]. Those studies assessed, amongst others, the use of new media, the promotion of youth-friendly health services or the involvement of families and communities. Effect evaluations of such single-targeted studies have shown a positive influence on knowledge, attitudes, intentions and other predictors of behaviour. To date, literature does not provide scientific

³According to the current working definition of the WHO, sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled [120]

evidence that single targeted interventions consistently lead to an impact on a sexual behaviour, such as contraceptive use. Single interventions seem useful but insufficient to ensure that individuals make healthy decisions about their reproductive behaviour. Therefore, scientists and experts agree that strategies aiming to change behaviours over the long term should be multifaceted and holistic [122][1][123] [124][125][28][126]. As sexual behaviours are determined by various interrelated personal and environmental factors, it is likely that an approach that targets this complexity will be more effective than single-level interventions [127]. In other words, the unmet needs of unmarried youth and adolescents should be addressed through multidisciplinary and **comprehensive approaches** that consider the social network and tackle structural factors.

Public health scientists recognize that health promotion programs need to be appropriate to the specific context in order to achieve behavioural change [128][129][130]. “What works best in a certain context’ differs according to factors including the geographical, cultural, socio-economic and political environment. Therefore, comprehensive interventions addressing unmet contraceptive needs of unmarried people should be **context specific**. The nuances and dynamics of local contexts should be taken into account for the development and implementation of comprehensive interventions.

1.4 Gaps in research

Worldwide, many young unmarried people and adolescents are at risk of unplanned pregnancy, which entails significant consequences for the well-being of mother and child. The high prevalence of unmet contraceptive need among singles is key in this. A series of factors at intrapersonal, interpersonal, community and societal level determine the sexual and contraceptive behaviours of young people and adolescents. Public health experts and scientists consent that comprehensive and context-specific interventions are best fitted to change behaviours of individuals. Specific intervention research inform policy-makers on how to address effectively the behaviours of unmarried people in order to reduce unplanned pregnancies. We identified gaps in research regarding the determinants of unmet contraceptive need of unmarried youth and adolescents in specific contexts, the effectiveness of comprehensive interventions and the impact of environmental factors on intervention outcomes.

Determinants of unmet contraceptive need of unmarried people in specific contexts

A good insight into the drivers of singles' sexual behaviours is crucial to be able to develop well-targeted interventions. We found considerable literature on the determinants of unmet contraceptive needs of unmarried people in general. However, little scientific information is available on contextual factors for unmarried youth and adolescents in specific contexts. We did neither find any article that reflected on differences between determinants from varying contexts.

Effectiveness of comprehensive interventions

In contrast to the number of single-target interventions that have been tested, only a few studies have assessed the effectiveness of comprehensive interventions addressing the contraceptive behaviour and condom use of unmarried youth and adolescents, and the results of those studies are inconsistent [131][132]. In addition, we did not find a consented approach on how such strategies should be developed and implemented. There is thus a need for research assessing the development, the implementation and outcomes of multicomponent interventions [121][126].

Impact of contextual factors on intervention outcomes

We have learned from literature that community and societal factors influence the sexual behaviour of unmarried people. In addition, it is likely that societal determinants also influence the effect of sexual health promotion programmes. Interventions that appear to be effective in one context for a particular target group might be unfeasible or ineffective in a different environment or for another target population. It is not appropriate to generalize results or draw general conclusions from one particular intervention study; therefore, there is a need to understand the context-specific dynamics between determinants, outcomes and interventions [133][128].

Chapter 2

Research objectives

2.1 General objective

Unintended pregnancy among adolescents and unmarried youth is a global challenge given the high prevalence and the negative consequences for the well-being of children and parents. The general objective of the study is to contribute to the knowledge on how to address the unmet contraceptive need of unmarried individuals by developing, implementing and evaluating comprehensive intervention programmes in different contexts.

2.2 Specific objectives

2.2.1 To assess factors that determine the unmet need among unmarried youth in China and adolescents in Latin America

According to the socio-ecological framework, unmet contraceptive need results from the interaction of factors at individual, interpersonal, community and societal level. In order to understand better the effect of the different factors we studied a series of determinants of sexual activity and contraceptive use in different contexts.

We chose China and Latin America, as in both countries the unmet need for contraception among unmarried people remains high, notwithstanding the

progress made in reducing the unmet need among married people (table 1.1). This suggests that the unmet contraceptive needs of unmarried and married people are driven by different factors and that different approaches are needed to address them.

The vulnerability to unplanned pregnancies among singles differs between the two regions. In China, young migrants from rural to urban areas are particularly vulnerable regarding their reproductive needs. In Latin America, many adolescents living in poor neighbourhoods are sexually active, and only few of them consistently use contraception. Notwithstanding considerable literature on the determinants of reproductive needs of unmarried people, knowledge is lacking on the particularities of the sexual behaviours of those specific populations. The aim is to understand and, ultimately, reduce societal inequities in contraceptive needs in both countries.

Research questions: What is the contraceptive prevalence? Which intrapersonal and interpersonal factors determine sexual activity and contraceptive use? How are these factors related to each other? What are the influences of the community and the societal context?

2.2.2 To assess the development, implementation and effect of comprehensive interventions

Up to date, evaluations of single interventions have not proven a consistent effect on the contraceptive use of unmarried people. Therefore, we hypothesized that comprehensive interventions addressing determinants of the sexual behaviour of unmarried youth and adolescents will lead to a reduction in unmet contraceptive needs. In order to test this hypothesis we developed, implemented and evaluated a comprehensive intervention in China and in Latin America. We decided to carry out an effect evaluation with the rationale that similar intervention programmes, if proven effective, can be reproduced in other contexts.

Research questions: How can comprehensive interventions be developed? What factors influence the effect of comprehensive interventions? What is the effect of comprehensive interventions on outcomes at individual and interpersonal level? What is the effect of comprehensive interventions on outcomes at community and societal level?

2.2.3 To reflect on differences in study results from two contexts

Interventions that work in one context do not necessarily work in another. Hence, setting research results from different environments side by side might generate new insights. Reflecting on the differences might answer the question ‘What works for whom in a particular context?’ We will reflect on and interpret the differences and formulate explanatory hypotheses that remain to be tested in future research.

Questions for reflection: What are differences in the research results from the two contexts? Which hypotheses can be formulated to explain the differences? What are the implications for future sexual interventions and research?

2.3 Presentation of publications

This thesis is based on a number of papers that have been published or are under review in international peer-reviewed journals. The manuscripts are presented in full in the Results section:

As first author:

1. Decat P, Zhang WH, Moyer E, Cheng Y, Wang ZJ, Lu CY, Wu SZ, Nadisauskiene R, Luchters S, Deveugele M, Temmerman M. *Determinants of unmet need for contraception among Chinese migrants: A worksite-based survey*. Eur J Contracept Reprod Health Care 2010 (IF 1.63)
2. Decat P, Zhang W, Delva W, Moyer E, Cheng Y, Wang Z, Lu C, Wu S, Nadisauskiene R, Temmerman M., Degomme O. *Promoting contraceptive use among female rural-to-urban migrants in Qingdao, China: a comparative impact study of worksite based interventions*. Eur J Contracept Reprod Health Care 2012 Oct 10 (IF 1.63)
3. Decat P, Nelson E, De Meyer S, Jaruseviciene L, Orozco M, Segura Z, Gorter A, Vega B, Cordova K, Maes L, Temmerman M, Leye E, Degomme O. *Community embedded reproductive health interventions for adolescents in Latin America: development and evaluation of a complex multi-centre intervention*. BMC Public Health. 2013 Jan 14;13(1):31. (IF 2.00)

4. Decat P, De Meyer S, Jaruseviciene L, Orozco M, Ibarra M, Segura Z, Medina J, Vega B, Michielsens K, Temmerman M, Degomme O. *Sexual onset and contraceptive use among adolescents from poor neighbourhoods in Managua, Nicaragua*. Eur J Contracept Reprod Health Care. 2014 Oct 20:1-13 (IF: 1.835)
5. Decat P, Ivanova O, Jaruseviciene L, De Meyer S, Ibarra M, Auquilla N, Vega B, Orozco M, Degomme O, Michielsens K. *Barriers for adolescent sexual healthcare in Latin America: perspective of caregivers*. In preparation.

As co-author:

1. Lu C, Xu L, Wu J, Wang Z, Decat P, Zhang WH, Chen Y, Moyer E, Wu S, Minkauskiene M, Van Braeckel D, Temmerman M. *Sexual and reproductive health status and related knowledge among female migrant workers in Guangzhou, China: a cross-sectional survey*. Eur J Obstet Gynaecol Reprod Biol. 2011 Nov 7 (IF 1.76)
2. He D, Zhou Y, Ji N, Wu S, Wang Z, Decat P, Moyer E, Minkauskiene M, Pang C, Cheng Y. *Study on sexual and reproductive health behaviors of unmarried female migrants in China*. J Obstet Gynaecol Res. 2012 Apr;38(4):632-638. Epub 2012 Mar 13. (IF 0.84)
3. Jaruseviciene P, Orozco M, Ibarra M, Cordova Ossio F, Vega B, Auquilla N, Medina J, Gorter A, Decat P, De Meyer S, Temmerman M, Edmonds A, Valius L, Lazarus J. *Primary healthcare providers' views on improving sexual and reproductive healthcare for adolescents in Bolivia, Ecuador, and Nicaragua*. Glob Health Action. 2013 May 6; 20444 (IF 1.267)
4. Jaruseviciene L, De Meyer S, Decat P, Zaborskis A, Degomme O, Rojas M, Hagens A, Auquilla N, Vega B, Gorter A, Orozco M, Lazarus J. *Factorial validation of the Attitudes toward Women Scale for Adolescents (AWSA) in assessing sexual behaviour patterns in Bolivian and Ecuadorian adolescents*. Glob Health Action. 2014 Vol 7 (IF 1.646)
5. Sara De Meyer, Lina Jaruseviciene, Apolinaras Zaborskis, Peter Decat, Bernardo Vega, Kathya Cordova, Marleen Temmerman, Olivier Degomme, Kristien Michielsens. *A cross-sectional study on attitudes towards gender equality, sexual behaviour, positive sexual experiences and communication*

about sex among sexually active and not sexually active adolescents in Bolivia and Ecuador. Glob Health Action. 2014 Jul 11;7:24089 (IF 1.646)

6. Gao X, Xu L, Lu C, Wu J, Wang Z, Decat P, Zhang WH, Chen Y, Moyer E, Wu S, Minkauskiene M, Van Braeckel D, Temmerman M. *Effect of improving the knowledge, attitude and practice of reproductive health among female migrant workers: a worksite-based intervention in Guangzhou, China.* Sex Health. 2014 Dec 4. (IF 1.576)
7. Cordova Pozo K, Chandra-Mouli V, Decat P, Nelson E, De Meyer S, Jaruseviciene L, Vega B, Segura Z, Auquilla N, Hagens A, Van Braeckel D, Michielsen K. *Improving adolescent sexual and reproductive health in Latin America: reflections from an International Congress.* Reprod Health. 2015 Jan 24;12:11.(IF 1.62)
8. Nelson E, Ballesteros M, Decat P, Edmonds A, Encalada D, Rodriguez O. *Sexual Communication in Conflict: Anthropological Dimensions of a Latin American Adolescent Sexual and Reproductive Health Project.* In preparation.
9. Ivanova O, De Meyer S, Cordova K, Segura Z, Vega B, Chandra-Mouli V, Hindin M, Decat P, Michielsen K. *Lessons learnt from the CERCA project, a comprehensive intervention study to promote adolescent sexual and reproductive health in three Latin America countries: A qualitative post-hoc evaluation.* In preparation.

Chapter 3

Methods

3.1 Introduction

The general objective of this thesis is to contribute to the knowledge on how the unmet contraceptive need of unmarried individuals could be addressed. To this end we will describe and analyse the results of two intervention studies addressing singles in different contexts - namely, YUR-migrants in Chinese factories and unmarried adolescents in Latin American cities. The methodologies applied in both studies have similarities and differences. Table 3.1 gives an overview of the research methodologies applied.

YOLAMI (young labour migrants in Chinese cities) was a conventional intervention study among female young rural-to-urban migrants. We included employees aged 18–29 from workplaces in two Chinese cities (Qingdao and Guangzhou). In a first step we conducted a cross-sectional quantitative survey in the workplaces, asking 4867 young female internal migrants to complete a questionnaire. Through those questions we tried to learn what young rural-to-urban migrants know about SRH and how they think and act. To complete this information, researchers had in depth interviews with migrants, health care providers and managers. We concluded this first phase of the project with stakeholder meetings, during which the action strategy was developed. It was decided to execute two kinds of interventions: a standard intervention targeting the community of migrant workers and a comprehensive intervention addressing the community and individual workers. The interventions ran in the workplaces

Table 3.1: Overview of research methodologies

		YOLAMI	CERCA
Overall methodology		intervention research conventional	intervention research AR and IM
Study population	sex age Study context	young rural-to-urban migrants females 18-29 factories	adolescents males and females 13-18 schools and communities
Situation analysis		Mixed research	Mixed research
comprehensive intervention strategy	participatory approach behavioural theories target population contextualization adaptability duration	limited participation not theory-based community and individuals decontextualized static 6 months	strong participation TPB and SCT Multi-level tailored to the context dynamic 18 months
effect evaluation	control group individual outcomes community and societal outcomes	standard intervention cross-sectional data limited qualitative data	no intervention longitudinal data <i>post hoc</i> process evaluation

AR = Action Research; IM = Intervention Mapping; TPB = Theory of Planned Behaviour; SCT = Social Cognitive Theory

from August 2008 until March 2009. After the interventions we presented new questionnaires to migrant workers with the aim of evaluating the effect of the interventions on their SRH. We assessed the differences in behaviour across the two study arms of the cross-sectional surveys. Interviews with migrant workers and managers provided additional information about how the interventions were perceived.

The CERCA (community-embedded reproductive health care for adolescents in Latin American cities) research built on the methodological frameworks of intervention mapping (IM)[134], participatory research [135] and action research (AR) [136]. The study focused on teenagers in poor neighbourhoods in Managua (Nicaragua) and students from secondary schools in Cuenca (Ecuador) and Cochabamba (Bolivia). To gather information on the determinants of adolescents' sexual health we collected and assessed quantitative and qualitative data. The action strategy was developed in close collaboration with the different stakeholders and was based on behavioural theories. The interventions, running from August 2011 until April 2013, addressed communities and indi-

viduals (teens, parents, health care providers, authorities and teachers) and were continuously adapted to the context. Their effectiveness was evaluated through a nested cohort analysis that compared the evolution of the behaviours of adolescents' in intervention and control groups. A *post hoc* process evaluation assessed the effect of the intervention on community and societal outcomes.

3.2 YOLAMI: young labour migrants in Chinese cities: a pilot intervention study

3.2.1 Study sites

The two cities, Qingdao and Guangzhou, were selected based on their large migrant population and their proximity to the participating Chinese research institutes.

Qingdao is situated in the eastern Shandong Province, about 550km south-east of Beijing. According to the 2010 census, the metropolitan area had more than 5 million inhabitants [137]. The manufacturing industry has attracted about 2.1 million internal migrants.

Guangzhou is the third-largest city in China and the capital of Guangdong province in southern China. The city is located on the Pearl River about 120km north-northwest of Hong Kong. The administrative area has a population of about 12 million people, of whom 2.3 million are non-residents [137]. Guangzhou was the first open city in China. Citizens from this city are more influenced by Western culture and values than people living in other regions of the Chinese mainland [138].

3.2.2 Situation analysis

The first phase consisted of an assessment of young internal migrants' SRH needs and barriers to SRH care through literature review and through qualitative and quantitative research.

Qualitative research

The qualitative study was conducted at the outset of the study to understand and contextualize the SRH needs of diverse groups of Chinese migrant workers,

including those working in construction, in high- and low-skilled factory jobs and in the service industry. The main research method was in-depth interviewing following structured questionnaires carried out in the workplace by teams of trained interviewers. Overall, a total of 90 workers belonging to different sectors and hierarchical levels were interviewed. In addition, researchers conducted structured observation of the workplaces, focusing on the availability and visibility of SRH information and services. These findings were used to inform the questions for the quantitative survey as well as to shape the form and content of the interventions.

Baseline survey

A baseline survey was conducted among 4867 female young rural-to-urban migrants at their workplaces. The sites were randomly chosen from a list of workplaces that met previously defined criteria related to the location and the number of migrants employed. Eight workplaces in Guangzhou and 10 in Qingdao were included. At each of the sites, all female workers between 18 and 29 years old, originating from rural areas and who volunteered to participate in the survey were enrolled. During lunch and dinner time, trained collaborators interviewed the women in a confidential room. Most interviews started with face-to-face questioning and ended with the respondents addressing more sensitive questions in writing. The questionnaire assessed their socio-demographic characteristics, sexual behaviours and precursors of those behaviours. In the data analysis a multivariable logistic regression was used to identify determinants of the unmet need for contraception.

3.2.3 Development and implementation of a comprehensive intervention strategy

We attempted to develop the comprehensive intervention strategy through a participatory approach. The results of the situation analysis were discussed between beneficiaries, employers, authorities, health care providers and researchers during workshops. Feasible interventions were identified. Based on those discussions the researchers developed an operational plan and monitoring tools for a package of comprehensive interventions. A participatory approach with the involvement of stakeholders in decision-making is innovative for the Chinese context, which is characterized by a hierarchical structure and a long-standing tradition of top-down decisions.

The comprehensive intervention strategy combined a standard package of community-based SRH promotion with targeted actions addressing individual migrant workers. The standard package corresponded to the common SRH promotion programmes in China and consisted of the monthly distribution of brochures to migrants, free condom distribution once a month and information posted in public places. The additional interventions that addressed individual workers aimed to facilitate access to personalized SRH information and services, promote interpersonal interaction between young rural-to-urban migrants and health professionals and enhance knowledge transfer by peers. A hotline was installed that offered SRH counselling over the telephone, and all workers received VIP cards which entitled them to pay less for SRH services. Health care providers from a local family planning service visited the sites every two weeks. During each visit the health care professionals gave a 30-minute lecture on an SRH theme, an informative video was shown, migrant workers had the opportunity for a face-to-face consultation with a health care provider, and an informative and instructive session was organized for selected peer educators. Except for the lectures, all activities took place outside working hours, and the workers were free to participate or not. At each site about 30 peer educators were trained. They were encouraged to discuss SRH issues informally with their colleagues.

The interventions were implemented simultaneously (July 2008 to January 2009) in a standardized way in all the factories. The protocols and monitoring forms helped to maintain uniformity of implementation between the different intervention sites.

3.2.4 Effect evaluation of the comprehensive interventions

Individual outcomes

An experimental design with intervention groups and control groups was applied to evaluate the effectiveness of the interventions on contraceptive use. The selected workplaces were randomly allocated to an intervention group (comprehensive package of interventions) and a control group (standard package of community interventions). Data were collected through cross-sectional enquiries which were conducted before (baseline) and after (end line) the interventions. The post-intervention questionnaire was identical to the pre-intervention questionnaire. For the analysis of the study in Qingdao we took into account the data from sexually active women without pregnancy intention. From the stan-

dard intervention arm (control), 721 and 615 respondents of were considered for, respectively, baseline and end line. From the intensive intervention group, the data of 684 (baseline) and 603 (end line) respondents were analysed. Consistent contraceptive use was the primary outcome variable. The secondary outcomes were indicators related to health-seeking behaviour, and the ease of communication about SRH with friends and a doctor. Logistic regression models were applied to evaluate the impact of the interventions. Specifically, we assessed the null hypothesis of equal pre- and post-intervention trends in reported consistent contraceptive use across both study arms.

Evaluation of community and societal outcomes

After the completion of the interventions, researchers returned to the study sites to interview people who had been employed there during the time of the interventions, to gain an insight into the ongoing impact of the intervention efforts. In Qingdao post-intervention interviews were conducted with 20 female workers at two study sites. In Guangzhou 37 women from four different factories were interviewed.

3.3 CERCA: Community-embedded reproductive health interventions for adolescents in Latin America

3.3.1 Study sites: three Latin American cities

The intervention research was conducted in three Latin American countries with a high prevalence of teenage pregnancy. The prevention of unwanted early pregnancies is a national priority in all of them [139][140]. Local teams conducted the studies in poor neighbourhoods in Managua (Nicaragua) and in secondary schools in Cuenca (Ecuador) and Cochabamba (Bolivia). The three cities have large teenage populations whose SRH situation is representative of urban adolescents in the region of the Andes (Cochabamba and Cuenca) and Central America (Managua). In 2006 **Managua** had 937,489 inhabitants, with 206,247 adolescents and 44% poor people as defined by the Unsatisfied Basic Needs index. According to projections for 2009, the city of **Cochabamba** had 611,025 citizens. About 47% of the population in Cochabamba are poor. **Cuenca** is one of the more prosperous cities in Ecuador (32% poor people), with a population of 402,000 inhabitants.

3.3.2 Situation analysis

During the first year a situation analysis was conducted in the research settings to assess the SRH needs of adolescents. The conceptual framework of social health determinants [141] [142] was used to identify and to analyse the SRH problems of teenagers and the means and activities to address them. We started our research from the basic principle that inequalities in the distribution of social determinants (housing, education, employment, transport, sanitation, social services etc.) lead to ill-health and health inequity.

Qualitative research

In the pre-intervention phase of the project we applied both participatory and researcher-led qualitative methodologies to better understand the specific adolescent SRH needs of communities at all three sites. The participatory ethnographic research was modelled on the 'PEER' method pioneered by Kirstan Hawkins and Neil Price of the University of Wales [143]. This method involved the training of volunteers from the community in collaborative research design and basic interview techniques over the course of a weekend, followed by a week- or two-week-long period during which they conducted interviews with their 'peers' (family, friends, neighbours), and concluding with an analysis workshop where findings are shared and discussed.

In addition to the use of the 'PEER' approach, more traditional qualitative research methods were applied to the pre-intervention situation analysis, including focus group discussions using gender-specific facilitation guides (with separate groups of young women and young men, aged 14–17), in-depth semi-structured interviews with health care professionals and community leaders, and participant observation at target intervention sites.

Quantitative research

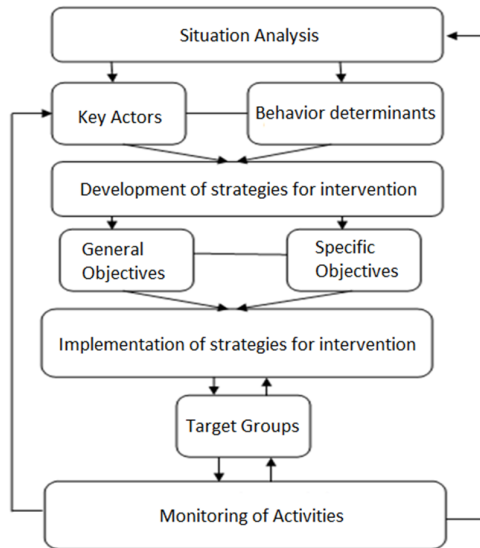
In July and August 2011, surveys were conducted among 2803 adolescents from poor neighbourhoods in Managua and among 3512 and 2401 secondary school students in, respectively, Bolivia and Ecuador. Adolescents completed a questionnaire on sexual behaviours and on the possible determinants of those behaviours. The data collected were analysed through univariate and multivariate logistic regression assessing intrapersonal and interpersonal factors related to sexual onset, contraceptive use and other sexual-health-related outcomes.

3.3.3 Development and implementation of a comprehensive intervention strategy

Intervention design

The developmental process of the intervention strategy had a community focus, was based on behavioural theories, was centred on personal needs and aligned with health systems. As shown in figure 3.1, the process did not develop chronologically: the different phases interacted continuously, generating periodical amendments.

Figure 3.1: The dynamics of the intervention design process



Intervention objectives

The comprehensive mapping of health determinants during the situation analysis and the consultations with stakeholders resulted in the formulation of four specific intervention objectives: 1) adolescents communicate on their SRH with parents, partners and among peers; 2) adolescents access and receive accurate information on SRH; 3) adolescents make use of SRH services within primary health care; and 4) adolescents consistently use modern contraceptive methods.

Intervention characteristics

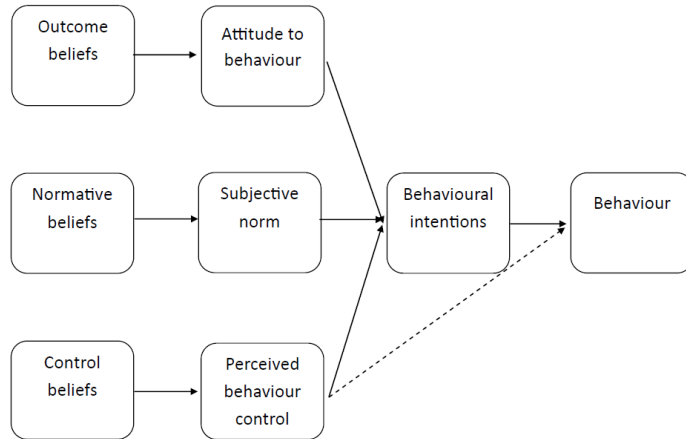
Complexity A public health problem is determined by a series of factors. Therefore, an effective strategy tackles a specific situation with a multi-focused approach, taking into account the complexity of health problems and acting on different determinants. Nevertheless, at the same time it is crucial to weigh up the viability of the strategies and avoid getting lost in the abundance of determinants. The ecological model was used as a conceptual framework as it acknowledges the influence of multiple contexts on health behaviours, including the SRH behaviour of unmarried people [144], [127].

Participation A core principle of the CERCA strategy was ‘community-embeddedness’, which means developing and implementing project objectives in close collaboration with adolescents, their parents/grandparents and family members, health care providers, teachers, local leaders and public health authorities at each of the selected project sites. In practice, the degree of local stakeholder participation varied due to the different degrees of previous experience of a participatory approach among consortium partners. However, all consortium partners endeavoured to develop and implement project activities with the support and input of community members, with the aim of increasing the efficacy and sustainability of project interventions. To this end, community advisory boards have been established at all three CERCA sites. At the national level, staff from Ministries of Health, experts and members of international and local non-governmental organizations (NGOs) participated in community board meetings. Community leaders, adolescents, youth educators and parents were involved at the local level. The participation of national and community stakeholders in the advisory committees established purposely for CERCA enabled the feeling of ownership.

Based on behavioural theories In order to achieve CERCA intervention objectives, consortium partners identified relevant theoretical models and strategies. Specifically, the Theory of Planned Behaviour [66] (figure 3.2) and the Social Cognitive Theory [145] frameworks were used to develop and design intervention strategies.

Recent studies have demonstrated the ways in which both theories can successfully promote safe sexual behaviour [146][147][148]. The Theory of Planned Behaviour (TPB) has proven effective for influencing adolescents’ behaviour with regard to modern contraceptive use and health-seeking behaviours. The

Figure 3.2: The theory of planned behaviour



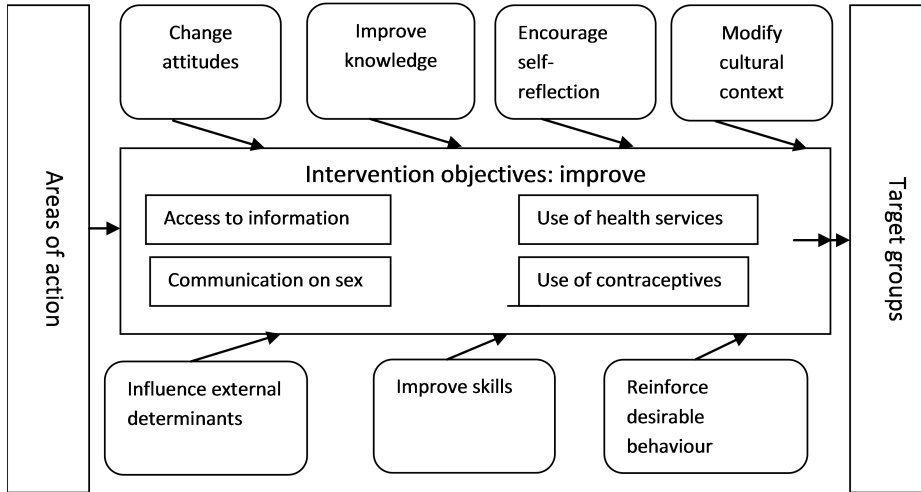
Social Cognitive Theory was useful for the development of strategies to improve interpersonal communication. The theories helped to identify the theoretical predictors of behaviour and areas of actions (figure 3.3) that should be targeted to achieve behaviour change.

The predictors of behaviour to be addressed were knowledge, perceived risk, attitudes, skills, self-efficacy, intentions and subjective norms (individuals' perceptions of the predominant views of appropriate behaviour).

Contextualization The approach used to address a health problem depends greatly on the context. The strategy for the same problem can differ widely in its implementation according to factors including its geographical, cultural, socio-economic and political environment. It is neither possible nor advisable to implement identical interventions in different realities. We did not aim to ensure reproducibility or generalizability.

The nuances of local cultural norms and site-specific power dynamics were taken into account for the development and implementation of interventions.

Figure 3.3: Areas of action



Another aspect of the contextualization was the concern to develop intervention activities in line with existing health system structures and government policies. Given the diverse nature of health systems in each of the three CERCA countries, the interventions at the level of health facilities looked quite different.

Lastly, as the contexts are changeable over time, the nature of the implementation process was dynamic. There was a continuous need to monitor and evaluate the interventions in order to adjust the activities.

Gender focus Gender was a transversal topic throughout the intervention process, as there is evidence that the more gender considerations are integrated and explicitly addressed within programmes, the greater the likelihood of improved SRH outcomes for both young men and women. In practice, considering gender within the project referred mainly to improving equality between boys and girls and taking into account the different perspectives and experiences of girls and boys, women and men. Between countries, there were methodological and content differences in treating gender. This is a logical consequence of the different perspectives and experiences that exist among and within local teams

and which reflect societal diversity. During consortium meetings gender aspects and other ethical issues were repeatedly discussed. This resulted in a progressive evolution towards more converging attitudes and viewpoints.

Multidisciplinary approach The CERCA strategy drew on multiple disciplines, including Western medicine, epidemiology, sociology, anthropology, demography and political sciences, in the design and development of the city-specific interventions. While the content and the focus of each intervention strategy varied according to the disciplinary strengths of the local teams, all members of the CERCA consortium worked to incorporate multiple perspectives on adolescent SRH in their decision-making processes. This required team members to go beyond their disciplinary comfort zones and think in new ways about the challenges of adolescent SRH specific to their target areas.

The interventions

Interventions targeting adolescents In Managua, due to the relatively high incidence of teenagers out of school in the selected low-income target neighbourhoods, the stakeholders decided to carry out intervention activities at the community level. In Cuenca and Cochabamba, the local partners chose a high-school-focused intervention strategy, conducting SRH workshops and facilitating youth groups in classrooms and school auditoriums. In Managua, Friends of Youth (FoY) were selected. FoY are young adults intensively trained in SRH. They served as mentors to the adolescents in their community, helped them build their competence in making deliberate choices and, when needed, referred and even accompanied teens to an appropriate health care provider. In addition to the one-to-one interaction with adolescents, the FoY also supported community activities including workshops, exhibitions, street theatre, movie screenings and awareness-raising campaigns. The FoY were supervised by the programme implementers of the research team. They received small financial incentives.

In Cuenca and Cochabamba there was no FoY strategy in place. Young professionals, psychologists and social workers organized similar activities as the FoY did in Managua. In Cuenca older adolescents participated in capacity-building exercises so that they might provide peer support on SRH issues to their friends and schoolmates. New media were also extensively used in the intervention strategy to reach adolescents, particularly Facebook and mobile phone messages. This delivers preventive health care to teenagers who do not

Table 3.2: Interventions targeting adolescents from secondary schools in Cochabamba, Bolivia

Type of activity	Number	Number of beneficiaries
Workshops on sexual awareness, communication, search for information, self-esteem, decision taking, conflict management	4 types of workshops in the 4 last classes of 12 schools	2774 students 102 classes 405 workshops in total
e-mails with SRH	8 types of e-mails	received by 500 students
SMS with SRH info	8 types of SMS	sent to 1823 students
In school consultation by physician and psychologist offering counseling and family planning methods	1 time every two weeks during 7 months	283 students

access health centres due to stigma, taboo, costs or waiting time. These communication methods were used less in Managua than Cuenca and Cochabamba, as adolescents from low-income neighbourhoods in Nicaragua have less access to these new media.

Interventions targeting parents and adult family members At each of the three project sites, consortium partners delivered the CERCA message to the parents, grandparents and significant adults of adolescents through a combination of media campaigns, workshops (at schools, health centres and community centres) and discussion groups. In Managua the local partner creatively negotiated the initial resistance to open discussion of adolescent SRH issues by carrying out home visits and informal talks in target neighbourhoods. Similarly, in Cuenca the University of Cuenca recruited parents following blanket workshops at high schools to participate in discussion groups and share information on the project with friends and neighbours.

Intervention targeting health care providers and health centres Interventions included workshops and virtual learning activities. Health care providers were trained in patient-centredness, focusing on characteristics of a good provider–patient communication such as empathy, courtesy, friendliness, reassurance, support, encouraging patients’ participation, giving explanations, positive reinforcement, shared decision-making and patient-centred verbal styles. An educational programme with role plays, videotaped vignettes of simulated patient interactions and feedback on participants’ own recorded con-

sultations was implemented to teach communication skills. In order to improve other competences among providers, existing national and international guidelines on providing SRH services to adolescents were presented and discussed during workshops. In peer sessions they were encouraged to reflect on their own attitudes, values and beliefs on teenage sexuality and how these might affect their work with adolescents. In case of problems with the supply chain, CERCA ensured the permanent availability of contraceptives in the health centres. At the same time, outreach activities were intensified. Health care providers visited schools and communities and offered counselling and contraception to teens.

Interventions targeting local authorities In order to better involve local authorities (public health officials, religious leaders, school prefects, municipal and regional government representatives) in the interventions, consortium partners conducted continuous information and outreach campaigns. Specifically, they carried out both formal and informal visits to discuss objectives, organized information events, produced and disseminated newsletters and reports, and in Cuenca and Cochabamba helped to form an SRH advocacy and advisory committee. These activities endeavoured to increase knowledge of the intervention objectives and actions and to encourage pro-adolescent SRH decision-making and policy changes at local, municipal and regional levels.

Interventions targeting community members CERCA consortium partners in all three cities sought to create an environment conducive to adolescent SRH behaviours by encouraging positive changes in attitudes, knowledge and practice at the community level. Specific intervention strategies include the organization of sports and cultural events where information on the CERCA strategy was distributed and promoted, the implementation of SRH education and awareness-raising media campaigns and community health fairs, and by continuously seeking the involvement of local community members in activities. In Managua, the local implementing partner sponsored a soccer tournament involving competing target neighbourhoods, garnering significant local media coverage in the process. In Cuenca, the local partner sponsored events such as a 10km running race and a youth SRH video competition to build awareness and support for the project. In Cochabamba, the implementers collaborated with other local SRH-focused NGOs to host an HIV/AIDS and SRH awareness fair for all high schools in the area. In addition to these on-the-ground activities, CERCA partners have used Facebook, text messaging and radio campaigns to keep community members up to date on project activities.

Interventions in the different cities Table 3.2 shows the activities addressing secondary school students in Cochabamba (Bolivia). Table 3.3 summarizes all interventions conducted in Ecuador with target groups, types of activities and number of beneficiaries. A video documentary has been made about the strategy implementation in Nicaragua.

See: <http://www.youtube.com/watch?v=cXzx5rzdlc8>.

Table 3.3: Interventions by target group in Cuenca, Ecuador

Target group	Activities	Target group	Activities	
Health authorities	Meetings	Adolescents	Sport events	
	Round tables		Workshops	
	Debates		Debates	
	Cultural events		Meetings	
Health providers	Workshops		Cine forum	Health fair
	Debates		Facebook	Help line
	In service training		SMS	Email
			Radio play	TV spots
Parents	Debates		Radio spots	Promo material
	Workshops		Promo material	Medical counseling
	Meetings			
	Cultural events			
	Promo material			
Teachers	Workshops	Community	Cine forum	
	Meetings		Meetings	
	Health fair		Concert	
	Cultural event		Health fair	
Community leaders	Meetings		Promo material	Sport events

3.3.4 Effect evaluation of the comprehensive interventions

Individual and interpersonal outcomes

As in the YOLAMI study, an experimental design was applied to measure the effect of the interventions on the behaviours of adolescents. We studied how behavioural outcomes evolved between the baseline and the 18-month mark. The

behavioural outcomes were assessed through surveys among the study population.

In Managua we applied a semi-randomized controlled study using town districts as selection units. Of the 33 town districts which complied with previously defined inclusion criteria, 18 were randomly allocated to an intervention arm and a control (no intervention) arm. In Cuenca and Cochabamba the surveys were carried out at local high schools. In those cities a random allocation to an intervention and control group was not possible, as the intervention could only be embedded in health centres that were allied with the research group.

Behavioural outcomes related to communication on sexuality, condom use and access to SRH services. We analysed the evolution of outcomes of a nested cohort of 2643 re-surveyed adolescents and compared the control and intervention groups.

Given the variability and the dynamic character of the interventions, we aimed to evaluate the effectiveness of the strategy as a whole rather than attributing the result to a single action.

Community and societal outcomes

Once the intervention period was under way, peer group discussions were used to assess the progress of the intervention. Peer group discussions are similar to focus group discussions but consist of repeat sessions with the same group. In contrast to focus group discussions, the repetition of engagement engenders relationships of trust and provides a dynamic understanding of change over time, validate reports, and help to evaluate complex or sensitive topics. The use of periodic peer group discussions, carried out at all three research sites within a similar time-frame and with identical facilitation guides, not only contributed to the evaluation and understanding of complex issues related to adolescent SRH but also provided consortium partners with direct feedback on the project from its participants.

In the final phase of the interventions semi-structured interviews were conducted with teens, adults involved in the project as parents/grandparents, and health workers. In addition, focus group discussions for mixed groups of adults

and adolescents and a rapid participatory ethnographic research process centring on communication and giving advice were implemented. Interviewees, peer group discussants and participatory researchers were recruited from the areas where we had built relationships via the work of the ‘community committees’.

A *post hoc* process evaluation has been conducted between October 2014 and January 2015. Qualitative data were collected through key informant interviews and through focus groups with adolescents, parents, teachers, community leaders, peer educators, health care providers, project leaders, country implementers and consortium management. A main goal of this *post hoc* study is to assess how stakeholders perceived the interventions and their impact on the communities.

3.3.5 Published study protocol

Paper 1

Decat P, Nelson E, De Meyer S, Jaruseviciene L, Orozco M, Segura Z, Gorter A, Vega B, Cordova K, Maes L, Temmerman M, Leye E, Degomme O. *Community embedded reproductive health interventions for adolescents in Latin America: development and evaluation of a complex multi-centre intervention*. BMC Public Health. 2013 Jan 14;13(1):31.

This article describes the development, implementation and evaluation design of the community-embedded reproductive health care for adolescents (CERCA) study in the three Latin American cities. Project CERCA’s research methodology builds on existing methodological frameworks, namely: action research, community based participatory research and intervention-mapping. The paper is presented in full hereafter.

STUDY PROTOCOL**Open Access**

Community embedded reproductive health interventions for adolescents in Latin America: development and evaluation of a complex multi-centre intervention

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Abstract

Background: Adolescents in Latin America are at high risk for unwanted and unplanned pregnancies, which often result in unsafe abortions or poor maternal health outcomes. Both young men and women in the region face an increased risk of sexually transmitted infections due to inadequate sexual and reproductive health information, services and counselling. To date, many adolescent health programmes have targeted a single determinant of sexual and reproductive health. However, recent evidence suggests that the complexity of sexual and reproductive health issues demands an equally multi-layered and comprehensive approach.

Methods: This article describes the development, implementation and evaluation design of the community-embedded reproductive health care for adolescents (CERCA) study in three Latin American cities: Cochabamba (Bolivia), Cuenca (Ecuador) and Managua (Nicaragua). Project CERCA's research methodology builds on existing methodological frameworks, namely: action research, community based participatory research and intervention-mapping.

The interventions in each country address distinct target groups (adolescents, parents, local authorities and health providers) and seek improvement of the following sexual health behaviours: communication about sexuality, sexual and reproductive health information-seeking, access to sexual and reproductive health care and safe sexual relationships.

In Managua, we implemented a randomised controlled study, and in Cochabamba and Cuenca we adopted a non-randomised controlled study to evaluate the effectiveness of Project CERCA interventions, in addition to a process evaluation.

Discussion: This research will result in a methodological framework that will contribute to the improved design and implementation of future adolescent sexual and reproductive health interventions.

Trial registration: ClinicalTrials.gov (NCT01722084)

Keywords: Reproductive health, Sexual behaviour, Adolescents, Latin America, Community based participatory research, Intervention mapping, Action research, Research design

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Background

In Latin America, 10 – 19 aged adolescents [1] are confronted with serious sexual and reproductive health (SRH) problems. Studies show that in Latin America adolescents initiate sexual activity at increasingly earlier ages and that only a minority of sexually active adolescents is taking any precaution for preventing sexually transmitted infections (STI) or pregnancy [2]. Data from 2001 showed that almost 50% of Nicaraguan women aged 20 – 24 gave birth for the first time before their 20th birthdate and a significant proportion of these pregnancies were unwanted [3]. Conception rates among sexually active single women aged 15–24 range from 14.1 per 100 woman-years in Nicaragua to 25.8 in Bolivia [2]. Early and unwanted pregnancies are linked to school drop-outs and have been steadily increasing among unmarried persons or those not in a stable union. A concurrent increase in abortion rates is to be expected. However, abortion is severely underreported because of its illegality in Latin American countries. In Brazil, Colombia, Dominican Republic and Peru between 10 and 21% of the hospitalisations for complications arising from unsafe abortion occurred among women aged 15–19 years [4]. These data suggest the number of induced abortions per 100 pregnancies ranges from 23 to 30 [4]. The magnitude of the STI and HIV epidemic in the region is also difficult to measure, due to limited data, underreporting, and weak surveillance systems [5].

Traditionally, adolescent health programmes aiming to prevent unwanted pregnancies and HIV/STI have targeted individual SRH issues despite the fact that changing health attitudes and behaviours demand a multidisciplinary and comprehensive approach [6]. For example, an intervention that proposes to improve access to SRH information and services may, in choosing such a unilateral approach, fail to achieve its desired objectives. Work in the field of HIV prevention has demonstrated that complex health issues which bisect socio-economic, geographic and gender inequities require culturally-informed, site-specific, and multidisciplinary responses [7]. Given the relatively new interest in adolescent sexual and reproductive health (ASRH) as a separate category within the broader field of maternal health and SRH, we do not yet have substantial evidence on what works best when taking a comprehensive approach [8]. The assessment of complex intervention strategies poses an additional challenge [9]. Studies which use an evaluation approach to measure impact of interventions in a continuously shifting social and cultural context are needed [10].

In response to this established need, we focus here on the development, implementation and evaluation design of the community-embedded reproductive health care for adolescents (CERCA) study (www.proyectocerca.org). Project CERCA is a multicentre study coordinated

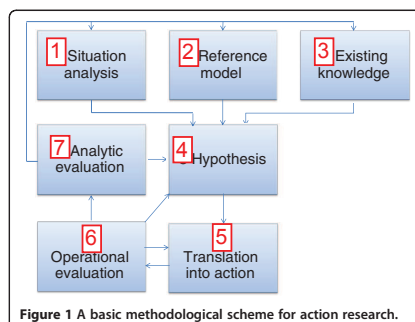
by the International Centre of Reproductive Health (ICRH) of the Ghent University. The CERCA study constitutes intervention research as it aims to develop and evaluate complex interventions that seek to improve access to, and the use of, SRH services by adolescents [11]. CERCA is based on the hypothesis that a comprehensive strategy of community-embedded interventions will improve the SRH and wellbeing of adolescents in target areas. The CERCA study, which runs from 2010 till 2014, will test this hypothesis in selected research settings in three Latin American cities: Cochabamba, Bolivia; Cuenca, Ecuador; and, Managua, Nicaragua. This intervention research will result in the development of a framework that will contribute to the planning of future SRH interventions which are both effective and responsive to target populations' established needs.

Methods

Methodological frameworks

The CERCA study incorporates three methodological frameworks: action research, community based participatory research and intervention mapping.

Action research (AR) provides the overarching framework. This methodology is most appropriate for intervention research projects as it enables the inclusion and testing of factors which are not necessarily quantifiable [12]. Nitayarumphong and Mercenier describe seven interacting stages in action research (see Figure 1). As the figure shows, these seven stages interact dynamically. For Project CERCA, we developed a hypothetical strategy for improving ASRH based on the following: 1) a study on ASRH determinants in each of the three study countries (stage 1 in the action research model); 2) a literature review of SRH and public health intervention models targeting adolescents both in Latin America and globally (stage 2); and finally, 3) a study of existing knowledge on adolescent SRH (stage 3). These studies



formed the basis of empirical decision-making regarding the strategy (stage 4) and the design and implementation of intervention actions (stage 5). Stage 6 (evaluation of the implementation process) and Stage 7 (evaluation of project results) are forthcoming.

In contrast to expert-driven health interventions, project CERCA seeks partnerships with local community residents in both the research and implementation phases of the project. Community-based participatory research (CBPR) is a collaborative research approach that is designed to ensure and establish structures for participation by all stakeholders in different aspects of the research process [13]. CBPR allows community members, health users and health providers to take ownership of the research and to critically reflect on iterative cycles of evaluation and monitoring. This approach enables a deeper understanding of the local context, as well as the creation of a more accurate framework for testing and adapting "best practices" to meet community's needs. To this end community advisory boards have been established in all three Project CERCA sites. At the national level, staff from Ministries of Health, experts and members of international and local NGOs participate in the community board meetings, while at the local level community leaders, adolescents, youth educators, and parents are involved. These boards discuss monthly (local boards) or twice a year (national boards) the continuous process of understanding and of planning the intervention. The involvement of local health and government authorities in the CERCA advisory boards engenders their involvement in, and their support of, the project. Similarly, the ICRH project CERCA coordinators were guided in the project implementation and design by a local advisory board of Belgian experts (see acknowledgement).

When defining the intervention strategy (stage 4 of the action research process) it became clear to the CERCA consortium that the intervention-mapping (IM) tool would be key in the evidence-based development of CERCA interventions. Intervention mapping is a step-by-step process used in the development of health promotion programs [14]. These steps include: 1) a health needs assessment; 2) defining program objectives; 3) selecting appropriate theoretical models; 4) designing an intervention program; 5) adopting and implementing health intervention activities; and finally, 6) evaluation of health outcomes and intervention efficacy. There is an obvious overlap with the stages of Action Research discussed previously. For this study, we did not adhere to a single method but instead selected the Action Research framework to guide the research progress and the Intervention Mapping approach to guide the process of developing and selecting interventions as explained below.

This study is in compliance with the Helsinki Declaration on Ethical Principles for Medical Research Involving Human Subjects and is approved by the Bioethics

Committee of Ghent University, Belgium (Belgian Registration number of the study: B670201111575).

Development of intervention objectives

During the first year of Project CERCA we conducted a situation analysis in each of the study sites (Managua, Cochabamba and Cuenca) to assess the SRH needs and challenges of local adolescents. We collected both quantitative and qualitative data on SRH determinants, as well as relevant anthropological and sociological studies. The result was a comprehensive mapping of these health determinants which then helped identify specific health-seeking or health-impacting behaviours which could be addressed with Project CERCA interventions. Discussions in advisory boards, an advisory board and with CERCA consortium members led to the identification of a core set of project objectives: 1) adolescents communicate on their SRH with parents, partners and among peers; 2) adolescents access and receive accurate information on SRH; 3) adolescents make use of SRH services within primary health care; and 4) adolescents use consistently modern contraceptive methods.

Objective 1: Improved Communication on Sexual and Reproductive Health

Open and regular communication about SRH issues between adolescents and their parents has a protective effect [15]. Open communication at the family level can help to encourage adolescents to approach health care providers with questions and concerns related to their SRH [16] as well as encourage healthy sexual behaviour more generally [15,17,18]. Allen et al. found that adolescent girls who communicate easily with their mothers were considerably less likely to become pregnant [19] and Wilson et al. reported that open communication with parents led to postponed sexual debut and fewer unwanted pregnancies [20]. In semi-structured interviews conducted in the pre-intervention phase of Project CERCA, parents, young people, teachers and health providers in all three project sites acknowledged the difficulty and cultural taboos that prohibit the discussion of sex and sexuality within families, at school, and in the community as a whole. Similarly, other research has shown that in Nicaragua and Bolivia adolescents rarely, if ever, talk to their parents or other trusted adults (such as teachers) about sex or sexuality [21,22].

Objective 2: Improved Quality of, and Access to, Sexual and Reproductive Health Information

Interviewees in our study pointed out that sexual education at school is poor. Adolescents perceive what little SRH lessons they receive as negative, heavy on 'scare tactics', moralistic and biologically oriented at the expense of discussions about relationships and communication. An independent assessment of sexual health education in Latin America and the Caribbean carried out by DeMaria et al. reports similar findings [23]. According to our interviewees the lack of comprehensive sexuality education and easy access to pornography and other dubious information sources lead to disinformation, poor knowledge on SRH, false beliefs, myths and negative attitudes towards e.g. contraception use. It is clear that young people need both accurate information on SRH, as well as the ability to navigate the overwhelming amount of inaccurate information in order to make healthy and well-informed choices [24].

Objective 3: Improved Access to Existing Sexual and Reproductive Health Services

Ideally, public health services are easily accessible and available to their target populations. However, it remains the case in a Latin American context that adolescents face multiple barriers when accessing public health care services [25]. Access in this region has been shown to be particularly problematic for young and unmarried women [26,27]. Studies also show that these barriers of access are not limited to the Latin American region specifically, but are in fact global in nature. The difficulties faced in accessing SRH services includes: 1) difficulty securing an appointment [25]; 2) concerns about confidentiality of care [28]; and, 3) concerns regarding communicating with health providers about SRH issues [29]. In addition, adolescents are negatively impacted by the following limitations of public health providers: 1) limited knowledge and training in the field of ASRH [25,30]; 2) lack of knowledge of legal provisions for confidential health services for adolescents [31,32]; and, 3) health provider reluctance to discuss SRH issues with adolescents [33]. The absence of a

clear legal context creates an additional obstacle to improving adolescents' access to SRH services in Bolivia and Nicaragua. A study in Nicaragua shows that adolescents who are able to make appointments with health providers are often not given the SRH care that they seek as health providers are unwilling to serve "legal minors" without the accompaniment of an adult guardian. Conversely, once these young women become pregnant their access to health services improves considerably regardless of their age as they can now be served under the auspices of the programme 'materno infantil' (mother and child care programme) [34].

Objective 4: Healthy and Safe Sexual Behaviours

A comparative analysis of data from Demographic and Health Surveys indicates that the percentage of sexually-active unmarried young women (ages 15 to 24) protected by contraception is 11.4% in Nicaragua and 19% in Bolivia [2]. A study among high school students in urban (Quito) and rural areas (Amazon Jungle) of Ecuador reported that 43% of the respondents had sexual intercourse of which 50% never used condoms and 70% did not use condoms at last intercourse [22,35].

There is substantial scientific evidence to support a multifaceted and community-centred approach when seeking to improve ASRH, both in terms of encouraging healthy behaviours [24] and improving access to existing SRH services [36]. On the one hand, public health interventions must achieve specific performance objectives related to attitudes, knowledge and practice in order to demonstrate the efficacy of a given approach. On the other, the nuances of local cultural norms and site-specific power dynamics related to socio-economic, racial and gender hierarchies must be taken into account for a given public health intervention to succeed. For example, in the preliminary phase of Project CERCA, ethnographic research consisting of one-to-one interviews, focus group sessions and participatory research methods revealed significant, though subtle, distinctions in local attitudes towards sexual diversity, abortion, acceptable female and male sexual behaviours, perceptions of existing health services and sex education. Ethnographic research conducted during the intervention period, to be published in the final year of the project, focuses more specifically on the impact of generation gaps on communication about sex and sexuality at the level of individual and extended families, and

within the community more generally. As a result of the input from on-going ethnographic research in the form of quarterly focus group sessions with key community members (both young people and parents/grandparents of young people), the project has been able to tailor its communication and outreach campaigns to the unique needs of the communities in which we work, in addition to focusing on improving the sex and sexuality education of parents and significant adults.

In order to obtain a general overview of the global intervention plan, a different matrix has been developed for each of the three countries combining determinants, performance objectives and strategies for each intervention objective (Table 1, example of such a matrix).

Theory-informed intervention methods and practical strategies

In order to achieve these stated project objectives, we identified relevant theoretical models and strategies. Specifically, we selected the Theory of Planned Behaviour (TPB) and the Social Cognitive Theory (SCT) as frameworks for the development and design of intervention strategies. Recent studies have demonstrated the ways in which both theories can be used to successfully promote safe sexual behaviour [37]. For example, the TPB^a has been proven an effective model for influencing adolescents' behaviour with regards to modern contraceptive method use and health seeking behaviours. The SCT helped us in the development of strategies at interpersonal level namely to improve communication about sex and adolescent sexuality at the level of families, communities, and within public health services. In addition, we conducted discussion groups with key stakeholders in the

three project sites to brainstorm on possible interventions. Using the suggestions for interventions from the stakeholders, the mentioned theoretical frameworks and the SRH determinants we identified in Phase 1 of the project, we then drew up an intervention plan of action. This dialogical process has continued to play a dynamic role in the continuous adaptation and modification of intervention strategies, in combination with the results from monitoring and evaluation activities and input from community-based ethnographic research.

Intervention strategies targeting adolescents

In Managua, due to the relatively high incidence of young people out-of-school in the selected low-income target neighbourhoods, the local partner chose to carry out intervention activities at the community level (e.g. mobile cinemas, sporting events, door-to-door outreach and education campaigns). In Cuenca and Cochabamba, the consortium partners chose a high school-focused intervention strategy, conducting SRH workshops and facilitating youth groups in classrooms and school auditoriums. In Managua Friends of Youth (FoY)^b were selected. FoY are young adults, intensively trained in SRH [38]. They served as mentors of the adolescents in their community, helped them building their competence to make deliberate choices and when needed they referred and eventually accompanied adolescents to an appropriate health provider. Besides the one-to-one interaction with adolescents, the FoY also supported community activities including workshops, exhibitions, street theatre, movie showing and awareness campaigns. The FoY were supervised by the programme implementers of the research team. They received small financial incentives. In Cuenca and

Table 1 Matrix combining determinants, performance objectives and strategies

Determinant	Performance objective	Strategy
Awareness	Adolescents consider communication about SRH among peers as necessary and important.	Friends of youth (FoY) talk informally with adolescents about the importance of communicating about SRH Awareness raising during workshops and group discussions Awareness raising campaign on communicating about SRH (TV, radio, brochure, video presentation, movie showing, events and happenings in neighbourhoods, street theatre)
Introspection	Adolescents reflect upon their communication about SRH with peers.	Friends of youth (FoY) reflect individually with adolescents about communication behaviour Monitoring of own behaviour and social comparison during workshops and group discussions Testimonies
Skills	Adolescents have the skills to communicate with each other about SRH	Skills training in workshops Individual training by FoY
Social support	Social and cultural obstacles (existing myths, taboo, machismo and marianismo) are addressed,	Support by peers during workshops and focus groups Individual support by FoY Activities in the communities and with parents. (see matrix communities and parents)

Example for the intervention objective 'promoting communication on sexual and reproductive health among peers'.

Cochabamba there was not a FoY strategy in place. Young professionals, psychologists and social workers, organized similar activities as the FoY did in Managua. In Cuenca young people participated in capacity building exercises so that they might provide peer support on SRH issues with their friends and schoolmates. New media were also extensively used in the intervention strategy to reach adolescents, particularly Facebook and cell-phone messages. Those communication methods were used to a lesser extent in Managua compared to Cuenca and Cochabamba, as adolescents from low income neighbourhoods in Nicaragua have less access to those new media.

Intervention strategies targeting parents and adult family members

In each of the three project sites, consortium partners brought the message of Project CERCA to the parents, grandparents and significant adults of adolescents through a combination of media campaigns, workshops (at schools, health centres and community centres,) and discussion groups. In Managua, ICAS creatively negotiated the initial resistance to open discussion of ASRH issues by carrying out home visits and informal talks in target neighbourhoods. Similarly, in Cuenca, the university of Cuenca recruited parents following blanket workshops at local high schools to participate in discussion groups and share information on the project with friends and neighbours.

Intervention strategies targeting health providers and health centres

Interventions included workshops and virtual learning activities. Health providers were trained in patient centeredness focusing on characteristics of a good provider-patient communication such as empathy, courtesy, friendliness, reassurance, support, encouraging patients' participation, giving explanations, positive reinforcement, shared decision making and patient-centred verbal styles. An educational program with role plays, videotaped vignettes of simulated patients and feedback on own recorded consultations has been implemented to teach communication skills. In order to improve other competences among providers, existing national and international guidelines on providing sexual health care services to adolescents were presented and discussed during workshops. In peer sessions they were encouraged to reflect on own attitudes, values and beliefs on adolescent sexuality and how these may affect their work with adolescents. In case of casual problems with the supply chain Project Cerca ensured the permanent availability of contraceptives in the health centres. Concurrently, outreach activities were intensified. Health providers paid visits to schools and communities and offered counselling and family planning methods to adolescents.

Intervention strategies targeting local authorities

In order to better involve local authorities in Project CERCA (public health officials, religious leaders, school prefects, municipal and regional government representatives) consortium partners have conducted continuous information and outreach campaigns. Specifically, they have carried out both formal and informal visits to discuss CERCA objectives, organized information events, produced and disseminated newsletters and reports, and in Cuenca and Cochabamba, helped to form an SRH advocacy and advisory committee. These actions endeavoured to increase knowledge of Project CERCA objectives and strategies and to encourage pro-adolescent SRH decision-making and policy changes at the local, municipal and regional level. The CERCA consortium believes that through outreach activities and on-going dialogue with local decision-makers we will help impact on adolescent SRH generally through increased awareness of the key issues and the reduced resistance to ASRH education and services.

Intervention strategies targeting community members

CERCA consortium partners in all three cities have sought to create an environment conducive to health adolescent sexual and reproductive behaviours by encouraging positive changes in attitudes, knowledge and practice at the community level. Specific intervention strategies include the organization of sports and cultural events where CERCA information is distributed and promoted; the implementation of SRH education and awareness media campaigns and community health fairs, and by continuously seeking the involvement of local community members in CERCA activities. In Managua, ICAS sponsored a soccer tournament involving competing target neighbourhoods, garnering significant local media coverage in the process. In Cuenca, University of Cuenca sponsored events such as a 10k running race and a youth SRH video competition to build awareness and support for the project. In Cochabamba, the South Group collaborated with other local SRH-focused NGOs to host an HIV/AIDS and SRH awareness fair for all area high schools. In addition to these on-the-ground activities, Project CERCA partners have used Facebook, text messaging and radio campaigns to keep community members up-to-date on project activities.

In summary, the Project CERCA intervention has incorporated the following strategic elements in an effort to improve ASRH in select communities:

1) PARTICIPATORY APPROACH:

The core principle of Project CERCA is "community-embeddedness", which means developing and implementing project objectives in close collaboration with adolescents, parents/

grandparents and family members of adolescents, health providers, teachers, local leaders and public health authorities in each of the selected project sites. In practice, the degree of local stakeholder participation has varied due to the different degrees of previous participatory-approach experience among consortium partners. However, all consortium partners have endeavoured to develop and implement project activities with the support and input of community members with the aim of increasing the efficacy and sustainability of project interventions.

2) HARMONISATION WITH EXISTING HEALTH SYSTEMS AND GOVERNMENT POLICIES:

In addition to seeking the collaboration of key stakeholders through participatory project design and implementation processes, Project CERCA has also sought to develop intervention activities in line with existing health system structures and government policies. Given the diverse nature of health systems and policies in each of the three CERCA countries, the strategies adopted look quite different. In Managua, for example, the public health system provides the majority of health services and private health services are either unaffordable or unavailable in the neighbourhoods selected for participation. Consequently, the project could identify which health centres adolescents living in target areas would access for SRH services. However, the recently implemented Family and Community Health Model in Nicaragua has meant that CERCA partner CIES could not set up an adolescents-only clinic within these identified health centres, providing instead capacity-building in ASRH for public health providers [39]. In Cuenca and Cochabamba, however, private health services exist in parallel with the public health system and are commonly used by adolescents. This has resulted in generalized communication and outreach campaigns on ASRH issues and modern contraceptive use in order to reach those adolescents not using the public health system for their SRH needs. Lastly, CERCA consortium partners have sought collaboration with ministry of health officials in all three countries, sharing research results and reports in an effort to promote ASRH-friendly policies.

3) FOCUS ON GENDER:

Gender was a transversal topic throughout the intervention process as there is evidence that the more gender considerations are integrated and explicitly addressed within programmes, the greater is the likelihood of improved SRH outcomes for both young men and women [40]. In practice considering the gender topic within the project referred mainly

to the improvement of the equality between boys and girls and taking into account the different perspectives and experiences of both girls and boys, women and men. Between countries, there were methodological and content differences in treating the gender topic. This is a logical consequence of the different perspectives and experiences that exist among and within local teams which reflects the societal diversity. During consortium meetings gender aspects and other ethical issues were repeatedly discussed. This resulted in a progressive evolution towards more converging attitudes and viewpoints.

4) MULTIDISCIPLINARY PROJECT TEAMS:

Project CERCA has drawn on multiple disciplines, including western medicine, epidemiology, sociology, anthropology, demography and political sciences, in the design and development of each city-specific intervention strategy. While the content and the focus of each intervention strategy varied according to the disciplinary strengths of the local teams, all members of the CERCA consortium have worked to incorporate multiple perspectives on ASRH in their decision-making processes. This has required team members to stretch outside of disciplinary comfort zones and think in new ways about the challenges of ASRH specific to their target areas.

Implementation and monitoring

In all Project CERCA intervention sites, consortium members created trimester and annual operational plans in collaboration with key stakeholders. These plans were based on the performance objectives and determinant factors matrices. The involvement of community members in the planning process helped to identify potential barriers to change and possible ways of managing these challenges. We also developed a monitoring and evaluation protocol to provide additional input to the action-research process, enabling CERCA partners to identify any changes needed to make intervention activities work. This M&E data includes information on target groups, duration of activities, activity objectives and determinants, methodologies used, activity content, number of participations, as well as general observations and comments. Each trimester the intervention components are then collated into a summary activity form, which allows the CERCA consortium to identify any gaps in the overarching strategy. In addition, the primary health centres involved in Project CERCA agreed to ASRH service-registration protocols. Finally, ethnographic fieldwork consisting of in-depth interviews (both video and audio), participant observation, community discussion groups, and participatory research methods, has engendered a more nuanced understanding among consortium members of the cultural contexts in

which the intervention activities are taking place. This research has also encouraged greater dialogue between the target populations of the project (adolescents, families of adolescents, and health providers) and the consortium members responsible for intervention decision-making.

Evaluation

In order to measure the impact of Project CERCA interventions, consortium partners have carried out a pre-intervention baseline survey of both target groups and control groups, and will conduct a post-intervention survey at the 18-month mark.

In Managua, we applied a cluster randomized controlled study, with results to be published according to the CONSORT statement [41]. For this study we used the town district boundaries as our selection unit, calculating sample size based on the outcome of modern contraceptive use. Drawing from national demographic statistics [42], we estimated that from a current 13–18 age cohort of adolescents in Managua 50% will be sexually active after two years and that 30% of the sexually active adolescents use a modern contraceptive with a 0.01 intra-cluster correlation within town districts. We assumed an average cluster size of 170 adolescents participating in the surveys. To detect a significant difference in contraceptive use of 10% between the intervention and control groups, we determined that 18 clusters (6 intervention and 12 control) were necessary. A list with population data of all the town districts in Managua, based on a census of 2005, was obtained from the municipality. We took into consideration only those 33 town districts which comply with the previously defined inclusion criteria (between 1400 and 4500 inhabitants and with more than 50% poor people –poverty measurement through the Unsatisfied Basic Needs approach-). A multi-level sampling method was applied to select the intervention and control group from these districts. Firstly, two intervention public primary health centres were randomly chosen from the nine public primary health centres in Managua. Subsequently, among the twelve town districts served by those two health centres, six centres were randomly selected. From the 21 remaining town districts served by other than the intervention health centres twelve were randomly selected as control groups. Trained interviewers conducted surveys among adolescents aged 13 to 18 in control and intervention districts by going door-to-door. After obtaining verbal consent from the adolescents and the responsible adult, when present, the interviewer began the questionnaire. For those questions directly related to sexual behaviour, adolescents completed the questionnaire by self-administration. These same adolescents will be interviewed a second time at the 18-month intervention mark.

In Cuenca and Cochabamba, consortium partners carried out the survey at local high schools. Random

allocation to an intervention and control group was not possible as the intervention could only be embedded in health centres that were allied with the research group. Within the intervention area, the university of Cuenca team chose to carry out intervention activities at three high schools, and the South Group team in Cochabamba chose to work with seven high schools. For each intervention school the local research team enrolled a control school with similar characteristics located in a separate district. All parents or guardians of the students from the selected schools were informed about the survey and were given the possibility to refuse the enrolment of their child or protected minor in the study. At selected schools interviewers visited all classrooms and invited all students aged 13 to 18 (whose parents did not oppose) to fill out the self-administered questionnaire after signing an informed consent. The same procedure will be repeated at the 18 intervention month-mark.

The questionnaire was designed by CERCA consortium members taking into account the intervention objectives and the determinants of adolescents' SRH identified during the situation analysis. It was based on the illustrative questionnaire for interview-surveys with young people conceived by John Cleland for the World Health Organization. The questionnaire contained questions regarding intervention goals, SRH history, self-esteem, gender norms, and social determinants of SRH behavior. The main outcome indicators were adapted to the specific cultural, language, and demographic context and constructed to assess the impact of the CERCA intervention on adolescent's behaviour with regards to the following: 1) access to accurate information on SRH; 2) degree of comfort and extent of communication on issues of sex and sexuality; 3) use of existing SRH services; and finally, 4) use of modern contraceptive methods. For the determinant variables related to gender attitudes and self esteem we used, respectively, the Spanish version of the validated "attitude towards women scale for adolescents" [43] and the questions on self-esteem from the JOP monitor 2 questionnaire [44]. The questionnaire was piloted in each country by presenting it to 30 adolescents not belonging to the sample population and then asking their opinion of the content, clarity and length of the questionnaire. Following the second round of surveying at the 18-month mark, we will use multilevel regression models to evaluate the impact of the CERCA intervention, adjusting for cluster effects within districts (Managua) and in schools (Cochabamba and Cuenca). Analyses will be performed according to the intention-to-treat principle. Linear and regression analyses will assess the variation of outcome values over time in intervention and control groups.

Discussion

Project CERCA aims to develop, implement and test an intervention model capable of improving ASRH in three

Latin American cities. We designed the research framework using the existing methodologies of action-research, community based participatory research and intervention mapping. These methodological tools allow us to conduct, on the one hand, intervention research that accounts for the complexity of ASRH determinants; and on the other, to carry out a comprehensive intervention strategy and evaluation plan. Instead of hewing precisely to one specific methodological framework, the CERCA consortium opted to develop a research and intervention model drawing from all three (AR, CBPR, and Intervention Mapping) in order to best meet existing ASRH needs, to ensure community ownership and participant empowerment, and to be responsive to changing political and socio-cultural contexts. In order to determine the effectiveness of the interventions it was crucial to work out an evaluation approach that allows us to measure impact of interventions in a continuously changing context [45]. To that end we developed a specific controlled impact study in the three cities making use of contextualized measurable behaviour outcomes. Given the complexity and variability of interventions, we expect to evaluate the effectiveness of the intervention model as a whole rather than attributing results to a single intervention activity or strategy. Whereas the quantitative evaluation purports to demonstrate the potential efficacy and impact of the intervention strategy, ethnographic (qualitative) research will provide a deeper understanding of the complex and community-specific factors that have challenged the intervention process. The monitoring data will be used for the detailed description of the intervention process, information which will be essential for reproducing the strategy in other contexts or on a larger scale.

The results of the CERCA study will help to gain insight in how to design effective health interventions targeted to ASRH needs specifically, and more generally will help to better understand how existing public health systems can be more responsive to the changing needs and demands of an adolescent population. Complete results from Project CERCA will be available in 2014.

Endnotes

^a According to the TPB, individuals are able to make a deliberate choice to behave in a certain way. This choice depends on attitudes towards the behaviour, social influences (social norms, reinforcement, tradition and culture), the perceived belief in oneself to make a deliberate choice and external factors. SCT focuses on observational learning and self-determination, namely the interactions of the person and the environment, expectations and self-efficacy.

^b The term FoY (Friends of Youth) was taken from a successful project implemented by Population Council in Kenya. FoY are young people slightly older and more experienced in relation to SRH who provide information to

adolescents, promote healthy sexual behaviour, serve as a mentor and person to turn to when adolescents have SRH questions as well as to refer and eventually accompany adolescents to an appropriate health provider.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

The work presented here was carried out in collaboration between all authors. PD, EN, SD, LJ, MO, ZS, AG, BV, KC, LM, EL, MT and OD provided support in the design of the study and contributed intellectual input into the main ideas of this paper. PD, SD and LJ designed and coordinated the implementation of the intervention. PD, MO, ZS, BV and KC supervised the data-collections and the implementation of the intervention. PD drafted the manuscript. EN provided substantial content and rewriting support. All authors contributed to the drafting of the manuscript. PD will act as guarantor of the paper. All authors read and approved the final manuscript.

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Chapter 4

Results

4.1 Outline

The results chapter is divided into five sections. The first two parts are related to the first objective. We elaborate on the determinants of unmet need of unmarried people by presenting the results of surveys among Chinese YUR-migrants and among Latin-American adolescents. Sections three to five are addressing the research questions of the second objective. We assess the effect of comprehensive interventions on individuals' sexual behaviour in China and Latin America and on community and societal outcomes in Latin America. In the discussion section we will reflect on the differences in study results from the two contexts (objective 3). At the beginning of each section we give an overview of the articles that have been published or are in preparation.

4.2 Determinants of unmet need for contraception among young unmarried rural-to-urban migrants in China

4.2.1 Introduction

We conducted cross-sectional surveys in factories in the Chinese cities Qingdao and Guangzhou. We asked young female rural-to-urban migrants aged 18 -29 to complete a questionnaire. Through those questions we tried to learn what

migrants know about SRH and how they think and act. The study has provided new insights on factors that determine unmet contraceptive needs of the study population. The results have been published in three papers.

Paper 2

Decat P, Zhang WH, Moyer E, Cheng Y, Wang ZJ, Lu CY, Wu SZ, Nadis-
auskiene R, Luchters S, Deveugele M, Temmerman M. *Determinants of unmet
need for contraception among Chinese migrants: A worksite-based survey*. Eur
J Contracept Reprod Health Care 2010

Of the 2513 sexually active respondents in Qingdao and Guangzhou, 36.8%
and 51.2%, respectively, reported unmet need for contraception. Unmet con-
traceptive need was associated with being unmarried, having no children, little
schooling, poor SRH knowledge, working in non-food industry, and not being
covered by health insurance. The article is presented in full in this section.

Paper 3

Lu C, Xu L, Wu J, Wang Z, Decat P, Zhang WH, Chen Y, Moyer E, Wu
S, Minkauskiene M, Van Braeckel D, Temmerman M. *Sexual and reproductive
health status and related knowledge among female migrant workers in Guangzhou,
China: a cross-sectional survey*. Eur J Obstet Gynecol Reprod Biol. 2011 Nov
7

This article focuses on the knowledge regarding sexuality among the 1346
interviewed young female rural-to-urban migrants in Guangzhou. Among un-
married respondents, the median knowledge score was 5 points, compared to
8 points for the married. For unmarried migrant workers, factors associated
with the knowledge level were age, education level, access to SRH information
and service, sexual experiences and RTI symptoms. This article is available on
request.

Paper 4

He D, Zhou Y, Ji N, Wu S, Wang Z, Decat P, Moyer E, Minkauskiene M, Pang
C, Cheng Y. *Study on sexual and reproductive health behaviors of unmarried
female migrants in China*. J Obstet Gynaecol Res. 2012 Apr;38(4):632-638.

From the 1690 female YUR-migrants in Qingdao only one-third of respondents was aware of emergency contraceptives. From the sexually active unmarried, 10.4% had an unwanted pregnancy and 95% of those unplanned pregnancies have been terminated. Premarital sex was associated with the duration of employment in the city. This paper is available on request.

4.2.2 Full articles

Determinants of unmet need for contraception among Chinese migrants: A worksite-based survey

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ABSTRACT **Background** Considerable sexual and reproductive health (SRH) challenges have been reported among rural-to-urban migrants in China. Predictors thereof are urgently needed to develop targeted interventions.

Study design A cross-sectional study assessed determinants of unmet need for contraception using semi-structured interviews in two cities in China: Guangzhou and Qingdao.

Results Between July and September 2008, 4867 female rural-to-urban migrants aged 18–29 years participated in the study. Of these, 2264 were married or cohabiting. Among sexually-active women ($n = 2513$), unmet need for contraception was reported by 36.8% and 51.2% of respondents in Qingdao and Guangzhou, respectively; it was associated with being unmarried, having no children, less schooling, poor SRH knowledge, working in non-food industry, and not being covered by health insurance. A substantial proportion of unmarried migrants reported they had sexual intercourse (16.6% in Qingdao and 21.4% in Guangzhou) contrary to current sexual standards in China.

Conclusion The study emphasises the importance of improving the response to the needs of rural-to-urban migrants and recommends strategies to address the unmet need for contraception. These should enhance open communication on sexuality, increase the availability of condoms, and improve health insurance coverage.

KEY WORDS Rural urban migration; Reproductive health; Health survey; Migrant workers; Needs assessment; Health services accessibility; Family planning services; Contraception behaviour; China

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INTRODUCTION

Over the last two decades, people from rural areas have been migrating to cities in an attempt to find gainful employment and a chance to reap the benefits of China's booming economy. An estimated 147 million rural-to-urban migrants work and live in Chinese cities¹. Most of these internal migrants are employed in manual labour including construction, manufacturing industry, and the service industries. Women migrate in numbers comparable to men, but are more often younger².

Previous studies demonstrated poorer sexual and reproductive health (SRH) indicators among women who are internal migrants as compared to urban residents. High rates of unprotected sexual activity resulted in higher rates of induced abortions and increased HIV/STI prevalence^{1,3-6}. Rural-to-urban migration has been identified as a contributing factor to the HIV epidemic in China⁷. Poorer sexual health among internal migrant compared to non-migrant populations has also been noted in other countries⁸.

There is scientific and political consensus that SRH policies should better address the needs of migrants in China^{1,9,10}. However, little is known about the determinants of the SRH of migrants. Knowledge about such SRH determinants allows for development of targeted, effective and feasible intervention strategies.

A three-year demonstration-intervention project 'YOLAMI' (Young Labour Migrants in Chinese cities) was undertaken to improve SRH services of internal migrants. The first phase of the project consisted of a baseline survey among migrants at worksites. This survey aimed to provide a detailed description of both the SRH situation among internal migrants and their access to services, and to assess determinants of SRH. The study was conducted in two cities, Qingdao and Guangzhou, with an approximate population of 2.2 million and 11.9 million, respectively¹¹. The cities were selected based on their proximity to the participating Chinese research institutes. Both are important manufacturing cities attracting large numbers of internal migrants: 1.2 million and 2.3 million, respectively¹¹. In the second phase interventions were implemented in the workplaces of migrants for a duration of 12 months. The interventions aimed at improving accessibility and quality of SRH services.

This paper reports on the results of the baseline survey, describing the SRH status and assessing determinants of unmet need for contraception among Chinese internal migrant women.

POPULATION AND METHODS

Participants

Study locations were selected based on their distance and accessibility to the study team implementing the intervention to optimise the feasibility of the project. From the district administrative authorities of each of the cities, an exhaustive list of worksites employing between 300 and 700 female migrants and located within a range of 15 km from a collaborating health facility was obtained. A *worksite* was defined as a unit within a company; it consists of one or more (grouped) buildings producing the same good. In total, 16 worksites were listed in Guangzhou and 24 in Qingdao. From the list of 40 worksites, 18 were randomly selected by coin tossing. Four worksites refused to participate and were randomly replaced by four of the remaining 22. Thus eight worksites in Guangzhou and ten in Qingdao were included in the project.

At each of the worksites, all female workers between 18 and 29 years old, originating from rural areas and who volunteered to participate in the survey, were enrolled.

Survey procedure

The survey was conducted between July and September 2008. Firstly, the management of the selected worksites was informed about the purpose and content of the survey. The manager at the worksites notified eligible workers and asked them to participate. Participation was voluntary and women unwilling to participate in the survey did not suffer any negative consequences in their employment. At a time arranged with the management, trained interviewers visited the worksites. During lunch and dinner time, interested workers presented themselves for an interview in a confidential room. Interviewers gave a detailed description of the study purpose and design and invited eligible women to participate in the survey. Those who provided written informed consent were interviewed. Most interviews started with face-to-face

questioning; they ended with the respondents addressing more sensitive questions, privately and in writing, to increase the accuracy of self-reported data regarding delicate issues. Respondents were given the choice either to fill out the questionnaire themselves or to be assisted by the interviewer. Small and locally-appropriate gifts (e.g., an umbrella) were offered for participation in the study.

Study measures

A questionnaire was designed by the study steering group including Chinese and European investigators; it is based on the illustrative questionnaire for interview-surveys with young people conceived by John Cleland for the World Health Organisation (WHO)¹². The questionnaire was developed in English, translated into Chinese and subsequently translated back into English by a different person. The translation and back translation were performed without knowledge and insight in the other study documents. Both English versions were compared and inconsistencies addressed in the Chinese version. The questionnaire was piloted among a convenient sample of 137 female migrant workers.

The questionnaire assessed socio-demographic characteristics, content and sources of SRH information, health seeking behaviour, knowledge, attitudes, sexual experiences, first intercourse, contraceptive use, pregnancies and abortions. Questions were designed to characterise determinants of SRH health of migrants. For behavioural questions, respondents were asked to report about the last six months prior to the interview.

SRH knowledge was assessed using a summary variable by making a percentage score of correctly answered questions (total of 16 knowledge questions including nine questions about contraception, six regarding STIs/HIV, and one about sexual violence). Respondents were categorised as having a score higher or lower than the median score. Unmet need for modern contraception was used as the outcome variable. A woman was considered to have such an unmet need if being married or in a consensual union and not wanting to become pregnant, she did not consistently use a modern method of contraception even though being at risk of conceiving. Sterilisation, condoms, intrauterine devices (IUDs), oral contraceptives and progestogen-only methods were all considered modern contraceptives.

Data collection and analysis

Completed questionnaires were entered once using Epi info 3.0 (CDC, Atlanta, GA, USA). The cleaned database was forwarded for statistical analysis using SPSS version 16 (SPSS Inc. Chicago, IL, USA) and Intercooled Stata, version 8.0 (Stata Corporation, College Station, TX, USA).

Unpaired Student's *t* test and the Mann-Whitney *U* test were used to assess differences between groups for continuous variables with a normal and non-normal distribution. Chi-square tests were used to detect heterogeneity. Crude and adjusted odds ratios with 95% confidence intervals (CIs) were calculated to assess predictors for unmet need for contraception as well as indicators related to access to SRH. Multi-variable logistic regression was used to adjust for potential confounding factors, with *p*-values > 0.05 as a criterion for removal of a variable from the model; *p*-values reported are two-tailed and an alpha level of 0.05 is used to establish statistical significance.

Ethical considerations

The study was approved by the ethical committee of the National Research Institute for Family Planning Beijing, (12 Da Hui Si, Hai Dian District, 100081 Beijing, China) and the ethical committee of Ghent University Hospital, Belgium. Written informed consent was obtained from all respondents.

RESULTS

Of the eligible female migrants at work in the worksite at the time of the interview, 7.3% in Guangzhou and 3.2% in Qingdao did not present themselves for the survey. Depending on the worksite, the number of eligible women willing to participate varied between 125 and 400. Overall, 4867 questionnaires were administered, 3522 in Qingdao and 1345 in Guangzhou. Most participants (78%) chose for a mixed interview method (self-administered and interviewer administered); 19% self-administered the questionnaire, and only 3% of respondents opted to fill out the questionnaire entirely with the assistance of the interviewer.

Participating women had a mean age of 23.9 years (standard deviation [SD] = 3.5 years) and over half

(53.5%) were unmarried (Table 1). Their workplaces consisted of factories producing clothing and fashion accessories (36.6%), food (22.7%), or electrical devices (18.2%), and processing and assembling factories (22.4%). Most respondents (2857/4818, 59.3%) were not covered by health insurance. Half the women (2513/4867, 51.6%) reported having been sexually active in the last six months. Significant differences were found between the two cities with respect to level of education, duration of stay in the city and marital status.

Sexual intercourse among unmarried respondents was more frequent in Guangzhou (178/831, 21.4%) compared to Qingdao (291/1757, 16.6%; $p = 0.003$, data not shown), and age at sexual debut was higher in Qingdao. Fewer respondents reported current use of any contraceptive method in Guangzhou (469/623, 75.3%) compared to Qingdao (1276/1415, 90.2%; $p < 0.001$). The methods most resorted to were the male condom (68.5%), IUDs (29.4%), and fertility awareness such as the calendar method (14.4%) (Table 2).

Unmet need for modern contraception was reported by 38.6% (730/1893) of sexually active migrants not planning pregnancy. Predictors of unmet

need for contraception include being unmarried (adjusted odds ratio [AOR] = 1.40; 95% CI = 1.01–1.94), having no children (AOR = 1.96; 95% CI = 1.60–2.41), lower education level (AOR = 1.49; 95% CI = 1.21–1.83), being less knowledgeable about SRH (AOR = 1.52; 95% CI = 1.24–1.85), and not being covered by health insurance (AOR = 1.26; 95% CI = 1.04–1.54) (Table 3).

Unplanned pregnancies in the last six months were reported by 10.3% (195/1893) of sexually active migrants without pregnancy desire. Of these women, 8.7% (164/1893) reported having had an abortion during the last year (data not shown). Unplanned pregnancies were significantly associated with residing in Guangzhou (AOR = 2.88; 95% CI = 2.10–3.93; $p < 0.001$), being younger than 25 years (AOR = 1.80; 95% CI = 1.32–2.47; $p < 0.001$), and working in a non-food industry (AOR = 1.88; 95% CI = 1.19–2.97; $p < 0.001$) (data not shown).

Table 4 shows associations between various indicators for health service access and the unmet need for modern contraception. Not having accessed SRH services and reluctance to discuss SRH with health providers significantly predicted unmet need for contraception.

Table 1 Demographic characteristics of female internal migrants in the cities of Qingdao and Guangzhou, China

Variables	All women (N = 4867)	Sexually active women (n = 2513)		
		Qingdao (n = 1890)	Guangzhou (n = 623)	p-value
Age, mean yrs (SD)	23.9 (3.5)	26.1 (2.5)	25.7 (2.9)	<0.001
Education level, n (%)				
<7 years	2846 (59.0)	1096 (58.6)	401 (64.4)	0.012
≥7 years	1975 (41.0)	773 (41.4)	222 (35.6)	
Current marital status, n (%)				
Unmarried (and divorced)	2603 (53.5)	262 (13.9)	149 (23.9)	<0.001
Married	2264 (46.5)	1628 (86.1)	474 (76.1)	
Duration of residence in the city, median yrs (IQR)	2.0 (3.0)	2.0 (5.0)	4.0 (7.0)	<0.001
Workplace, n (%)				
Fashion and clothing industry	1783 (36.6)	621 (32.9)	303 (48.6)	<0.001
Processing and assembling factories	1089 (22.4)	364 (19.3)	204 (32.7)	
Electronics manufacturing	888 (18.2)	359 (19.0)	68 (10.9)	
Food industry	1107 (22.7)	546 (28.9)	48 (7.7)	
Health insurance, n (%)				
No	2857 (59.3)	988 (52.8)	352 (56.5)	0.11
Yes	1961 (40.7)	883 (47.2)	271 (43.5)	

SD, standard deviation; IQR, interquartile range

Table 2 Sexual behaviour and family planning of sexually active women ($N=2513$) among internal migrants in the cities of Qingdao and Guangzhou, China

Variables	Qingdao ($n=1890$)	Guangzhou ($n=623$)	<i>p</i> -value
Age at sexual debut, median yrs (IQR)	22.0 (21–24)	21.0 (20–23)	<0.001
Number of children, <i>n</i> (%)			0.90
None	662 (35.0)	220 (35.3)	
One or more	1227 (65.0)	403 (64.7)	
Current pregnancy desire, <i>n</i> (%)			0.010
No	1407 (74.8)	486 (78.0)	
Yes	475 (25.2)	135 (21.7)	
Any contraceptive use, <i>n</i> (%)			<0.001
No	139 (9.8)	154 (24.7)	
Yes	1276 (90.2)	469 (75.3)	
Contraceptives used in past six months, <i>n</i> (%); multiple responses allowed			
Fertility awareness (e.g., calendar method)	188 (14.7)	64 (13.6)	0.56
Withdrawal	143 (11.2)	50 (10.7)	0.74
Male condoms	883 (69.3)	311 (66.3)	0.24
Oral contraceptives	75 (5.9)	43 (9.2)	0.015
Emergency contraceptives	96 (7.5)	37 (7.9)	0.80
Intrauterine devices	377 (29.6)	135 (28.8)	0.75
Injectables	0 (0)	5 (1.1)	0.001

IQR: interquartile range

Lack of access to SRH services was significantly associated with lower education level, being unmarried, being childless, and living in the city for less than two years (Table 5). Similar associations were seen for lack of access to SRH information and access to free condoms (data not shown).

DISCUSSION

Determinants of unmet need for modern contraception

The vulnerability of Chinese rural-to-urban migrants with regard to their SRH has previously been described^{1,3–7}. The present study presents new knowledge on the determinants of unmet need for modern contraception among sexually active rural-to-urban migrants. It shows that over one-third of women had an unmet need for contraception. Unmarried, childless migrants who are not covered by health insurance, who have a lower education level, and are less knowledgeable about SRH, are at increased risk of having an unmet need for contraception. As in other studies, we found that unmet need for contraception

resulted in a high incidence of unplanned pregnancy and abortion¹³. Over 10% of women reported an unplanned pregnancy in the past six months, while 8.7% of sexually-active migrant women with no intention of becoming pregnant stated they had had an abortion in the last year. Although in Chinese society abortion for married women is commonly accepted as a solution for unwanted pregnancies, the psychological impacts of abortion appear to be much greater for unmarried women¹⁴. As premarital sex is still censured by society, and virginity among brides highly valued, unmarried women undergoing abortions are often shunned and criticised by their peers¹⁴. Consequently, abortion may lead to social isolation, psychological distress and sexual dysfunction¹⁵.

Not surprisingly, unmet need for modern contraception is associated with reduced access to SRH care, SRH information, and free condoms. There is therefore an urgent need to increase access to such services, particularly among identified risk groups.

Lack of access to quality care and services for migrants has already been described¹⁶. Migrants are faced with a series of obstacles in accessing SRH services. The high cost of health care for migrants in

Table 3 Factors associated with unmet need for contraception in the last six months among sexually active migrant women having no pregnancy desire ($N = 1893$)

Variables	Respondents with unmet need for contraception in the last six months				
	% (n/N)	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age					
<25 years	46.3 (238/514)	1.55 (1.27–1.91)	<0.001	1.10 (0.87–1.40)	0.43
≥25 years	35.7 (492/1379)	1.00		1.00	
Education level					
<7 years	41.6 (487/1171)	1.39 (1.15–1.69)	0.001	1.49 (1.21–1.83)	<0.001
≥7 years	33.9 (240/709)	1.00		1.00	
City of residence					
Guangzhou	44.2 (215/486)	1.37 (1.11–1.69)	0.003	1.27 (1.02–1.59)	0.030
Qingdao	36.6 (515/1407)	1.00		1.00	
Duration of residence in the city					
<2 years	38.6 (255/661)	1.00 (0.82–1.12)	1.0	–	
≥2 years	38.6 (466/1208)	1.00		–	
Workplace					
Non-food industry	40.5 (572/1413)	0.72 (0.58–0.90)	0.003	0.77 (0.62–0.97)	0.026
Food industry	32.9 (158/480)	1.00		1.00	
Marital status					
Unmarried	51.7 (186/360)	1.94 (1.54–2.45)	<0.001	1.40 (1.01–1.94)	0.045
Married	35.5 (544/1533)	1.00		1.00	
Number of children					
None	49.3 (288/584)	1.91 (1.57–2.33)	<0.001	1.96 (1.60–2.41)	<0.001
One or more	33.7 (441/1308)	1.00		1.00	
Knowledge on SRH					
<median score	45.9 (330/719)	1.64 (1.36–1.98)	<0.001	1.52 (1.24–1.85)	<0.001
≥median score	34.1 (400/1174)	1.00		1.00	
Health insurance					
No	42.6 (448/1051)	1.46 (1.21–1.76)	<0.001	1.26 (1.04–1.54)	0.021
Yes	33.7 (279/827)	1.00		1.00	

OR: odds ratio; CI: confidence interval

the city is one important factor^{17,18}, particularly in view of the fact that most migrants in this study were not covered by health insurance, which implies more out-of-pocket expense. Accessibility to services was also dependent on education level and marital status of the migrants. Unmarried sexually active respondents had significantly less access to SRH services compared to their married peers. Unmarried migrants reported fewer contacts with SRH health workers, even when having gynaecological complaints (data are not shown). This is consistent with investigations in other populations groups in China^{19,20} and may be explained by the fact that SRH services are mainly advertised and offered to married migrants. A

prominent obstacle to the provision of SRH information and services to unmarried people is the reluctance and ambivalence on the part of policy-makers, programme managers, parents, and service providers^{21,22}. Our data shows the importance of enhancing the accessibility to SRH services for unmarried migrants.

There is presumptive evidence that among rural-to-urban migrants a gradual transition to more liberal sexual behaviour is taking place²³. Factors influencing this tendency among migrants may be the gradual opening up of China, particularly in the realm of socio-cultural factors; the effect of living away from the rural home base, where individual behaviour

Table 4 Access and taboo indicators associated with unmet need for contraception in the last six months among sexually active migrant women without pregnancy desire ($N=1893$)

Variables	% (n/N)	Crude OR (95% CI)	p-value
Accessed SRH health service, % (n/N)			
No	43.7 (450/1030)	1.62 (1.34–1.96)	<0.001
Yes	32.4 (279/862)	1.00	
Accessed free condoms for last six months, % (n/N)			
No	47.8 (478/1001)	2.31 (1.90–2.80)	<0.001
Yes	28.4 (250/881)	1.00	
Know where to receive SRH services, % (n/N)			
No	58.3 (144/247)	2.52 (1.93–3.32)	<0.001
Yes	35.6 (586/1645)	1.00	
Accessed SRH information, % (n/N)			
No	46.6 (219/470)	1.55 (1.26–1.92)	<0.001
Yes	36.0 (511/1421)	1.00	
Reluctance to discuss SRH with health provider			
Yes	47.4 (319/673)	1.76 (1.45–2.14)	<0.001
No	33.8 (411/1215)	1.00	

OR, odds ratio; CI: confidence interval; SRH, sexual and reproductive health
The shortfall in some denominators is due to missing information.

might have been more closely supervised by relatives and neighbours; and the postponing of marriage. The recorded proportion of sexually active women among unmarried migrants (Qingdao: 16.6%; Guangzhou: 21.4%) seems to be of the same magnitude as among university students²⁴ but lower than among unmarried women belonging to other population groups in China^{14,25–28}. Aside from possible underreporting in this study due to a social desirability bias, differences may be explained by the attachment to traditional values of migrants originating from rural areas, the non-inclusion of respondents from more 'sex-prone' entertainment worksites (hotels, bars, restaurants, massage centres) and the housing conditions of female unmarried migrants who often live in overcrowded quarters and dormitories without privacy, which may hamper intimate contacts.

Migrant women reported discomfort discussing SRH with health providers or their peers. Our study indicates that reluctance to discuss SRH is associated with unmet need for modern contraception. Other studies confirm that open and honest discussions and negotiations about sexuality and related issues are limited in Chinese society²⁹. This seems to be restricted even more among unmarried migrants, possibly as a result of the existing taboo with regard to reporting of premarital sex^{21,22}. Previous

exploratory research among migrants²⁰ pointed out the passive role of women in Chinese culture. This prevents them from initiating conversations with their partner on sexuality and contraceptive use.

Study limitations

Recruiting respondents from worksites provided a practical context for sampling rural-to-urban migrant women to assess behaviour and attitudes. The support of the worksite management and the choice of the interview method encouraged the workers to complete the questionnaire; this explains the high response rate and the low proportion of missing values. However, sampling was limited to two cities, to a reduced number of worksites within specific labour sectors and to migrant workers labouring during the day, who voluntarily presented themselves. Four of the 18 worksites refused to participate without giving a clear justification; this might have biased the results. We do not claim that our findings are representative for the whole rural-to-urban population in China, which is admittedly more diverse than our study would suggest. But, given the large sample size, it provides an interesting insight. Inherent to a cross-sectional survey, any causal relationship between variables could not be established, but the strengths

Table 5 Factors associated with not having accessed sexual and reproductive health (SRH) services in the last six months among sexually active respondents (N=2513)

Variables	Respondents who did not access SRH services in the last six months				
	% (n/N)	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age					
<25 years	62.1 (408/657)	1.81(1.50–2.17)	<0.001	1.05 (0.84–1.31)	0.62
≥25 years	47.6 (882/1854)	1.00		1.00	
Education level					
<7 years	54.6 (818/1497)	1.41 (1.20–1.66)	<0.001	1.55 (1.31–1.85)	<0.001
≥7 years	46.1 (458/994)	1.00		1.00	
City of residence					
Guangzhou	64.0 (389/623)	1.82 (1.51–2.19)	<0.001	1.95 (1.60–2.39)	<0.001
Qingdao	47.7 (901/1888)	1.00		1.00	
Duration of residence in the city					
<2 years	58.2 (489/840)	1.52 (1.29–1.80)	<0.001	1.45 (1.22–1.73)	<0.001
≥2 years	47.8 (783/1639)	1.00		1.00	
Marital status					
Unmarried	72.9 (299/410)	3.02 (2.39–3.81)	<0.001	2.57 (1.91–3.44)	<0.001
Married	47.2 (991/ 2101)	1.00		1.00	
Number of children					
None	60.3 (531/880)	1.75 (1.48–2.07)	<0.001	1.31 (1.06–1.61)	0.014
One or more	36.5 (758/1630)	1.00		1.00	
Health insurance					
No	54.7 (733/1339)	1.34 (1.15–1.57)	<0.001	1.16 (0.98–1.39)	0.089
Yes	47.4 (546/1153)	1.00		1.00	

OR, odds ratio; CI, confidence interval.

The shortfall in some denominators is due to missing information.

of associations were identified and adjusted for identified confounders. Other potential confounding factors that were not measured (e.g., wages) could have influenced the associations. Nevertheless, since the results appear consistent with the existing literature, we believe this study contributes to the understanding of the health needs of migrants and adds to the knowledge in this domain.

Recommendations

Continued investment in effective prevention and treatment strategies is essential to protect adolescents' and young adults' SRH. The Chinese health system should re-appraise SRH programmes to improve the way needs of rural-to-urban migrants are addressed.

Based on the results of the present study, recommendations in this regard could be formulated. SRH services and information should address unmarried

people more specifically. Enhancing open communication on sexuality and promoting knowledge transfer on SRH issues may result in improved sexual and reproductive awareness and self-determination. Increased availability of free or low-priced condoms in public places and worksites may encourage migrants to engage in safer sexual behaviour. In addition, improving health insurance coverage for migrant workers will likely benefit the SRH of this population group. Through visits at worksites, living- or entertainment places, or initiation of help-lines, one should be able to increase the visibility of the SRH care services and to bridge the gap between the migrant population and the public health system. A strategy for the reform of health service delivery may have more chances of success in China if it combines a bottom-up approach, involving citizens and communities, with the traditional top-down decision making.

In the second phase of the YOLAMI research some of the recommended strategies are currently being implemented and their impact on the unmet need of contraception and other SRH indicators will be evaluated.

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4.3 Determinants of unmet need for contraception among adolescents in Latin America

4.3.1 Introduction

In order to gather information on the determinants of adolescents' unmet contraceptive need in Latin America we collected and assessed quantitative and qualitative data from three cities. Local teams conducted the studies in poor neighbourhoods in Managua (Nicaragua) and in secondary schools in Cuenca (Ecuador) and Cochabamba (Bolivia). In July and August 2011, quantitative surveys were conducted among adolescents. Latter completed a questionnaire on sexual behaviours and on the possible determinants of those behaviours. In addition, focus group discussions were held with health care professionals and community leaders. Three papers have been published. One manuscript is in preparation. Paper 5 is freely available online. The other ones will be presented in full hereafter.

Paper 5

Decat P, De Meyer S, Jaruseviciene L, Orozco M, Ibarra M, Segura Z, Medina J, Vega B, Michielsens K, Temmerman M, Degomme O. *Sexual onset and contraceptive use among adolescents from poor neighbourhoods in Managua, Nicaragua*. Eur J Contracept Reprod Health Care. 2014 Oct 20:1-13

This article presents data from 2803 Nicaraguan adolescents living in poor neighbourhoods. Of the 475 and 299 sexually active boys and girls, 43% and 54%, respectively, reported contraceptive use. The paper describes associates of adolescents' sexual behaviour related to personal characteristics (sex and alcohol use), to the interaction with significant others (parents, partners, peers) and to the environment (housing condition, religion). We interpreted those associates within the context of the rapidly changing society and the recently implemented health system reform in Nicaragua.

Paper 6

Jaruseviciene L, De Meyer S, Decat P, Zaborskis A, Degomme O, Rojas M, Hagens A, Auquilla N, Vega B, Gorter A, Orozco M, Lazarus J. *Factorial validation of the Attitudes toward Women Scale for Adolescents (AWSA) in assessing*

sexual behaviour patterns in Bolivian and Ecuadorian adolescents. Glob Health Action. 2014 Vol 7

This article presents a factorial validation of the Attitudes toward Women Scale for Adolescents (AWSA). This scale is widely recognised as a useful tool to assess gender attitudes among adolescents but, up to date, the AWSA has never been applied in Latin America. We used the data of quantitative surveys among 5919 secondary school students in Cochabamba and in Cuenca. The factorial analysis resulted in three factors: power dimension (PD), equality dimension (ED) and behavioural dimension (BD). ED showed the highest correlates with adolescent sexual behaviour. Higher scores of this dimension were associated with a more positive experience of sexual relationships, a higher current use of modern contraception and greater sexual activity among girls.

Paper 7

De Meyer S, Jaruseviciene L, Zaborskis A, Decat P, Vega B, Cordova K, Temmerman M, Degomme O, Michielsen K. *A cross-sectional study on attitudes towards gender equality, sexual behaviour, positive sexual experiences and communication about sex among sexually active and not sexually active adolescents in Bolivia and Ecuador.* Glob Health Action. 2014 Jul 11;7:24089

This article describes the correlations between gender equality attitudes and SRH related behaviours among 5913 adolescents in Cuenca and Cochabamba. The analysis shows that sexually active adolescents who consider gender equality as important report higher current use of contraceptives within the couple. They are more likely to describe their last sexual intercourse as a positive experience and consider it easier to talk with their partner about sexuality than sexually experienced teens who are less positively inclined toward gender equality. Non-sexually active adolescents, who consider gender equality to be important, are more likely to think that sexual intercourse is a positive experience. They consider it less necessary to have sexual intercourse to maintain a relationship and find it easier to communicate with their girlfriend or boyfriend than sexually non-active adolescents who consider gender equality to be less important.

Paper 8

Decat P, Ivanova O, Jaruseviciene L, De Meyer S, Ibarra M, Auquilla N, Vega B, Orozco M, Degomme O, Michielsen K. *Barriers for adolescent sexual healthcare in Latin America: perspective of caregivers*. In preparation.

This article presents the views of primary healthcare providers from Bolivia, Ecuador and Nicaragua on barriers that impede adolescents to access quality SRH care. During moderated discussions, 126 healthcare providers shared their ideas on the accessibility and appropriateness of SRH services and on reasons why teenagers do not make use of them. They identified socio-cultural, health system related and adolescent-specific factors affecting adolescents' access to existing SRH services. Reflecting on the mentioned barriers we hypothesize that important issues such as negative attitudes and perceptions of health care providers towards questions related to adolescents' SRH, and a lack of self-criticism and self- reflection are overlooked or ignored by participants.

4.3.2 Full articles

Sexual onset and contraceptive use among adolescents from poor neighbourhoods in Managua, Nicaragua

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ABSTRACT **Background and objectives** The prevalence of teenage pregnancies in Nicaragua is the highest in Latin-America. This study aimed to gain insight into factors which determine the sexual behaviours concerned.

Methods From July until August 2011, a door-to-door survey was conducted among adolescents living in randomly selected poor neighbourhoods of Managua. Logistic regression was used to analyse factors related to sexual onset and contraceptive use.

Results Data from 2803 adolescents were analysed. Of the 475 and 299 sexually active boys and girls, 43% and 54%, respectively, reported contraceptive use. Sexual onset was positively related to increasing age, male sex, alcohol consumption and not living with the parents. Catholic boys and boys never feeling peer pressure to have sexual intercourse were more likely to report consistent condom use. Having a partner and feeling comfortable talking about sexuality with the partner were associated with hormonal contraception.

Conclusions Our data identified associates of adolescents' sexual behaviour related to personal characteristics (sex and alcohol use), to the interaction with significant others (parents, partners, peers) and to the environment (housing condition, religion). We interpreted those associates within the context of the rapidly changing society and the recently implemented health system reform in Nicaragua.

KEY WORDS Adolescents; Nicaragua; Contraception; Pregnancy in adolescence; Sexual behaviour; Latin America

INTRODUCTION

Teenage pregnancies in Latin-America are linked to a higher incidence of maternal complications during pregnancy and delivery¹ and children of adolescent

mothers are at increased risk of preterm birth, low birth weight and neonatal mortality². In many cases, the context in which adolescent pregnancy occurs makes it difficult for the young mother to complete school and leads to adverse socio-economic consequences³.

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The prevalence of teenage pregnancies in Nicaragua is the highest in Latin America with an adolescent fertility rate (births per 1000 females aged 15–19) of 109, compared to the Latin American average of 79 births⁴. Almost half of Nicaraguan women aged 20 to 24 gave birth for the first time before their 20th birthday and nearly half of these pregnancies were unwanted⁵. Furthermore, it is likely that in Nicaragua many pregnant teenagers are seeking unsafe and risky backstreet abortions, as abortion is prohibited under all circumstances⁶.

In Nicaragua, there is an urgent need for effective strategies to reduce the number of teenage pregnancies. To develop such strategies drivers of adolescents' sexual behaviour and contraceptive use must be identified. In Latin America teenagers initiate sexual activity at ever earlier ages and only few sexually active youths take any measures for preventing pregnancy⁷.

Youths move within multiple contexts (family, peers, community etc.) and their sexual behaviour is determined by diverse factors from these different contexts that influence attitudes, knowledge, skills and norms⁸. In the literature we found evidence that age, residence, education level, gender norms, socio-economic status and access to health services are important intrapersonal predictors of adolescent sexual and reproductive health (ASRH) in Nicaragua as elsewhere in Latin America^{9–11}.

In our opinion, previous assessments of ASRH in Nicaragua focused mainly on personal determinants, disregarding the role of significant others and the socio-political context. Firstly, the role of the family and the community remains pivotal in the daily life of most Nicaraguans¹², despite the individualising forces coming along with the current globalisation wave. Consequently, it is likely that interpersonal factors have an important effect on adolescents' sexual behaviour. Secondly, Nicaragua passed through many changes at political level over the last decades. In 1979, the Sandinista Revolution put an end to the Somoza dictatorship and initiated leftist reforms. After seven years of civil war a conservative coalition government, elected in 1990, initiated economic adjustments policies and reduced basic social services such as health and education. Since the elections of 2006 the Sandinistas have come again into power and are implementing new social reforms. However, the current politics are not clear-cut and the policy-making concerning ethical issues is strongly influenced by the Catholic and Evangelic churches

which resulted in a complete ban on abortion even in the case of rape or a life-threatening pregnancy⁶. In all probability the unique societal environment in Nicaragua has repercussions on ASRH. A better understanding of intrapersonal, interpersonal and environmental factors will contribute to appropriately shape specific interventions.

To assess associates of youths' sexual behaviour and contraceptive usage in Nicaragua we analysed data from a survey conducted among adolescents living in poor neighbourhoods of the capital city, Managua. We intended to generate baseline data for the intervention study "community-embedded reproductive health care for adolescents" (CERCA)¹³. The CERCA project is a multicentre study coordinated by the International Centre of Reproductive Health (ICRH) of Ghent University which aims at developing and evaluating complex interventions that seek to improve access to- and use of sexual and reproductive health (SRH) services by adolescents.

POPULATION AND METHODS

Selection of study sites

In Nicaragua, the intervention research project which includes this study was conducted in Managua, in areas with more than 50% poor people as defined by the Unsatisfied Basic Needs index (UBN)¹⁴. It was decided to address teenagers living in poor neighbourhoods as they are particularly vulnerable concerning their SRH¹⁵. In 2006 Managua counted 934,489 inhabitants with 206,247 adolescents aged between 10 and 19 years, 81,527 of whom lived in a town district with more than 50% poor people (UBN)¹⁵. The random sampling of town areas has been extensively described in a previous article; it is based on the calculations for a cluster randomised control study measuring the impact of interventions on contraceptive use among adolescents¹³. A list with population data of all the town areas in Managua based on a census of 2005, was obtained from the municipality. From this list, 33 town areas met the following criteria: more than 50% poor people (UBN) and a number of inhabitants between 1400 and 4500. We employed the latter criterion as the inclusion of very large or very small town areas might have complicated the implementation of the interventions. From these 33 town areas identified, 18 were randomly selected for this study.

Data collection

The study had a cross-sectional design. The data were collected in July and August 2011 through a door-to-door survey aiming to include all adolescents aged 13 to 18 who lived in the 18 randomly selected town areas. The lower age limit was chosen as it was not possible to get ethical approval for surveying subjects younger than 13 years of age. Trained interviewers went to all the houses, asked the person at the door the number of youths aged 13 to 18 living in the house, and invited them to participate in the survey. If the adolescent was absent and could not be located, the interviewer returned once on the next day. The teenagers concerned and the responsible adults were briefed about the purpose of the study and were assured that their responses would remain confidential. They were also informed that participation was voluntary and that they could withdraw at any time. After obtaining verbal consent from the adolescent and the responsible adult the interviewer and the adolescent sat apart and proceeded with the questionnaire. If there were several youths aged 13 to 18 in a family the questionnaire was administered one at a time. The teenagers self-administered questions directly related to sexual behaviour.

The questionnaire was designed by CERCA consortium members based on the illustrative questionnaire for interview-surveys with young people conceived by John Cleland for the World Health Organization¹⁶. The questionnaire contained 59 questions on socio-demographic characteristics, relationships, communication skills, information-seeking behaviour, use of existing SRH services, reproductive history and sexual behaviour. Table 1 presents the variables used for this study. The questionnaire was pilot-tested among 30 adolescents from non-selected eligible study sites to check the potential ambiguity and difficulty in understanding and responding to the questions, the clarity of the instructions given, the design of questionnaire, etc. Minor language revisions and small changes in the design were made after this pilot testing.

Statistical analysis

Completed questionnaires were entered twice using Epi Info™ 7 (CDC, Atlanta, GA, USA). The cleaned database was forwarded for statistical analysis by means

of SPSS Statistics version 20 (IBM Corporation, New York, USA) and R version 3.0.1.

The analyses were stratified for boys and girls. Statistical differences between the groups were evaluated by means of χ^2 -tests, with a significance level of 0.05. We employed univariate and multivariate logistic regression to assess factors related to sexual onset, condom use and use of oral or injectable contraceptives. The odds ratio (OR) and 95% confidence interval (CI) were used as measures of association.

Ethics

This study complies with the Helsinki Declaration on Ethical Principles for Medical Research Involving Human Subjects. It was approved by the Bioethics Committee of Ghent University, Belgium and the committee of ethics and research of the Universidad Nacional Autonoma de Nicaragua.

RESULTS

Sample characteristics

According to the information received from the persons at the door the total number of eligible adolescents in the selected town areas amounted to 3071. Overall, 257 eligible youths did not participate in the survey; of those, 79 (3%) refused participation and 178 (6%) were absent during both the first- and the second visit. From the 2814 collected questionnaires 11 were incompletely filled out and therefore excluded from analysis. The main characteristics of the 2803 enrolled respondents split by sex are given in Table 2. The sample consisted of 1445 (52%) girls and 1358 (48%) boys. The respondents' age varied from 13 to 18 years, with an under-representation of the 18-year-olds (13% in comparison to the other ages (from 16–19%).

Differences between girls and boys were found with respect to whether or not the adolescent was living with the parents ($p = 0.047$). More boys than girls stated they were insufficiently informed on sexuality-related issues ($p < 0.001$). Girls more frequently reported having visited a healthcare provider (HCP) to obtain information on sexuality issues. On the other hand, more girls (162 out of 504) than boys (117 out of 567) said it was not possible to discuss sexuality with their partner ($p < 0.001$). Among the girls 9% (128 out of 1445) were or had ever been pregnant (Figure 1).

Table 1 Definition of the variables.

Variable	Question	Categorisation of answers
<i>Intrapersonal, interpersonal and environmental variables</i>		
Main floor material	What is the main flooring material in your house?	Natural floor Other
Religious affiliation	To which religion do you belong?	Catholic Other No religion
Alcohol consumption	How frequently do you drink alcohol?	Never Less than once a week Weekly or more
Living with parents	How many years did you live with your father/mother over the last three years?	Yes (= 3 years) No (< 3 years)
Ease to talk about sexuality with friends/partner	Do you find it easy to talk about sexuality with friends/partner?	Yes No
Initiative for the last sex was taken by	Who took the initiative at the last sexual intercourse?	Respondent Partner Both
Sex without love	Did you ever have sexual intercourse without feeling love?	Yes No
<i>Sexual health variables</i>		
Sufficiently informed on sexuality	Do you consider yourself being sufficiently informed on the topic sexuality?	Yes No
Visited healthcare provider	Did you visit a healthcare provider to obtain information on sexuality issues over the last year?	Yes No
Sexually active	Have you ever been sexually active (penetration)?	Yes No
Use of oral or injectable contraceptives	Are you or your partner currently using one of the following contraceptive methods? a) Consistent use of condoms during the last three sex acts; b) contraceptive pill; c) contraceptive injection; d) an implant; e) intrauterine device	Yes (b and c) No (other)
Current contraceptive use	Are you or your partner currently using one of the following contraceptive methods? a) Consistent use of condoms during the last three sex acts; b) contraceptive pill; c) contraceptive injection; d) an implant; e) intrauterine device	Yes No
Pregnancy	Are you currently pregnant or have you ever been pregnant?	Yes No

Determinants of sexual onset

There were 475 (35%) boys and 299 (21%) girls who reported being sexually active (OR = 2.06; $p < 0.001$). This sex difference was found in all ages with the exception of the 18-year-olds for whom no difference at the 0.05 level was found. As was expected, age itself

was a determinant of sexual activity: among 13-year-olds, 2% of the girls and 8% of the boys reported being sexually active compared to 57% and 66% among 18-year-olds (Figure 2).

Higher levels of sexual activity were also observed among adolescents not living with their parents (Table 3). In addition, among girls, the absence of the

Table 2 Overview of the characteristics of the sample (N= 2803).

Socio-demographic characteristics	Girls n = 1445	Boys n = 1358
<i>Age</i>		
Median	15	15
Inter-quartile range	[14;17]	[14;17]
Mean	15.29	15.38
<i>Living</i>		
With both parents	737 (51%)	691 (51%)
With father only	54 (4%)	68 (5%)
With mother only	489 (34%)	480 (35%)
With no parents	165 (11%)	119 (9%)
<i>Main floor material</i>		
Natural floor	288 (20%)	269 (20%)
Cement	631 (44%)	635 (47%)
Tiles or wood	525 (36%)	454 (33%)
<i>Religion</i>		
No religion	346 (24%)	407 (30%)
Catholic	443 (31%)	347 (26%)
Evangelical	625 (43%)	567 (42%)
Jehovah's Witnesses	22 (2%)	19 (1%)
Other	9 (1%)	18 (1%)
<i>Alcohol consumption</i>		
Never	1167 (84%)	969 (74%)
Less than once a week	218 (16%)	323 (25%)
Weekly or more	10 (0%)	17 (1%)
Insufficiently informed on sexuality	235 (16%)	333 (25%)
Having a partner	510 (35%)	572 (42%)
Visited healthcare provider	317 (22%)	227 (17%)
Sexually active	299 (21%)	475 (35%)
Sex without love among sexually active	[n = 299]	[n = 475]
	63 (21%)	305 (65%)
Without partner among sexually active	[n = 299]	[n = 475]
	67 (22%)	232 (49%)
Pregnancy	128 (9%)	–

father alone (= living alone with mother) showed a higher odds for being sexually active; this was less the case for boys. Among both girls and boys, alcohol use was linked to a higher probability of being sexually active.

Use of contraception

Of the adolescents who were sexually active, 162 (54%) girls and 206 (43%) boys reported that they were using a modern contraceptive at the time of the survey; this difference between girls and boys was statistically significant ($p = 0.004$). Table 4 shows the contraceptive use among sexually active respondents with a regular

partner (69%) and those not having a regular partner (31%). The latter were less likely to report the current use of a contraceptive.

Hormonal injections were the most common (25%) form of contraception reported by girls, followed by oral contraceptives (OCs, 13%), intrauterine devices (IUDs, 4%) and implants (0.3%).

The logistic multivariate regression analysis of consistent condoms use (Table 5) showed that boys who were Catholic, lived with their mother only, lived in a house with a manufactured floor and had never felt peer pressure to have sex were more likely to report consistent condom use during the last three sex acts. Girls who considered they had sufficient information

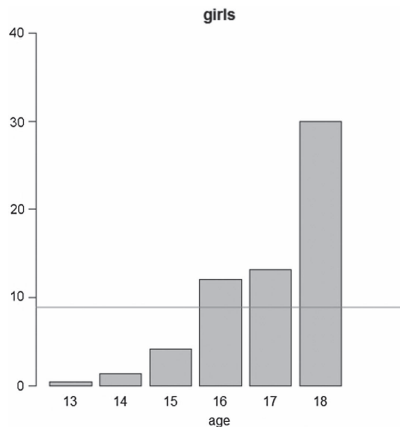


Figure 1 Percentages of girls who were pregnant or had ever been pregnant (the line represents the mean value).

on sexuality and who talked about it with their friends reported a more consistent condom use. Girls older than 16 years and girls whose partner took the initiative for the last sex act were less likely to state they had consistently employed a condom.

Univariate and multivariate regression analyses were done to assess factors related to the use of oral or injectable contraceptives (Table 6). Having a partner was associated with hormonal contraceptive use among boys and girls. Boys who found it easy to talk about sexuality with their partner and employed condoms consistently mentioned more frequently that their partners used oral or injectable contraceptives.

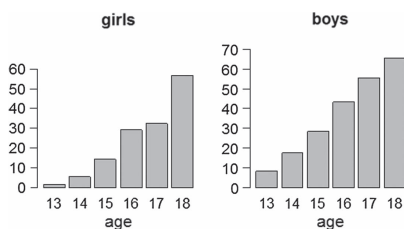


Figure 2 Percentages of sexually active adolescent girls and boys per age group.

DISCUSSION

Main sexual health outcomes

This study assessed sexual health outcomes among adolescents aged 13 to 18 living in poor neighbourhoods in Managua. One quarter of the boys and 16% of the girls stated they were insufficiently informed on issues related to sexuality. Less than 20% of the respondents visited a HCP to obtain information on sexuality in the last 12 months. Of all respondents, 35% of boys and 21% of girls reported that they were sexually active. Among those sexually active adolescents, 43% of the boys and 54% of the girls mentioned that they used a modern contraceptive shortly before the survey. Condoms, OCs and injectables were the methods most frequently relied upon. Few adolescents in our study sample chose long-acting reversible contraceptives (LARCs) such as IUDs or hormonal implants. A current or previous pregnancy was reported by 9% of girls aged 13–18 and by 30% of girls aged 18.

Intrapersonal factors

The sex of respondents and alcohol use were related to sexual behaviours. Boys under 18 were more frequently sexually active than their female peers. A sex difference was also seen in the reported use of contraception. More girls than boys were relying on a modern contraceptive at the time of the survey. Adolescents who consumed alcohol were more likely to have started sexual activity.

Interpersonal factors

ASRH is also determined by the interaction of adolescents with significant others. A recent review provides evidence to support a protective association between adolescents' sexual behaviour and the emotional attachment and communication with family members, friends and partners¹⁷.

Parental liaison

Half of our respondents were not living with both their parents, whose absence was related to sexual onset. The finding that the physical presence of the father is particularly important for girls' sexual behaviour corroborates the results of prior studies associating fathers' absence to early sexual activity and teenage pregnancy¹⁸.

Table 3 Odds Ratios for being sexually active (bivariate analysis).

	Girls	Boys
<i>Age group (ref= 15 or younger)</i>		
≥ 16	8.3 ($p < 0.001^{***}$)	5.35 ($p < 0.001^{***}$)
<i>Living or not with parents (ref= Living with both parents)</i>		
Only with father	1.04 ($p = 1$)	1.32 ($p = 0.342$)
Only with mother	1.36 ($p = 0.049^*$)	1.2 ($p = 0.149$)
With no parents	3.6 ($p < 0.001^{***}$)	1.83 ($p = 0.003^{**}$)
<i>Alcohol consumption (ref= Never)</i>		
Less than once a week	3.87 ($p < 0.001^{***}$)	6.67 ($p < 0.001^{***}$)
Weekly or more	2.17 ($p = 0.387$)	14.2 ($p < 0.001^{***}$)
Having a partner (ref = Not having a partner)	10.77 ($p < 0.001^{***}$)	4.13 ($p < 0.001^{***}$)

The asterisks indicate a difference between boys and girls with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

It is assumed that the impact of the father's absence on the daughter's sexual behaviour is mainly caused by concomitant factors such as divorce, family conflict and income loss. However, a longitudinal study in the United States and New Zealand provides arguments for the hypothesis that, in relation to girls' sexual development, the presence of the father is important in its own right and not just as a proxy for the correlates¹⁸.

Emigration is one of the most common reasons for parental household absence in Central America¹⁹. In Nicaragua, emigration has been increasing during the last years with a net migration rate of -3.3 per 1000 in 2013²⁰ and might be a contributing factor to the current epidemic of teenage pregnancies.

Kind of relationship with sexual partner

The contraceptive prevalence rate was significantly lower among respondents without a regular partner

at the time of the survey. Because it is irregular and less predictable, teenagers who indulge in casual sex might not perceive the need for consistent contraception²¹.

Communication

Communication influences the contraceptive behaviour of adolescents. Feeling comfortable to talk about sexuality with friends is positively associated with condom use. Boys who find it easy to talk about sexuality with their partner report more frequently that the latter uses a hormonal contraceptive than those who state it is difficult to discuss such matters with her. Other studies are concordant with our findings related to communication and contraceptive use^{17,22}.

Peer pressure

In agreement with other investigators¹⁷ our study demonstrates the effect of peer pressure on sexual risk

Table 4 Contraceptive use among sexually active adolescents.

	Adolescents who have a regular partner		Adolescents who do not have a regular partner	
	Girls (N= 232)	Boys (N= 305)	Girls (N= 67)	Boys (N= 170)
Current contraceptive use	138 (59%)	155 (51%)	24 (36%)	51 (30%)
Consistent use of condoms	51 (22%)	84 (27%)	19 (28%)	38 (22%)
<i>Respondent or partner currently uses</i>				
Oral contraceptives	35 (15%)	68 (22%)	4 (6%)	–
Intrauterine devices (copper T)	9 (4%)	5 (2%)	2 (3%)	–
Hormonal implants	1 (0.4%)	2 (0.7%)	0 (0%)	–
Hormonal injections	71 (31%)	37 (12%)	3 (4%)	–

Table 5 Factors associated with consistent condom use during the last three sex acts, univariate and multivariate analyses.

	Univariate analyses				Multivariate analyses			
	Girls (N = 299)		Boys (N = 475)		Girls (N = 299)		Boys (N = 475)	
	OR	p	OR	p	aOR	p	aOR	p
<i>Demographic and socio-economic determinants</i>								
Age group (ref = 15 or younger) ≥ 16	0.67	0.235	1.27	0.328	0.39	0.015*		
Living or not with parents (ref = Living with both parents)								
With no parents	0.97	0.922	0.69	0.328			0.88	0.760
Only with father	0.90	0.895	0.93	0.79			1.10	0.851
Only with mother	0.91	0.777	1.33	0.212			1.89	0.011*
Main floor material (ref = Natural floor)	1.22	0.558	2.22	0.013*			1.95	0.048*
Other type of floor	0.91	0.788	1.97	0.009**			1.77	0.042*
Religion (ref = No religion)	0.81	0.530	0.98	0.943			0.94	0.838
Catholic								
Evangelical and other								
<i>Determinants of knowledge</i>								
Respondent considered to have sufficient information on the topic sexuality (ref = No)	2.67	0.032*	1.08	0.778	2.48	0.061		
<i>Communication about sexuality</i>								
Respondent finds it easy to talk about sex/sexuality with... ... friends (ref = No)	1.97	0.024*	0.83	0.411	2.16	0.023*		
<i>Reasons for having sexual intercourse</i>								
Initiative for the last sex act was taken by...(ref = Both)	0.32	0.141	0.66	0.222	0.31	0.144		
Respondent	0.09	0.021*	0.51	0.094	0.09	0.025*		
Partner	0.72	0.623	0.35	0.023*			0.35	0.034*
Respondent never felt peer pressure to have sexual intercourse (ref = No)								

OR, odds ratio; aOR, adjusted odds ratio.

The p-value refers to the significance of difference with the reference category. The asterisks indicate the level of significance with *p < 0.05; **p < 0.01.

Table 6 Factors associated with use of oral or injectable contraceptives, univariate and multivariate analyses.

	Univariate analyses				Multivariate analyses			
	Girls (N = 299)		Boys (N = 475)		Girls (N = 299)		Boys (N = 475)	
	OR	p	OR	p	aOR	p	aOR	p
<i>Demographic and socio-economic determinants</i>								
Living or not with parents (ref = Living with both parents)								
With no parents	1.68	0.097	0.63	0.205				
Only with father	1.60	0.501	1.11	0.810				
Only with mother	1.09	0.759	0.53	0.010**	0.95	0.886	0.61	0.091
Having a partner (ref = Not having a partner)	6.96	<0.001***	8.04	<0.001***	5.99	<0.001***		
<i>Communication about sexuality</i>								
Respondent finds it easy to talk about sexuality topic of sexuality with...								
... partner (ref = No)	1.62	0.247	2.27	0.019*			2.15	0.030*
... friends (ref = No)	0.55	0.015*	0.74	0.194	0.61	0.071		
<i>Contraceptive practice</i>								
Respondent consistently used condoms during last three sex acts (ref = No)	0.92	0.780	1.90	0.006**			1.80	0.019*
<i>Reasons for having sexual intercourse</i>								
Initiative for the last sex act was taken by... (ref = Both)								
Respondent	0.63	0.381	0.66	0.250	0.65	0.443		
Partner	0.77	0.532	1.00	0.995	0.79	0.593		
Respondent ever felt peer pressure to have sexual intercourse (ref = No)	0.37	0.103	1.11	0.812	0.28	0.064		

OR, odds ratio; aOR, adjusted odds ratio.

The p-value refers to the significance of the difference with the reference category. The asterisks indicate the level of significance with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

taking. Boys and girls who report ever having felt peer pressure to have sexual intercourse are less likely to use condoms and hormonal contraceptives, respectively.

Environmental factors

The context of lasting poverty, changing lifestyles, religiosity, sexual double standards and healthcare reform affect the SRH of adolescents in Nicaragua.

Poverty

Nicaragua is the second poorest country in the Western Hemisphere, with 43% (2009) of the population living below the poverty line²⁰. The floor material is a proxy for household poverty in Nicaragua¹⁴. Twenty percent of our respondents lived in a house with an

earthen floor. Boys living in such a house were less likely to report consistent condom use than their peers living in a house with a manufactured floor. Several studies acknowledge that economic hardship is associated with an early sexarache and unsafe sexual behaviour^{1,5,17}. Poor access to health services, transactional sex and low education are the most frequently mentioned factors related to low socio-economic status with a negative impact on ASRH¹⁷.

Transition to more liberal sexual behaviours

According to Caldwell et al. the penetration of Western mass media and the loss of social control favour sexual experimentation among adolescents²³. In our study sample approximately one third of the respondents were sexually active. Previous research

showed that in Nicaragua, as elsewhere in Latin America, sexual activity is becoming more frequent among teens and starts at an ever earlier age^{7,9,11,17}. The liberal sexual behaviour among Nicaraguan boys can also be inferred from the fact that 65% of the male respondents reported having sexual intercourse without being in love.

Religion

A religious affiliation was reported by 73% of the respondents. In contrast to the prevailing views on religion and contraceptive use, we found that Catholic respondents used condoms more frequently than non-religious adolescents and youths from other faith groups. Nicaraguan researchers argue that local Catholic priests and laypersons, faced with the reality of teenage pregnancies in their parishes and despite the conservative position of the Nicaraguan Catholic Church, promote safe sexual behaviour and condom use among adolescents. As they do not attend church activities, non-religious youths are not receiving this additional, church-based sexuality education. Furthermore, Catholic adolescents attach less importance to religion and religious regulations than their peers belonging to another faith²⁴.

Gender and social norms

In Nicaragua, tradition, religious and cultural beliefs are crucial determinants of normative ideas about good and bad²⁵. Machismo and marianismo (the veneration for feminine virtues like purity and moral strength) are still hegemonic patterns within families²⁶. As a consequence, adolescents often receive contradictory messages regarding sexual behaviour. Boys are encouraged to be sexually active while premarital sex is disapproved for girls^{25,26}.

Those gender issues might partially explain the difference in reported sexual intercourse between male and female respondents. It is likely that, due to social desirability, female respondents denied sexual intercourse in the face-to-face interviews. Similarly, the reported use of contraception differs according to the sex of the respondents. Possibly boys were often not aware of the use of contraceptives by their partners. This lack of awareness among boys about their partner's contraceptive use can also explain the discrepancy regarding reported use of injectables (girls: 31% vs.

boys: 12% of their partners). Both findings suggest that there is a gender difference in taking responsibility regarding protection against pregnancy. Also other studies point out that boys rely on girls' sense of responsibility concerning contraception^{27,28}.

The cultural standards and social pressure may also account for respondents' low use of health services regarding their sexual health. The taboo on sexuality and the expectation that health providers will react negatively restrain girls from seeking help for their contraceptive needs^{28,29}.

Health system in transition

Despite some improvements in health indicators, the Nicaraguan healthcare system still faces challenges regarding the allocation and utilisation of resources, inequities in access, poor working conditions of HCPs and the limited capacity of the Ministry of Health to perform its stewardship role to ensure the quality and efficiency of the health services³⁰.

Some of the study findings can be interpreted in the light of the aforementioned context. The poor access rate of adolescents to SRH services in our study is not unexpected given the overall accessibility problems of the healthcare system³¹. Furthermore, HCPs are reluctant to provide modern contraceptives to adolescents³² notwithstanding the national guidelines on family planning including up-to-date recommendations regarding ASRH³³. In many cases HCPs are not familiar with the content of those standards or do not feel themselves sufficiently backed up to address adolescents' SRH issues in daily practice²⁹⁻³¹. Furthermore, it is likely that the poor working conditions and the job insecurity of HCPs³⁴ have an impact on their willingness to provide SRH services to teenagers. A doctor working under the threat of losing her or his job will be little inclined to take initiatives such as seeing unaccompanied teens or prescribing contraceptives to them for which she/he might be criticised by colleagues, parents or superiors.

In 2007 the Ministry of Health, endorsed by the World Health Organisation (WHO), introduced a new model of care known as the Family and Community Health Model³⁵. This model focuses on a decentralised, community-based and comprehensive approach of primary healthcare. HCPs are expected to offer a broad range of care to the whole population instead of focusing on a particular population group or health

topic. This transition affecting the health system restrains the provision of specific services like ASRH counselling³⁶.

Study limitations

The specific design of this study must be taken into account when interpreting the results. We assessed adolescents living in randomly selected town areas in Managua that met specific criteria regarding poverty and number of inhabitants. Our findings may not be representative for all Nicaraguan youths. But, given the large sample size, it provides an insight in the sexual behaviour of teenagers living in poor urban areas. It is likely that the determinants of that behaviour which we identified are similar to those applying to other adolescent populations in Nicaragua, as those determinants also have been described by other investigators.

Our results could be biased by the fact that 3% of the eligible adolescents refused to participate and that 6% of them could not be located. We have no information on the characteristics of the non-respondents. However, it is likely that a majority of those absent were older adolescents given the under-representation of the 18-year-olds in the sample and the fact that older teenagers are more often absent from home than younger ones. Adjustment of the results for age might have reduced the bias effect of non-respondents.

Sexual behaviours were measured through self-report which might, given the sensitivity of the topic, have led to report bias. We tried to minimise the bias effect by changing during each face-to-face interview to a self-administered procedure for the questions directly related to sexual behaviour.

In the interpretation of the results we link the variable 'main floor material' to the socio-economic situation (SES) of the respondent. The use of this single variable as indicator for the SES can be criticised. However, the floor material, being the most discriminating factor for the quality of the house, is considered a rough proxy for SES in Nicaragua.

Recommendations for interventions and future research

The great number of sexually active youths and the low contraceptive prevalence in Nicaragua underline the need to make contraception accessible to every

teenager. Based on this study, recommendations can be formulated for actions to achieve this.

First, contraceptive counselling should be provided to teenagers consulting a primary healthcare setting. However, the current implementation of a new healthcare model in Nicaragua entails some additional challenges for the provision of adolescent-specific services. Training and structural measures are required to assure the integration of ASRH counselling within the global package of care.

Second, the promotion of LARCs might be an effective strategy that circumvents the barrier of repeated contacts with HCPs. Experts maintain that LARCs are appropriate for adolescents³⁷. They should be offered, in particular, to sexually active teenagers without a current partner as the use of oral or injectable contraceptives among those respondents was extremely low.

Third, our data show the importance of including gender aspects in ASRH promoting interventions. One should investigate the role of fathers in the sexual development of girls and how this role could be positively influenced. Also boys' attitudes towards contraceptive risk-taking should be explored with a view to target the promotion of contraceptive use to both girls and boys.

Fourth, our study identified several interpersonal and contextual factors related to adolescents' sexual behaviour. ASRH promoting strategies should consider both the dynamics between adolescents and important others, and the modifying effect of the context^{4,38}.

CONCLUSION

The adolescent fertility rate in Nicaragua is the highest in Latin America and is among the highest in the world. This study has shed a light on critical factors related to youths' sexual behaviour, which will be useful for the development of effective strategies in Nicaragua.

Adolescents from poor neighbourhoods in Managua initiate sexual activity at early ages and only a few of them consistently use contraceptives. Youths' sexual behaviour is related to personal aspects (sex, alcohol use), to the interaction with important others and to the environment (housing condition, religion). We interpreted the found associates within the Nicaraguan

context including the current societal changes and the recently implemented health system reform.

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GENDER AND HEALTH

A cross-sectional study on attitudes toward gender equality, sexual behavior, positive sexual experiences, and communication about sex among sexually active and non-sexually active adolescents in Bolivia and Ecuador

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Background: It is widely agreed upon that gender is a key aspect of sexuality however, questions remain on how gender exactly influences adolescents' sexual health.

Objective: The aim of this research was to study correlations between gender equality attitudes and sexual behavior, sexual experiences and communication about sex among sexually active and non-sexually active adolescents in 2 Latin American countries.

Design: In 2011, a cross-sectional study was carried out among 5,913 adolescents aged 14–18 in 20 secondary schools in Cochabamba (Bolivia) and 6 secondary schools in Cuenca (Ecuador). Models were built using logistic regressions to assess the predictive value of attitudes toward gender equality on adolescents' sexual behavior, on experiences and on communication.

Results: The analysis shows that sexually active adolescents who consider gender equality as important report higher current use of contraceptives within the couple. They are more likely to describe their last sexual intercourse as a positive experience and consider it easier to talk with their partner about sexuality than sexually experienced adolescents who are less positively inclined toward gender equality. These correlations remained consistent whether the respondent was a boy or a girl. Non-sexually active adolescents, who consider gender equality to be important, are more likely to think that sexual intercourse is a positive experience. They consider it less necessary to have sexual intercourse to maintain a relationship and find it easier to communicate with their girlfriend or boyfriend than sexually non-active adolescents who consider gender equality to be less important. Comparable results were found for boys and girls.

Conclusions: Our results suggest that gender equality attitudes have a positive impact on adolescents' sexual and reproductive health (SRH) and wellbeing. Further research is necessary to better understand the relationship between gender attitudes and specific SRH outcomes such as unwanted teenage pregnancies and sexual pleasure among adolescents worldwide.

Keywords: *adolescents; gender attitudes; Latin America; sexual behavior; positive sexual experiences*

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It is widely agreed upon that gender is a key aspect of sexuality (1–4); however, questions remain on how gender exactly influences adolescents' sexual health (2, 5, 6). The relationship between gender and sexuality is a multifaceted and multi-determined social process (7),

strongly affected by societal, interpersonal, and personal factors (1, 8). During adolescence, sexual and reproductive development and health are key issues that go hand in hand with gender equality (2, 9). Studies have shown that less egalitarian gender norms threaten the sexual

health and wellbeing of adolescents (2, 10–13). Adolescent boys with less egalitarian gender norms are more likely to engage in sexual risk behavior, such as having multiple sexual partners. Adolescent girls with less egalitarian gender norms are more vulnerable to negative sexual and reproductive health (SRH) outcomes, such as experiencing sexual coercion (6, 8, 14).

Background

On a societal level, former research clearly indicated that social influences and cultural attitudes have an effect on sexual behavior among adolescents (2, 8, 14). Different gender norms exist for adolescent boys and girls (2). Adolescents internalize these social norms and values before they become sexual active (15) and their sexual attitudes and behavior are shaped by them (6, 14, 16).

On an interpersonal level, research indicated the need to further explore factors that are related to adolescent communication about sexuality (17, 18). It has been proven that gender stereotypes shape the way young people communicate (19) and that communication about sexuality is different for adolescent boys and girls (18, 20–22).

On an individual level, aspects such as norms and attitudes influence adolescents' sexual behavior and experiences. Girls tend to have more egalitarian gender role attitudes than boys who claim to have more traditional gender role attitudes (6, 23). These differences play a role in diverse sexual behavior for both sexes (2). Little is known on the association between adolescent sexual behavior and sexual pleasure (2, 24). However, research has proven that adolescents consider sexual pleasure to be an important goal in their relationships and that they expect sex to result in sexual pleasure (13). Studies among students in the United States have shown that gender equality and perceived equity in a relationship are both associated with sexual enjoyment (12, 25). Similar data were found among Swedish adolescent heterosexual girls who mentioned sexual pleasure on equal terms as a characteristic of their ideal sexual situation (26).

Limited research in Latin America confirmed these results. At societal level, Latino cultures are characterized by a cultural machismo–marianismo system, which includes a traditional gender ideal of male dominance and female submission (10, 27, 28). Studies in the Caribbean and Ecuador indicated that these diverse social and cultural gender norms lead to different sexual behavior among boys and girls (8, 28). The macho male adolescents are supposed to be heterosexual, have many sexual partners and should engage in higher sexual risk behavior than the female adolescents who are expected to be innocent and self-sacrificing and therefore more vulnerable to negative SRH outcomes (8, 28, 29). These traditional gender norms also constitute barriers for adolescent girls to enjoy sexual experiences (10, 28).

At an interpersonal level, research in the United States has shown that a cultural Latin American background increases the difficulty to communicate on sexuality (30, 31). The Horizon project in Brazil concluded that boys who participated in interventions that promoted gender equitable behavior, communicated with their primary partners about a broader range of key HIV/STI-related topics (29).

At an individual level, the same project indicated that men who had more equitable gender norms showed less sexual risk behavior (32). Research in Ecuador and Brazil found an increasing tendency among adolescents to have more consensual and pleasant sex and depicts a close relationship between gender norms and adolescent sexual pleasure (10, 28, 32).

We can conclude that evidence on the association between gender and adolescent sexuality exists and is growing. The importance of gender for adolescents' sexuality is also recognized by international organizations such as the United Nations Population Fund and the World Health Organization (WHO) who recognize the need to address gender as an 'upstream' antecedent of adolescents' sexual health behavior (33, 34). However, until now in Latin America, only limited research was conducted on societal, interpersonal and personal levels to understand the link between gender equality and adolescents' sexuality (8, 10, 27–29, 32). On a societal level, comparing different gender equality indicators could assess this relationship. Nevertheless, our research focusses on the individual and interpersonal level, while taking into account that adolescents remain the main target group in changing behavior programs to improve their sexual health. We defined the interpersonal level as the level which includes factors that are related to the interaction of the adolescent with their partners, peers and parents. The main objective of this article is to describe how gender equality attitudes among adolescents in Latin America are correlated to their sexual behavior, positive sexual experiences and communication about sex. To the best of our knowledge, these correlations have not yet been structurally studied in any large-scale research performed in Latin America.

Methods

This paper presents partial results of the international interventional research project Community Embedded Reproductive Health Care for Adolescents in Latin America (CERCA), funded by the European Commission (35). CERCA seeks to create a community-based model to improve adolescent health, by organizing activities such as workshops, family visits, sending informative text messages and psychological counseling. The topics treated were related to SRH and wellbeing for adolescents, communities, health care providers and authorities. The intervention ran for a period of approximately 2 years.

In 2011, a cross-sectional study was carried out among 5,913 adolescents aged 14–18 years in 20 secondary schools in Cochabamba (Bolivia) and 6 secondary schools in Cuenca (Ecuador). These schools were purposively selected according to a strategy developed by the CERCA consortium: 1) selection of primary health care centers that took part in the interventions: 2 in Cochabamba and 3 in Cuenca; 2) selection of secondary intervention schools that fell within the area of coverage of these health care centers: 12 in Cochabamba and 3 in Cuenca; and 3) selection of secondary control schools within the area of coverage of other primary health care centers: 8 in Cochabamba and 3 in Cuenca. The selected intervention and control schools had similar characteristics (socio-economic indicators, geographic location and the size of school). The survey was conducted in both intervention and control schools (20 out of a total of 1,100 schools in Cochabamba and 6 out of a total of 127 schools in Cuenca) before the intervention started. The amount of selected schools and participants was based on the calculations for a cross-sectional control study measuring the impact of interventions on contraceptive use among adolescents. We estimated that among 14–18 year-old adolescents, 30% are sexually active and that 30% of the sexually active adolescents use a modern contraceptive. Using the finite population correction factor, we determined that a minimum of 2,057 respondents was needed in each country to detect a significant difference of 10% in contraceptive use between the intervention and control groups. Due to the larger amount of schools in Cochabamba, within the area of coverage of the selected health care centers, more schools were selected in Cochabamba than in Cuenca. In Cochabamba, the selected health care centers and schools were located in 3 different zones, which are all urban with basic health services. One zone is mainly populated by middle-income families (Sarcobamba); the other 2 areas (Central Cochabamba and Quintanilla) have a mix of very poor and very rich inhabitants. In Cuenca, the survey was conducted in urban (parish Cañaribamba) and rural areas (parish El Valle and Chiquintad). The parish of Chiquintad is characterized by migration and poverty; the other 2 parishes have residents of middle-income. Due to the fact that the selected schools in Cuenca were mainly technical schools, girls were underrepresented in our sample. However, our sample had a representative mix of adolescents with an urban versus rural (only Ecuador) and diverse socio-economic background.

In Bolivia, the study was approved on 6 July 2011 and in Ecuador on 13 September 2011 by the relevant ethical committees (Tribunal de Ética Médica Colegio Médico de Cochabamba and Comisión de Bioética Facultad de Ciencias Médicas, Universidad de Cuenca). In both countries, different procedures were applied, depending on the national legislation. In Bolivia, the permission of

the Ministry of Education and institutional permission of all selected schools was obtained. Subsequently, trained CERCA staff invited all 14–18 year-old students who were present that day, to complete a self-administered questionnaire after having signed an informed consent form (36). In the selected schools in Ecuador, firstly, institutional permission was obtained and secondly, all parents or guardians of the students were, during a school meeting, informed by project staff about the study. Afterwards, they were asked to provide written refusal or agreement on the participation of their children. The students who had parental permission to participate were asked to sign an informed consent. Of all Ecuadorian students who received approval of their parents to participate (all but 11), 2 refused to take part in the study. In Bolivia all invited adolescents participated. In total, 4,000 adolescents in Bolivia and 2,699 in Ecuador (total 6,699 adolescents), aged between 14 and 18, took part in the research. However, 486 questionnaires in Bolivia and 300 in Ecuador were invalid and excluded from the study. This brought the total final sample down to 5,913 adolescents.

One of the investigated topics was adolescents' gender attitudes, which was measured using the Attitudes toward Women Scale for Adolescents (AWSA) (37). This scale is widely used to assess gender attitudes among adolescents (38–42). Galambos et al. found high reliability for the internal consistency estimates and the test–retest stability of the scale as well as a large support for the construct validity of the scale (37). For this study, the Spanish version of AWSA was used. The scale was pilot tested before conducting the survey.

A factor analysis of the AWSA scale was performed and is described in detail in the authors' article on the AWSA scale (36). Three subscales emerged from the factor analysis: power dimension, equality dimension and behavioral dimension. When testing the external validity of the different factors, mainly the factor of equality dimension revealed a consistent correlation with adolescent sexual behavior. This article provides a more in-depth analysis of the equality dimension subscale. Respondents were asked if they agreed with the following 4 statements which refer to the fact that men and women should have the same rights and opportunities (in brackets the number of the item in the AWSA is presented):

- 1) (V03) On average, girls are as smart as boys
- 2) (V05) It is alright for a girl to want to play rough sports like football
- 3) (V09) If both husband and wife have jobs, the husband should do a share of the housework such as washing dishes and doing the laundry
- 4) (V12) Girls should have the same freedom as boys

Each item represents an attitude to which the study participants responded on a 4-point Likert-type scale ranging from 1 'strongly agree' to 4 'strongly disagree'. In the analyses, the responses were reversely coded to create a gradient with higher scores indicating a more positive attitude toward gender equality. For each item, on average 40 (0.7%) values were missing. They were replaced by the estimated mean from the respondent's answers to the remaining items. For further analysis, the values of the factorial scores on the equality dimension were divided in 3 categories, using their terciles as cut-off points and coded as: 1 = low, 2 = medium and 3 = high positive attitude toward gender equality. Due to differences in responses, this procedure was performed by splitting data into: respondents' sex, age group (14–16 and 17–18) and country.

The Cronbach α was used as a measure of internal consistency of the subscale. The subscale was subjected to the Spearman–Brown prediction formula to adjust its reliability to the reliability of the full 12-item test (43). A Cronbach $\alpha \geq 0.70$ (0.70 for girls and 0.73 for boys) was considered acceptable.

The statistical analyses were done using SPSS 21.0. As the sample of our study was not randomly selected, in all analyses, data were adjusted through weighing by sex, country and age, using the average distribution of the respondents as a standard population. By weighing, we aimed at reflecting the distribution in the general study population.

Logistic regressions were performed to estimate the adjusted odds ratios (aORs) and their 95% confidence intervals of adolescents' sexual behavior, sexual experiences and communication about sex in relation to adolescents' attitudes toward gender equality. The goodness of fit of the logistic regression model was evaluated calculating the Hosmer and Lemeshow test ($p > 0.05$ indicating an acceptable model). Interactions between sex and gender equality attitudes (both categorical variables) were tested.

Sexual behavior was measured, using the following questions and variables: 'Did you ever have sexual intercourse (coitus)?' (yes/no), 'Do or did you feel pressure to have sexual intercourse because a lot of your peers already had sexual intercourse?' (yes/no), number of sexual partners (2 or more/1), current contraceptive use of couples (yes/no) (current use of contraceptives or the use of a condom during the 3 most recent sexual experiences), the fact whether both had taken the initiative to have sexual intercourse the last time (yes/no) and the agreement on the necessity to have sexual intercourse to maintain a relationship (yes/no).

Positive sexual experiences for sexually active adolescents were measured by the outcomes 'positive experience' and 'not positive experience' (neutral, negative, don't know) on the question 'How did you feel the last time you

had sexual intercourse?' For sexually inactive adolescents a bivariate variable was formulated based on the question 'Do you think that sexual intercourse is a positive experience?'

The bivariate variable (yes/no) 'easy communication with the partner' is based on the answers of adolescents who indicated currently having a partner.

We assessed the predictive role of attitudes toward gender equality in different components of adolescents' sexual behavior, experiences and communication for sexually active and for sexually non-active adolescents separately. The same confounding factors (age, sex, country, living with mother/father, living conditions, and importance of religion) were included in both models as adjusting components. The confounders were identified based on correlation analysis and on literature research.

Results

Of the 5,913 respondents, 3,330 were boys and 2,583 were girls, 59.4% were Bolivian and 40.6% Ecuadorian. Of all respondents 23.4% ever had sexual intercourse. In the overall sample, 93.9% of the respondents completed the AWSA scale. One hundred and thirty-seven respondents (2.3%) did not respond to any of the items V03, V05, V09 and V12 and were therefore excluded from the analysis. Table 1 describes the crude and the weighted distribution of respondents by social, demographic and sexual outcome variables.

Table 2 displays the distribution of the scores per AWSA item by sex and age.

The mean of the total score on the gender equality subscale was 12.68 and the median 13.00. Girls expressed more positive attitudes toward gender equality than boys (mean scores were 13.10 and 12.27, $p < 0.001$, respectively for girls and boys). The scores did not significantly differ by age or by whether or not the adolescents were sexually active.

Table 3 shows the results of the logistic regression for sexually active adolescents. Adolescents who were sexually active and who considered gender equality as important (high vs. low) declared higher current use of contraceptives within the couple, were more likely to describe their last sexual intercourse as a positive experience and considered it easier to communicate with their partner about sex than sexually experienced adolescents who were less positively inclined toward gender equality. Gender equality attitudes were not a significant predictor of ever having had sexual intercourse, of the number of sexual partners, of mutual initiative to have sexual intercourse, or of pressure for sexual intercourse. When calculating the interaction between sex and gender equality, the outcome remained consistent.

The same analysis was done for non-sexually active adolescents (Table 4). In this group, adolescents who considered gender equality as important, were more likely

Table 1. Crude and weighted distribution of respondents by social, demographic and sexual outcome variables

Characteristics (predictors and outcome variables)	Crude number	Weighted
	of cases <i>n</i> (%)	number of cases <i>n</i> (%)
All cases	5,913 (100.0)	5,913 (100.0)
Sex		
Boys	3,330 (56.3)	2,957 (50.0)
Girls	2,583 (43.7)	2,956 (50.0)
Age (years)		
14	1,173 (19.8)	1,183 (20.0)
15	1,451 (24.5)	1,183 (20.0)
16	1,456 (24.6)	1,183 (20.0)
17	1,274 (21.5)	1,182 (20.0)
18	559 (9.5)	1,182 (20.0)
Country		
Bolivia	3,514 (59.4)	2,957 (50.0)
Ecuador	2,399 (40.6)	2,956 (50.0)
Living with mother during the last 3 years		
Less than last 3 years	1,043 (18.2)	1,034 (18.1)
3 years or more	4,696 (81.8)	4,691 (81.9)
Living with father during the last 3 years		
Less than last 3 years	2,273 (39.5)	2,437 (42.4)
3 years or more	3,486 (60.5)	3,315 (57.6)
Quality of living house		
Poor	2,069 (35.0)	2,125 (36.0)
Good	3,834 (65.0)	3,779 (64.0)
Importance of religion		
Not important	1,487 (26.9)	1,344 (24.3)
Important	4,047 (73.1)	4,186 (75.7)
Factor of gender equality		
Low	1,963 (33.2)	1,971 (33.4)
Middle	2,077 (35.1)	2,042 (34.5)
High	1,873 (31.7)	1,900 (32.1)
Had sexual intercourse (penetration)		
No	4,518 (76.6)	4,341 (73.6)
Yes	1,379 (23.4)	1,557 (26.4)
Those who had sex	1,379 (100.0)	1,557 (100.0)
Number of sexual partners		
1	596 (51.2)	719 (53.6)
2 or more	569 (48.8)	622 (46.4)
Actual use of contraceptives		
No	954 (69.2)	1,054 (67.7)
Yes	425 (30.8)	502 (32.3)
Experience of last sexual intercourse		
Not positive	518 (39.5)	531 (35.8)
Positive	794 (60.5)	953 (64.2)
Mutual initiative to have sexual intercourse the last time		
No	767 (55.6)	798 (51.3)
Yes	612 (44.4)	758 (48.7)
Pressure to have sexual intercourse		
No	1,010 (85.6)	1,169 (86.9)
Yes	170 (14.4)	175 (13.1)

Table 1 (Continued)

Characteristics (predictors and outcome variables)	Crude number	Weighted
	of cases <i>n</i> (%)	number of cases <i>n</i> (%)
Easy communication with partner about sex		
No	432 (37.8)	457 (36.3)
Yes	712 (62.2)	802 (63.7)
Those who did not have sex	4,518 (100.0)	4,341 (100.0)
Ideas about sexual intercourse		
Not positive	3,336 (76.8)	3,245 (77.5)
Positive	1,005 (23.2)	943 (22.5)
Agreement with necessity to have sexual intercourse to maintain a relationship		
Did not agree	3,271 (74.4)	3,205 (75.7)
Agreed or did not know	1,128 (25.6)	1,031 (24.3)
Feeling the pressure to have sexual intercourse		
No	2,991 (89.3)	2,884 (89.5)
Yes	359 (10.7)	340 (10.5)
Easy communication with partner about sex		
No	985 (69.3)	952 (68.5)
Yes	436 (30.7)	437 (31.5)

to think that sexual intercourse is a positive experience, considered it less necessary to have sexual intercourse to maintain a relationship and found it easier to communicate about sex with their girlfriend or boyfriend than sexually non-active adolescents who were less supportive toward gender equality. An association between gender equality attitudes and pressure to have sexual intercourse has not been found. Similar aOR have been obtained when including the interaction between sex and gender equality in the model.

The differences between the groups with medium and high attitudes toward gender equality are small and not significant.

Considering the confounding factors, we can observe that especially religion was positively correlated with the sexual experiences of adolescents and the mutual initiative to have the most recent sexual experience. Except for the outcome of feeling pressure to have sexual intercourse, age was also positively correlated with adolescents' sexual behavior, experiences, and communication. Negative correlations were found between sexual active adolescents' religion and the fact that they ever had sexual intercourse, the communication with their partner about sex, their number of sexual partners, and with feeling pressure for sexual intercourse. For non-sexually active adolescents, religion was merely negatively correlated with the agreement of needing to have sexual intercourse to be able to maintain a relationship. For these adolescents who did not have sexual intercourse yet, age is an important confounding factor for all outcomes.

Table 2. The distribution of the scores per AWSA item by sex and age

Group of respondents	Distribution of responses to the items of the gender equality subscale ^a							
	V03		V05		V09		V12	
	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree
Boys	770 (26.3%)	2,157 (73.7%)	1,041 (35.3%)	1,904 (64.7%)	260 (8.8%)	2,679 (91.2%)	667 (22.7%)	2,271 (77.3%)
Girls	508 (17.3%)	2,426 (82.7%)	808 (27.6%)	2,120 (72.4%)	127 (4.3%)	2,805 (95.7%)	455 (15.5%)	2,486 (84.5%)
p^b	<0.001		<0.001		<0.001		<0.001	
14–16-year old adolescents	808 (23.0%)	2,707 (77.0%)	1,158 (32.9%)	2,363 (67.1%)	264 (7.5%)	3,259 (92.5%)	610 (17.3%)	2,911 (82.7%)
17–18-year old adolescents	469 (20.0%)	1,876 (80.0%)	692 (29.4%)	1,661 (70.6%)	123 (5.2%)	2,225 (94.8%)	512 (21.7%)	1,846 (78.3%)
p^b	0.007		0.005		0.001		<0.001	

^aResponses 'Strongly disagree' and 'Disagree' were aggregated to 'Disagree' and responses 'Agree' and 'Strongly agree' were aggregated to 'Agree'; ^bChi-square test.

Discussion

This study investigated how gender equality attitudes among adolescents in Bolivia and Ecuador are linked with sexual topics at the individual level (mainly sexual behavior and positive sexual experiences) and at the interpersonal level (communication with partner about sex). Our study revealed that more egalitarian gender attitudes are related to higher current use of contraceptives within the couple, with more positive experiences and ideas related to sexual intercourse and easier communication about sex with the partner among sexually active and sexually non-active adolescents.

The finding of higher current contraceptive use within couples corresponds with research results found in Brazil, where intervention research indicated the link between gender equitable norms of young men and a higher reported condom use at last sexual intercourse (32). The fact that individual positive attitudes toward gender equality are related to a higher use of contraceptives is not surprising within a Latin American culture, known for its machismo. Having positive attitudes toward gender equality means one breaks free from the typical male role as virile, promiscuous and dominant and from the female stereotype as being innocent, submissive and self-sacrificing (2, 8, 14, 28). This might – at the interpersonal level – open opportunities to discuss not only topics related to HIV, as was demonstrated in Brazil (29), but also to discuss topics concerning contraceptive use. This assumption is in line with our research, which indicates a positive correlation between gender equality attitudes and communication with the partner about sexuality.

Former research indicated an association between physically measured sexual enjoyment and perceived equity among young adults in the United States (12).

The research of Goicolea et al. (10) revealed an emerging interest in women's sexual pleasure among Ecuadorian adolescents. Our research is the first to indicate the relationship between attitudes in favor of gender equality and more positive experiences and ideas about sexual intercourse in Latin America.

The fact that no significant difference was found between the groups with medium and high positive attitudes toward gender equality could be related to the characteristics of the Latin American culture, known for its' distinct gender roles for men and women. As gender equality is not yet widely accepted, the fact that adolescents' have positive attitudes toward gender equality or not could be more important and significant than the magnitude of these attitudes. We hypothesize that the intensity of gender equality attitudes is of more importance in cultures where gender equality is well accepted.

Our data did not show a correlation of positive attitudes toward gender equality with the number of sexual partners, or with a mutual initiative to engage in the most recent sexual experience or with feeling pressure to have sexual intercourse. Former research conducted in 37 countries concluded that individuals living in highly egalitarian countries are more likely to have more sexual partners, compared to someone living in a country where women's status is significantly inferior to the status of men (44). It might be that we could not find a correlation between adolescents' individual gender attitudes and their number of sexual partners due to the impact of gender at societal level. Bolivia and Ecuador are respectively ranked 97 and 83 in the list of the Gender Inequality Index (45). This influence of social gender norms can also explain why we did not find a relation between a mutual initiative to engage in the most recent sexual experience and gender attitudes. Regarding sexual pleasure of adolescents girls in

Table 3. Demographic and social factors predicting different aspects of sexual behavior among sexually active adolescents: odds ratios (ORs) and 95% confidence intervals (CIs) estimated from the multivariate binary logistic regression

Predictors	Ever had sexual intercourse		Number of sexual partners		Current use of contraceptives		Positive experience last sexual intercourse		Both have taken initiative to have sexual intercourse the last time		Pressure for sexual intercourse		Easy communication with partner	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age ^a	1.85	(1.75; 1.95)***	1.17	(1.06; 1.30)**	1.17	(1.06; 1.29)**	1.20	(1.09; 1.33)***	1.31	(1.20; 1.44)***	0.92	(0.80; 1.06)	1.18	(1.06; 1.31)**
Country ^b	1.21	(1.05; 1.39)**	0.98	(0.76; 1.26)	1.33	(1.05; 1.70)*	1.81	(1.42; 2.31)***	1.51	(1.23; 1.94)***	0.68	(0.47; 0.97)*	1.15	(0.88; 1.51)
Sex ^c	2.17	(1.89; 2.50)***	3.1	(2.41; 3.98)***	0.88	(0.69; 1.18)	0.79	(0.62; 1.02)	0.65	(0.52; 0.82)***	0.85	(0.60; 1.22)	0.77	(0.58; 1.01)
Gender equality ^d	0.9	(0.77; 1.07)	1.01	(0.75; 1.36)	1.52	(1.14; 2.03)**	1.13	(0.85; 1.50)	1.27	(0.97; 1.66)	0.89	(0.57; 1.38)	1.06	(0.79; 1.44)
Gender equality ^e	0.88	(0.84; 1.16)	1.16	(0.87; 1.55)	1.87	(1.28; 2.71)***	1.71	(1.28; 2.28)***	1.21	(0.93; 1.56)	1.28	(0.85; 1.92)	1.83	(1.94; 2.50)**
Living with mother ^f	0.61	(0.51; 0.72)***	0.72	(0.53; 0.97)	0.83	(0.62; 1.10)	0.88	(0.65; 1.18)	1.10	(0.83; 1.45)	0.42	(0.28; 0.62)***	0.88	(0.64; 1.23)
Living with father ^g	0.77	(0.66; 0.89)***	0.95	(0.73; 1.23)	1.15	(0.88; 1.48)	1.44	(1.11; 1.86)**	0.90	(0.70; 1.14)	1.12	(0.76; 1.63)	0.75	(0.57; 0.99)**
Living conditions ^h	1.16	(1.01; 1.34)*	1.37	(1.05; 1.78)*	1.13	(0.88; 1.45)	1.34	(1.04; 1.73)*	1.12	(0.88; 1.42)	0.80	(0.55; 1.16)	2.05	(1.56; 2.69)***
Importance of religion ^h	0.61	(0.53; 0.72)***	0.6	(0.45; 0.79)***	0.87	(0.67; 1.13)	1.64	(1.27; 2.12)***	1.32	(1.03; 1.69)*	0.69	(0.48; 1.00)*	0.68	(0.51; 0.92)*
p ⁱ	0.853		0.133		0.098		0.090		0.090		0.058		0.155	

^aChange by 1 year; ^bEcuador vs. Bolivia (ref.); ^cboys vs. girls (ref.); ^dmedium vs. low gender equality (ref.); ^ehigh vs. low gender equality (ref.); ^fduring last 3 years, lived together with father/mother all time vs. not all time (ref.); ^ggood vs. poor (ref.); ^hreligion was considered as a value vs. not a value (ref.); Hosmer and Lemeshow test to evaluate the goodness of fit of the logistic regression model. **p* < 0.05; ***p* < 0.01; ****p* < 0.001 (bolded).

Ecuador, Goicolea mentions that, on the individual level adolescent girls may feel equal to boys, but due to powerful cultural expectations, at the interpersonal level they may consider it inappropriate or impossible to take initiative for having sex and thus for seeking sexual pleasure (10). And finally, the fact that our study neither shows correlations between gender equality attitudes and feeling pressure to have sexual intercourse among both sexually active and non-sexually active adolescents, could be influenced by the fact that our question concerning pressure did not exclusively refer to the partner – presumed mostly of the opposite sex. The answers to our question could also imply pressure felt by peers or siblings – of both sexes. If, for example, girls reported about pressure felt by other girls, their decision to initiate sex could mainly be influenced by peer pressure and not by the gender stereotype that, being a girl, they should fulfill their boyfriend's wishes.

Our research indicated that adolescents who considered religion as important, were less likely to have developed (an extensive) sexual life. However, when they were sexually active, they demonstrated more positive experiences and mutual initiative to have sexual intercourse. This significant relationship of religiosity is of interest as it is, besides gender attitudes, an important cultural factor influencing adolescents' sexual health and wellbeing.

Sexuality education for adolescents in Latin America is rarely widely embedded in the cultural context of a country (46) and still needs improvement. However, our research is in line with former research, which demonstrates the importance of incorporating a gender transformative approach and of promoting gender-equitable relationships between men and women to produce effective behavior that improves SRH (5). The impact of such educational programs could be measured using the 'gender equality' scale, which we obtained through factor analysis on the AWSA scale (36). Additionally, we would like to point out that our results suggest that these gender programs could be important for boys and for girls. Although until now, principally boys are targeted in established gender transformative projects to reduce sexual risk behavior and to prevent violence (29), our study depicts that gender attitudes are related to sexual behavior, experiences and communication of both sexes. Furthermore, our results show a correlation between positive attitudes toward gender equality and communication and ideas about sexual intercourse of adolescents who didn't have sexual intercourse yet. This implies that gender transformative programs could also be important for the sexual health and wellbeing of adolescents who are at earlier stages of their sexual trajectory (3).

Our study has various limitations. The first is related to the sampling methodology. It is important to note that the adolescents who participated in the study were not randomly chosen and they all attended schools in the

Table 4. Demographic and social factors predicting different aspects of sexual behavior among adolescents who haven't had sexual intercourse yet: odds ratios (ORs) and 95% confidence intervals (CIs) estimated from the multivariate binary logistic regression

Predictors	Positive ideas about sexual intercourse		Agreement to have sexual intercourse to maintain a relationship		Easy communication with partner about sex		Feeling pressure to have sexual intercourse	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age ^a	1.17	(1.10 1.24)***	1.09	(1.03; 1.15)**	1.30	(1.21; 1.40)***	1.20	(1.10; 1.31)***
Country ^b	1.57	(1.33; 1.86)***	0.96	(0.82; 1.13)	0.81	(0.66; 1.00)*	0.73	(0.57; 0.93)*
Sex ^c	3.75	(3.16; 4.44)***	3.67	(3.11; 4.32)***	1.64	(1.34; 2.02)***	2.22	(1.74; 2.84)***
Gender equality ^d	1.30	(1.06; 1.59)*	0.79	(0.65; 0.95)***	1.41	(1.10; 1.81)***	0.94	(0.70; 1.25)
Gender equality ^e	1.36	(1.11; 1.66)**	0.60	(0.49; 0.73)***	1.86	(1.44; 2.39)***	0.93	(0.70; 1.24)
Living with mother ^f	1.32	(1.03; 1.71)*	1.11	(0.87; 1.41)*	0.89	(0.67; 1.18)	0.87	(0.65; 1.17)
Living with father ^f	0.91	(0.77; 1.09)	1.09	(0.92; 1.30)	1.03	(0.83; 1.28)	0.94	(0.66; 1.32)
Living conditions ^g	1.59	(1.34; 1.90)***	0.90	(0.77; 1.06)	1.08	(0.87; 1.33)	0.90	(0.69; 1.16)
Importance of religion ^h	1.14	(0.93; 1.39)	0.77	(0.64; 0.92)**	1.13	(0.86; 1.44)	0.83	(0.63; 1.10)
ρ^i	0.173		0.223		0.716		0.234	

^aChange by 1 year; ^bEcuador vs. Bolivia (ref.); ^cboys vs. girls (ref.); ^dmedium vs. low gender equality (ref.); ^ehigh vs. low gender equality (ref.); ^fduring last 3 years, lived together with father/mother all time vs. not all time (ref.); ^ggood vs. poor (ref.); ^hreligion was considered as a value vs. not a value (ref); ⁱHosmer and Lemashow test to evaluate the goodness of fit of the logistic regression model. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (bolded).

city of Cochabamba (Bolivia) and Cuenca (Ecuador). Hence, we did not capture answers of adolescents in other cities nor from more vulnerable adolescents who lived in rural and poorer areas or who did not go to school. Taking into account the fact that lower socio-economic status is associated with risky sexual behavior (8) and the knowledge that education influences the gender role attitudes of adolescents (23, 47), we could expect to find different results among adolescents in broader target groups. Secondly, we are confronted with blindness within the sample, as we did not gather data on the sexual diversity of our participants. Nevertheless, in a Latin culture where many people define gender roles based on a binary biological division (man vs. woman), a relationship between sexual identity, gender attitudes and sexual behavior could be expected. Thirdly, at the level of analysis and due to the fact that our research was a sub-study within a broader investigation about SRH of adolescents, we were bound by limited socio-demographic features as confounding factors. And finally, inherent to a cross sectional study, our research did not allow to formulate causal relationships between adolescents' gender equality attitudes and aspects related to their sexual behavior, experiences and communication with their partner.

These limitations of our study indicate the need for additional research to understand how gender has an impact on the sexual behavior of a more diverse group of adolescents. Considering the necessity to incorporate gender into a socio-ecological model of adolescent sexual

health, as indicated by Pilgrim et al. (2012) and Tolman et al. (2003), we consider it important to conduct longitudinal research among a randomly selected adolescent population aiming at understanding how gender barriers function at the different levels of the socio-ecological model and how they can be removed in order to ensure healthy and satisfactory sexual health outcomes for all adolescents. Additionally, we would like to suggest to do research on comprehensive indicators for adolescent sexual pleasure. Our research results on the topic can only be viewed as a first step in the systematic measurement of sexual pleasure in Latin America.

In spite of the mentioned limitations, we were able to conduct one of the first systematically performed descriptive researches on the relationship between gender attitudes and sexual behavior, experiences and communication among a large sample of Latin American adolescents.

Conclusion

Descriptive research in Bolivia and Ecuador has indicated a positive relationship between attitudes toward gender equality and sexual behavior, sexual experiences and communication of sexually active and non-sexually active adolescent boys and girls. Our results suggest that gender equality attitudes have a positive impact on adolescents' SRH and wellbeing. Further research is necessary to better understand the relationship between gender attitudes and specific SRH outcomes such as unwanted teenage pregnancies and sexual pleasure among adolescents worldwide.

Authors' contribution

The work presented here was carried out jointly between all authors. SDM, LJ, AZ, PD and KM provided support in the design of the study and contributed intellectual input into the main ideas of this paper. PD and SDM coordinated the implementation of the study. PD, SDM, LJ and OD supervised the data collections. SDM drafted the manuscript. AZ and OD performed statistical analysis and KM gave intellectual input. SDM provided substantial content and rewriting support. All authors contributed to the drafting of the manuscript. All authors read and approved the final manuscript.

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Title

Barriers for adolescent sexual and reproductive healthcare in Latin America: perspective of caregivers from public primary health centres.

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Abstract

Several studies described barriers for adolescents to access sexual and reproductive health (SRH) services, but little research is available on the perspectives of caregivers in this matter. The purpose of this study was to elicit the views of primary healthcare providers from Bolivia, Ecuador and Nicaragua on barriers that impede adolescents to access quality SRH care. During moderated discussions, 126 healthcare providers (46 from Bolivia, 39 from Ecuador and 41 from Nicaragua) shared their ideas on the accessibility and appropriateness of SRH services and on reasons why adolescents do not make use of them. The written answers provided by participants and the discussion notes were analysed by employing a content analysis methodology. Socio-cultural, health system related and adolescent-specific factors that according to health providers affect young people's access to existing SRH services were identified. The study also showed that some important issues such as negative attitudes and perceptions of health care providers towards questions related to adolescents' SRH, and a lack of self-criticism and self-reflection were overlooked or ignored by participants. Interventions aiming to improve the accessibility and quality of SRH services should take into account the perspectives of health care providers on aspects hampering adolescents' access to SRH services and address the overlooked topics and factors.

Key words: adolescents, sexual and reproductive health services, primary health care, health personnel, accessibility of health services, Latin America

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Introduction

Despite overwhelming evidence that adolescents face significant barriers to achieve sexual and reproductive health (SRH), many countries struggle to implement adequate, sexual and reproductive health (ASRH) programs targeting adolescents (1-3). As a result, young people most in need of accurate information and sexual counseling remain underserved. This is a cause of concern, since worldwide adolescents are confronted with serious SRH problems. More specifically - in Latin America, where adolescents aged from 10 to 19 also are at high risk for STI/HIV and unwanted pregnancies. The latter often results in negative health consequences such as unsafe abortions or poor maternal health outcomes (4-7).

Consequently, there is an urgent need to make SRH services more responsive to the necessities of adolescents in order to improve the provision of ASRH care (8,9). Expectations and perceived needs of health staff should be assessed before implementing interventions at the level of health care facilities (10). However, we found only a few studies assessing the perspectives of caregivers in the United States and Europe related to ASRH care (11,12).

The present paper describes perceptions of primary healthcare providers in Latin America on barriers that impede adolescents' access to quality SRH care. The study is based on qualitative data collected in Cochabamba (Bolivia), Cuenca (Ecuador) and Managua (Nicaragua). The selection of study sites happened purposively including health centers that were involved in interventions of a multicenter research project, the community-embedded reproductive healthcare for adolescents (CERCA) project, coordinated by the International Centre of Reproductive Health (ICRH) of the Ghent University and funded by a European Commission (13). The CERCA project is an intervention research that aims to develop and to evaluate complex interventions that seek to improve access to, and the use of, SRH services by adolescents.

Methods

Group discussions were conducted in seven public primary health centres (two in Bolivia, three in Ecuador and two in Nicaragua). All personnel were invited to participate in a session that was organized as an extraordinary staff meeting. Those present were informed on the study and everyone who agreed to participate provided written informed consent. Participants were guaranteed confidentiality and were informed on how the collected data would be further processed.

In total nine group discussions were carried out. The number of personnel during each discussion varied and the number of potential participants was not known prior to the start of the meetings. Groups ranged in size from 6 to 24 study participants. The total number of participants in this convenience sample was 126. The number of participants in each group was as follows: 24, 10 and 12 in Bolivia; 17, 6 and 16 in Ecuador; and 17, 15 and 9 in Nicaragua. Each group consisted of personnel from one health center. Prior to each discussion, study participants were asked to provide anonymously written answers to the following questions:

- What do you think are the reasons for adolescents not to go to health centers for SRH services?
- What difficulties do health center personnel encounter in providing SRH services to adolescents?
- What measures could be implemented in health centers to improve ASRH care?

The answers were collected and summarized when participants were introduced to the CERCA project objectives. Participants' insights served as prompts for the discussions that lasted approximately 90 minutes each. Two CERCA staff attended each discussion, one acting as a moderator and the other taking notes. Discussions lasted approximately 90 minutes and they were not recorded.

The written responses produced by the participants to each specific question and the discussion notes were translated from Spanish to English for further analysis. Those texts were analyzed employing the conventional content analysis methodology (14). Initial codes were developed after a careful reading of the texts. In the next stage of analysis, the codes were clustered into emergent categories. These categories were structured and grouped to determine final themes.

This study was approved by the Bioethics Committee of Ghent University, Belgium, in 2011. The management of the participating health centers of Cochabamba, Cuenca and Managua gave their permission for the study.

Results

Demographic information about study participants is presented in the first subsection below and in Table 1. Qualitative findings are presented in three subsections, representing three categories of perceived barriers to access quality SRH care, namely at social, health system and adolescent levels (table 2)

Table 2. Categories of barriers for adolescent sexual and reproductive healthcare

Societal level:
sociocultural environment
social literacy on sexuality
family context
Health system level:
health policy
health facilities' environment
providers' performance
Adolescent level:
Adolescents' characteristics

Study participants

The study enrolled 126 people working at primary healthcare facilities: 46 from Bolivia, 39 from Ecuador and 41 from Nicaragua. Male study participants were outnumbered by females. In Bolivia and Ecuador health providers of all age groups participated in the discussion groups. In Nicaragua there was an underrepresentation of age groups younger than 31 and older than 50. Almost half of the participants were physicians, and approximately one-third -

nurses. There was less representation of psychologists, educators, medical students and administrative staff.

Table 1. Demographic breakdown of participants

Indicator	Bolivia	Ecuador	Nicaragua	Total
Gender				
Male	15	10	8	30
Female	31	29	33	88
Age				
Younger than 30	14	10	5	29
31-40	13	11	19	39
41-50	42	7	15	31
51 and older	7	11	2	19
Occupation				
Physician	14	19	25	54
Nurse	16	11	15	38
Psychologist, educator, medical student	13	2	-	15
Administrative staff	3	7	1	11
Total	46	39	41	118

Barriers at social level

Socio-cultural environment. Across all three sites, participants identified ‘religious traditions’ as an impediment both to open discussion of SRH issues with young people, as well as a factor preventing young people from accessing existing public health services. In Cochabamba (BO) and Managua (NI) participants suggested that high incidences of illiteracy and the perceived lack of education have a negative impact on adolescents’ knowledge and use of health services. In Managua (NI) healthcare personnel also identified the perceived insecurity in the districts as an additional social barrier: ‘*the high crime risk in our neighborhoods hampers the participation of adolescents in activities and the outreach efforts of health providers*’ (NI).

Social literacy on sexuality. In the three study settings health providers perceived a lack of candor among adolescents to address SRH aspects. Participants in all three sites spoke of how sexuality and sexual health are ‘forbidden’ topics of discussion: ‘*in our country we are ashamed to talk about sexuality*’ (BO). Health personnel in Cuenca argued that this ‘shame’, together with the virtual absence of adequate sexual education in the public school system: ‘*hardly any sexual education*’ (EC) - results in poor adolescents’ knowledge about body changes during puberty, methods to prevent unintended pregnancy, and about their sexual rights. At the same time, health providers in all three sites spoke of persistent myths concerning contraceptive methods and pregnancy. In Ecuador and Bolivia, the Andean countries, health personnel mentioned the prevalent perception of health centers as curing places, rather than as places where one seeks health: ‘*they think that health services are only providing care and not offering general information on sexuality*’ (EC) and that ‘*it is not the right place to find an answer to their questions*’ (BO).

Family context. The participants from all three sites identified poor communication within families, the ‘disintegrating’ impact of migration of one or more family members, and economic difficulties as negatively affecting adolescents’ ability to access SRH services. Healthcare providers believe that poor mutual understanding between adolescents and their parents and the lack of parents’ support impede adolescents’ communication about sexual issues in the families ‘*they lack confidence to communicate about their problems with their parents, they prefer not to talk*’ (EC).

Barriers at health system level

Health policies. According to health providers, the lack of a defined policy on ASRH promotion and outdated guidelines that are often disregarded in practice are both barriers for the provision of SRH services for adolescents: ‘*deficient implementation of the SRH policies of the Ministries of Health and Education*’ (BO). Besides, participants mentioned a poor political commitment, a weak participation of the educational sector and the lack of an intersectoral approach to ASRH. Study participants believe that health authorities prioritize other health problems: ‘*it does not seem to be an important problem for public health authorities. They focus more on other pathologies that are supposed to have a higher morbidity and mortality*’ (BO), and other populations: ‘*at health centers they pay more attention to pregnant women and the elderly*’ (EC). Eventually, the health providers state that there is a lack of strategies focusing on adolescents and that adolescents with their health problems are missed in the health system: ‘*they are not considered in the health system*’ (BO).

Health facilities’ environment. The complex managerial reality of primary health centers was pointed out by study participants as a major constraint for providing good SRH services to adolescents. According to study participants the consultation time is too short for counseling adolescents properly due to an overload of patients and a lack of human resources: ‘*there is a great demand from patients*’ (NI) and ‘*there is little time to establish and maintain a good and empathic relationship with the adolescent that allows to break the taboo on sexuality*’ (EC). Healthcare providers supposed that health facilities are structurally hindered from offering privacy and confidentiality in reception and consultation areas: ‘*Adolescents feel ashamed to tell the intake personal the reason for consultation*’ and ‘*they fear being caught by neighbors or relatives*’ (EC).

In all three study sites health providers cited a lack of adolescent-specific counseling facilities in primary care centers, in addition to a lack of educational materials related to SRH issues: ‘*there is a shortage of material for the education of adolescents in SRH issues*’ (NI).

Finally, in Ecuador health providers pointed out that not having access to a health provider of the same sex might be an additional barrier for adolescents: *'a factor that might influence is the fact that adolescent girls do not trust in a male professional'* (EC).

Providers' performance. Although healthcare providers participating in this study were keen to reiterate the importance of adolescent-specific SRH services, they also recognize a number of barriers to care among health personnel themselves. In the first place, study participants acknowledged that many of their colleagues (and including themselves) are not up-to-date on existing protocols and guidelines for adolescent-specific SRH care. Secondly, study participants cited a need for capacity-building in adolescent-friendly communication and patient care at all levels of primary healthcare provision: *'The personnel including receptionists, nurses and physicians is not trained in how to get on with adolescents'* (EC). Thirdly, healthcare providers suggested that their colleagues are reluctant to provide SRH services to adolescents as they do not feel encouraged by their superiors or receive stimuli to do so: *'The provision of sexual health services to adolescents is not included as an evaluation item for primary health services'* (EC). Moreover, study participants suggested that their fellow healthcare providers are anxious about their professional reputation when treating unaccompanied minors for SRH issues: *'physicians prefer that adolescents are accompanied by a parent to avoid legal actions'* and *'there are law suits between parents and health professionals for such things'* (NI).

Barriers at adolescent level

Socio-cultural and psychological barriers. In all three study sites, health providers perceived the nature of adolescence itself as preventing adolescent access to existing SRH services. Specifically, study participants suggested that the 'adolescents' need for autonomy', their sensitivity to criticism, their restlessness, their generalized rebellion and their reliance on peers and the internet for SRH information prevent adolescents from accessing preventative or curative SRH care: *'Adolescents mostly rely on friends or on the internet'* (EC).

Study participants also thought that adolescents are less likely to tolerate long waiting times in public health centers in comparison with other patient populations: *'Adolescents are more impatient and they do not like to wait'* (NI).

The health providers added that the opening hours of health centers often conflict with school schedules and working hours, further complicating health service access. In addition, health providers wrote that adolescents do not keep appointments and show little interest in SRH information or services: *'they forget their appointment or lose their turn number'* (NI) and *'they show little interest in being informed about SRH'* (EC).

Finally, in all three study sites health providers emphasized adolescents' ignorance of existing healthcare services as a significant barrier: *'Adolescents lack knowledge on how they will be treated in the health services'* (BO).

Discussion

Our results present primary healthcare providers' perspective on barriers for ASRH services in selected public health centers in Cochabamba, Cuenca and Managua. This study identified socio-cultural, health system related and adolescent-specific factors that according to health providers affect young people's access to existing health services.

In the three countries the health providers pointed out several aspects related to socio-cultural factors and norms interfering with the provision of quality SRH care to adolescents. They

mention religion, taboo on sexuality, poor communication skills and the persistent myths as barriers for adolescents to address themselves to SRH services. According to the health providers adolescents grow up in an environment where sexuality is a taboo issue with a negative effect on sharing information on sexual health at familial and educational level. Scientific evidence confirms providers' vision that open and regular communication about sexual topics at schools or within families encourage adolescents to address themselves to healthcare services for their SRH (15,16). However, it is striking that the health providers relate on cultural aspects that hamper adolescents' access to SRH services abstracting the fact that they themselves are members of the same society, acting within the same context and thinking from the same paradigms. In the discussions and written answers health providers did not reflect on how their own personal perspectives and norms are crucial for their attitudes and behavior towards adolescents. Several studies demonstrate the effect of the social context on the attitudes and behavior of health professionals. A qualitative study among providers in the Amazon basin of Ecuador concludes that moralistic attitudes and sexism among providers are limiting services' capability to promote girls' SRH and rights (17). Similarly, a qualitative study among midwives and doctors in Vietnam demonstrates how the cultural and societal contexts of the healthcare providers determine their practice (18). A study in Ghana describes how health providers are denying family planning services to unmarried clients. (19).

Analyzing the obtained notes and written answers we had the impression that health providers easily mentioned factors related to how adolescents are behaving. They stereotyped adolescents as being rebellious, impatient and irresponsible and therefore as a vulnerable and hard to reach population for SRH services. The negative perceptions of health providers on youth demonstrate the difficulties to bridge the generational gap in the adolescent – provider interactions. The prejudiced views of health providers on adolescents and their unawareness about those prejudgments might be a hampering factor for their communication with adolescents. This hypothesis is supported by studies demonstrating adolescents' reluctance towards a moralizing attitude by health providers (20, 21). How much this is true for the context of the CERCA research is subject to future research.

Participants mentioned that health providers are reluctant to provide SRH services to adolescents. Many scientific articles relate on possible causes for providers' discomfort to counsel adolescents on their sexual health (22-24). In our study, health providers report that they do not feel themselves sufficiently backed up to address adolescents SRH in daily practice. They mention a lack of clear health policies and guidelines, the non-existence of incentives and their legal vulnerability when seeing adolescents without the presence of a parent or guardian. However, the Ministries of Health of Bolivia, Ecuador and Bolivia have specific programs and guidelines concerning ASRH care (25-27). Similarly as in other regions of the world, health providers from our study are not familiar with the content of those programs (28-30). Furthermore, it is likely that the poor working conditions and the job insecurity of health providers might have an impact on their willingness to provide SRH services to adolescents. A doctor working under the threat of losing her or his job will be little inclined to take initiatives such as seeing unaccompanied adolescents or prescribing contraceptives to adolescents. Moreover, when these actions might be criticized by colleagues, parents or superiors. This hypothesis needs to be studied further but is supported by the fact that different studies report on the negative view of Latin American health professionals on their working conditions and the effect of labor dissatisfaction and job insecurity on the professional performance (31-34).

Our study shows that the primary healthcare providers do not feel adequately trained for the provision of quality SRH healthcare to adolescents. Those findings are consistent with

research data from the US demonstrating primary healthcare providers' difficulties to deliver quality SRH services for teenagers (30,35,36). The participants of our study expressed explicitly the need for training in communication skills and for the instruction in existing legal regulations and guidelines on adolescent sexual and reproductive healthcare. However, for the planning of such provider training we plead to go beyond commonly proposed topics and to include such important aspects as training of healthcare providers in self-reflection and self-criticism related to adolescents' sexuality. It would be innovative to use a methodological approach that allows health providers to reflect introspectively on how their own sexual norms, perspectives on adolescents and vocational attitudes influence their performance. Studies support including self-awareness training and reflective learning in professional education (37,38). Shindel and Parish give an overview of methods for sexuality education in North American medical schools by which medical students can be better prepared to address sexual health needs of patients (39). Also the active involvement of adolescents in training programs could help care givers to understand the ideas and perspectives that young people have and to look at the adolescent-provider interaction from a different angle (22).

This study has a number of limitations. The views and experiences of the participants may not represent those of the greater primary healthcare providers' community since the study included only providers from those primary care facilities that took part in the CERCA project. As all study participants were based at urban clinics, their perspective may be different from those of staff at rural clinics. Moreover, the study took place in three Latin American cities which may differ in educational, cultural background and access to information. These differences could apply to both the adolescents and the participated healthcare providers. Consequently the described results are not necessarily applicable for all study sites and, by no means, the study intended to come to generalizations for the Latin American region.

Although the group of participating health care providers was heterogeneous, the data haven't been broken down into categories. The used methodology (anonymous note and group discussions) did not allow us to differentiate responses according to the characteristics (age, sex, position) of the participants. Therefore we lost some richness of the data.

Another possible limitation of the study is related to the method of the data collection. Study participants provided written insights which could not be explored thoroughly and in more details in the subsequent group discussions. However, the interviews' notes taken by the researchers were used in addition to the participants' written answers which helped to amplify them and retrieve additional information. The specific focus groups discussions method could provide more insights into the topic but it could not be used in our study due to the greatly varying number of participants in each group, the non-homogeneity of professional backgrounds and the uneven status of the participants in the health setting's hierarchy. Probably, we would have gained depth of understanding when participants would be interacting during longer sessions and in smaller groups (40).

Although it is possible that a more comprehensive verbal interaction in the group of primary healthcare providers would have helped to reveal more aspects related to the topic, we believe that the chosen approach gave voice to all participants regardless of their status in the health setting's hierarchy and elicited a diverse range of opinions. Furthermore, the confidentiality of the procedure allowing participants to write anonymously their ideas might have helped to overcome the taboo barrier related to the topic and to disclose more sensitive viewpoints.

The individuals collecting the data (moderator and note-taker) were CERCA staff members who were known by most participants. This may have influenced study participants' answers.

However, as participants identified the factors in written form before the discussions were held, the influence of CERCA staff was likely to be limited.

Future research should expand the findings of this study by verifying the hypotheses originating from our analysis, by using quantitative methods, and by looking at the broader context. For example, studies should consider the perspectives of adolescents and other community actors. Furthermore, it would be interesting to compare the perspectives of providers from the three cities.

Conclusion

Health providers mentioned different aspects hampering adolescents' access to SRH services. We classified those reported barriers in social, health system related and adolescent specific categories. However, in our analysis we also reflected on what seems to be overlooked by health providers. The issues such as healthcare providers' reflections on how their own personal perspectives and norms are crucial for their attitudes and behavior towards adolescents were ignored by caregivers. Those might be interesting for further research and should, together with the clearly stated barriers, be taken into account for the development of comprehensive interventions aiming to improve the accessibility and quality of SRH services for adolescents in Latin America.

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4.4 Effect of YOLAMI interventions on individual outcomes

4.4.1 Introduction

The effect of two types of interventions in Chinese factories were compared: a standard package (SPI) targeting the community of employees and a comprehensive package (IPI) addressing the community and individual workers. The interventions ran from August 2008 until March 2009. After the interventions we presented new questionnaires to female YUR-migrants with the aim of evaluating the effect of the interventions on their SRH. We assessed the differences in behaviour across the two study arms of the cross-sectional surveys. Two papers have been published, one on the results in Qingdao and another on those in Guangzhou.

Paper 9

Decat P, Zhang W, Delva W, Moyer E, Cheng Y, Wang Z, Lu C, Wu S, Nadisauskiene R, Temmerman M., Degomme O. *Promoting contraceptive use among female rural-to-urban migrants in Qingdao, China: a comparative impact study of worksite based interventions*. Eur J Contracept Reprod Health Care 2012 Oct 10

This paper describes the effect of the two types of interventions on the contraceptive behaviour of young female rural-to-urban migrants in Qingdao. The self-reported contraceptive use among childless migrants increased significantly after SPI and IPI. Childless interviewees older than 22 years reported a greater use after IPI than after SPI.

Paper 10

Gao X, Xu L, Lu C, Wu J, Wang Z, Decat P, Zhang WH, Chen Y, Moyer E, Wu S, Minkauskiene M, Van Braeckel D, Temmerman M. *Effect of improving the knowledge, attitude and practice of reproductive health among female migrant workers: a worksite-based intervention in Guangzhou, China*. Sex Health. 2014 Dec 4.

The paper presents the results of the intervention study in Guangzhou. At follow up, SRH knowledge was improved among all participants and the SRH

attitude scores were increased among unmarried women. Compared to the SPI, the IPI strategy had a larger effect on the knowledge level of the whole target population and on the condom use of those who were unmarried.

4.4.2 Full articles

Promoting contraceptive use among female rural-to-urban migrants in Qingdao, China: A comparative impact study of worksite-based interventions

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ABSTRACT **Background** We conducted a comparative study in worksites to assess the impact of sexual health promoting interventions on contraceptive use among female rural-to-urban migrants.

Study design In Qingdao ten manufacturing worksites were randomly allocated to a *standard package of interventions* (SPI) and an *intensive package of interventions* (IPI). The interventions ran from July 2008 to January 2009. Cross-sectional surveys at baseline and end line assessed the sexual behaviour of young female migrants. To evaluate the impact of the interventions we assessed pre- and post-time trends.

Results From the SPI group 721 (baseline) and 615 (end line) respondents were considered. Out of the IPI group we included 684 and 603 migrants. Among childless migrants, self-reported contraceptive use increased significantly after SPI and IPI (adjusted odds ratio [aOR] = 3.23; 95% confidence interval [CI] = 1.52–6.84; $p < 0.01$ and aOR = 5.81; 95% CI = 2.63–12.80; $p < 0.001$, respectively). Childless migrants older than 22 years reported a greater use after IPI than after SPI.

Conclusion Implementing current Chinese sexual health promotion programmes at worksites is likely to have a positive impact on migrant women working in the manufacturing industry of Qingdao. More comprehensive interventions seem to have an added value if they are well targeted to specific groups.

KEY WORDS Labour migration; Reproductive health; Programme evaluation; Workplace; Family planning services; Contraception; Intervention study; Comparative effectiveness research; China

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INTRODUCTION

In China, an estimated 147 million people have migrated from rural to urban areas over the last two decades, in search of gainful employment¹. Most of these internal migrants are employed in manual labour, including construction, manufacturing and service industries. Migrants hope to reap the benefits of China's booming economy and to improve their quality of life.

However, migration to cities does not necessarily lead to greater wellbeing. Sexual and reproductive health (SRH), for instance, seems to be negatively affected by migration. Rural-to-urban migration is reported as a contributing factor to the spread of HIV in China². Previous studies have demonstrated poorer SRH indicators among internal migrants compared to residents. Higher rates of induced abortions, HIV and sexually transmitted infections (STIs) have been observed within migrant populations^{1,3-6}. Migrants are also faced with a series of obstacles in accessing SRH services. One barrier for access is the high cost of health care for migrants in the city⁷. Most migrants are not covered by health insurance, which implies greater out-of-pocket expense⁸. However, SRH vulnerability varies among rural-to-urban migrants in China⁹. In a previous article we showed that, among migrants, being unmarried, childless, uninsured for health care and less educated are risk factors for having an unmet need for contraception¹⁰. The increased vulnerability for an unintended pregnancy has particular implications concerning social inequity in a country with strict regulations on family size. In all major cities of China, a one-child policy has been strictly enforced since 1979¹¹.

Scientists and politicians recognise that SRH policies should address the contraceptive need of migrants in China^{12,13}. However, how to address those needs is unclear and underexplored. We found only one pilot study that described an intervention promoting contraceptive use among migrants¹⁴. In light of the lack of rigorous operational research on strategies aimed at improving SRH among migrant workers in China, the YOLAMI (Young Labour Migrants in Chinese cities) study was designed to develop and test an intervention strategy aimed at improving contraceptive use among rural-to-urban migrants.

METHODS

Setting

Qingdao is an economically important city with 1.2 million internal migrants and 8,456,100 residents¹⁵. Most internal migrants in the city are employed in the manufacturing industry. The Young Labour Migrant (YOLAMI) research in Qingdao targeted female factory workers.

Study design

A study comparing the impact of interventions at worksites was conducted. A *worksite* is defined as a unit within a company producing the same goods. The worksites were randomly allocated to a *standard package of interventions* (SPI) or an *intensive package of interventions* (IPI). We assessed attitudes and SRH behaviour among female migrants through cross-sectional surveys at worksites before and after interventions.

The number of worksites was calculated using a sample size software package for a cluster randomised trial with binary outcome (Liu X. et al., Optimal design for multilevel and longitudinal research - Version 1.77.). We used a study of unmarried youths aged 15-24 in Shanghai to calculate the minimum sample size¹⁶. We assumed a median cluster size of 200 sexually active respondents and an intra-cluster correlation of 0.20. Consequently, ten clusters were required to detect a significant increase in contraceptive use from 40-50% or more with 80% power at the 5% significance level.

Recruitment

An exhaustive list of 238 manufacturing worksites was obtained from the district administration. From this list we selected worksites located within a range of 15 km from a collaborating health facility, which employed between 300 and 700 female migrants. In total, 24 worksites were identified corresponding to those criteria; they were matched into 12 pairs using criteria such as the production goods of the worksites, the number of female migrants, the ratio of unmarried to married female migrants, and the distance to a health centre. Three worksites declined to participate and were excluded together with the matched pair. From the nine remaining pairs five were randomly

selected. Finally, from each pair one worksite was allocated by coin tossing to the SPI arm and the other to the IPI arm (Figure 1). The interventions continued for six months from July 2008 until January 2009. At each worksite, all female workers between 18 and 29 years old who originated from rural areas were given the possibility to be enrolled in a pre- and post-intervention survey. Participation was voluntary, and workers were assured that not participating would not have any consequences for their employment.

Interventions

The intervention objective of both packages was to promote the consistent use of modern family planning (FP) methods among migrant workers.

The SPI corresponded to the common SRH promotion programmes in China and consisted of the monthly distribution of brochures to migrants, monthly free condom distribution and informative posting at public places in the worksites (four sets of posters that were changed monthly).

In developing the content of IPI, we took into account the results of the baseline survey and additional qualitative research that explored the SRH needs of Chinese migrant workers^{10,17}. The intermediary objectives of this package were to facilitate access to SRH information and services, to enhance open communication on sexuality and to promote knowledge transfer by health providers and peer educators. The interventions addressed both married and unmarried migrants, and combined the standard package with group activities and activities targeting individual migrant workers. A hotline was installed that offered SRH counselling over the phone, and all workers received VIP cards which entitled them to pay less for sexual and reproductive health services. Health providers from a local FP service visited the worksites fortnightly. During each visit, the health care professionals gave a 30-minute lecture on a SRH theme; an informative video was shown; migrant workers got the opportunity for a face-to-face consultation with a health provider; and an informative and instructive session was organised for selected peer

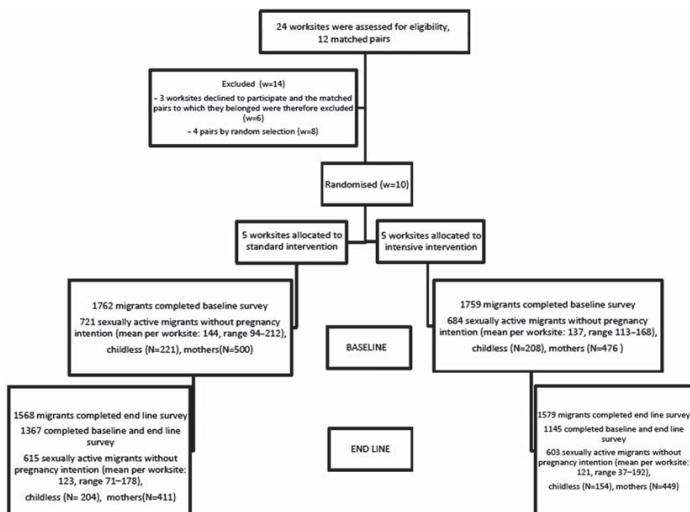


Figure 1. Study design.

educators. Except for the lectures, all activities took place outside working hours, and the workers were free to participate or not. In each worksite, about 30 peer educators were trained. They were encouraged to discuss SRH issues with their colleagues in an informal way.

Data collection

Data were collected through cross-sectional inquiries which were conducted before (baseline) and after (end line) the interventions. At a time arranged with management, trained interviewers visited the worksites. During lunch and dinner, interested workers presented themselves for an interview in a confidential room. Interviewers gave a detailed description of the study purpose and design, and invited all female migrants aged between 18 and 29 to participate in the survey. The respondents were given the choice either to fill out the questionnaire themselves or to be assisted by an interviewer. Small and locally appropriate gifts (e.g., an umbrella) were offered for participation in the study. All participants gave written informed consent.

The questionnaire gathered information on socio-demographic characteristics, knowledge, attitudes, and behaviour. With regard to behaviour, respondents were asked to report about the last six months prior to the interview. The post-intervention questionnaire was identical to the pre-intervention questionnaire.

The questionnaire was designed by a study steering committee including Chinese and European investigators. It was based on the illustrative questionnaire for interview-surveys with young people conceived by John Cleland for the World Health Organisation¹⁸. The questionnaire was developed in English, translated into Chinese and, subsequently, translated back into English by another researcher. The translations were done without knowledge of the study specifics or insight into other study documents. Both English versions were compared, and inconsistencies were resolved by modifying the Chinese version. The questionnaires were piloted among a convenient sample of 137 female migrant workers.

Completed questionnaires were entered into the database Epi info 3.0 (CDC, Atlanta, GA, USA) in China. Data were analysed using SPSS 16.0 (SPSS Inc. Chicago, IL, USA) and STATA 11.2 (Stata corporation, College Station, TX, USA).

Outcome variables

Consistent contraceptive use is the primary outcome variable. This dichotomous variable reflects self-reported continuous use of a modern contraceptive over a six-month period. Sterilisation, condoms, intra-uterine devices (IUDs), oral contraceptives and progestogen-only methods are all considered modern contraceptives. The secondary outcomes are the indicators related to health-seeking behaviour, and the ease of communication about SRH with friends and a doctor.

Statistical analysis

Baseline characteristics of women were summarised with counts (percentages) for categorical variables, mean (standard deviation [SD]) for normally distributed continuous variables, or median (interquartile [IQR]) for other continuous variables.

Marginal logistic regression models were applied to evaluate the impact of the interventions among sexually active respondents who had no current intention to become pregnant. We analysed separately the outcome of childless migrants and migrant mothers as these groups differed considerably in contraceptive needs¹⁰. Specifically, we assessed the null hypothesis of equal pre-post time trends in the reported consistent contraceptive use across both study arms. All models were fitted using generalised estimating equations with exchangeable working correlation. In addition to the simple model with only intervention arm, time and the interaction term as predictor variables, we tested multiple expanded models, including terms and interaction terms related to age, marital status and duration of stay in the city. The Akaike information criterion (AIC) was used to measure the relative goodness of fit of the statistical models. All reported *p*-values and confidence intervals (CIs) are corrected for within-cluster correlation.

Ethical considerations

The study was approved by the ethical committee of the National Research Institute for Family Planning Beijing, (12 Da Hui Si, Hai Dian District, 100081 Beijing, China) and the ethical committee of Ghent University Hospital, Belgium, on 12 August 2008.

RESULTS

Figure 1 shows the trial profile. In the SPI arm 1762 and 1568 eligible workers, respectively, completed the baseline and end line survey. Within the IPI arm 1759 (baseline) and 1579 (end line) female migrants filled out the questionnaires adequately. For the present analysis we took into account the data from sexually active women without pregnancy intention. We only included respondents from the end line-survey who confirmed that they had also completed the baseline survey in order to omit women who entered the study late and had not been exposed to the full intervention. Consequently, 721 and 615 respondents of the SPI arm were considered for, respectively, baseline and end line. From the IPI group, the data of 684 (baseline) and 603 (end line) respondents were analysed.

We studied the outcomes separately for respondents with and without children. Table 1 shows some characteristics of participants from both study arms at baseline and end line. Age, age at sexual debut and marital status were similar in the different groups, but differences were noted in years of education and duration of residence in the city. Migrant mothers from the SPI group had more years of education compared to their peers from the IPI group.

Consistent contraceptive use and all secondary outcomes increased by the end of the interventions in both study arms among respondents with and without children (Table 2). Table 3 shows the adjusted odd ratios (aOR) of the reported consistent contraceptive use that is calculated within the best fitting model. Among childless migrants, self-reported consistent contraceptive use increased significantly after intervention in both the SPI and IPI study arm (aOR = 3.23; 95% confidence interval [CI] = 1.52–6.84; $p < 0.01$ and aOR = 5.81; 95% CI = 2.63–12.80; $p < 0.001$, respectively). The interaction term of age and standard intervention (not shown in the table) suggests that the effect of the SPI was smaller in older participants (aOR of intervention effect by one-year increment = 0.86; 95% CI = 0.77–0.95; $p < 0.01$). Consequently, the group of childless migrants older than 22 years of age did not report a better contraceptive use after the SPI. Only after the IPI was there an improvement resulting in a significant difference of consistent contraceptive use at end line comparing IPI and SPI (aOR = 2.16; 95% CI = 1.23–3.79; $p < 0.01$).

Table 1 Characteristics of participants.

	Childless migrants						Migrants with child(ren)					
	Baseline		End line		Baseline		End line		Baseline		End line	
	SPI (n = 221)	IPI (n = 208)	SPI (n = 204)	IPI (n = 154)	SPI (n = 500)	IPI (n = 476)	SPI (n = 411)	IPI (n = 449)	SPI (n = 476)	IPI (n = 411)	SPI (n = 411)	IPI (n = 449)
Years of age, mean (SD)	24.4 (3.1)	23.5 (2.6)	24.0 (2.6)	24.1 (2.4)	26.8 (1.8)	27.0 (2.0)	26.4 (2.1)	27.3 (1.7)	26.8 (1.8)	27.0 (2.0)	26.4 (2.1)	27.3 (1.7)
Age at sexual debut, mean in years (SD)	21.5 (2.3)	21.1 (2.0)	20.9 (2.1)	21.5 (1.9)	22.4 (1.7)	22.3 (1.9)	22.1 (2.0)	22.7 (2.1)	22.4 (1.7)	22.3 (1.9)	22.1 (2.0)	22.7 (2.1)
Unmarried, n (%)	74/221 (33)	95/208 (46)	70/204 (34)	61/154 (40)	500/500 (100)	476/476 (100)	411/411 (100)	449/449 (100)	379/499 (76)	234/469 (50)	300/411 (73)	252/449 (56)
Less than seven years of education, n (%)	115/218 (53)	123/206 (60)	92/204 (45)	65/154 (42)	379/499 (76)	234/469 (50)	300/411 (73)	252/449 (56)	379/499 (76)	234/469 (50)	300/411 (73)	252/449 (56)
Months of residence in the city, median (IQR)	24.9 (30)	35.0 (49)	20.8 (20)	29.0 (30)	22.8 (35)	44.2 (82)	22.9 (30)	33.0 (60)	22.8 (35)	44.2 (82)	22.9 (30)	33.0 (60)

SPI, Standard package of interventions; IPI, Intensive package of interventions; SD, Standard deviation; IQR, Interquartile range.

Table 2 Baseline and end line outcomes by intervention group.

Variables	Childless migrants				Migrants with children			
	SPI		IPI		SPI		IPI	
	Baseline	End line	Baseline	End line	Baseline	End line	Baseline	End line
Consistent contraceptive use, n/N (%)	122/220 (55)	130/204 (64)	99/207 (48)	102/154 (66)	358/497 (72)	327/411 (80)	316/476 (66)	330/449 (73)
Ease in communicating about SRH with friends, n/N (%)	95/218 (44)	131/204 (64)	107/208 (51)	116/154 (75)	203/500 (41)	261/411 (64)	285/474 (60)	369/449 (82)
Ease in communicating about SRH with a doctor, n/N (%)	140/218 (64)	152/204 (75)	121/208 (58)	133/154 (86)	292/500 (58)	329/411 (80)	300/474 (63)	399/449 (89)
Accessed health service when sexual health problem, n/N (%)	46/103 (45)	60/86 (70)	40/92 (43)	43/62 (69)	116/183 (63)	128/171 (75)	101/202 (50)	171/221 (77)

SPI, Standard package of interventions; IPI, Intensive package of interventions; SRH, Sexual and reproductive health.

The factors related to the contraceptive use of migrant mothers were different from those related to the childless migrants. Consistent use was lower among migrant mothers with less than seven years education compared to migrant mothers with a longer education time (aOR = 0.66; 95% CI = 0.52–0.83; $p < 0.001$). The contraceptive use at end line among migrants with children did not differ among the study arms (aOR = 0.95; 95% CI = 0.62–1.45).

We also studied secondary outcomes among sexually active respondents without current pregnancy intention (Table 4). Participants from both study arms reported being more comfortable when communicating about SRH with friends at the end of the study. The larger impact of the IPI was not statistically significant. After the IPI more childless migrants reported feeling more at ease talking with a doctor than after the SPI (aOR = 2.52; 95% CI = 1.23–5.17; $p < 0.05$). The multivariate model shows that unmarried women felt less at ease with a doctor (not shown in the table, aOR = 1.62; 95% CI = 0.45–0.89; $p = 0.008$). Among migrant mothers, the ease of talking with a doctor improved after both interventions. This outcome was not significantly better after the IPI. The access to SRH services among childless migrants improved after both interventions but did not differ among the two intervention arms. Conversely, migrant mothers subjected to the IPI were significantly more likely to access a health service when having a SRH problem than their peers from the SPI arm (aOR after IPI vs. after SPI = 1.98; 95% CI = 1.06–3.69; $p < 0.05$).

DISCUSSION

Findings and interpretation

Our study provides indications concerning the differential impact of a simple and a complex intervention in worksites. The multi-component intervention including face-to-face counselling, peer education and preferential prices for SRH services improved the contraceptive use among childless migrants older than 22. Additionally, we found that a comprehensive intervention had an additional impact compared to a standard intervention on improving ease of discussing SRH with a doctor for childless migrants and on the use of SRH services among migrant mothers.

Table 3 Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) from logistic regression analysis assessing association between consistent contraceptive use and intervention type.

	Childless migrants						Migrants with child(ren)	
	18–29 years		18–22 years		23–29 years		aOR	95% CI
	aOR	95% CI	aOR	95% CI	aOR	95% CI		
Following standard intervention	3.23**	1.52–6.84	3.78***	1.82–7.80	0.67	0.41–1.10	1.56**	1.15–2.13
Following intensive intervention	5.81***	2.63–12.80	3.09**	1.35–7.10	3.19**	1.52–6.68	1.48**	1.11–1.98
Age (years)	1.13*	1.04–1.22	1.09	0.86–1.39	1.04	0.94–1.15	1.00	0.95–1.06
Unmarried	0.81	0.60–1.10	0.76	0.44–1.30	0.86	0.58–1.27	NA	NA
Less than seven years of education	0.81	0.60–1.08	1.05	0.63–1.77	0.65*	0.46–0.93	0.66***	0.52–0.83
Time living in the city (months)	1.01	0.99–1.01	1.02**	1.00–1.03	1.00	0.99–1.00	1.00	0.99–1.00
After intensive intervention versus after standard intervention	1.80 [†]	0.99–3.28	0.82	0.28–2.40	2.16**	1.23–3.79	0.95	0.62–1.45

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; [†] p between 0.05 and 0.1.

Considering only the SPI arm, the data show that contraceptive use at end line increased among female migrants except for childless migrants aged 23–29. The SPI was similar to common SRH promotion programmes in China and consisted of the monthly distribution of brochures among migrants, a monthly free condom distribution, and informative posting at public places in the worksites. The absence, for ethical reasons, of a non-interventional control group prevents us from drawing hard conclusions on the effect of standard interventions alone. However, the results of the study suggest that interventions that are comparatively simple and low-priced may achieve an impact on contraceptive use.

The impact of the standard intervention on contraceptive use decreased with age. It seems that behavioural change is more easily achieved among young people in their early twenties than among those in their mid-twenties. Probably it is easier to establish a desired pattern of sexual behaviour from the onset of sexual involvement than it is to change pre-existing habits^{19,20}.

Finally, our study demonstrates that worksites are an effective venue for SRH interventions targeting internal migrants in China.

Study strengths and limitations

The research primarily demonstrates how to address the SRH of a million internal migrants employed in manufacturing worksites in Qingdao. By extension, we believe that the study generates valuable insight for adjusting national health policies to the SRH needs of internal migrants.

Yet the specific design of this study needs to be taken into account when interpreting the results. The study was limited to one city, to a specific labour sector and to migrant workers labouring during the day, who voluntarily presented themselves for the surveys. Specific criteria were applied for the selection of worksites and four of the 18 worksites refused to participate without giving a clear justification. Furthermore, the health services in Qingdao are considered

Table 4 Adjusted odds ratios [aORs] with 95% confidence intervals [CIs] from logistic regression analysis assessing association between secondary SRH outcomes and intervention type adjusted to age, marital status and years of education.

		Childless migrants		Migrants with children	
		aOR	95% CI	aOR	95% CI
Ease in communicating about SRH with friends	Following standard intervention	2.28***	1.54–3.39	2.57***	2.97–3.34
	Following intensive intervention	2.35***	1.48–3.75	3.01***	2.16–4.21
	After intensive intervention versus after standard intervention	1.03	0.56–1.90	1.17	0.77–1.80
Ease in communicating about SRH with doctor	Following standard intervention	1.47 [†]	0.96–2.27	2.80***	2.03–3.87
	Following intensive intervention	3.73***	2.10–6.63	4.21***	2.89–6.12
	After intensive intervention versus after standard intervention	2.52*	1.23–5.17	1.50	0.92–2.46
Accessed health service when sexual health problem	Following standard intervention	3.12***	1.67–5.82	1.51 [†]	0.97–2.35
	Following intensive intervention	2.65**	1.28–5.45	2.98***	1.92–4.63
	After intensive intervention versus after standard intervention	0.85	0.33–2.21	1.98*	1.06–3.69

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; [†] p between 0.05 and 0.1

the best in the country which might have affected the quality of the health talks. Those aspects might have biased the results; moreover, the results can hardly be generalised to the whole of China.

The study compared data of cross-sectional surveys before and after interventions. The comparison of data from the same respondents before and after interventions would have strengthened the study results. Unfortunately, it was not possible to collect longitudinal data as the collection of personal data allowing identification of respondents was not ethically approved.

Within the scope of this project self-reported outcomes were the only achievable sources for measuring behaviour change. Self-report bias cannot be excluded but is unlikely to be the single cause of the marked differences between pre- and post-intervention values.

Despite randomisation, the baseline rates of the outcome variables differed statistically between the intervention groups. This is a likely consequence of having

selected a limited number of clusters. The effect on the estimate of the intervention impact was corrected by employing the Generalised Estimating Equations (GEE) statistical method and by including baseline characteristics and the interaction term intervention type and time in the model.

For ethical reasons it was not justifiable to include a no-intervention group as control. This limitation prevented us from identifying factors other than the intervention that could have influenced the results. For instance, just the fact of having answered the baseline questionnaire could account for a change at end line. However, the marked differences between pre- and post-intervention values and the differences between the two intervention groups allowed us to draw reliable conclusions.

The study was too short to permit measurement of long-term impact and the effect on more direct SRH indicators such as unplanned pregnancies. The duration

of the research was constrained by budgetary affordability. The evaluation of a long-term impact would have strengthened the conclusions of the study.

There could have been contamination between arms, but serious contamination is unlikely as clusters were geographically separated and the total sample size was small compared with the overall population, so the likelihood of participants having contacts with or moving to worksites from another study arm was low.

Results from other studies

Similarly to our research, several interventional studies show a positive impact on contraceptive use. A systematic review of randomised controlled trials examined theory-based interventions for improving contraceptive use²¹. According to that review four of the nine trials assessed showed more or better self-reported contraceptive use in the intervention group than in the comparison group and 14 of 20 studies showed some positive results with regard to condom use among intervention groups. A community-based intervention in suburban Shanghai had positive influences on contraceptive practice and condom use among unmarried young females and males²².

That a minimal intervention already may have an impact on contraceptive use has also been reported by Jemmott *et al.* who demonstrated a decrease in unprotected sexual intercourse among African American women after a single-session intervention²³.

The effectiveness of using worksites for health promotion programmes has also been established in an international review on behavioural change²⁴. We found one Chinese study that described a single pilot workplace intervention targeting unmarried female migrants¹⁴.

Implications for policy makers

This study may contribute to Chinese health policies as it provides scientific arguments for the design of effective interventions that are well targeted to specific migrant groups with well-defined objectives. Implementing the current Chinese sexual health promotion programmes at worksites is likely to have a positive impact on the contraceptive use of the youngest female migrant workers. More comprehensive interventions – including face-to-face counselling,

peer education and preferential prices for SRH services – seem to have an added value: on contraceptive use among childless migrants in their mid-twenties; on the ease with which childless migrants communicate about SRH with a doctor; and on utilisation of SRH services by migrant mothers.

Future research

Sexual and reproductive health cannot be reduced to the use of contraceptives and SRH services alone. SRH encompasses a diverse range of issues including, but not limited to, sex and gender identities and roles, gender norms, sexual orientation, tolerance, respect, pleasure, intimacy, reproductive awareness and self-efficacy. Fulfilment within these areas is not easy to evaluate. Further quantitative and qualitative research could reveal the impact of intervention strategies on other SRH outcomes. Additional research including other cities and focusing on the design process and cost-effectiveness of interventions is useful for scale-up new SRH programmes for Chinese rural-to-urban migrants.

CONCLUSIONS

The Young Labour Migrant (YOLAMI) study provides arguments that the implementation of current Chinese sexual health programmes at worksites might reduce the contraceptive needs of young female migrants. More comprehensive interventions seem to have an added value if they are well targeted to specific groups.

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EM, RN, OD and MT contributed largely to the writing of the article during the course of revisions. All authors approved the final draft of the manuscript.

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Effect of improving the knowledge, attitude and practice of reproductive health among female migrant workers: a worksite-based intervention in Guangzhou, China

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Abstract. *Background:* The sexual and reproductive health (SRH) knowledge and attitudes of female migrant workers are far from optimum in China. A worksite-based intervention program on SRH-related knowledge, attitude and practice (SRH KAP) modification may be an effective approach to improve the SRH status among migrant workers. This study aimed to identify better intervention approaches via the implementation and evaluation of two intervention packages.

Methods: A worksite-based cluster-randomised intervention study was conducted from June to December 2008 in eight factories in Guangzhou, China. There were 1346 female migrant workers who participated in this study. Factories were randomly allocated to the standard package of interventions group (SPIG) or the intensive package of interventions group (IPIG). Questionnaires were administered to evaluate the effect of two interventions. *Results:* SRH knowledge scores were higher at follow up than at baseline for all participants of the SPIG; the knowledge scores increased from 6.50 (standard deviation (s.d.) 3.673) to 8.69 (s.d. 4.085), and from 5.98 (s.d. 3.581) to 11.14 (s.d. 3.855) for IPIG; SRH attitude scores increased among unmarried women: the attitude scores changed from 4.25 (s.d. 1.577) to 4.46 (s.d. 1.455) for SPIG, and from 3.99 (s.d. 1.620) to 4.64 (s.d. 1.690) for IPIG; most SRH-related practice was also modified ($P < 0.05$). In addition, after intervention, the IPIG had a higher knowledge level than the SPIG; the scores were 11.14 (s.d. 3.855) versus 8.69 (s.d. 4.085), and unmarried women in the IPIG had higher condom use rate than the SPIG (86.4% versus 57.1%). *Conclusions:* The interventions had positive influences on improvements in SRH knowledge, attitudes and behaviours. Additionally, IPIs were more effective than SPIs, indicating that a comprehensive intervention may achieve better results.

Additional keywords: China; female migrant; intervention; sexual and reproductive health; worksite based.

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Introduction

The economy of China has grown since the 1980s and the gap between the rich and poor has widened. Since 2000, the Chinese government has reformed the household registration system,

thus encouraging increased labour migration to urban areas every year.¹ In 2011, the number of migrant workers in China reached 230 million.² The appearance of migrant workers largely promoted the development of the national

economy. However, this migration also increased public health problems and affected the quality of life of the migrant population, particularly for females.

Guangzhou City, deemed to be the economic centre of southern China, has grown to become a large migrant base in mainland China. The sixth census results of Guangdong Province indicated that there were 31.3 million migrants in the year 2010;³ females comprised approximately half of those migrant workers, and most of these women were of child-bearing age.

In recent years, as an indispensable part of family planning and public health area, SRH has become a hot topic universally. Based on the Cairo International Conference on Population and Development in 1994,⁴ SRH not only refers to the absence of disease, but also the human reproductive system and its function and processes involved in the physical, psychological and social health domains. Previous studies have demonstrated that female migrant workers are more vulnerable than urban residents to SRH problems, such as sexually transmissible disease, the maternal reproductive risk and so on.⁵⁻⁸ In Guangzhou, 33.4% of HIV-infected patients were migrants and 30.8% of migrant female workers contracted a gynaecological disease.^{9,10} Also, female migrant workers seldom visited hospitals and did so only when their pain became unbearable.¹¹ This may be attributed to their limited income, social status, working and living conditions and education level. Although Chinese Health and Family Planning Commission has introduced policies on birth control and SRH services for migrants, the current work is still far from being satisfactory. Even worse, some employers pay little attention to the SRH of their employees, so those work units do not have labour unions or a family planning association, and employees are often not covered by medical insurance.¹² This results in higher percentages of reproductive tract infections (RTIs), unintended pregnancies and induced abortions. It also leads to increases in the prevalence of human immunodeficiency virus (HIV) and other sexually transmissible diseases in the migrant population.^{5,7,13-16}

Previous studies have indicated that SRH-related knowledge and attitudes are statistically associated with the occurrence of SRH problems. It has been confirmed that improved SRH knowledge is related to decreased risk behaviours^{17,18} and that a sensible perception of risk can help prevent female migrants from engaging in high-risk behaviours.^{13,17} Migrant women have extremely limited knowledge about SRH and STD, they scarcely use condoms or other contraception^{5,17} and barely consider health care and SRH services.^{19,20}

Nevertheless, previous intervention studies have been limited by serious shortcomings, including a single control group, short follow-up time, small sample size and simple intervention contents. Based on the current circumstances, there is an urgent need for a long-term and well-designed intervention program to improve this situation.

In China, labour-intensive factories are major working and living places for migrant workers. Participants here are relatively concentrated and stable, thus can facilitate the organisation and management for researchers, so factory-based intervention would be ideal for migrant populations. This factory-based intervention study primarily aimed to

evaluate and compare the effectiveness of different intervention packages among migrant workers in the Guangzhou Huangpu Area. We hope that the research results will help our government develop a standard reproductive health package for our country.

Methods

Study design

A randomised and controlled intervention study based on the worksite was conducted. Factories were the unit of randomisation to avoid the dissemination of group-specific information among female workers in the same factory. In the baseline survey, we investigated the SRH-related knowledge, attitude and practice (KAP) of the female workers. After the baseline survey, the factories were randomly allocated to the standard package of interventions group (SPIG) or the intensive package of interventions group (IPIG). The randomisation was performed using a random number generation method by a statistician who was blinded to the factory names. The SPIG and the IPIG each included four factories. After implementing two interventions, we compared the SRH KAP status of these participants between the SPIG and the IPIG and assessed the effect of the interventions pre- and post-intervention within the same group. The self-administered questionnaires were used to evaluate the SRH KAP.

Participants and sampling

The current study was conducted in the Huangpu Area in Guangzhou, which has a large number of labour-intensive factories within it. For inclusion in this study, the factories had to employ ~1000 labourers, with at least 50% of the workers being female. In addition, factories with less staff mobility were given primary consideration. In total, 32 factories met the criteria, and eight were chosen by random cluster sampling and were randomly assigned to either the SPIG or the IPIG. All female workers enrolled in this study met the criteria (18 to 29 years old and non-residents of Guangzhou). The actual sample recruited consisted of 708 female workers (477 unmarried and 231 married) in the SPIG and 638 (354 unmarried and 284 married) in the IPIG.

Intervention packages

The intervention spanned a period of 6 months from June to December 2008.

The intervention in this program included the following items: (1) distributing easy-to-understand brochures concerning SRH monthly; (2) making SRH posters including RTI prevention and cure, contraceptive methods, AIDS Prevention and healthy sexual behaviour. These were then put up on the bulletin board and in the canteens of the factories every 2 months; (3) providing free condoms to the female workers monthly; (4) playing various SRH education videos for participants in the canteen and establishing a cultural activities room every month; (5) distributing VIP cards to the participants for a free gynaecological examination every month; (6) installing hotlines for providing free SRH counselling in seven hospitals in the Huangpu Area; (7) conducting a SRH

lecture in the cultural activities room and meeting room in November; an open discussion and teaching were available during the lecture; (8) developing peer education programs in July and October, and choosing the administrators of workshops or dormitories who had a relatively high education level as our training objects; and (9) showing SRH-related knowledge on display boards inside the dormitories and canteens of their factories in September and December. Items (1) to (5) were conducted by the managers and doctors of the factories; item (6) was conducted by doctors at the seven hospitals in the Huangpu Area; items (7) and (8) were conducted by doctors from a maternal and child care service centre in the Huangpu Area; and item (9) was conducted by the researchers of this study.

In this research, the IPIs included all nine items, while the SPIs only included items (1) to (3).

Data collection and measurements

A self-administered questionnaire was developed based on literature reviews^{15,21,22} and was pre-tested in our previous study.¹² We revised the questionnaire based on the characteristics of Guangzhou female migrant workers. The final version contained seven components: (1) demographic characteristics: age, education level, marital and reproductive history, medical insurance; (2) acquisition of SRH-related information on contraception, induced abortion, RTIs, SRH services sites, etc.; (3) utilisation of sexual and reproductive services, including family planning, diagnosis and treatment for RTIs, getting free SRH brochures and other services; (4) RTI status and health-seeking behaviours; (5) 16 items of SRH knowledge, including contraception, AIDS, sexual behaviour and so on; (6) seven items of SRH attitude such as 'can you discuss sexual topics with your family and friends?', 'If your colleagues got sexually transmitted disease, will you refuse to contact with him/her?'; and (7) SRH-related behaviours such as multiple sex partners, unwanted sex, contraception, unplanned pregnancy and induced abortion. The questionnaire was anonymous to guarantee the privacy of the participants. We recruited assistants and performed a unified training program

before the study began. Each assistant was in charge of six to seven participants to provide the questionnaire instructions and check them on the spot. After a second-round confirmation questionnaire, we created unified codes for all qualified questionnaires.

Data entry and statistical analysis

Completed questionnaires were entered by using EpiData 3.0 (EpiData Association, Odense, Denmark). Data analyses were performed by using SPSS 13.0 (SPSS Inc., Chicago, IL, USA). The baseline characteristics were described with the mean (standard deviation, SD) for continuous numerical variables, the frequency distributions and percentages for categorical variables. The differences between SPIG and the IPIG were compared using *t*-tests for continuous variables and χ^2 tests for categorical variables. To assess the effects of the intervention, we used *t*-tests to compare the differences of SRH knowledge and attitude scores and a χ^2 analysis to compare SRH-related behaviours between the two groups. We also calculated changes from baseline to follow up. The significance level for all analyses was set at $P < 0.05$ (2-sided).

Results

Demographic characteristics at baseline

The baseline sample consisted of 1346 female migrant workers (708 were assigned to the SPIG and 638 were assigned to the IPIG). The ages of the participant ranged from 18 to 29 years, with a mean age of 23.4 years [standard deviation (s.d.)=3.5 years]. The majority of all participants (53.7%) reported junior high school as the highest education level they had obtained. Overall, 61.7% of the participants were unmarried and 56.3% were not covered by health insurance. The differences between the two marital status groups were significant ($P < 0.05$) in terms of demographic characteristics as well as in terms of SRH KAP; therefore the stratified analysis by marital status was performed (Table 1, Appendix 1).

Table 1. Demographic characteristics of female migrant workers by marital status in Guangzhou, China, 2008

SPIG, the standard package of interventions group; IPIG, the intensive package of interventions group; A, Elementary school or less; B, Junior high school; C, Senior high school; D, Junior college or more

Variables	Unmarried				Married				Total			
	SPIG		IPIG		SPIG		IPIG		SPIG		IPIG	
	n	%	n	%	n	%	n	%	n	%	n	%
Age (years old)												
18–21	238	49.9	199	56.2	6	2.6	8	2.8	244	34.5	207	32.4
22–25	143	30.0	102	28.8	46	19.9	63	22.2	189	26.7	165	25.9
26–29	96	20.1	53	15.0	179	77.5	213	75.0	275	38.8	266	41.7
Education level												
A	5	1.0	2	0.6	7	3.0	12	4.2	12	1.7	14	2.2
B	227	47.6	155	43.8	152	65.8	189	66.5	379	53.5	344	53.9
C	218	45.7	180	50.8	70	30.3	71	25.0	288	40.7	251	39.3
D	27	5.7	17	4.8	2	0.9	12	4.2	29	4.1	29	4.5
Health insurance												
Covered	224	47.0	150	42.4	102	44.2	112	39.4	326	46.0	262	41.1
Uncovered	253	53.0	204	57.6	129	55.8	172	60.6	382	54.0	376	58.9

*SRH KAP status at baseline**SRH knowledge*

In the baseline survey, the knowledge scores of the married women in the IPIG and the SPIG were not significantly different, whereas unmarried females in the SPIG had a higher score than those in the IPIG at baseline ($P < 0.05$; Table 2).

SRH attitude

At baseline, married women had comparable scores between the SPIG and the IPIG. However, the scores of unmarried women in the SPIG were slightly higher than those in the IPIG ($P < 0.05$; Table 2).

SRH behaviours

The SRH behaviours portion of the questionnaire focussed on multiple sex partners and unwanted sex, contraception, unplanned pregnancy and induced abortion. The SRH behaviours of the two groups were comparable (Table 3).

*Effectiveness of the intervention on SRH KAP**Effect on SRH knowledge*

We found that knowledge scores increased in both the SPIG and IPIG after the intervention ($P < 0.05$). In addition, the IPIG had a higher knowledge level than the SPIG at follow up ($P < 0.05$; Table 2).

Table 2. Effect on SRH knowledge and attitude scores of female migrant workers in Guangzhou, China, 2008

SRH, sexual and reproductive health; SPIG: the standard package of interventions group; IPIG: the intensive package of interventions group; Follow up, after intervention; #significant differences were found between the SPIG and the IPIG at baseline, the baseline and follow up in the SPIG and in the IPIG, and the SPIG and the IPIG after intervention; ($P < 0.05$); *significant differences were found between the baseline and follow up in the SPIG and in the IPIG, and the SPIG and the IPIG after intervention; ($P < 0.05$); **significant differences were found between the SPIG and the IPIG at baseline, the baseline and follow up in the SPIG and in the IPIG; ($P < 0.05$); ***significant differences were found between the baseline and follow up in the SPIG and in the IPIG; ($P < 0.05$). Results are presented as average with standard deviation in parentheses

Scores	Baseline		Follow up	
	SPIG	IPIG	SPIG	IPIG
Knowledge score				
Unmarried [#]	6.03 (3.697)	4.62 (3.399)	8.36 (4.501)	10.88 (4.072)
Married*	7.46 (3.432)	7.68 (3.039)	9.17 (3.364)	11.38 (3.630)
Total [#]	6.50 (3.673)	5.98 (3.581)	8.69 (4.085)	11.14 (3.855)
Attitude score				
Unmarried**	4.25 (1.577)	3.99 (1.620)	4.46 (1.455)	4.64 (1.690)
Married	4.93 (1.537)	4.90 (1.552)	5.03 (1.593)	4.91 (1.650)
Total***	4.47 (1.596)	4.39 (1.652)	4.70 (1.538)	4.78 (1.673)

Effect on SRH attitude

The SRH attitude scores of both the IPIG and SPIG increased significantly after the program ($P < 0.05$), indicating that the SRH attitude of female migrant workers had an overall healthier tendency. The increase in attitude scores among unmarried women was significant but this was not the case for the married women (Table 2).

Effect on SRH-related behaviours

For unmarried women, the IPI decreased the prevalence of multiple sex partners and unwanted sex and increased the percentages of women reporting contraception and condom use ($P < 0.05$). However, the pre- to post-intervention differences in the unplanned pregnancy and induced abortion rates were similar for both groups (Table 3).

For married females, the findings showed that the prevalence of unwanted sex decreased in both the SPIG and IPIG, but only the IPIG showed a reduction in the percentage of multiple sex partners ($P < 0.05$). The contraception percentages improved in both groups, while the percentage of condom use significantly increased only in the SPIG ($P < 0.05$). In addition, the percentage of unplanned pregnancies and induced abortions decreased significantly after intervention ($P < 0.05$) in both the IPIG and SPIG (Table 4).

Discussion*Summary of main results*

The SRH of vulnerable Chinese migrant workers has previously been described.^{7,23} The baseline survey of the SRH KAP of female migrant workers revealed a dismal picture. On the one hand, most of the participants had a low SRH knowledge level, misconceptions and a high risk for unsafe sexual behaviours, which is consistent with previous studies.^{24,25} However, the participants could not obtain helpful and convenient health services. These findings indicate an urgent need for better SRH promotion among female migrants.

In this worksite-based intervention program, we used IPIs and SPIs to promote the SRH KAP of female migrant workers. We examined the effectiveness of these two intervention packages and compared the effect between the IPIG and SPIG. Our findings showed that participants in both the SPIG and IPIG demonstrated higher knowledge scores at the end of this 6-month intervention study. The results obtained are consistent with previous similar studies²⁶⁻²⁸ and indicate that a specific intervention may be an effective way to improve the SRH knowledge level of migrant workers. Besides, we can see that the SRH knowledge scores in the SPIG were higher than in the IPIG at baseline, but the scores in the SPIG became lower than IPIG after interventions. Therefore, we believe that the IPIs had a better intervention effect than the SPIs towards SRH knowledge.

Both groups presented a healthier tendency towards SRH in general following the intervention. However, although the improvement in attitude scores was significant in the unmarried group, it was not significant in the married group. This finding suggests that it may be easier to improve the attitudes of unmarried females than their married peers. The

Table 3. Effect of intervention on SRH-related behaviours of unmarried female migrant workers in Guangzhou, China, 2008

SRH, sexual and reproductive health; SPIG, the standard package of interventions group; IPIG: the intensive package of interventions group. *Significant differences were found pre- and post-intervention in the IPIG ($P < 0.05$); **significant differences were found between the SPIG and the IPIG after intervention, and the pre- and post-intervention in the IPIG ($P < 0.05$); $\Delta\%$ means the difference in the prevalence rate of related behaviours pre- and post-intervention

Related behaviours (in the past 6 months)	SPIG			$\Delta\%$	IPIG					
	Baseline		Follow up		Baseline		Follow up			
	n	%	n		%	n	%			
<i>Multiple sex partners and unwanted sex</i>										
<i>Two or more sex partners*</i>										
Yes	4	3.6	2	3.2	-0.4	6	9.1	0	0.0	-9.1
No	108	96.4	60	96.8		60	90.9	55	100.0	
<i>Unwanted sex behaviours*</i>										
Yes	14	12.5	6	9.7	-2.8	15	22.7	1	1.8	-21
No	98	87.5	56	90.3		51	77.3	54	98.2	
<i>Contraception</i>										
<i>Practised contraception*</i>										
Yes	77	68.8	49	79.0	10.2	36	54.5	44	80.0	25.5
No	35	31.3	13	21.0		30	45.5	11	20.0	
<i>Condom used**</i>										
Yes	59	52.7	28	57.1	4.4	27	40.9	38	86.4	45.5
No	53	47.3	21	42.9		39	59.1	6	13.6	
<i>Unplanned pregnancy and induced abortion</i>										
<i>Unplanned pregnancy</i>										
Yes	12	10.7	9	14.5	3.8	10	15.2	3	5.5	-9.7
No	100	89.3	53	85.5		56	84.8	52	94.5	
<i>Induced abortion</i>										
Yes	11	9.8	7	11.3	1.5	9	13.6	5	9.1	-4.5
No	101	90.2	55	88.7		57	86.4	50	90.9	

prevalence of unsafe sexual behaviours decreased in both the SPIG and the IPIG. For married females, all aspects of SRH behaviours in the study were modified by various degrees. However, it is notable that the contraceptive knowledge, attitude and practice of unmarried participants improved significantly from pre- to post-intervention, whereas the differences in 'unplanned pregnancy and induced abortion' were not significant. Therefore, we hypothesise that contraceptive failure or improper use may be the main reasons for unplanned pregnancy; additionally, this finding agrees with the results of many previous studies.²⁹⁻³¹ Additionally, this finding suggests that a comprehensive and deep understanding of contraception is required for female migrants to achieve our optimal goal. Additionally, females in China, particularly those with a low social status, are at a disadvantageous position in sexual relationships with males; their partners have an important influence on contraceptive failure. Therefore, some intervention items focusing on men could be helpful to increase the effects of the interventions. The two intervention packages successfully improved the SRH KAP, and the IPIs had a stronger effect than the SPIs. After the interventions, the IPIG had significantly higher knowledge scores, and their contraception status improved compared with the SPIG. These findings imply that an extensive intervention package including peer education, gynaecological services, hot-line consultation and SRH lectures could serve as a

model for future interventions and improve the traditional intervention strategies.

SRH KAP for married versus unmarried females

It has been demonstrated that younger people in many developing countries are at an acute risk of RTI infection and unplanned pregnancy.²⁷ The majority of younger females were unmarried and had lower knowledge and attitude scores than their married peers in our baseline survey. This may be because most women in China with a low education level acquire sexual knowledge from their sexual partners or through a self-summary of their sexual experience, and the younger unmarried females commonly had less sexual experience. Women may gain sexual experience with age, acquiring a greater amount of sexual knowledge from their sexual partners; once their SRH attitudes and habits have formed, they are not easily changed. During the intervention, it is notable that the increases for both knowledge and attitude scores among unmarried females were greater than those for married females. This indicates that those interventions may be more effective for younger and unmarried females, and we therefore propose to improve the SRH KAP at an early age.

Previous studies have demonstrated that unmarried females have significantly less access to SRH information and services compared with their married peers.¹³ This may be because the

Table 4. Effect of the intervention on SRH-related behaviours of married female migrant workers in Guangzhou, China, 2008

SRH, sexual and reproductive health; SPIG, the standard package of interventions group; IPIG, the intensive package of interventions group. *Significant differences were found pre- and post-intervention in the SPIG ($P < 0.05$); **significant differences were found pre- and post-intervention in the SPIG and the IPIG ($P < 0.05$); $\Delta\%$ means the difference for the prevalence rate of related behaviours pre- and post-intervention

Related behaviours (in the past 6 months)	SPIG				$\Delta\%$	IPIG				
	Baseline		Follow up			Baseline		Follow up		
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
<i>Multiple sex partners and unwanted sex</i>										
<i>Two or more sex partners*</i>										
Yes	16	7.0	6	2.4	-4.6	10	3.5	5	1.7	-1.8
No	214	93.0	248	97.6		274	96.5	285	98.3	
<i>Unwanted sex behaviours**</i>										
Yes	42	18.3	28	11.0	-7.3	44	15.5	20	6.9	-8.6
No	188	81.7	226	89.0		240	84.5	270	93.1	
<i>Contraception</i>										
<i>Practised contraception**</i>										
Yes	166	72.2	224	88.2	16	196	69.0	248	85.5	16.5
No	64	27.8	30	11.8		88	31.0	42	14.5	
<i>Condom used*</i>										
Yes	81	35.2	107	47.8	12.6	112	39.4	117	47.0	7.6
No	149	64.8	117	52.2		172	60.6	132	53.0	
<i>Unplanned pregnancy and induced abortion</i>										
<i>Unplanned pregnancy**</i>										
Yes	58	25.2	35	13.8	-11	57	20.1	32	11.0	-9.1
No	172	74.8	219	86.2		227	79.9	258	89.0	
<i>Induced abortion**</i>										
Yes	44	19.1	22	8.7	-10	38	13.4	21	7.2	-6.2
No	186	80.9	232	91.3		246	86.6	269	92.8	

unmarried women are often shy in dealing with SRH problems or are even unaware of the symptoms. Moreover, they typically hesitate and are unwilling to see doctors because they perceive them to be unfriendly and show contempt towards them. Furthermore, some policies set obstacles to the provision of SRH information and services to unmarried females.^{32,33} Therefore, future public health efforts should focus on providing better health services and increasing the availability of approaches to provide SRH information to unmarried women.

Situation and development of SRH in China

Since the WHO proposed improvements to 'sexual and reproductive health' in 1988, this area has received an increasing amount of attention throughout the world. However, as a country with a large and diverse population, China faces many challenges to their SRH goals. In recent decades, as migrant workers have flooded into large cities and raised more public health concerns, special attention has been given to this vulnerable population. The resolution of Fourth World Conference on Women in Beijing (Family Care International 1995) specifically suggested the topic of "women and healthcare", including improving the proper, affordable and quality health care and services, advocating the equal rights on SRH for men and women, preventing and curing the HIV, STD

and other SRH problems.³⁴ However, effective strategies for increasing SRH KAP among female migrant workers in China are still lacking. Under the current Chinese health policy, migrants are generally excluded from the urban employee's basic insurance Scheme (7), and SRH services and education are primarily conducted in urban areas.³⁵

In this study, we found that prevention packages have positive effects on female migrant workers. As the SRH knowledge and attitude improved, the participants increased their use of protection and partook in less risky behaviours. It was agreed that related knowledge may lead to behavioural changes in the long term,³⁶ so correct information and knowledge are the key conditions to reduce risk behaviours. However, most schools in China do not provide in-depth sex education, and young people with little sexual experience cannot acquire sufficient SRH knowledge, particularly for migrants having less education or have dropped out of school early.³³ Because sex education is very important, we suggest that the education system should create appropriate SRH courses in middle school to provide guidance for younger individuals before they become sexually active. Moreover, as we have previously stated, most migrants are at low income levels and do not have health insurance, creating barriers and difficulties to accessing SRH services. Therefore, establishing a SRH service centre and special health insurance for the migrant population

could increase the convenience and support for seeking medical treatment. This study is a first step to providing intervention strategies for our State authorities, so the participation of the society as a whole would be a valuable contribution. Only in this manner can the SRH status of migrant workers truly be improved over the long term.

Strengths of study

As a cluster-randomised and controlled trial, the randomness of the sample can be guaranteed. Previous relevant studies often adopted SPIs and measured their effectiveness; our study used the same approach with IPIS that included more specific contents. We investigated the effects of the two intervention packages and evaluated their differences. We randomly allocated participants to the SPIG and IPIG and examined the comparability of the groups at baseline. Given the difference in marital status between the groups, further analyses were stratified by marital status. This reduced selection bias, and the difference in SRH KAP changes between the SPIG and IPIG can therefore be attributed to the different intervention packages. During the study, all participants were blinded to their group and we emphasised the importance of truthfully filling out the surveys. We guaranteed anonymity and confidentiality to enable the participants to answer the questions without worry, so the information authenticity can be guaranteed. In addition, one factory was treated as one independent intervention unit; participants in one unit received the same intervention items, which effectively avoid the contamination between groups. Furthermore, we simultaneously measured SRH KAP, which can comprehensively evaluate the intervention effect and validate the consistency of the intervention. For these reasons, this study greatly contributes to the modification of traditional intervention items.

Limitations

This study is not exempt of limitations. First, the outcome variable data were gathered by self-administered questionnaires. Some of the data were retrospective, so reporting bias and false information are inevitable. Furthermore, most female migrants had limited education levels; although the response process was conducted under the guidance of trained personnel, there remained some misunderstanding and missing data that we could not control. Second, our investigation required some personal privacy, and some highly sensitive data could therefore not be accurately collected. In addition, some information was subjective and had no uniform standards; this may lead to a biased estimation. Finally, we only recruited eight factories in the Huangpu Area for participation. Because China is a pluralistic country with more diversity than this study could reflect, these data may not be representative of other cities, so the results should be generalised to other populations with caution.

Ethics statement

The study was approved by the Committee of the School of Public Health, Sun Yat-sen University, and each participant went through a written informed consent process with a trained researcher before data collection. The study was anonymous,

and no identifying information was collected for this research. The data were stored at the School of Public Health of Sun Yat-sen University in accordance with the China Data Protection Act.

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Conflicts of interest

None declared.

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Appendix 1. Demographic characteristic of the female migrant workers in Guangzhou, China, 2008

SPIG, the standard package of interventions group; IPIG, the intensive package of interventions group; A, Elementary school or less; B, Junior high school; C, Senior high school; D, Junior college or more

Characteristics	SPIG (n = 708)		IPIG (n = 638)		Total	
	n	%	n	%	n	%
Age (years old)						
18–21	244	34.5	207	32.4	451	33.5
22–25	189	26.7	165	25.9	354	26.3
26–29	275	38.8	266	41.7	541	40.2
Education level						
A	12	1.7	14	2.2	26	1.9
B	379	53.5	344	53.9	723	53.7
C	288	40.7	251	39.3	539	40.0
D	29	4.1	29	4.5	58	4.3
Marital status						
Unmarried	477	67.4	354	55.5	831	61.7
Married	231	32.6	284	44.5	515	38.3
Health insurance						
Covered	326	46.0	262	41.1	588	43.7
Uncovered	382	54.0	376	58.9	758	56.3

4.5 Effect of CERCA interventions on individual outcomes

4.5.1 Introduction

Interventions were conducted in the three Latin American cities from August 2011 until April 2013. The strategy addressed communities and individuals (adolescents, parents, health care providers, authorities and teachers) and was continuously adapted to the context. The effectiveness on individual outcomes was evaluated through a nested cohort analysis that compared the evolution of the behaviours of adolescents in intervention and control groups. The results of this effect evaluation, presented hereafter, have not been published yet.

4.5.2 Methods

An experimental design was applied to measure the effect of the interventions on the communication and health behaviour outcomes among adolescents. We studied how these outcomes evolved between the baseline and the 18-month mark. The behavioural outcomes were assessed through surveys among the study population.

Study design

Interventions were implemented from August 2011 until April 2013 in randomly chosen town districts in Managua and in purposively selected secondary schools in Cochabamba and Cuenca. Cross-sectional surveys were conducted before and after the interventions among adolescents from intervention and control groups. For the impact evaluation a nested cohort analysis has been realized by assessing the evolution of behavioural outcomes among the teenagers who participated in the two surveys. For the sample size calculation we used results of a study among single women aged 15-24 in eight Latin American countries [49]. Minimally 920 sexually active respondents were needed to detect an increase from 0.25 to 0.35 in the proportion of adolescents using condom at last three sexual contacts with 90% power at 5% significance level. Assuming that 30% of the teenagers are sexually active we needed a cohort of at least 2700 adolescents in each study site. The selection of intervention and control clusters has been described in the protocol article [149]. In Nicaragua the town district boundaries have been used as selection unit. From the 33 town districts which comply with previously defined inclusion criteria (between 1400 and 4500 inhabitants

and with more than 50% poor people) 18 clusters (6 intervention and 12 control) were randomly chosen. In Bolivia and Ecuador the intervention schools were chosen based on the proximity of health centres that were allied with the research group. Within the intervention area in Ecuador, three secondary schools were randomly selected to carry out intervention activities and nine secondary schools were selected in Bolivia. Each intervention school has been purposively matched with a control school from a separate district that had similar characteristics (number of male and female students, type of education, private or public school).

Recruitment and data collection

In August 2011 surveys have been conducted among adolescents living in control and intervention districts in Managua and among students of selected schools in Cuenca and Cochabamba. In Managua trained interviewers went to all the houses of the selected town districts, asked the person at the door the number of youths aged 13 to 18 living in the house, and invited them to participate in the survey. If the adolescent was absent and could not be located, the interviewer returned once on the next day. The teenagers concerned and the responsible adults were briefed about the purpose of the study and were assured that their responses would remain confidential. They were also informed that participation was voluntary and that they could withdraw at any time. After having obtained verbal consent from the adolescent and the responsible adult the interviewer and the adolescent sat apart and proceeded with the questionnaire. If there were several youths aged 13 to 18 in a family the questionnaire was administered one at the time. The teenagers self-administered questions directly related to sexual behaviour. In Cochabamba and Cuenca interviewers visited all classrooms of the selected schools at a time arranged with the school management. The parents were informed beforehand with a letter and could deny the participation of their child by signing the letter. In the classroom the interviewers gave a detailed description of the study purpose and design and invited all adolescents to fill out the questionnaire after signing the informed consent attached to the questionnaire. The questionnaire contained 59 questions on socio-demographic characteristics, relationships, communication skills, information-seeking behaviour, use of existing SRH services, reproductive history and sexual behaviour. The development and content of the questionnaire have been described previously in the study on determinants in Nicaragua [150]. In May 2013, after 18 intervention months, cross-sectional surveys were repeated in the same study sites. This time the surveys enrolled adolescents until 20 years

old.

Outcomes

In order to measure the effect of the interventions on adolescents SRH we chose two intermediate outcomes (communication on sex, use and knowledge of health services) and one effect outcome (condom use).

Evolution in communication on sexuality issues We created a continuous outcome variable that evaluated the evolution regarding the ease of discussing sexuality over the study period. The communication outcome is based on 4 variables:

- Com1: Do you feel you can talk about sexuality with your parents? (answers: yes – no – sometimes)
- Com2: Do you feel you can talk about sexuality with your partner? (answers: yes – no – sometimes – no partner)
- Com3: Do you feel you can talk about sexuality with your friends? (answers: yes – no – sometimes)
- Com4: Did you talk with other than a parent, partner or friend about sexuality last year? (answers: yes – no)

We recoded 'yes' as 1, 'no' as 0 and 'sometimes' as 0.5. For question com2, values for individuals without partner were assumed to be missing. To obtain an overall score about the communication, we calculated the mean of the 4 answers to these questions for both the pre and post questionnaire. We constructed the difference between the post and pre values to obtain a measure of evolution in communicating sexuality. The constructed variable has values between -1 and 1.

We compare the evolution in communication between the control and intervention group while correcting for baseline covariates.

Evolution in use and knowledge of ASRH services In order to evaluate the occurrence of a positive evolution in the use and knowledge of health services, we created one binary variable that summarizes four binary outcome

variables :

- P043: Knows a health care center (1 = yes, 0 = no)
- P044: Visited a health care center last year (1 = yes, 0 = no)
- P046: Knows a health care provider (1 = yes, 0 = no)
- P047: Consulted a health care provider last year (1 = yes, 0 = no)

1 = positive trend in the use/knowledge of health care provider/center: adolescent knows or visited a health care provider/center after the intervention and not at the beginning of the study

0 = no positive trend :

- adolescent knew/visited a provider before and after intervention;
- adolescent knew/visited no health care provider before or after intervention;
- no information on the use/knowledge before or after intervention.

As soon as one of the four variables has a positive evolution, we have a general positive evolution recorded in the variable trend-access.

Because we are mainly interested in the impact of the CERCA-intervention on the subgroup of adolescents who did not consult a health care provider, last year, at baseline, we excluded adolescents who have visited a health care provider at baseline. The respondents who knew a health care provider at baseline and not at follow-up were also excluded.

Evolution in condom use The individuals that are sexually active were asked how many condoms they used during the last 3 sexual contacts (0 - 1 - 2 - 3 - don't know). The individuals that answered 'don't know' were recoded to be missing. For evaluating the effect of the intervention on condom use we created a continuous variable that looks at the difference of condom use between follow-up and baseline. The continuous outcome variable 'Difference in condom use' takes values between -3 and 3.

Baseline covariates

For the analysis we considered covariates that were identified as determinants of contraceptive use in literature and previous research:

Sex Male or female

Age For each country, we centred the age around the mean age of that country

Sexually active The bivariate variable 'sexually active' was informed by the question 'Have you ever been sexually active (penetration)?'

Participation The continuous variable 'participation' is set to 0 in the control group and corresponds to the number of attended workshops (max 10) for the adolescents from the intervention group (see table 4.1). For the calculation of this variable only the participation at workshops was considered. This is a proxy of the real exposure to the intervention strategy as workshops were only a part of the activities addressing adolescents. We did not consider other aspects of the intervention (e.g. new media, community activities etc.) as those could not be adequately measured.

Complier The bivariate variable 'Complier' is set to 0 in the control group. The value 0 is given to respondents from the intervention group who never participated and 1 to those who participated in at least 1 workshop (see table 4.1).

Non-complier The bivariate variable 'Noncomplier' is set to 0 in the control group. The value 0 is given to respondents from the intervention group who participated in at least 1 workshop and 1 to those who never participated (see table 4.1).

Main floor material The variable 'main floor material' dichotomised the three possible answers (natural ground, cement, tiles or wood) for the question 'What is the main material used for the floor in your house?' into 'natural floor' and 'other'. The floor material is a proxy for household poverty in Latin America.

Importance religion We recoded the importance of religion into a numeric variable with 0 being not important at all and 3 being very important.

Alcohol consumption The variable 'alcohol consumption' reduced the five options in the questionnaire ('How frequently do you drink alcohol?') to three values: 'never', 'less than once a week', 'once a week or more'.

Selfesteem We created a new variable for self-esteem based on four questions (Adolescent is proud of himself/herself; adolescent thinks he/she is a good person; adolescent has some qualities; and adolescent thinks he/she is a failure.) Missing values on one or more of the four items will get a mean score of the other answers that were given and the sum of the 4 values are divided by 16 and multiplied by 100. In that way, we have a score between 0 and 100. The higher the score the higher the self-esteem.

Gender attitudes Adolescents' gender attitudes were measured using the Attitudes toward Women Scale for Adolescents (AWSA)[151]. A factor analysis of the AWSA scale was performed and is described in detail in the authors' article on the AWSA scale . Three subscales emerged from the factor analysis: power dimension, equality dimension and behavioral dimension.

Table 4.1: Level of participation in workshops

	Non-complier	Complier	Participation
Control	0	0	0
Intervention			
0 workshops	1	0	
1 or more workshops	0	1	continuous

Statistical analysis

Baseline and follow-up data of the resurveyed adolescents were analysed. We compared the evolution in communication, condom use and use and knowledge of SRH services over the study between the two study arms (No intervention and Intervention) and corrected for baseline covariates. Given the variability and the dynamic character of the interventions, the impact evaluation assessed the effectiveness of the strategy per city as a whole rather than attributing the result to a single action.

We modelled the continuous outcomes (evolution in communication and condom use) through a mixed regression model that consists of the treatment status as fixed effect to which baseline covariates are added to adjust to the treatment effect. We start by adding all interesting baseline covariates and use backward model building on the main effects (with a p-value of 5% for remaining in the

model and keeping treatment in the model) and forward model building (with a p-value of 5% for entering the model) for interaction effects (only using covariates that had a significant main effect).

For measuring the impact of intervention on the evolution in the use and knowledge of health services we used a GEE model. First we fitted a full main effects model to get a first impression if a linear model seems suitable. To define the best fitted model we chose forward stepwise selection. We used an alpha-level of 0.05 for the p-values of the regression coefficients to add or remove a predictor from the model.

4.5.3 Results

Cohort versus loss to follow up

For the effect evaluation we intended to assess the evolution of behavioural outcomes of the cohort of adolescents who participated in the two surveys. However, only a fraction of the initially enrolled respondents could be included in the cohort. From the 9011 adolescents of the baseline survey only 2643 participated in the second survey. In other words, the loss to follow up was very high, namely 76% in Nicaragua, 58% in Ecuador and 79% in Bolivia.

Table 4.2 presents the baseline characteristics of the resurveyed teens (cohort) and the adolescents who only participated in the first survey (loss to follow up). In Bolivia and Ecuador the cohort group was significantly younger and less sexually active. In Bolivia the sex ratio differed between the two groups. In the three cities the resurveyed adolescents were more likely to live with their mother and to attach importance to religion. The loss to follow up were more likely to be sexually active than the cohort group with particularly large differences in Ecuador and Bolivia. Condom use did not differ among both groups at baseline.

The further analyses were performed on the cohort of 2643 adolescents who completed the baseline and follow-up survey. This cohort consisted of 651, 1330 and 662 adolescents in respectively Bolivia, Ecuador and Nicaragua. Due to the high loss to follow up and important differences between cohort and loss to follow up group, the results of this analysis cannot be extrapolated.

Table 4.2: Baseline characteristics cohorts and drop-outs

	Nicaragua (N=2766)		Ecuador (N=3164)		Bolivia (N=3081)	
	Cohort n	Loss to FU	Cohort	Loss to FU	cohort	Loss to FU
Mean Age in yrs	662	2104	1330	1834	651	2430
Sex (female %)	15.2	15.4	14.1	14.9*	15.0	15.9 *
Religion is important (%)	53.5	50.8	30.0	30.5	53.1	59.5*
Living with mother (%)	70.2	64.4*	83.2	80.7	72.0	66.9*
Sexually active (%)	89.0	84.5*	90.1	87.0*	81.5	77.8*
No condom use** (%)	25.2	28.5	9.5	19.4*	9.9	24.8*
	36.1	39.7	36.7	31.2	23.0	25.4

** : no condom use in last 3 sex acts; *: $p \leq 0.05$,

Evolution in communication on sexuality

Table 4.3 presents the number of adolescents with improved communication on sexuality at follow-up. In Nicaragua and Bolivia more adolescents from the intervention group had an improved communication outcome compared to those from the control group. However, the regression model (table 4.4) did not show a significant intervention effect in none of the study sites.

Table 4.3: Number of adolescents with improved communication on sexuality issues at follow-up

	Nicaragua (N=662)		Ecuador (N=1330)		Bolivia (N=651)	
	Control	Intervention	Control	Intervention	Control	Intervention
Improved communication	101	94	163	222	58	148
	26%	35%	29%	29%	27%	34%
Total	392	270	563	767	216	435

Bolivia The improvement of communication within the intervention group was significantly related to the degree of participation in activities. Unexpectedly, the non-compliers -about 4% of the adolescents from the intervention group did not participate in any workshop- had a better outcome compared to those who participated between one and eight times (not significant). Baseline variables that significantly influence a change in communication behaviour over time were age, alcohol consumption and gender attitudes (equality dimension). Alcohol drinking adolescents reported a larger increase in communication on sexuality issues over time than non-consumers. Adolescents with egalitarian gender norms moved towards a more open communication on sexuality compared to their peers with less egalitarian gender norms.

Table 4.4: Output of the mixed regression model for the continuous outcome ‘evolution in communication’

	Nicaragua		Ecuador		Bolivia	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-2.84	0.7971	-3.11	0.6787	0.34	0.912
Study arm						
No intervention (ref)	0.00		0.00			
Intervention	2.85	0.571	1.39	0.658		
*Noncomplier					18.91	0.058
*Complier					-3.28	0.347
*Participation	0.41	0.593			1.34	0.035
Age					-4.16	0.002
Sex						
Male (ref)			0.00			
Female			-5.68	0.005		
Sexually active at baseline						
Not sexually active (ref)			0.00			
Sexually active			2.88	0.029		
Gender attitudes						
Equality dimension					1.76	0.038
Behaviour dimension	3.32	0.019				
Power dimension			-0.84	0.034		
Floor material floor						
Natural floor (ref)			0.00			
Cement or solid			14.61	0.010		
Ceramic, wood or other			13.85	0.014		
Alcohol consumption						
Never (ref)					0.00	
Weekly or more					24.73	0.016
Less than once a week					7.97	0.006
Importance religion	-8.21	0.001				
Religion						
Other religion (ref)	0.00					
Catholic	16.83	0.043				
Evangelic	16.92	0.039				
No religion	-2.026	0.853				

* only intervention arm: the term is 0 for no-intervention arm

Nicaragua Religion and attitudes to gender behaviour are the most important correlated factors of the communication outcome. Adolescents belonging to a Catholic or Evangelic church reported an improved communication compared to their unreligious peers. On the other hand youth who attach more importance to religion make less progress in talking about sexuality compared to those who give less weight to religion.

Ecuador The progress in communication was negatively correlated with the female sex, and positively correlated with being sexual active at baseline and living in a house with manufactured floor.

Evolution in knowledge and use of SRH services

In Ecuador and Bolivia, the knowledge and use of SRH services improved more among adolescents from the intervention group compared to adolescents from the control group (table 4.5). The association between intervention type and outcome improvement was only significant in Ecuador (table 4.6). A non-significant reverse trend (more improvement in control group) has been noticed in Nicaragua.

Furthermore, the improvement of knowledge and use of SRH services was significantly positively associated with the male sex (Nicaragua and Ecuador), being sexually active (Ecuador) or having a partner (Nicaragua) and living in a house with a manufactured floor (Bolivia).

Table 4.5: Number of adolescents with improved use/knowledge of SRH services at follow up

	Nicaragua (N=622)		Ecuador (N=1285)		Bolivia (N=629)	
	Control	Intervention	Control	Intervention	Control	Intervention
Improved use/ knowledge of services	188 30%	119 19%	229 18%	370 47%	77 12%	157 25%
Total	369	253	546	739	216	419

Evolution in condom use

Only in Ecuador, the reported condom use significantly improved among adolescents from the intervention group compared to those from the control group (table 4.8). In Bolivia the improvement was not statistically significant. In

Table 4.6: Output of GEE model for the bivariate outcome ‘evolution in use/knowledge of SRH services’

	Nicaragua		Ecuador		Bolivia	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0.10	0.61	-0.47	0.143	-1.09	0.001
Study arm						
No intervention (ref)	0.00		0.00		0.00	
Intervention	-0.12	0.41	0.36	0.001	0.11	0.48
Sex						
Female (ref)	0.00		0.00			
Male	0.38	0.011	0.37	0.011		
Sexually active at baseline						
Sexually active (ref)			0.00			
Not sexually active			-0.65	0.001		
Having a partner						
Having a partner (ref)	0.00					
Not having a partner	-0.45	0.002				
Main floor material floor						
Natural floor (ref)					0.00	
Manufactured floor					0.37	0.001

Nicaragua, the change in condom use within the intervention group was significantly correlated with the frequency of participation in workshops. This positive effect of the participation on condom use decreased with gender attitudes (power dimension)

In Bolivia adolescents who are in favour of a more even distribution of power between men and women and those who attach more importance to religion are more likely to have reported an improved condom use after two years. Within the intervention group of Managua gender attitudes (power dimension) are positively related to the increase in condom use.

Table 4.7: Number of adolescents with improved condom use at follow up

	Nicaragua (N=134)		Ecuador (N=82)		Bolivia (N=34)	
	Control	Intervention	Control	Intervention	Control	Intervention
Improved condom use	32 35%	10 24%	11 30%	15 34%	5 33%	8 41%
Total	91	43	38	44	15	19

Table 4.8: Output of the mixed regression model for the continuous outcome ‘evolution in condom use’

	Nicaragua		Ecuador		Bolivia	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.097	0.768	-0.023	0.904	-6.25	0.005
Study arm						
No intervention (ref)	0.00		0.00		0.00	
Intervention	-2.66	0.039	0.51	0.040	0.85	0.41
*participation	0.40	0.044				
Sex						
Male (ref)	0.00					
Female	-0.53	0.029				
Gender attitudes: Power dimension	0.32	0.128			0.34	0.004
Study arm X Power dimension	2.34	0.007				
Importance religion					1.50	0.001
Religion						
Other (ref)					0.00	
Catholic					0.55	0.560
Evangelic					1.88	0.14
None					5.46	0.006
*Participation X PowerDimension	-0.38	0.013				

* only intervention arm: the term is 0 for no-intervention arm

4.5.4 Discussion

Important study limitations

We did not succeed in our attempt to select a cohort that is representative and large enough to evaluate the effect of the interventions on behaviours. The study design using two cross-sectional surveys in schools and neighbourhoods did not work in this context. We started with the assumption that a large number of adolescents would remain in the same neighbourhoods and schools during the intervention and could be resurveyed afterwards. However, we underestimated the mobility of adolescents. Apparently teenagers in the study sites were highly mobile and moved from neighbourhoods and schools. A major part of the initially enrolled adolescent did not participate in the follow up study. This had important consequences for the quality of the study.

First, the study did not achieve the required sample size. While the predetermined sample size was 2700 respondents per study sites, the actual sample sizes were 662, 1330 and 651 in Nicaragua, Ecuador and Bolivia respectively. We did a post-hoc power calculation to determine the power the study had to detect an increase in condom use from 0.5 to 0.6, given the actual sample size. The power was respectively 0.29, 0.16 and 0.14 in Nicaragua, Ecuador and Bolivia.

This could mean that there were changes in outcome indicators, but that these were not detected in the analyses.

Second, the study had low internal and external validity. There were important differences between the intervention and control group, and between the cohort and loss to follow-up group. Amongst other, the loss to follow up group was more likely to be sexually active than the cohort group. Consequently it is likely that those who dropped out the study were also at larger risk concerning their sexual health.

Intervention effect on individual behaviours

Notwithstanding the important limitations, we analysed the data of the cohort with the aim to assess the effect of the interventions on behavioural outcomes among the cohort of resurveyed adolescents. Given the discussed validity problems the results only relate to the respondents of the study, and cannot be generalized to other groups.

The analyses demonstrate an intervention-related progress on behaviours in Ecuador, where we found a significant improvement in condom use and in knowledge of/access to SRH services. The interventions in the Nicaraguan and Bolivian study sites did not result in such significant change of behavioural outcomes.

Different reasons could be formulated for the absence of a consistent effect. Apart from the mentioned **power problems** due to the high drop out rate, the variability in effect might also be a consequence of the **inconstant participation**. The data of Bolivia and Nicaragua show that respectively the progress of communication and condom use were positively correlated with the frequency of participation in workshops. The exposure to messages and intervention activities differed within and among intervention groups. First of all, participants decided themselves to what extent they participate. Furthermore, the chance of bumping into a community-based campaign or event depended on many factors such as the habit of going out.

The **divergence in the applied interventions** is another critical aspect that might contribute to the inconsistency of evaluation results. According to the principles of action research the implementers had the intention to adapt

the interventions to the local contexts. However, from the stakeholders at the final conference in Cuenca (paper 12) and from the qualitative research [152] we know that the CERCA teams only partially succeeded in addressing site-specific barriers for adolescents' access to sexual health services and contraceptives. In Managua, some health authorities were reluctant to approve the set-up of adolescent-oriented SRH services as they were inclined to think that such specific services go against the comprehensive care principles of the recently implemented Family and Community Health Model [150]. Local health care providers refused to see unaccompanied minors as they were confused about legal codes. In Cuenca, some CERCA activities, including the free distribution of condoms among adolescents, were opposed by pro-life movements. In Cochabamba, the director of a health centre in Cochabamba opted out for moral reasons during the interventions leading to the discontinuation of interventions at the level of the health centre.

Modifiers of intervention effects

The study showed that factors related to gender attitudes, alcohol use, religion, and living conditions confounded or modified the effect of our intervention. However, none of those effects was consistent. The modifying effect of those factors differed greatly between the study sites and was sometimes reversed. For example, progressive gender attitudes were related to improved condom use and more open communication in Managua and Cochabamba but seemed less important in Cuenca. Likewise, a stronger affinity with religion was related to less communication on sexuality among adolescents in Nicaragua while religiosity was positively correlated to condom use in Bolivia. In sum, contextual factors influenced behavioural outcomes in a varying way.

4.5.5 Conclusion

Overall, the CERCA study did not succeed in demonstrating consistent effects of complex community- and school-based interventions on adolescents' sexual health behaviour in Latin America. A major problem was the high loss to follow up in the study population resulting in poor power and validity problems. The analyses on the cohort data of Ecuador showed a small increase in condom use and in the outcome related to the access to SRH services. The interventions in Bolivia and Nicaragua did not lead to a measurable change in individual outcomes. Variability in participation of the target population and in the quality of intervention implementation were probably additional reasons

for the inconsistency of evaluation results. Lastly, our study identified a series of effect modifying factors - gender attitudes, alcohol use, religion, and living conditions - that influenced the outcomes.

4.6 Effect of CERCA interventions on community and societal outcomes

4.6.1 Introduction

Information on the effect of the CERCA interventions on community and societal outcomes was provided by the qualitative research during the interventions, the post hoc process evaluation and the expert reflections at the final CERCA conference. Throughout the intervention process, semi-structured interviews, focus group discussions and a participatory ethnographic research process were conducted among teens and adults involved in the project. In addition, a qualitative *post hoc* process evaluation was carried out from October 2014 to January 2015. A main goal of this *post hoc* study was to assess how stakeholders perceived the interventions and their impact on the communities. The article on the conference has been published. The papers on the qualitative research and on the results of the *post hoc* study are still in preparation. Hereafter, the published article and a draft manuscript are presented in full.

Paper 11

Nelson E, Ballesteros M, Decat P, Edmonds A, Encalada D, Rodriguez O. *Sexual Communication in Conflict: Anthropological Dimensions of a Latin American Adolescent Sexual and Reproductive Health Project*. In preparation.

This article examines the dynamics of communication on sexuality between adult family members and teenagers within the context of the CERCA research. Using mixed ethnographic methods over a 16-month intervention period, this research shows that adult-adolescent communication on sexuality is a negotiated process that transpires not just between parents and teens, but also within extended families and communities.

Paper 12

Cordova Pozo K, Chandra-Mouli V, Decat P, Nelson E, De Meyer S, Jaruseviciene L, Vega B, Segura Z, Auquilla N, Hagens A, Van Braeckel D, Michielsen K. *Improving adolescent sexual and reproductive health in Latin America: reflections from an International Congress*. *Reprod Health*. 2015 Jan 24;12:11.

In February 2014, an international congress on ASRH took place in Cuenca, Ecuador. Its objective was to share evidence on effective ASRH intervention projects and programs in Latin America, and to link this evidence to ASRH policy and program development. This paper summarizes the key points of the Congress and of the CERCA project.

Paper 13

Ivanova O, De Meyer S, Cordova K, Segura Z, Vega B, Chandra-Mouli V, Hindin M, Decat P, Michielsen K. *Lessons learnt from the CERCA project, a comprehensive intervention study to promote adolescent sexual and reproductive health in three Latin America countries: A qualitative post-hoc evaluation* In preparation.

This paper presents the results of the post-hoc analysis. As the impact evaluation showed minimal impact, this qualitative study aimed to gain insights into the strengths and weaknesses of its development and implementation and to identify other potential achievements of the project. First, we did a document analysis of the main project documents to assess the quality of the intervention and its implementation. Second, we conducted 20 in-depth interviews and 19 focus group discussions including 154 stakeholders and intervention target groups in the three countries. Stakeholders felt that CERCA prepared the soil for future interventions in adolescent SRH. People in the communities reported higher awareness of the problems related to adolescent sexuality and the need to communicate about it, policy makers are taking actions and different organizations are joining forces. CERCA generated a social environment that is supportive of the possibility of health-enhancing behaviour change, possibly resulting in individual behaviour changes on the long term.

4.6.2 Full articles

Sexual Communication in Conflict: Anthropological Dimensions of a Latin American Adolescent Sexual and Reproductive Health Project

Erica Nelson^{1*}, Marco Ballesteros², Peter Decat³, Alex Edmonds⁴, Diana Encalada⁵, M.D., Octavio Rodriguez⁶

Improving parent-adolescent communication on sexuality is a central objective of global adolescent sexual and reproductive health (ASRH) interventions. However, the complexity of cultural dimensions of communication in non-U.S. and European contexts has received little research attention to date. This article examines the dynamics of communication on sexuality between adult family members and young people within the context of a four-year research intervention in Cochabamba, Bolivia, Cuenca, Ecuador; and, Managua, Nicaragua. Using mixed ethnographic methods over a 16-month intervention period, this research shows that adult-adolescent communication on sexuality is a negotiated process that transpires not just between parents and young people, but also within extended families and communities. These differences in turn reflected broader power dynamics related to shifting socio-sexual norms on issues such as the reputational value of female virginity, knowledge versus use of modern contraceptives, and adult control over young people's relationship and sexual choices. These findings question the assumption that global health interventions can rewrite the 'script' of parent-adolescent communication on sexuality in a Latin American context without taking account broader family networks and the socio-cultural ramifications of young people's relationship choices.

Keywords: Adolescent Sexual and Reproductive Health, Parent-Adolescent Communication, Community-Embedded Interventions, Latin America

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Globally, health programmes and development interventions are increasingly seeking community participation. This goal has been approached in various ways and through the use of distinct terminologies. Individuals defined as “community stakeholders” might be invited to participate in the project planning and execution. “Community impact” studies are conducted. Or – as in the project discussed here -- anthropologists are asked to assess community needs, and health interventions are formulated as “community embedded.” This focus on community participation points to complex political developments in public health and ‘North-South’ collaborations. It builds on a long tradition of grassroots activism in public health, but also reflects a shift at higher levels of governance.

In some policy circles and international development agencies, as well as among major development donors, there has been recognition that “top down” interventions can be ineffective or unsustainable (Mosse 2013). In the fields of public health and health promotion there has also been greater recognition that socio-cultural context mediates conceptions of illness and risk, as well as healthcare seeking. Understanding “communities” can thus become an important means to obtain participant “ownership” in an intervention as well as respond to critiques of health promotion as paternalistic or misguided. The interest in community participation may signal a “progressive” redistribution of power in the field of public health, but it also raises tough questions about whether such changes will actually result in improved health or community empowerment, whether they will yield new forms of “technoneurosis” (Biehl, Coutinho and Outeiro, 2001) or health-based anxiety and social control, or whether they will simply allow current forms of governance to continue largely unchanged (Zigon, 2011 and Ferguson, 1994). Given the high political and health stakes of these issues, it is important to examine how community-focused health interventions are planned and practiced.

Written by project participants, this article examines a “community-embedded” intervention designed to improve adolescent sexual and reproductive health (ASRH) in three Latin American countries. Beginning in February 2010, a multi-country consortium consisting of public health professionals, obstetrician-gynecologists, epidemiologists, economists, psychologists, statisticians, peer educators and anthropologists embarked on a four-year, European Commission funded research intervention titled, The Community Embedded Reproductive Health Care for Adolescents in Latin America (CERCA) (Decat 2013). The intervention sites – Cochabamba, Bolivia; Managua, Nicaragua and Cuenca, Ecuador – were selected as representative of current challenges to ASRH in the region, namely: inadequate sexual and reproductive health services and access to free or low-cost contraceptives for adolescents; insufficient knowledge of modern contraceptives and sexual health risk in adolescent populations; practices of early sexual debut, and socio-sexual norms complicating the discussion of sex and sexuality in homes, schools and clinics (Rani et. al, 2003, Liposvek, 2002, Ali and Cleland, 2005; UNFPA, 2007; Guttmacher, 2010; Brock and Columbia, 2007; Bearinger, 2007; Kostrzewa, 2008).

**In line with the parameters for global ASRH action first delineated at the International Conference on Population and Development in 1994 (UN, 1995) and latterly incorporated into Millennium Development goals numbers 4 and 5 (United Nations, 2000), project CERCA set out to test the hypothesis that a comprehensive and locally-informed set of public health interventions (versus a unilateral and top-down

approach) would result in increased modern contraceptive use, increased use of already-existing health services and improved communication on sexuality within targeted adolescent populations (Decat 2013). Given the increasing, rates of adolescent pregnancy and sexually transmitted infections in the Andes (UNFPA, 2011) and the persistence of high rates of adolescent pregnancy in Central America (Samandari and Spezier, 2010) the project endeavored to meet the urgent demand for new models of collaborative, replicable and impactful ASRH programs. “Community-embeddedness” was conceived of as a collaborative process through which those populations targeted by the project (namely, adolescents, parents of adolescents and ‘community leaders’) would participate in project decision-making through ongoing research activities and consultations. This included a pre-intervention situation analysis which, in combination with existing demographic data, health records and the results of quantitative surveys, took into account what adolescents, parents, health and education professionals understood to be the factors contributing to poor adolescent sexual and reproductive health.

This article considers the implications of a ‘community-embedded’ approach on the polemical issue of adult-adolescent communication on sexual issues. Through the use of ethnographic methods and sustained engagement with communities targeted by the project, we concluded that the adults and adolescents in question were engaged in dynamic processes of negotiation and contestation over what aspects of sex could or could not be talked about, which adult family members should or should not take responsibility for having the ‘sex talk,’ and what the consequences – intended or not - of open communication on sex might be. By going beyond what was possible to measure quantitatively, the research revealed the multiple modalities and practices of adult-adolescent communication, and a diversity of opinions across and within generationally-specific groups about how this communication has, or should be, changed.

For the purposes of this article, we ask: how do young people in CERCA-targeted communities perceive their existing communication on sex and relationships with their parents or other significant adults? And, how do parents or significant adults in CERCA-targeted communities perceive their existing communication on sex and relationships with young people? Our research was informed by the vast U.S.-based scholarship linking ‘open communication’ between parents and adolescents to positive adolescent sexual and reproductive health-seeking behaviors (Miller et. al, 1998; Whitaker et. al, 1999; Jaccard, Dodge and Dittus, 2002; Hutchison et. al, 2003; Martino et. al, 2008; Wight, Fullerton 2013), in addition to research identifying challenges to communication in Latin American and African contexts (Amaran and Fawole, 2008; Crichton et. al, 2012; Harrison, 2008; Bochow, 2012; Gallegos et. al, 2007; Atienzo et.al., 2011; Caal et. al, 2013).

We found that while the parent-child relationship was central to family communication on sex, it was important to take into account wider, extended kin networks. Young people get and share information with many different relatives from different generations, especially in social contexts where it was common for a parent – either the mother or father – to work as migrant laborers. While the wider community beyond the nuclear family was important, we also found that the community, not surprisingly, did not “speak” with one voice. Here we show that neither young people nor adults involved in the project spoke with a unified voice about the desired outcomes of an ASRH intervention, and in particular, what adult-adolescent communication on

sexual issues should consist in, when it should occur, and what impact this communication might have.

Methods

Study Area and Data Collection

In the first year of project CERCA (2010) we conducted a situation analysis in neighborhoods/geographic zones selected as intervention sites (randomly in Managua, and purposively in Cochabamba and Cuenca). The goal was to assess the sexual and reproductive health needs and challenges of local adolescents. CERCA colleagues conducted a literature review of existing demographic and health data by country and region, and a pre-intervention quantitative survey of contraception knowledge, attitudes and practices in control and target areas. For our part, we used a range of qualitative methods, from participatory ethnographic methods (Price and Hawkins 2002) and collaborative filmmaking, to more traditional qualitative methods such as in-depth interviews, participant observation and focus group discussions.⁷ The resulting analysis identified the issue of communication between parents/significant adults and young people on sex and sexuality as central to the development of the project.

During the second (intervention) phase of the project, these same mixed ethnographic methods were brought to bear on challenges and questions shared by all three CERCA project sites. In this instance, ethnographic research (and researchers) played multiple roles, providing feedback on project interventions through ongoing work with local peer discussion groups, as well as carrying out intensive periods of field research to further deepen our understanding of key issues. These peer group discussions were repeated with roughly the same group of people, at quarterly intervals during the intervention period, building over time the trust between participants and the facilitator (Nelson, Ballesteros or Rodriguez), as well as between participants (Harrison, 2008; Bohmer and Kirumira, 2000). The groups were named *comités comunitarios* to reinforce the premise that the discussions would not be used simply to 'extract' information about socio-sexual norms and behaviors, or to disseminate the values and objectives of the project, but would instead function as non-hierarchical spaces in which all participants

⁷ Unless stated otherwise, the data referred to in this article derives from observational notes from lead author's field research, and transcripts of recorded interviews and focus groups facilitated by the lead author. All participants in qualitative research were required to first give either oral (in the case of some informal interviews) or written consent (in the case of focus group discussions, participatory ethnographic research, and semi-structured interviews). Given the sensitive nature of SRH-focused research, all participants were offered complete anonymity, though most commonly people offered for their names to be used. To avoid confusion between those individuals who wanted to use first names only, and those who wanted to use first *and* last names, we have decided to use first names for all excerpts. In instances where the individual asked for anonymity, we will use a pseudonym and an "*" to denote this fact. The transcripts and notes are kept by the lead author in accordance with European standards of Human Research Subjects protocol and will be destroyed within a 5-year period following the publication of any Project CERCA-related articles or reports.

(facilitators included) held equal opinions and equally valid knowledge. In addition an experienced ethnographer (Nelson) conducted 10 months of intensive fieldwork in Cuenca.

At the country level, these “community committees” were divided into two to four groups of young people and, separately, parents/grandparents/caretaking relatives of young people, meeting a total of five times each during the 18-month intervention period. Topics discussed included: 1) generational differences and talking about sex and relationships in the Family; 2) gossip, scandal and stigmatization; 3) sex vs. sexuality and perceived challenges to achieving sexual health; 4) the “value” of virginity and romantic partnership ideals, and lastly, 5) intergenerational communication.

Table 1. Pre-Intervention Research Activities (May 2010 – May 2011)

<i>Pre-Intervention</i>	<i>Cuenca, Ec</i>	<i>Cochabamba, Bo</i>	<i>Managua, Ni</i>
<i>Total In-Depth Interviews</i>	18	20	10
<i>Total Peer Interviews**</i>	20	9	20
<i>Total Focus Groups</i>	5	3	3
<i>Total On-Camera Interviews</i>	8	n/a	n/a

***Refers to interviews carried out by peer researchers. These were not recorded but researchers took notes for each interview, which were later discussed and analyzed together with the lead researcher.*

Intervention

Table 2. Intervention Research Activities (January 2012 – April 2013)

<i>Intervention</i>	<i>Cuenca, Ec</i>	<i>Cochabamba, Bo</i>	<i>Managua, Ni</i>
<i>Total In-Depth Interviews</i>	30	14	20
<i>Total Peer Interviews**</i>	11	10	14
<i>Total Focus Groups</i>	18	13	15
<i>Total On-Camera Interviews</i>	7	n/a	n/a

The accumulated research from the first 14 months of the intervention informed the planning of a final period of fieldwork carried out for three-weeks in each country as CERCA activities came to a close. Together with preliminary analyses of the earlier research period we developed three semi-structured interview guides (one for young people, one for adults involved in project as parents/grandparents, one for health workers involved in the project), a focus group discussion guide for mixed groups of adults and young people, and a rapid participatory ethnographic research process centering on communication and advice-giving. We recruited interviewees, peer group discussants and

participatory researchers from the areas where we had built relationships via the work of the “community committees.”

Each country partner interpreted the division of population and the definition of a target community in different ways. These choices reflected the particular urbanization patterns of each city. For example, in Cochabamba, local partner South Group targeted high schools and clinics within defined municipal districts (Quintanilla and Sarcobamba) as in practice adolescents attending a given school or using a certain clinic may travel in from one of many dispersed, peri-urban settlements that have crept outwards from the city’s center in recent decades. In Nicaragua, ICAS (Instituto CentroAmericano de Salud) and CIES (Centro de Investigaciones y Estudios en Salud) worked with geographically contained neighborhoods, reflecting the post-revolutionary settlement of Managua’s urban fringe and the popular organization of health and sanitation services. The neighborhoods where we conducted research in Managua were named after fallen Sandinista rebels, sons of local residents – Salomón Romero and Enrique Lorente. Finally, in Cuenca, the University of Cuenca medical team chose individual high schools and health posts located in two semi-rural parishes, Chiquintad and El Valle, which have over the last twenty years become linked to the outer edges of Cuenca’s urban sprawl, in addition to one urban high school and district health center (César Dávila high school and the Pumapungo Health Center, district 1).

Although CERCA targeted adolescents aged 13 to 18, participants of qualitative research processes were in the vast majority aged 14 to 18, but also included 19 and 20 year olds. This reflected both the age range of the high schools targeted by the project in Cuenca and Cochabamba, as well as the fact that the population of informants aged over the course of the intervention. The complications of securing parental consent forms for those under sixteen meant that in practice younger informants were often those whose parents or adult guardians were active participants in CERCA outreach and education activities.

There were two analytical processes at play in this research. Firstly, Nelson, Ballesteros and Rodriguez discussed the results of each round of peer discussion groups and identified together the emergent issues demanding further attention. Nelson carried out a preliminary analysis after each round (five rounds in total) and from these results created subsequent facilitation guides. It was through this dialogic process that the importance of intergenerational dynamics and extended family network communication on sexuality came to the fore. In the final period of fieldwork (January to April 2013), semi-structured interviews, peer group discussions and participant ethnographic research focused exclusively on the issue of adult-adolescent communication. The resulting transcripts, collected over the course of the intervention period, together with field notes consisting of observations and unrecorded conversations, were subjected to holistic content analysis through which key themes were identified. Excerpts of transcripts and field notes, organized thematically, were then treated to discursive analysis and the method of continual comparison.

Ethical Considerations

This study was conducted in compliance with the Helsinki Declaration on Ethical Principles for Medical Research Involving Human Subjects and is approved by the

Bioethics Committee of Ghent University, Belgium (Belgian Registration number of the study: B670201111575).

Results

Youth Perceptions of Communication with Parents/Adult Family Members on Sexuality

From the earliest stages of our research, young people expressed a desire to learn more from their parents and/or other significant adults about how to negotiate romantic relationships, how to prepare for decision-making related to sex, and how to deal with issues of jealousy and control in male/female relationships. In all three cities young people stated a desire to have “*más confianza*” (more trust) with their parents/significant adults in order to be able to talk about these issues.⁸ At the same time that young people shared whole lists of unanswered questions, in-depth interviews in the pre-intervention stage suggested that adults (parents, grandparents, community leaders, health professionals, and teachers) assumed young people already knew more about sex, pre-marital romantic relationships and contraception than any previous generation: “*los chicos con el Internet puede ser que saben más que los padres*” (Young kids with their Internet might know more than their parents) explained one project organizer.

In this section we consider perceptions of communication from the standpoint of young people as talked about in peer discussion groups, individual interviews, peer interviews and informal conversations. Broadly speaking, the first finding (discussed at length in [cite A&M article here](#)) of the qualitative research was that young people tended at first to claim either that they talked about ‘lots of things’ or talked about ‘nothing’ related to sex and relationships with their parents (or with the adult family members with whom they lived). Concomitantly, they frequently expressed either having a state of ‘trust’ or *confianza* with their parents or not having trust (*falta de confianza*). If one were to take this self-reporting at face value, it would seem that communication within *cuencano*, *cochabambino*, and *managuense* families on sex and relationships is an all or nothing practice. However, while this was the most common way of talking about ‘talk’, continuous engagement with target communities instead revealed a contradictory and complex dynamics of communication.

For example, those who claimed to have open communication with their parents would nonetheless describe the precise limitations of communication that made this ‘openness’ possible. This could mean keeping a romantic relationship secret (whether sexually active or not), keeping one’s sexual status secret (virgin or not, heterosexually inclined or not), or keeping one’s knowledge of contraceptive methods and abortive methods secret (whether having used them or not). Young men and young women equally expressed these underlying currents of silence and evasion in relationships of ‘*confianza*,’ although the specifics of what could or could not be talked about were gendered. As one young woman explained (age 16, Cochabamba):

⁸ For an overview of young people’s demands for improved dialogue on issues related to sexual and reproductive health at the project site in Cuenca, Ecuador see: <http://www.youtube.com/watch?v=L8o0kFfUddy>

Jenny: I can't talk with my mom if, let's say, I am going to have sex with my boyfriend (*enamorado*), I still can't tell her because she could react really badly, she might beat me (*hasta los golpes tal vez*).

Interviewer: So if she figured out that you were having sex with your boyfriend it would be a disaster (*sería fatal*)?⁹

J: The end of the world, the end of everything.

I: Anything else you can't talk about?

J: Just that. I have a lot of trust with my mom (*tengo mucha confianza*)

That being found out by parents as sexually active could lead to a beating may seem extreme, but informants of all ages spoke of corporal punishment as an inherited practice challenged only recently by the rise in global human rights discourse and child protection laws. Both young women and young men in all three cities (though most especially in Cuenca and Cochabamba) cited the threat of physical punishment as a factor limiting communication.

In those families where physical threats were not a factor, young people nonetheless described communication as circumscribed by expectations of certain kinds of sexual behaviors and romantic partnerships. In Cuenca, this might mean keeping secret any adolescent relationship with someone of unequal race/class standing, expressed in the language of having a 'good family name' (*buen apellido*) or 'bad family name.' In Cochabamba, it might mean keeping any kind of non-platonic relationship with the opposite sex hidden from adult family members until at least the age of 18, when this might be considered appropriate (for both young men and young women). In Managua, it might mean avoiding getting caught socializing 'in the street' with the 'wrong' crowd, as this could be interpreted by adults as the first step towards teen pregnancy. In all three research sites, homosexuality and sexual diversity were taboo subjects that could not be discussed with adults under any circumstances.

Frequently, the limits of what could or could not be discussed with parents and adult family members, including in relationships of reported 'open communication,' came up at the end of interviews once the tape recorder was turned off, or in anonymous 'comment' slips circulated at the end of peer discussion groups. These questions reflected a wide range of doubts and concerns, such as:

-How should a person act after they have had sex with their boyfriend/girlfriend for the first time?

-How do you know if you are ready for sex?

-How do you know if you are with the right person and how do you make sure someone is with you for the right reasons?

-How should you deal with jealousy (either yours or your partners')?

-How do you tell your parents that you have a boyfriend/girlfriend?

-How do you tell your parents you are sexually active?

-How old do you have to be to fall in love?

-What happens to you if you have an abortion?

--Is pornography bad for you?

⁹ In all transcript excerpts included in this article, I, (interviewer), or F, (facilitator), refers to Erica Nelson.

At the same time that these interviews and discussions made clear a desire for the chance to talk about relational aspects of sex or taboo subjects like pornography or abortion, it was also evident that in both situations of 'lots' of communication or 'no' communication, a whole range of sexual behavioural norms and expectations were expressed by adults to their children, nieces and nephews and grandchildren. Teresa (17, Cuenca), explained that, 'I really never talk about these issues with my parents, we've never talked about this stuff.' She then recounted how a cousin of hers got pregnant in high school and her aunt and uncle threatened to disinherit this cousin. When asked how her parents' responded to this extended family crisis, Teresa stated, 'They didn't say anything about it, but they put it to me as an example, like, 'look how their life turned out'' (*veras como es la vida de ellos*). Similarly, Fabiana* (16, Managua) claimed not speaking with her mom about sex or relationships, "its pretty rare, but when I talk to her she sometimes tells me that I have to be really careful about who I get involved with, so I don't screw things up later (*no cometa ninguna caballada*)."

We also found that, while young men reported similarly ambivalent states of communication on sexual issues in their homes, it was far more likely that they received a prescriptive 'condom talk' from either a parent or an adult family member (often an uncle, or an older cousin). Tovi, 17, (Cochabamba), related that,

T: Since I'm not [living] with my parents, we haven't known (*no sabemos*) how to talk about this issue, or its like, there wasn't a way (*no había como*). Normally when we would begin to talk about it, we would say, "how can we possibly talk about this?"

Nevertheless, Tovi explained, his mother, having witnessed high levels of teen pregnancy and heard stories about spreading HIV in the lowland metropolis of Santa Cruz where she lived and worked, told him to 'use condoms if the opportunity [for sex] presents itself.' This condom-talk, given by mothers or fathers, uncles, older cousins and even grandfathers to young men, was framed as 'disease prevention' first, and pregnancy prevention second.

For young women, the first explicit talk about sex and relationships often occurred in the context of first menarche. Talk about menstruation varied widely. In some instances young women told of how older female adults (mothers, grandmothers, aunts) began sharing 'wisdom' about the sexual aggressiveness and single-mindedness of the male species once they had their first periods: "men are slippery so you have to watch out," "men are just looking to get you pregnant and then they will run off." In other instances, adult women explained the practicalities of how to handle pre-menstrual syndromes and bleeding. In Managua, this inherited advice included not eating beans or fatty foods to avoid spoiling the blood during menstruation. In Cuenca and Cochabamba healing 'waters' or *aguitas* consisting of boiled herbs and plants, sometimes mixed with cane alcohol, were recommended. Equally, female informants described having learned about menarche in school and cobbling together the practicalities of how to deal with the bleeding from older sisters or cousins.

Both sets of gender-specific advice giving we have just described relate to a core conflict in communication dynamics between young people and adult family members: the reputational value of female, pre-marital, virginity to individuals and families. In Cuenca, beyond the prescriptive condom talk, some young men described uncles and

fathers counseling the importance of ‘respecting’ and ‘not harming’ (*hacerse daño*) young women even though it was ‘natural’ that they would want to ask for a ‘test of love’ (read: penetrative sexual intercourse) before committing to marriage. In Cochabamba, young men described being advised to ‘respect’ young, virginal women, while at the same time prove their masculinity through multiple pre-marital sexual ‘conquests’. In Managua, adults portrayed sex to young men as automatically leading to pregnancy, and therefore young men were encouraged to first finish school or get a job before becoming sexually active. For young women, adult family members in all three cities depicted the loss of female virginity in terms irreparable damage: once you had sex you were like a ‘rose without petals,’ or a ‘cracked crystal vase.’ Some young women worried that if their parents or adult family members found out they were bleeding from their first period, they might mistakenly misinterpret this blood as evidence of first sex. In a peer discussion group on the topic in Cuenca, one young woman explained:

My grandma says that if a woman has ‘relations’ before she gets married then she is impure, and she told me that if you do this you are impure and you aren’t going to have any peace, because you will know what you did.

Similarly, a young woman in Cochabamba recounted how if you lost your virginity before marriage -according to her grandmother - your future husband would be justified in giving you beatings. The stakes of virginity loss were higher still than physical abuse in speculative future relationship. Young women, and adult family members’ greatest concern, was that a first sexual experience might lead to being qualified as a ‘slut’ and thus treated with less respect, and considered a less likely candidate for an ‘honorable’ partnership. In the semi-rural/peri-urban zones of Cuenca and Cochabamba, young people of both genders described family pressures on partner choice reflecting the continued practice by which marriage links extended families in a web of social and economic reciprocity (Pribilsky, 2007: 130-131).

The universal undercurrent of adult-youth communication, as understood by both male and female informants, was fear. For young people, they talked about the fear that their questions about sex and relationship issues would be misinterpreted as already having sexual knowledge. In a peer discussion group in Cuenca, one young woman explained:

Look, when we talk about this at home, our parents already think we are up to trouble. [It is difficult] to try and express ourselves freely without worrying that dad is going to give you the evil eye (*mala cara*), or start worrying or thinking bad about you.

Young people also talked about their parent and adult family members’ fears that if they spoke openly about sex, their adolescent children would misinterpret this as a green light to start having sex. Sometimes this fear was the direct consequence of having older siblings involved in adolescent pregnancies. Alicia*, 17 (Cuenca), understood her mother’s ambivalence as linked her sister’s pregnancy.

Sometimes [my mom] gives me advice, but my sister has a daughter and now she’s pregnant again, and so my mom, it scares her because she used to talk about this stuff [with my sister], but now with me she doesn’t.

In addition, Alicia reported, in parallel with other informants, that she thought her parents were worried they might give advice in contradiction to what Project CERCA was teaching at her school.

This leads us final, shared concern of young informants involved in CERCA: how to interpret adult family members' advice on sexual 'readiness.' This notion that there might be a 'right' age to start having sex, a chronological threshold that should not be crossed too early or too late, was a point of constant frequent debate and discussion in peer group discussions throughout the intervention period. What young men and women understood as the adult-defined appropriate age for first sexual encounter varied across countries (later in Cuenca and Cochabamba, earlier in Managua), and by gender (earlier for young men, later for young women). In Cochabamba and in Cuenca, a number of young women reported that they were expected to wait to have a serious boyfriend (e.g. a relationship that may lead to the 'loss' of virginity) until they were at least 21: "my mom says 'I don't' want to see you with a boy until you are at least 21.' When you get to 21 you are an adult and you can do what you want," explained one young *cochabambina*. The more crucial point, however, was not the age itself but the universal recognition that there was a chronological point in time at which they – the non-adults – would be considered 'ready' for sex.

We found that, what Ashcraft refers to as the limitations of the 'discourse of readiness' (Ashcraft, 2006) were closely related to fears that adults would misinterpret open talk on sex as evidence of having already had sex. In order to work through questions about readiness, young people would have to first admit to that they considered themselves potentially 'ready,' and for the most part this was the trickiest element of talking about sex with parents or adult family members.

It was on this question of sexual 'readiness' that the diversity of young people and adults' opinions and expectations were most evident. The most general, and oft-repeated, advice received by young men and women was to 'wait until the right time' (*esperar hasta el debido tiempo*). While this may have been the overarching advice, the specifics of what this meant varied not only by family, but also within families. For example, a young man in Managua was told by his aunt he should wait to have sex until he finished high school. She suggested that once he started having sex he would have to drop out to begin preparing financially for the inevitable unplanned pregnancy. Meanwhile, his mother told him he should wait to become sexually active until he was older, but not because he would have to drop out of high school. She argued that it was a question of good contraceptive practice with whoever his future sexual partner might be, and this practice demanded a certain degree of 'maturity'. In this instance, the two sisters (aunt and mother) disagreed about the implications of his becoming sexually active, and openly talked about these disagreements in front of the young man.

Ivana (17, Cochabamba), reflected a similar conflict in family advice-giving around sexual 'readiness.' In Ivana's case, her aunt recommended she avoid getting into an exclusive relationship with a young man at her school, "just be friends, get to know him better," her aunt counseled. At the same time, Ivana's older female cousins told her,

"You should lose your virginity before you get married!"

"And when am I going to get married?"

"In a couple of years, but you should really lose your virginity before you are 17."

The third opinion, that of her father, was that she should wait to find someone of her 'social stature' before getting serious, the question of class/race equivalency of greater concern than the prospect of friendship or romance.

These are just a few examples of the polyphony of adult advice giving that young people described in discussion groups and one-to-one interviews. Although the content and the specifics varied dramatically, across gender, social status and cultural context, the undercurrent of adult communication on sex was one of fear. This fear was first and foremost of unwanted or unplanned adolescent pregnancies, but also of children partnering up (or being forced to partner up) with the wrong people at the wrong time (before finishing school, before establishing a profession, before figuring out who makes for a good wife or good husband). These messages were, as documented and observed, wholly hetero-normative. There appeared to be no scope for open discussion with adult family members about sexual desires or relationships not in line with hetero-normative expectations. However, this was not the only taboo that required obfuscation or silence on the part of young men and young women involved in Proyecto CERCA. Turning to how adults perceive their communication sexuality with adolescent family members it becomes clearer the extent to which these taboos are defined and negotiated in an extended family context.

Adult Perceptions of Communication on Sexual Issues

How, then, did adults involved in Proyecto CERCA understand the dynamics and challenges of cross-generational sexuality communication? As with young people, a wide range of adult family members were cited as giving advice, setting the parameters of 'open' communication and relaying gender-specific messages about acceptable sexual behavior and practices. In contrast to young people whose overarching fear was that seeking to talk about sex with adult family members would be misconstrued as already having sex, adults expressed concerns that ranged from the reputational to pragmatic. One common issue discussed in peer groups was that they by talking about sex they might expose their own inadequate knowledge of modern contraceptives. A second common fear was that by talking about sex they might 'incite' sexual activity. Both of these concerns were connected to radical changes in modern contraceptive knowledge and access that spanned one, or sometimes two, generations, combined with the advent of the Internet which meant young people had a level of access to information about sex (and pornography) previously unimaginable¹⁰. Almost universally the parents, grandparents, aunts and uncles involved in CERCA, not just those targeted by the project

¹⁰ In Bolivia, between 1989 and 2008, modern contraceptive knowledge in Bolivia rose from 66% of the total population of women of fertile age, to 94.7%, while the actual use of modern contraceptive methods rose from 2.4% of 15-19 year old women to 6.1%; and from 13.3% of 20-24 year old women to 21.9% (source: ENDSA 1989 and 2008). In Nicaragua, modern contraceptive knowledge was at 97.2% of the total population of women of fertile age at the time of the first DHS survey in 1998, but actual modern contraceptive method use rates were an abysmal 10.9% of 15-19 year old and 33.8% of 20-24 year old women. In 2001, a follow-up DHS survey recorded increases of 13.8% actual use of modern contraceptive methods ages 15-19 and 40.3% for 20-24 year olds (source DHS Nicaragua 1998 and 2001). There is no comparative historical DHS data for Ecuador.

but including those running interventions, described upbringings where knowledge of condoms, tubal ligations, or birth control pills was non-existent, extremely limited, or at best, something acquired due to their own initiative. This absence of historical precedence for talking about contraception within families contributed to fears that, by speaking openly about the pragmatics of being sexually active, they might be accused of being 'depraved' by other adult relatives.

One of the benefits of including adults in rolling peer discussion groups and in participatory ethnographic research was that these conversations and interviews filled in some of the gaps in young people's reports on communication. When young people spoke of having no 'direct' communication with parents about sexual issues, it was nonetheless possible to identify the messages expressed implicitly or indirectly by adult family members which informed young people's understandings of acceptable and unacceptable sexual and relationship behaviors. When speaking with adults, the answers hinged less on having 'good' or 'no' communication, and centered instead on adults' own experiences of adolescence and family communication and the ways in which these experiences informed their current practices. Many, like Martha (mother, Managua), interpreted the current state of communication between adults and young people as a substantially more 'open' than it had been for them:

"My mom didn't have this closeness with me. She would say, 'hey, *chavala*, get up already, its time to get a move on,' screaming at me from a distance. It would get me running! Young people today are closer to their parents. They have more freedom (*libertad*) to get close to them and talk about things... When my mom heard me talking about this stuff she said, 'Why are you talking like this with the girl [her niece] and I said, 'this is reality. She should learn about it from someone in her own family.'"

Yet, even as adults talked about shifts in parenting practices (for instance, declining practices of physical punishment and unquestioned parental authority), they also reported on disagreements with partners, parents and siblings over what constituted acceptable talk with young people. In Cochabamba and Cuenca, the refrain: '*es wawa todavia*' or '*todavia es mocoso/a*' (meaning, adolescents are 'still children') came up repeatedly in reference to how grandparents or elder aunts/uncles questioned CERCA's objectives when speaking adult family members active in the project. Elizabeth (mother, Managua) explained that her sister had proved unwilling to speaking directly with her 11 year-old daughter about these issues. Subsequently, Elizabeth took her niece aside, telling her,

"Look, Charito, I know you are coming up to adolescence, and you are going to fall in love one day and have your boyfriend, and I can't take that away from you... I can't deny you becoming sexually active, but you've got to protect yourself and educate yourself.'
And she listens to me. I've got this freedom to speak with her."

That a non-parental adult relative would take equal responsibility for counseling adolescent family members about sexual issues goes back to an issue raised by our discussions and interviews with young people: the reputational and socio-economic impact of an out-of-wedlock teen pregnancy goes beyond the immediate family. In

illustration of this point, Yamileth (mother, Managua), recalled the reverberations of her niece's teen pregnancy through the extended family:

Y: We all asked her, "Mari, come here, are you pregnant?"

"Lies" she said.

"And that gut?"

"The food made me sick."

Everyone came, even her step-dad, who sat her down and said, "Tell me the truth, we aren't going to do anything. We will support you. Are you pregnant?"

Her dad came, he slapped her and said: "I'm not going to beat you because you are pregnant."

All of us [the adults of the family] were like, [shocked] because she was the baby of the house.

This story echoed those related by young people and adults in Cuenca and Cochabamba, as in practice nearly every informant had a cousin or a sibling who got pregnant/got someone pregnant in adolescence, or were themselves the products of adolescent pregnancies.

In Cuenca and Cochabamba, adult fears of unplanned teen pregnancy went hand in hand with the fear that young people would form couples that were not race/class equivalent. As one mother explained in a Cuenca discussion group,

In a family of pure *sucos blancos* (light skinned Spanish-descent *mestizos*), if a young person falls in love with a *morenita* or *morenito* (darker-skinned, more 'Indian') then the family wouldn't allow it, saying 'you are going to blemish the race' (*vas a dañar la raza*).

These race-mixing fears reflect a colonial and post-colonial history in the Andes where 'whiteness' is not based solely on phenotype but on a whole set of indicators that define where one sits on a racial scale, such as a person's occupation, their way of dressing, the neighborhood or village where they live, their education status, their economic status, their last name, and the associations that a given community or micro-society have with that name and family (Weismantel, 2001 and Miles, 2004). In Chiquintad, for example, local young and adult people described certain family names as "more Indian" than others on the basis of having fewer landholdings, economic resources and a lesser degree of '*palanca*' (reciprocity ties that help ensure access to jobs and political power). To become sexually involved with someone who is 'more Indian' than you are means exposing your family to the risk of losing power, status and economic resources. In this sense, the extended family and broader community are invested in the reproductive outcomes of its young women and young men, because these decisions impact of relationships of reciprocity that impact not just the immediate family but a whole network of aunts, uncles, cousins and in-laws

For these reasons, adults often described 'good' or 'open' communication in terms of having increased surveillance over the sexual behaviors and relationship choices of adolescent family members. Adults in Managua and Cuenca gave concrete examples of how the CERCA intervention had encouraged their children or nieces/nephews to present boyfriends and girlfriends to the family when these relationships had previously been kept hidden. As one *cuencano* father reported, the project had 'produced results'

given that his daughter had since brought her *enamorado* to the house for a formal introduction. Another mother in Cochabamba described the ‘open’ communication she maintained with her daughter in terms of her ‘having to tell me everything’ and keep any conversations with romantic interests in the public areas of the house so that, ‘they are talking where I can see them.’ In all three countries, there were parents who understood ‘open’ talk about contraceptives and sex as knowledge imparted for future use (versus actionable knowledge), and also an opportunity to restate the ‘limits’ of sexual and social behavior. Migdalia (Managua), parent of several adolescent children, including a 13 year-old boy, stated:

“The fact that he is going to fall in love with a girl doesn’t mean he goes straight to ‘the street.’ There are limits. One has to set limits for your kids, not let them run free, or they will end up in the street, catching vices and everything.”

Not all adults, however, viewed ‘open’ communication on sexual issues as an opportunity to extend family surveillance and control over adolescent relationships. In all three sites, some adults expressed the belief that public health or school-based education was problematic and potentially detracted from families’ ability to control the sexual behaviors of their children and adolescent relatives. In a peer discussion in Cuenca, one father argued that,

“These days, health projects give out condoms for protection, so young people can take care of themselves, but they don’t explain that this isn’t right. For example, religion (*la religión*) tells us that sex before marriage is not ok. So, I think the best thing would be to give talks about sexuality, but to conduct them in line with our values (*llevarlas con lo que son valores*).

Given that participation in CERCA-affiliated peer discussion groups and in-depth interviews was completely voluntary, there was a self-selecting element to the research process that weighted the results towards those adults in favor of, or at least not actively opposed to, sexual and reproductive health and education in the community. With that said, the language of ‘values’ gave adult participants a way to politely challenge and critique the perceived aims of the project. In other instances, adult community members approached CERCA-affiliated researchers directly to voice opposition to ‘open’ talk on sex and sexuality with young people (we discuss one such instance in a recent A&M publication – [cite here](#)). In other moments, parents and grandparents in favor of CERCA expressed interpretations of project aims that were beyond the purview of a public health intervention, such as getting young people to ‘respect’ (read: obey) the limitations on sexual behavior and socializing with the opposite sex as set by parents and family elders.

While the research discussed here focused on adult family members of adolescents at the ‘community’ level (e.g. those targeted by Proyecto CERCA community education and outreach activities), conversations and interviews included adults who were CERCA-affiliated health providers and educators *but also* parents of adolescents themselves. The ethnographic research results matched certain findings of the CERCA qualitative study of health provider opinions on ASRH needs and challenges (Jarusciviciene et. al, 2013). Specifically, the notion that it would be possible to ‘train parents’ – those not already medical professionals – to better guide their adolescent children towards healthier sexual behaviors and choices. This idea was based on the

assumption that other, non-medical professional adults, 'cultural' barriers get in the way of adolescents' achieving sexual and reproductive health, but without a parallel self-critique or self-analysis of the ways in which their own 'culture' or value-system might impede young people's access to SRH services and education. "Good communication" from the standpoint of CERCA-affiliated health professionals might have involved a more direct conversation about contraceptive methods than that supported by the general adult population targeted by project outreach activities. However, these conversations and interviews reflected just as wide a range of values-informed messages given adolescent family members about when to have sex, with whom to have sex, and under what circumstances it would be ok or not to have sex.

Discussion

In our analysis of the data we returned repeatedly to question this notion of "good communication" or "open communication" within families on sexual issues. This was, as stated in the original proposal, one of the hoped for outcomes of the project. But – would we recognize 'open' communication when we saw it? How would we identify it? As we pointed out in the introduction, the overwhelming majority of young people of both sexes, in all three cities, self-reported in the pre-intervention quantitative survey a desire to "talk about sexuality" with their mothers (and to a much lesser extent, fathers – aunts, uncles, grandparents, older cousins not listed as separate options). What would these talks consist of? What did young people *want* to talk about and how different is this from what is actually talked about? On the flip side, what did adults think they should be talking about? How were their expectations of communication different or not from their children/nieces/nephews/grandchildren?

Here we have explored how ethnographic research within project CERCA identified considerable "desires" for more adult-adolescent communication on sexuality, but also conflicts over what this communication should consist of, when it should occur, which adult family members are responsible for making it happen, and when the knowledge that was communicated should be put into practice. The resulting polyphony of responses to these questions shows that communities – and the extended family networks that make up these communities - do not speak with one "voice". The range of differences in desire and expectations around communication varied not only by country, or city, but also within neighborhoods and villages. For example, adult perceptions of young people's sexual knowledge were different to young people's own perceptions of their knowledge. Young people insisted that whether they could 'talk about anything' or not, they had a desire to talk about relational aspects of sex beyond contraceptive methods or the obscure counsel to 'wait until you are ready.' Young men described communication centered on the practicalities and pragmatics of being sexually active (use a condom, get a job before getting serious with someone) whereas young women reported advice centered on the reputational and future relationship value of staying abstinent.

Within extended family networks, adults described conflicts of opinion over what could or could not be talked about adolescent children or relatives, and the objectives of this talking or 'open communication.' Was more communication important because it would allow adults greater surveillance by flushing young people's romantic relationships out into the open? Was it important because the 'reality' of sex, love, and

unplanned pregnancy was something adult family members should teach, versus leaving the task to outsiders? Did adults even have the requisite knowledge for the task or was this communication best left to experts? Would giving advice about sex lead to more young people having it, or would it delay them having it?

It would be easy enough to chalk the differences in communication practices to 'entrenched' gender norms, or 'cultures' of femininity and masculinity that dominate the Latin American region. However, the sustained ethnographic component of this research helped to put these reported communication dynamics into the context of daily life, complicating the content of interviews and discussion group transcripts. These differences did not simply reflect a gendering of socio-sexual norms and expectations – the advice was not strictly divided along male/female lines. It instead reflected shifting power dynamics within families (individual and extended) and 'communities' more broadly, power dynamics due to shifting marital practices and the impacts of outward migration in Cuenca and Cochabamba, and in all three settings, a dramatic expansion of modern contraceptive knowledge, access to communication technologies (and thus, to information), and access to secondary education.

In the *barrios* of Managua where Proyecto CERCA operated, extended families often lived in the same dwelling, thin sheets marking off bedrooms, grandmothers perched on rocking chairs guarding front entryways, cousins and siblings running in and out of gates and barbed wire fences. In the midst of interviews, uncles and aunts, grandmothers and grandfathers, sometimes popped in to hear what was being talked about, contributing their own stories and those of neighbors and friends to the conversation.

In Cochabamba, the high-school based nature of the CERCA intervention meant that young people were targeted separate from the neighborhoods where they lived, but the description of conversations and advice received made clear that adult family relatives were as relevant to the dynamics of communication as mothers and fathers. Furthermore, the impact of a decades-long exodus to Santa Cruz and Spain meant that many young people lived with grandparents, or aunts and uncles, as their parents worked elsewhere (Guaygua, Castillo, Prieto and Ergueta, 2010) This was similarly the case in Cuenca, although migration (to the United States) had reached its peak at an earlier moment in time (the late 80s, early 90s) meaning that during the CERCA intervention period it was not uncommon to hear of fathers and uncles returning after long periods abroad (Pribilsky 2007 and Miles 2004). In all three cities, whether in a place such as Managua where extended families lived in close daily contact, or in Cuenca and Cochabamba where some extended family members lived in close daily contact while others maintained a watchful eye over adolescent children from great distances, the circulation of competing messages about expected sexual behavior and romantic partnerships directed at young people was a constant.

In all three settings, the implications of an unwanted adolescent pregnancy extended beyond immediate families and carried potential reputational, or economic repercussions for grandparents, aunts, uncles and cousins. The advice giving reported by young people or recounted by adults contained certain repeated narrative tropes, such as the dangerous sexuality of young men or the potential sexual victimization of young women, but it was often more nuanced than this. Embedded within this advice were concerns about a family's reputation, their status, access to community resources, and the

potential of a young person to contaminate the family with the dangers of ‘the street’ (Managua) or a more generalized ‘Indian-ness’ (Cuenca, Cochabamba) through their choice of sexual partner.

Recommendations for future research

Polyphony of voices is a key concept in this article. Communities, parents, extended family and other adults with relevant authority do not speak with a uniform “voice”. Adolescents receive a wide range of varying responses on their questions regarding sexuality. Many of those messages are confusing, ambiguous and contradictory. Regarding patterns of communication, we argue that it is not an all or nothing practice. Communications on sexuality vary from silences, evasions, purposively delayed information to full open-heartedness. The degree of openness seems closely correlated with the level of “confianza” (trust).

Those insights might be deepened by future research that addresses following research questions:

- How do adolescents deal with ambiguous messages? Does the variability in content influence their attitudes, norms and practices?
- What are patterns of communication on sexuality? What factors determine the quality of communication on sexuality? How can the level of openness be measured?

Ultimately we will aim to test the hypothesis that respectful and open communication on sexuality has the potential to drive individuals, communities and societies towards improved sexual health. We argue that the interaction itself prevails over the content. The basic principle is that there is no right and wrong and that, ultimately, the agreed truth will rule. Longitudinal and/or interventional research would be useful to test causality between patterns of communication and sexual wellbeing.

Conclusion

In the broader field of sexuality and sexual health research, ‘culture’ has been deemed increasingly relevant to understanding why people know, believe or act in certain ways with regards to sex and contraception (see Parker, 2009 and Wellings et. al, 2006). However, much of this research has centered on individuals, parent-adolescent relationships, or community (and culture) ‘writ large.’ Through participatory research and sustained ethnographic engagement with young people and adults in three distinct Latin American urban/peri-urban contexts we were able to stretch beyond the confines of the ‘parent-adolescent dyad’ and look at communication practices in an extended family context. This view made clear the limitations of interventions that seek to ‘re-script’ adult-adolescent sexuality communication without first considering what the existing communication practices (explicit or implicit) seek to achieve.

Authors' contributions

The work presented here was carried out in collaboration between all authors. OR, DE, MB and AE provided support in the development of semi-structured interview questionnaires and of peer group discussion guides and contributed intellectual input to the ideas of the paper. EN designed and implemented the ethnographic research discussed in this paper, with intellectual contributions from AE and peer group facilitation support from MB, OR and DE. EN drafted the manuscript. All authors contributed to revisions of the manuscript. EN will act as guarantor of the paper. All authors read and approved the final manuscript.

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COMMENTARY

Open Access

Improving adolescent sexual and reproductive health in Latin America: reflections from an International Congress

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Abstract

In February 2014, an international congress on Promoting Adolescent Sexual and Reproductive Health (ASRH) took place in Cuenca, Ecuador. Its objective was to share evidence on effective ASRH intervention projects and programs in Latin America, and to link this evidence to ASRH policy and program development. Over 800 people participated in the three-day event and sixty-six presentations were presented.

This paper summarizes the key points of the Congress and of the Community Embedded Reproductive Health Care for Adolescents (CERCA) project. It aims at guiding future ASRH research and policy in Latin America.

1. Context matters. Individual behaviors are strongly influenced by the social context in which they occur, through determinants at the individual, relational, family, community and societal levels. Gender norms/attitudes and ease of communication are two key determinants.
2. Innovative action. There is limited and patchy evidence of effective approaches to reach adolescents with the health interventions they need at scale. Yet, there exist several promising and innovative examples of providing comprehensive sexuality education through conventional approaches and using new media, improving access to health services, and reaching adolescents as well as families and community members using community-based interventions were presented at the Congress.
3. Better measurement. Evaluation designs and indicators chosen to measure the effect and impact of interventions are not always sensitive to subtle and incremental changes. This can create a gap between measured effectiveness and the impact perceived by the targeted populations.

Thus, one conclusion is that we need more evidence to better determine the factors impeding progress in ASRH in Latin American, to innovate and respond flexibly to changing social dynamics and cultural practices, and to better measure the impact of existing intervention strategies. Yet, this Congress offered a starting point from which to build a multi-agency and multi-country effort to generate specific evidence on ASRH with the aim of guiding policy and program decision-making. In a region that contains substantial barriers of access to ASRH education and services, and some of the highest adolescent pregnancy rates in the world, the participants agreed that there is no time to lose.

Keywords: Adolescents, Latin America, Sexual and reproductive health, Policy, Intervention strategies, Teenage pregnancies

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Resumen

En febrero de 2014, un congreso internacional sobre la promoción de la Salud Sexual y Reproductiva de los adolescentes (SSRA) tuvo lugar en Cuenca, Ecuador. Su objetivo era compartir evidencia sobre proyectos y programas de intervención eficaz en SSRA en América Latina, y vincular esta evidencia a la política de SSRA y al desarrollo de programas. Más de 800 personas participaron en un evento de tres días con sesenta y seis presentaciones. Este documento resume los puntos clave del congreso y del proyecto CERCA (Cuidado de la Salud sexual y Reproductiva para Adolescentes enmarcada en la comunidad). Su objetivo es orientar la investigación futura y la política de SSRA en América Latina.

1. El contexto es importante. Los comportamientos individuales están fuertemente influenciados por el contexto social en el que se producen a través de factores determinantes a nivel individual, relacional, familiar, comunitario y social. Las normas de género, actitudes y facilidad de comunicación son dos factores determinantes.
2. Acción innovadora. Hay evidencia limitada e irregular de los enfoques eficaces para llegar a los adolescentes con intervenciones que necesitan llevarse a escala. Sin embargo, existen varios ejemplos que fueron presentados en el congreso y que se ven prometedores e innovadores porque proporcionan una educación integral de la sexualidad a través de los métodos convencionales y el uso de nuevos medios de comunicación, la mejora del acceso a servicios de salud, y uso de intervenciones comunitarias para llegar a los adolescentes, familias y su comunidad.
3. Mejor medición. Los diseños de evaluación y los indicadores elegidos para medir el efecto e impacto de las intervenciones no siempre son sensibles a los cambios sutiles y graduales. Esto puede crear una brecha entre la eficacia de medidas y el impacto percibido por las poblaciones beneficiarias.

Por lo tanto, una conclusión es que necesitamos más pruebas para determinar mejor los factores que obstaculizan el progreso en la SSRA de América Latina, para innovar y responder con flexibilidad a los cambios en la dinámica social y las prácticas culturales, y para medir mejor el impacto de las estrategias de intervención existentes. No obstante, este congreso proporcionó un punto de partida para construir un esfuerzo común entre las multi-agencias y multi-país que genere evidencia específica sobre SSRA con el objetivo de orientar la toma de decisiones políticas y programas. En una región que aún tiene barreras de acceso a la educación y los servicios de SSRA y se encuentran las tasas de embarazo adolescente más altas del mundo, los participantes coincidieron en que no hay tiempo que perder.

Background

The International Congress on promoting adolescent sexual and reproductive health

In February 2014, an International Congress on Promoting Adolescent Sexual and Reproductive Health (ASRH) took place in Cuenca, Ecuador. This Congress was the culmination of a four-year, multi-country intervention-research study titled the "Community Embedded Reproductive Health Care for Adolescents in Latin America" (CERCA) project [1]. CERCA was funded by the European Commission's 7th Framework Program. The Study endeavored to develop and test a package of ASRH interventions that could be delivered in collaboration with existing public health systems and in conjunction with community actors. The project was implemented in three Latin American cities: Managua, Nicaragua; Cochabamba, Bolivia and Cuenca, Ecuador.

As a research project, CERCA both generated new evidence on social determinants of ASRH, and developed innovative strategies for promoting ASRH at the community level with ongoing participation and inputs from stakeholders such as adolescents, parents and adult family members of adolescents, educators and health professionals.

Controlled intervention trials have been conducted in the three cities. Interventions were implemented from August 2011 to April 2013 in randomly chosen town districts in Managua and in purposively selected secondary schools in Cochabamba and Cuenca. In order to assess the impact of the interventions we compared the change in reports of selected behaviours between adolescents from intervention groups and control groups. The total number of respondents that participated in both the baseline and the post-intervention survey was 2,642.

The objective of the Congress was to present innovations and share lessons learned in the design and delivery of clinical and educational interventions – with a focus on outreach- ASRH actions that are evidence-based, and to link this evidence to ASRH policy development. Over three days, sixty-six presentations were given and over 800 people participated. The congress resulted in the 'Cuenca Declaration on ASRH in Latin America' which stresses the need for meeting the needs and fulfilling adolescents' rights to reliable sexuality education and to good quality sexual health services in Latin America [2].

This paper combines key lessons learned from the CERCA project and key issues raised in the Congress

that are relevant for guiding ASRH research and policy in Latin America. It is the result of consultations with the main CERCA partners and Congress organizers. In a region that has barriers of access to ASRH education, services and some of the highest adolescent pregnancy rates in the world there is no time to lose.

Adolescent sexual and reproductive health in Latin America

The point of departure the CERCA project and the Cuenca Congress was the observation that adolescents in Latin America continue to face serious SRH problems and substantial barriers to SRH education and services. Regional data shows that the majority of sexually active adolescents do not consistently use modern contraceptive methods to prevent pregnancy or sexually-transmitted infections (STIs) [3]. Of the estimated 1.2 million unplanned pregnancies in the region, half occur during adolescence [4]. Up to 50% of the women in the region give birth for the first time during their adolescence. Teenage pregnancies are associated with a higher incidence of maternal complications during pregnancy and delivery, especially for younger adolescents [5,6]. Children of adolescent mothers are also at increased risk of neonatal mortality, preterm birth and low birth weight [7,8]. Given that abortion remains highly restricted in all three CERCA countries, and in most other countries in Latin America, there are limited options for a young person faced with an unwanted or unplanned pregnancy [9]. In the face of this public health crisis, quality evidence can help Latin American governments develop and implement sound policies and programs.

Key lessons

Context matters

Individual behaviors are strongly influenced by the social context in which they occur, through determinants at the individual, relational, family, community and societal levels. Gender norms/attitudes and ease of communication on ASRH are two key determinants.

Early pregnancy and poor reproductive outcomes among adolescents are determined by a web of micro-, meso- and macro-level factors. Individual choices to engage in specific behaviours are shaped by social, economic and cultural factors that operate at the individual, interpersonal (couple, peer group), family and community level. This ecological approach can help identify the determinants in ASRH, and can be used to develop better strategies, and ways to monitor and evaluate them. The CERCA project and the Congress contributed to additional insights into determinants of ASRH. The CERCA project demonstrated that positive gender attitudes are of critical importance. Personal attitudes towards gender equality appeared to have a high predictive value for

adolescents' sexual behaviour and experiences and partner communication. More egalitarian gender attitudes are related to higher rates of contraceptives use within the couple, more positive experiences of sexual intercourse and better communication about sex with the partner among sexually active and sexually non-active adolescents [10,11]. As the prevailing norms link women's status to their fertility, a significant proportion of teenage pregnancies are, in fact, wanted. Borile's study [12] suggests that the desire to become a teenage mother is related to gendered role patterns, social recognition, cultural factors, and limited economic and professional opportunities [13]. These views were reinforced by anecdotal evidence and professional experiences presented at the conference. For example gender norms influence young men's decisions not to use contraception since "a macho" is expected have children everywhere [14,15].

The CERCA project's findings further highlight the importance of communication. Firstly, feeling comfortable to talk about sexuality with friends is positively associated with condom use. Boys and young men who find it easy to talk with their partner about sexuality issues report a greater likelihood of hormonal contraceptives use by their partners [16,17]. Secondly, ethnographic data collected through participatory research processes and peer group discussions revealed much room for improvement in adult-child communication on sexuality which is often characterized by silence, implied expectations and gendered conflicts [18]. In order to have a substantial effect, interventions need to take into account this multitude of determinants at the levels of both their development and implementation.

Innovative action

There is limited and discontinuous evidence of effective approaches to reach adolescents with the health interventions they need at scale. Yet, there exist several promising and innovative examples of providing comprehensive sexuality education through conventional approaches and using new media, improving access to health services, and reaching adolescents as well as families and community members using community-based interventions.

Here is a description of some successful intervention experiences which involve multidisciplinary approaches and ways to measure.

Comprehensive sexuality education

The congress emphasized that children and young people are rightfully entitled to age and developmentally appropriate and correct information on SRH. One issue that often rose in the Congress was that public educators and health centers provide limited sexuality education that focuses on risk-reduction and negative messages.

During the CERCA project, country partners asked local populations of adolescents^a what topics they would like to see included in sexuality education. In Bolivia, this resulted in an education strategy that included personal and intimate partner communication techniques, self-esteem building, positive gender attitudes and gender equality, a life project, conflict management, and available health services [19]. Many Congress presentations included a plea for comprehensive and developmentally appropriate sexuality education as the bedrock for attitude formation and decision-making [20,21].

Adolescents' access to health services

One of CERCA project's central objectives was to increase access to health services for adolescents. One of the main barriers to adolescents access to contraception is that they do not trust the stated confidentiality of health facility staff and are worried about being judged negatively for being sexually active [22]. This is particularly the case for young girls. Furthermore, health workers feel inadequately equipped to deal with adolescents seeking contraceptive counseling: they are confused about legal codes, parental consent and moral concerns, as well as unable to cope with practical constraints such as limited personnel and opening hours [23,24]. A qualitative study^b done by Nelson demonstrated that, according to health service providers, adolescents grow up in an environment where sexuality is a taboo issue hindering their sharing information on sexual health at the familial and educational levels. Health service providers blame 'the culture of taboo' as a barrier to access to ASRH services, however, they do not seem to be aware that their own attitudes and reactions regarding to adolescents, in particular girls, who ask information and services related to ASRH have a strong negative impact as well [25]. Congress participants concluded that any SRH promotion strategy must necessarily pay attention to health service providers' attitudes as well as wider social and cultural norms in addition to health infrastructure and contraceptive supply chains [26,27].

Using text messages to reach adolescents

Mobile phone, smart phone, and internet and social media use is on the rise among young people in Latin America. Borile and Cordova Pozo [28] stressed that the changing technological and communication landscape has opened new opportunities for sexuality education, sexual health promotion and advocacy efforts in the region. New media offers a valuable tool for recruiting and mobilizing adolescents to use already-existing public health services and to act as 'first responders' to the questions and doubts that can create barriers to health service access.

As part of the CERCA project in Bolivia, adolescent-friendly text messages were used for cost-effective and efficient adolescent outreach, resulting in an overwhelming response from adolescents. Over a period of 18 months, 507 questions on ASRH issues were received by text messages on a bidirectional text-messaging base linking CERCA and adolescents. An evaluation with adolescents revealed that receiving a text message with health advice and having the opportunity to ask questions reduced the obstacles to those who normally would not access health centers due to stigma, taboo, costs or long waiting times [29]. The large number of questions and different sensitive topics broached by adolescents in a short time showed that text messages have the potential to break down the barriers between the health center/health service professional and the adolescent and can motivate adolescents to seek help [30]. While this is not sufficient on its own, such an approach should be embedded in a broader context that includes addressing providers' attitudes, it can contribute to the beginnings of change in adolescents' attitudes and the initiation of dialogue on difficult topics.

Community-based interventions

Given the important influence of determinants at the meso- and macro-level on individual behavior, it seems evident that ASRH promotion interventions should address the wider community. However, this is often not yet the case. In her presentation, Segura explained that in Managua, due to the relatively high levels of young people out-of-school in the CERCA project's selected neighborhoods, the local consortium partner chose to carry out intervention activities at the neighborhood level (e.g. mobile cinemas, sporting events, door-to-door outreach and education campaigns). Friends of Youth (FoY) were the driving forces of the community interventions. FoY are young adults, intensively trained in ASRH. They served as mentors for adolescents in their community and helped them build their competence to make deliberate choices. In addition, they referred them to appropriate health service providers when needed. Besides one-to-one interactions with adolescents, the FoY also supported community activities including workshops, exhibitions, street theatre and awareness campaigns. Another action that was used in this type of setting was the "Movisex", an adapted car aimed at reaching adolescents who are out of school, providing face-to-face education and information. The evaluation of these activities was done through in-depth interviews by Nelson who concluded that these community-oriented interventions were highly appreciated by the community.

Adult and family involvement

During the CERCA project young people indicated that they wanted to learn more from adults about how to

negotiate within a romantic relationship about contraceptive use, how to prepare for decision-making related to sex, and how to deal with tensions in communication with adult family members [18]. Several Congress presentations indicated that the involvement of the family in ASRH interventions is important: family can create or destroy an environment to address ASRH [20,21,31].

Better measurement

Evaluation designs and indicators chosen to measure the effect and impact of interventions are not always sensitive to the subtle and incremental changes that occur. This can create a gap between measured effectiveness and the impact of interventions perceived by the targeted populations.

While the qualitative effectiveness evaluation of CERCA did demonstrate some positive effects -on condom use and overall knowledge and use of sexual health services in Ecuador, on ease of communication in Bolivia, but these results were not quantitative measurable. Ethnographic research suggested that the chosen quantitative indicators and measurements used in the Project did not capture the complexity of social determinants of ASRH or the shifting gender and power dynamics at the family and community level that influenced the ways in which intervention activities were received and acted upon. Quantitative measures only could focus on one or two aspects of the intervention, neglecting the multidimensional approach that the interventions took [18]. Furthermore, the limited evidence regarding the effectiveness of the interventions may be due to the fact that randomized controlled trials alone are not capable of capturing the full complexity of a community-embedded intervention process. Or maybe because of the lesser resources given for process evaluation and rigorous qualitative research and the lesser status given to 'soft' evidence within the context of public health interventions.

Although little quantifiable positive impact of the CERCA interventions could be measured, different presentations indicated that improvements were made possible by the CERCA project. Bersosa J., from Ecuador [24], presented the effects at the local level, where adolescent SRH networks were established with city government funding, health centers were made adolescent-friendly and sexuality education in schools broadened their horizons. There were clear impacts at the policy level too as was highlighted in the presentations from Malo M. and Guijarro S. (Ministry of Health in Ecuador) [25,32,33] who talked about the contribution of the Project to the development of national strategies for adolescent pregnancy prevention and creating a vision for improving policies in ASRH and health services.

Complex problems require comprehensive solutions and tailored evaluation designs. This can seem at odds

with the increasing call for evidence-based policy making and programme development. While we continue to develop and test effective approaches to provide adolescents with the most effective sexuality education and SRH services, we must use the available evidence to respond to the needs of adolescents today and to fulfill their right to sexuality education and health. Process evaluations are a crucial part of this. What constitutes evidence needs to be reflected upon further among programme implementers, evaluation researchers and policy makers.

Conclusions

Research presented at the congress reiterated that individually-targeted ASRH interventions are not sufficient to bring about change in adolescents' sexual behaviours, but rather that extended family networks, communities, local and regional actors must also be involved. This idea corresponds to the Andean Plan to Prevent Teen Pregnancy (PLANEA) an initiative of the Ministries of Health of Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela, that indicates that establishing strong bonds between young people and their teachers, health professionals, parents, and friends can contribute to effective programmes. When teenagers develop strong relationships in a secure, safe environment, they can build the life skills they need to take control of their own destinies. Alongside this focus on the individual, relational and community levels, we agree with the conclusions of the International Inter-agency Meeting on Current Evidence, Lessons Learned and Best Practices in Adolescent Pregnancy Prevention in Latin America and the Caribbean that there should also be a clear focus on the macro-level with a political and financial commitment to create empowering legal frameworks and to implement sexual and reproductive health programmes for adolescents.

Better mechanisms and measurements are needed to produce the kind of evidence that can guide policy and programme development reflecting the complex nature of adolescent sexuality and sexual behaviors. It is too easy to look at the 'problem' of adolescent pregnancy through one disciplinary lens, be it medical, legal, economic or political. In order to develop the necessary political and programmatic frameworks to shift ASRH in a positive direction, multi-disciplinary and comprehensive approaches are necessary. This Congress provided a starting point to building a multi-agency, multi-sector effort to generate improved evidence and strategies which could contribute to reducing gaps in access to healthcare services in an equitable manner, taking into account cultural issues and social participation. In a region that contains pockets of stagnant modern contraceptive use, substantial barriers of access to ASRH education and

services and some of the highest adolescent pregnancy rates in the world, there is no time to lose.

Endnotes

¹This data was collected in the pre-intervention quantitative survey as well as through pre-intervention and intervention period qualitative research consisting of peer discussion groups, focus discussion groups, in-depth interviews, and participatory ethnographic research.

²This qualitative study included in-depth interviews to adolescents and health personnel that participated in CERCA research.

Abbreviations

ASRH: Adolescent sexual and reproductive health; CERCA: Community Embedded Reproductive Health Care for Adolescents; FoY: Friends of Youth; IUD: Intrauterine device; LARC: Long acting reversible contraception; NGO: Non-governmental organizations; SASIA: Sociedad Argentina para la Salud Integral del Adolescente; SRH: Sexual and reproductive health; STI: Sexually transmitted infections.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

The work presented here was carried out jointly between all authors. KC, PD, SDM, VCM provided support in the design of this paper. KC drafted the manuscript and collected the feedback from the authors. KM, EN and VCM provided substantial rewriting support. All authors commented on the manuscript providing feedback. All authors read and approved the final manuscript.

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Chapter 5

Discussion

5.1 Determinants of unmet contraceptive need among unmarried individuals

5.1.1 Unmet contraceptive need: the figures

In the introduction we stated that the prevalence of unmet contraceptive need is high among unmarried people in Latin America and China. The data from the baseline studies in China and Latin America indicate that this is likely also the case for the study populations in our research, given the high level of sexual activity and low proportions of consistent contraceptive use (Table 5.1).

In this section I will describe some factors that, according to our research, determine the unmet contraceptive need among YUR-migrants in China and among adolescents living in poor neighbourhoods in Latin America. The determinants are graphically presented in figure 5.1. The overview is not exhaustive. For instance, I will purposively not expand on the effects of migration and the socio-economic context. In the introduction of this dissertation I already described the determining and transversal impact of internal migration on sexual health in China (and elsewhere in the world). Low socio-economic situation was the overarching determinant in the Latin American study population. For this discussion, I confined myself to new determinants that were salient in our research or that I considered meaningful for understanding the unmet contraceptive need in both contexts. We will use the socio-ecological

Table 5.1: Sexual activity and contraceptive use among the study populations in China and Latin America

	China		Latin America	
	Qingdao	Guangzhou	Managua	Cochabamba Cuenca
Study sites		Factories	Neighbourhoods	High schools
Age		18 to 29	13 to 18	14 to 18
Sex		girls	girls and boys	girls and boys
Number respondents	1757	831	2803	5913
Sexually active	16.6%	21.4%	28%	26.4%
Consistent contraceptive use*		51.7%	47%	32.3%
Current or past pregnancy**		10.3%	9%	not available

* among sexually active respondents; ** among sexually active girls

model as the framework for the discussion. For each level of the socio-ecological model I will describe associations between determinants and behavioural outcomes. This mapping is based on results from the cross-sectional surveys at baseline (YOLAMI and CERCA) and from the follow-up study that assessed the evolution of behaviours after 18 months (CERCA).

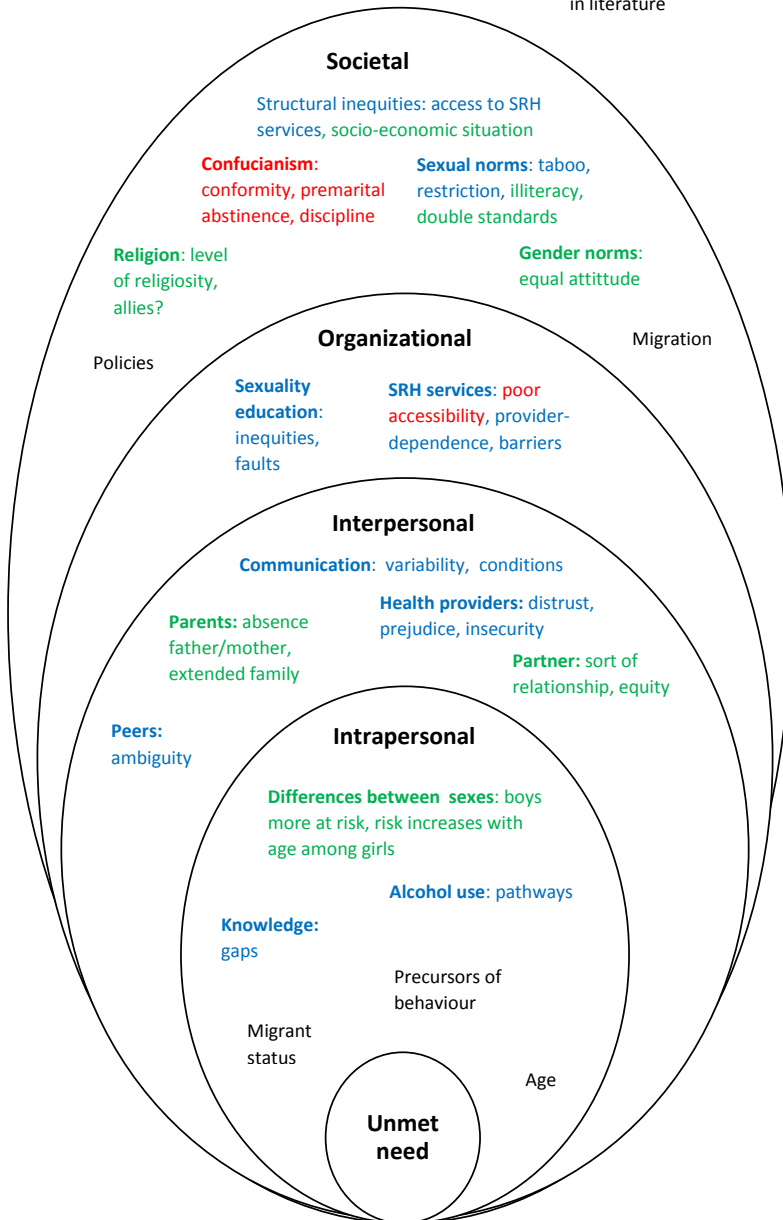
Figure 5.1: Determinants of unmet need in the YOLAMI and CERCA studies

Red: YOLAMI findings

Green: CERCA findings

Blue: findings in both studies

Grey: determinants found in literature



5.1.2 Determinants at intrapersonal level

Within the sphere of young unmarried people we found determining factors that were related to individuals' gender, alcohol use, knowledge about sexuality and educational level.

Differences between sexes

In general, **boys seem to be more at risk of unprotected sexual activity** than girls. In line with previous research [28], the CERCA study shows that boys are more sexually active and use condoms less frequently (paper 5). This finding shows that particular efforts are needed to target boys in reproductive health promotion programmes.

We also noticed a **difference between boys and girls in the effect of age on condom use** in Nicaragua. With increasing age, condom use declined among girls and rose among boys. The baseline study demonstrated that Nicaraguan girls aged 16–18 were less likely to use condoms than those younger than 16 (paper 5). From the data of the follow-up study we infer that condom use after 18 months improved more among boys than among girls. It seems that, at least in Nicaragua, female adolescents tend to break the habit of using condoms when they become older, which increases their risk of pregnancy. Possibly girls older than 16 years become less careful or even stop contraception due to a dormant or active wish to become pregnant. This wish might be influenced by socio-economic factors (desire to escape an unpleasant familial situation) or the fact that adolescent girls often partner up with older boys who want a child.

Alcohol use

Alcohol use is linked to unmet contraceptive need. Young people in China and Latin America are increasingly consuming more alcohol [153][154]. The CERCA data show that adolescents using alcohol were significantly more sexually active than teens who never drink alcohol (paper 5). Plenty of research has established the association of alcohol intoxication with unsafe sexual behaviour, including inconsistent condom use [155].

Unavoidably, alcohol is becoming more and more part of young people's and adolescents' life in China and Latin America. Banning alcohol seems unrealistic. Therefore, alternatives should be found to mitigate the effect of alcohol

on unsafe sexual behaviours. I mentioned before the myopia theory and the role of sexual arousal as an indirect pathway through which alcohol influences sexual behaviours. Alcohol consumption results in increased perceptions of sexual arousal, which in turn increases sexual risk-taking [64]. I also described the biphasic effect of alcohol on sexual decision-making, which explains why risky behaviour is more likely when the alcohol level in the blood is rising. This knowledge might inspire actions aiming to reduce the alcohol-induced risk of unprotected sexual intercourse, which might include: 1) promoting the ‘Double Dutch’ method (combination of condom and hormonal contraception) among youth who drink alcohol ; 2) facilitating access to condoms at the moment of alcohol-induced sexual arousal; and 3) the restriction of late-night alcohol sales, in order to shorten the time of ascending alcohol concentration in the blood of drinking adolescents.

Knowledge

Data from Qingdao demonstrated that many misconceptions about contraception still exist among YUR-migrants (paper 4). Among Nicaraguan girls and boys, 16% and 25%, respectively, stated being insufficiently informed about sexuality (paper 5). We also confirmed the link between poor SRH knowledge and unmet contraceptive need among unmarried people. The study in China showed that young women who have a lower educational level and are less knowledgeable about SRH are more likely to be sexually active and use modern contraception less frequently. Similarly, Nicaraguan girls who perceived not having received sufficient information about sexuality were less likely to use condoms.

These results indicate that unmarried youth and adolescents lack information about contraception. However, intergenerational discussions, which were part of the qualitative research in Latin America, made clear that SRH knowledge among today’s adolescents is much better than among previous generations [156]. This is in line with literature stating a decline in ignorance about contraception in most countries [70].

It might be worthwhile exploring the specific knowledge gaps. Our research results might entail clues for identifying lacunae in sexual information. Are unmarried people sufficiently informed on the whole spectrum of contraceptive methods, including the underused long-acting reversible contraceptive methods (LARCs)? Do they know about the effect of alcohol on sexual decision-making? Do they understand the dynamics of intimate partner relations? Have they

any idea about how ‘hot processes’ such as sexual arousal and sexual sensation-seeking might overrule behavioural intentions? Do they understand the impact of gender norms? In fact, those are topics adolescents asked about themselves during discussion groups in the CERCA study (paper 12).

5.1.3 Determinants at interpersonal level

In both studies, data show that the interaction and communication of unmarried individuals with important others is a crucial determinant of contraceptive use.

Interaction with parents

Our research in Nicaragua shows that the absence of parents - half of the respondents were not living with both parents - influences the unmet contraceptive use of unmarried adolescents and that the effect of paternal or maternal presence differs between sexes (paper 5 and 7). Adolescents who lived with **none of their parents** were much more likely to have engaged in sexual intercourse than their peers who lived with both parents.

The **absence of the father** had a different effect on the sexual behaviour of girls and boys. Girls who lived alone with their mother, without their father, were more likely to be sexually active than those who lived with both parents. The association of girls’ sexual onset and the absence of their fathers is in line with previous research [157]. Recent experimental studies support a causal relationship between paternal absence and changes in girls’ psychology that promote risky sexual behaviour [158].

Surprisingly, boys living with their mother, without their father, were more likely to use condoms. This finding contrasts with other studies [159]. A possible explanation might be that, in the Nicaraguan context, boys living alone with their mother have a closer relationship with their mothers and talk more with them about sex-related topics than those who live with both parents. Previous research has demonstrated the importance of the communication and closeness between mothers and their sons on the boys’ intention to use condoms [160][161].

An interesting observation from our qualitative study is that in Latin American society the **extended family** also plays an important role in the sexual

development of adolescents (paper 11). It is probable that the contribution of significant adults from the family network increases when parents are absent.

Interaction with peers

Data from Qingdao show that YUR-migrants who talked about sexuality with friends were more sexually active (paper 2). However, this association does not allow us to make any statement about causality. Unmarried women who are sexually active might feel the need to talk with friends. Or vice versa: peer talk about sex might reduce one's caution to engage in sexual intercourse. Also, the study in Nicaragua generated contradictions regarding the influence of peers on the sexual behaviours of adolescents (paper 5). Nicaraguan girls who found it easy to talk with friends about sexuality reported a more consistent condom use but a less frequent use of oral or injectable contraception. Boys who felt peer pressure were less likely to use condoms.

Nevertheless, the results suggest that peers influence unmet contraceptive need and that the peer effect differs between girls and boys. It is likely that the dynamics of the peer interaction and the content of peer talk determine the effect on sexual behaviours. Boys might feel pressure from peers pushing them to 'tough' sexual behaviours, while girls might, on the one hand, incite each other to negotiate condoms with their partners and, on the other hand, share myths and stories about side-effects of hormonal contraception which may have a dissuading effect.

Interaction with partner

The Nicaraguan data show that the kind of relationship and the interaction between the sexual partners are associated with contraceptive behaviours (paper 5).

Adolescents in a **stable partnership** were more likely to use modern contraception than those who were unpartnered and sexually active. If teens without a stable partner use contraception, they tend to choose condoms rather than hormonal contraception. The prevalence of hormonal contraception was 50% among couples, compared to 37% among sexually active adolescents with casual partners. It is likely that unmarried teenagers who indulge in casual sex do not feel the need for consistent contraceptive protection, as they perceive the risk of unintended pregnancy less than partnered adolescents. This is in

line with the conclusion of a review on reasons for non-use of contraception: “infrequent sexual activity is the most important reason for not using consistent contraception among women in Latin America and Asia” [69]. This finding might be an argument to promote the use of LARCs among unmarried people once they have started (or have the intention to start) sexual activity. It is typical that the frequency of sexual activity varies in adolescence and young adulthood, as relationships are more changeable. LARCs keep young people and adolescents protected at the stage of their life when they have more casual sexual intercourse and are, therefore, less conscious of the risk of pregnancy.

Allied with this, we found that **communication among partners** was positively associated with contraceptive use. Nicaraguan boys who communicated with ease on sexuality with their partner reported more frequently their partner’s use of hormonal contraception. Girls who said that their last sexual intercourse was a joint initiative - and thus deliberated on - were more likely to use condoms than those who reported that their last sex was unilaterally initiated by the partner.

In sum, our findings give arguments for the theses that, first, unmarried people who indulge in casual sexual intercourse are more at risk of unprotected sex than those in stable relationships and, second, communication and shared decision-making in premarital relationships contribute to a higher contraceptive prevalence.

Interaction with health care providers

In both China and Latin America, people depend mainly on health care providers for their access to contraceptive methods. Data from both research projects point out the difficult interaction between health care providers and unmarried people with reproductive health needs (papers 2, 3, 8).

The quantitative baseline study from China shows that the reluctance to discuss SRH with providers was significantly associated with the unmet need for contraception. The qualitative studies in Latin America provide deeper insight into the patterns of interaction between unmarried individuals and health care providers. Adolescents are reluctant to discuss SRH issues with health care providers because they feel ashamed and do not believe that the discussions will remain confidential. Health care providers behave in an unfriendly and

moralistic way towards singles seeking reproductive health care. Providers feel insecure when seeing unmarried people for SRH issues and fear legal action “*physicians prefer that adolescents are accompanied by a parent to avoid legal action*”. Latin American health professionals stereotyped teenagers as being rebellious, impatient and irresponsible “*adolescents are impatient, and they show little interest in being informed about SRH*”.

In sum, the interaction between health care providers and singles in need of contraception seems to be characterized by negative emotions and to occur in an atmosphere of distrust, prejudice and insecurity. This is certainly not conducive to unmarried people’s intention to access SRH services and providers’ willingness to respond to the reproductive needs of unmarried people. This conclusion invites us to seek alternatives that circumvent unmarried people’s dependence on health professionals to obtain contraception.

Communication about sexuality

Our data show that communication about sexuality with parents, friends, health care providers and partners mostly contributes to a reduction in unmet contraceptive need among unmarried people (paper 5). However, we also found some contradictions regarding communication about sexuality (paper 5 and 11). We mentioned the possible negative effect of peer talk and the confusion about the effect of the interaction between parents and adolescents. The ambiguities of fathers’ messages on sexuality might explain why boys’ condom use is higher when the father is absent. Also, in literature we found some nuances regarding the impact of communication on sexual behaviours. The social pressure that adolescents experience from peers to engage in unsafe sex is commonly known, and some studies assessed the negative and contradictory effects of parent–child communication on risky sexual behaviours [162][163].

To better understand those complexities, we explored further the patterns of communication about sexuality. The ethnographic fieldwork carried out in the three Latin American cities revealed some aspects of communication about sex and sexuality (paper 11).

Communication about sex and sexuality is not a straightforward transmission of facts but entails plenty of forms of talk. Adolescents are exposed to gossip, morality tales, family histories, scandals and contradictory messages about sex,

sexuality and what is good and bad sexual behaviour. These confusing and ambiguous communications are not limited to peers, parents or the direct community but are also expressed by teachers, health care providers and other professionals.

In all three cities adolescents stated that communication about sexuality is often characterized by strategic manoeuvring that includes silences, evasions, implied expectations and temporally delayed knowledge. Adolescents expressed the desire to have ‘*más confianza*’ (more trust) with parents, family members, their partners, teachers, health care providers and significant other adults in order to be able to talk openly about all aspects of sexuality. However, within the community there are different understandings of what can and should be said about sex.

In sum, more than pursuing the vain hope of providing unmarried people with the right and good messages, young people and adolescents should acquire the skills to deal with contradictory communications, and there is a clear need for safe and trustworthy environments to openly discuss all aspects of sexuality.

5.1.4 Determinants at community and organizational level

Sexual and reproductive health services

The data from Guangzhou clearly establish the **poor accessibility** of SRH services for unmarried people (paper 3). Married people with SRH complaints sought medical assistance about three times more than their single peers. Moreover, less than 30% of the unmarried respondents knew where to find SRH services, compared to 70% among the married ones. In both studies poor access to SRH services repeatedly appeared as a determining factor for contraceptive use.

The YOLAMI and CERCA research identified similar and varying **barriers** for unmarried people regarding availability (“*SRH services are only addressing married couples*”), accessibility (“*SRH services are hard to reach*”), acceptability (“*SRH services are unfriendly for unmarried adolescents*”) and affordability (“*many migrants are not covered by health insurance*”). We have already discussed how the difficult interactions between health care providers and unmarried youth and adolescents hinder access to SRH services (paper 8).

Furthermore, the CERCA article on providers' views for improving SRH care for adolescents gives an overview of possible **actions to address the barriers** [164]. Many of the problems mentioned are structural and intrinsic to the context of poverty and socio-economic scarcity and consequently difficult to change through local and health-system interventions alone. Also, cultural impediments related to social and gender norms evolve very slowly and require a broad, multi-sectoral approach. Conversely, organizational barriers at the level of health centres (opening hours, treatment of adolescents, waiting times, appointment system, duration of consultations, lack of privacy) can be addressed in the short term. The accessibility of services might be improved by outreach activities that bring SRH services nearer to the target populations (schools, communities, workplaces). Such managerial interventions can only be successful if they are supported by communities and the authorities. Obstacles at the level of providers' performance might be, in the medium term, influenced by intensive and sustained training activities. Providers' behaviours and attitudes are largely determined by subjective and social norms. Changing norms is quite challenging and requires introspective reflection. Lastly, the evidenced need for health policies supporting the provision of SRH for unmarried individuals (lack of guidelines, unclear legal conditions, poor incentives) requires long-lasting advocacy work.

The above shows that the challenges at the level of health services are huge. From previous intervention experiences we have learned that overcoming the barriers is feasible in the long term [123]. In the meantime singles continue to need contraception. We wonder if alternatives could be found that **circumvent the SRH service barrier** by reducing adolescents' dependence on health services and helping them to gain control over their contraception. For instance, the use of LARCs, such as intra-uterine devices (IUDs) and subdermal implants, substantially reduces the number of contacts needed with health care services and is associated with a reduction in teenage pregnancy [165]. However, in our study population LARCs are barely used. Other ideas that emerged were the provision of over-the-counter contraceptives and the installation of dispensers for contraception.

Sexuality education in schools

In both studies **inequities** in the transfer of SRH knowledge emerged as a determinant of the unmet contraceptive need of unmarried people. The data from Guangzhou showed that YUR-migrants have received substantially less

information on different aspects of SRH than married migrants (paper 3). Respectively, 16% and 25% of the Nicaraguan girls and boys reported that they were insufficiently informed on sexuality (paper 5), and Latin American health care providers mentioned that “*hardly any sexual education*” [sic] is given in schools (paper 8). Nevertheless, there is also encouraging progress regarding sexuality education. From the intergenerational discussions we learn that much has changed compared to the school times of adults aged 40+ with “*absolutely no sexual education*” [156]. In fact, in both China and Latin America, schools do currently provide sexuality education [94], [95].

Shortcomings of sexuality education from both regions are described in the literature overview [94], [95]. Furthermore, Latin American adolescents in the focus group discussions criticized the fact that some information is deliberately not shared or temporally delayed [152]. Hence, there is definitely room for improvement. In addition to the existing evidence regarding the implementation of good sexuality education [88][79][166], our research provides arguments for **adjusting the aims of sexuality education** to improve young adult’s and adolescent’s capacity in: 1) making choices from the full range of contraceptive methods available, including LARCs; 2) understanding interpersonal dynamics; 3) dealing with contradictory and confusing communications; 4) appraising the complexity of interacting determinants; and 5) reflecting on their own attitudes, beliefs, norms and behaviours.

5.1.5 Determinants at societal level

Structural inequities

The analysis of determinants in our research was based, amongst others, on the conceptual framework of the social health determinants (SHD) [141] [142]. Our research results endorse the basic SHD principle that **societal inequities lead to less well-being**. We identified structural inequities at societal level that correlate with unmet contraceptive needs among unmarried youth and adolescents.

Previous studies showed that **Chinese health policies unequally address the health needs** of migrants compared to the needs of urban residents [32] [167]. Accessing health care services, for instance, implies a greater out-of-pocket expense for rural-to-urban migrants as they are less frequently covered by health insurance [38]. This and other structural factors contribute to the poorer SRH among rural-to-urban migrants compared to non-migrants [168] [167]. Our

research showed that the SRH vulnerability still varies among the population of internal migrants. Singles have less access to SRH services compared to their married peers. Consequently, YUR-migrants are more at risk of unplanned pregnancy and of abortion (paper 2). Furthermore, YUR-migrants undergoing abortion are judged differently by the community compared to young married migrants who seek abortion. As premarital virginity is highly valued by society, unmarried pregnant women are often criticised and marginalized.

Data from the CERCA project show that **inequities in the social economic situation influence the contraceptive use of adolescents** (paper 5) and that, similarly as in China, unmarried adolescents have less access to SRH services than those who are married (paper 8).

According to the SHD paradigm, **effective actions addressing inequities** are needed to improve health [169]. Based on our findings, we can conclude that, in China and in Latin America, urgent actions should be undertaken to make SRH services accessible for all, regardless of marital status.

Sexual norms

In both regions the issue of sexuality is shrouded in an atmosphere of taboo and restriction. Non-marital sex in particular is censured by society. About 70% of the unmarried respondents from the survey in Qingdao stated that they cannot talk about sexuality with friends, and about 60% were reluctant to discuss sexuality issues with doctors (paper 2 and 4). Likewise, the qualitative research in Latin American cities highlights the sexual illiteracy of Latin societies. The word ‘ashamed’ is often used. Communication about sex is complex, indirect and strategic [152]. The most common advice that adolescents hear when the topic of sexuality is in the air is that they should ‘set life goals’ - a rather vague and idle recommendation that implies the unspoken message that they should postpone sexual activity in favour of the pursuit of higher aspirations.

The sexual double standard is another, apparently stubborn, societal phenomenon that often emerges in the discussion groups and interviews (paper 11). Boys are often encouraged to be sexually active, while premarital sex is disapproved of for girls. These sexual double standards for boys and girls were not limited to the ‘community’ and peers but were also expressed by parents, educators and health care professionals.

Gender norms

Machismo and marianismo are still hegemonic patterns within Chinese and Latin American societies [85][101][103]. The CERCA research showed that egalitarian attitudes towards gender roles contribute to an improved contraceptive use among teenagers (papers 6 and 7). We found that sexually active adolescents who considered gender equality important reported higher use of contraceptives, better communication about sexuality issues and more pleasant sexual experiences [170][151]. Also, the follow-up study demonstrated a positive modifying effect of equal gender norms on sexual health promotion interventions. We saw, namely, that condom use and communication about sexuality improved more among adolescents with non-sexist attitudes than among their peers who had more conservative gender norms.

In sum, the still prevailing traditional gender norms in both societies are important determinants of the unmet contraceptive need among unmarried youth and adolescents. Therefore, we strongly support the recent calls of gender experts and scientists to integrate a gender-transformative approach in sexuality education [90]. The interesting finding that more egalitarian gender norms, apart from reducing the risk of unplanned pregnancy, also contribute to more pleasant sexual experiences for men and women provides an additional argument for taking action to promote gender equity.

World vision

In Latin America religion is an important societal factor that influences sexual behaviours, including contraceptive use [110]. About 75% of our respondents reported a religious affiliation, and many of them attached a lot of importance to their belief (paper 15). In contrast to the prevailing perspective that religion is an obstacle to contraceptive use, our data suggested a more balanced judgement on the impact of religion. First, Catholic adolescents from Nicaragua reported higher condom use than non-religious and Evangelical teens. Second, the longitudinal data show that communication about sex improved with age more among religious teens than among non-religious youth. Third, the Bolivian data reveal differences in the age-dependent evolution of behaviours between those who hold firmly to their belief and those who are less strict. We saw, namely, that the more religious adolescents used more condoms but talked less about sexuality with increasing age.

We reflected on these unexpected findings with our Latin American colleagues. They argued that local priests and laypersons, faced with the reality of teenage pregnancies in their parishes, promote contraceptive use among adolescents. In addition, adolescents belonging to a Church come together in meetings where topics such as sexuality are discussed, which might explain why they communicate more easily about sex. In line with our findings an anthropological study in rural Mexico describes how women interpret and use religious doctrine to achieve their fertility desires without jeopardizing their standing as devout Catholics [111]. To illustrate this, our colleagues from Ecuador mentioned an anecdotal experience from the CERCA intervention in Ecuador of a local Catholic priest who opened his church for an informative talk on contraceptive methods to adolescents and other community members.

Commonly, religious people and implementers of sexual health promotion programmes are perceived as opponents when sexuality and birth regulation are concerned. However, our data and the reflections of our colleagues show a more moderate picture and call for dialogue. Based on our research, we can state that it is worthwhile to study how alliances can be made based on common goals, including the reduction of teenage pregnancies and the promotion of sexual well-being.

Modern Chinese culture is rooted in a Confucian world vision. The Confucianists have clear principles on familial and intimate relationships: each person exists as a part of a family or group, not as an individual; women should be passive and sexually innocent in relationships with men; and, in terms of sexuality, men and women should conduct themselves properly from an emotional distance at all times and not have any contact before marriage [107].

At risk of oversimplification, I tried to consider some of the results of the YOLAMI research (papers 3-5) from the perspective of the Chinese paradigm:

- 1) Compared to other regions of the world, the prevalence of sexual activity among young unmarried adults was very low. Only 16 to 21% of the unmarried respondents aged 18–19 reported that they had ever had sexual intercourse. By comparison, the level of sexual activity among 18-year-old unmarried adolescents in our Nicaragua study was over 60%. This finding seems to indicate that young people in China stick to the set cultural standards regarding sexual morals. In addition, under-reporting due to a self-reporting bias might also

play a part in the low prevalence of sexual activity in the study population. Despite the efforts taken to guarantee confidentiality and anonymity, it is likely that respondents were reluctant to admit having sexual intercourse in the surveys. Although difficult to prove, it might be that self-reporting bias in sexual behaviour research is more frequent in the Chinese context than other environments. This hypothesis is underpinned by the anthropological thesis that 'caring for one's face' is very much part of the Chinese consciousness and the fact that virtuous behaviour and self-cultivation are highly estimated in Chinese society [171]. People try to maintain their reputation to gain recognition and respect from others.

2) In Qingdao almost 50% of the respondents disagreed with the statement that condoms should be made available to YUR-migrants. It seems that respondents, at least in words, agree with the set moral standards. I expected more disagreement and protest from young people against imposed restrictions. I hypothesize that this could be explained from the traditional Confucian perspective that individuals should conform to the expectations of society and should respect the social hierarchy, whereas the right of each person to pursue his/her own beliefs is a more Western value [107].

3) In Guangzhou significantly more young internal migrants (21%) were sexually active than in Qingdao (16%). A possible explanation might be that respondents from Guangzhou adhere less to traditional Chinese values because Guangzhou is more influenced by Western culture and the city is known as the first open city in China [138].

Three conclusions can be drawn. First, social desirability might have biased the answers on sexual behaviours to a greater extent than in similar research in non-Chinese contexts. It would be interesting to try to assess the social desirability bias with alternative, experimental or qualitative research techniques. Second, the Confucian vision on intimate relations is likely to influence the unmet contraceptive need of YUR-migrants. Third, the geographical differences in reported behaviours corroborates with the vision that norms and values are changing and that exposure to Western culture is an important driver for this transition [107]. Hence, it is likely that the contraceptive needs of unmarried people in China will increase over time.

5.2 Evaluation of comprehensive interventions

In this section I will briefly describe the methods and main results of the effect evaluation in both studies.

5.2.1 Effect outcomes

Table 5.2 summarizes the main evaluation results from the Chinese (YOLAMI) and Latin American (CERCA) studies. The effect evaluation of individual and interpersonal outcomes is based on the results of experimental trials that compared the outcomes of an intervention group (comprehensive strategy) and a control group (standard strategy in China and no intervention in Latin America). Community and societal outcomes are assessed through qualitative studies.

Table 5.2: Effect evaluation of comprehensive interventions: outcomes at individual, interpersonal, community and societal level

	YOLAMI	CERCA
Outcomes at individual and interpersonal level		
increased condom use	significant	only significant in Cuenca
increased contraception	significant among aged 23-29	no data available
increased ease to talk	not significant	depending on participation level
increased use of services	not significant	only significant in Cuenca
increased knowledge	significant	no data available
changed attitudes	significant	no data available
Outcomes at community and societal level		
communication	press conferences	ongoing public debate
norms	no data available	changed ideas, opinions, perspectives
leadership	no data available	new leaders emerged
level of participation	informational, contractual, consultative	collaborative, collegiate, auto-regulative
community power	no data available	autonomous actions by communities
innovation	individual counselling	new media, community out-reach
	in workplaces	counselling in schools
sustainability	no data available	ongoing actions

5.2.2 Outcomes at individual level

Methods

We studied the effectiveness of comprehensive interventions by evaluating the effect on behaviours of unmarried youth and adolescents. In both studies we applied an experimental design with intervention groups and control groups. The

selection of participants was cluster-randomized in most studies. Outcomes were related to condom use, contraceptive use, access to SRH services, communication about sexuality, SRH knowledge and attitudes regarding sexuality. In the **YOLAMI study** outcome data were collected through cross-sectional enquiries which were conducted before and after the interventions. We assessed pre- and post-intervention trends across two study arms. The control group was exposed to a standard set of community interventions, while the intervention group was exposed to a package of comprehensive interventions that combined actions targeted at the individual and the community. In the **CERCA study** a nested cohort analysis was undertaken by assessing the evolution of behavioural outcomes among the adolescents who participated in the baseline and end-line surveys. Behavioural evolutions were compared between the intervention group that was exposed to a comprehensive package of interventions and a no-intervention control group.

Main results

YOLAMI All outcomes were significantly improved after standard and comprehensive interventions (papers 9 and 10). Compared to standard interventions, the effect of comprehensive interventions was significantly larger for condom use, SRH knowledge and attitudes to sexuality. The difference between standard and comprehensive interventions was not significant for the use of contraception among youth under the age of 23, for the use of SRH services and for ease in communicating about SRH with friends.

In sum, the implementation of community sexual health promotion programmes at workplaces had a positive impact on the contraceptive use of young unmarried females. Adding an individual component (counselling) to the community interventions had an additional effect on condom use and on some precursors of contraceptive behaviours.

CERCA Overall, the CERCA study did not succeed in proving consistent effectiveness of comprehensive interventions on adolescents' contraceptive use and related behaviours. We measured a high drop-out rate. Among the adolescents who completed the programme the effect on sexual behavioural outcomes was limited and varied between study sites. Only the follow-up study in Ecuador showed a significant difference for condom use and for the outcome related to the use and knowledge of SRH services. The interventions in Nicaragua and Bolivia, on the other hand, did not result in a significant change in outcomes.

5.2.3 Outcomes at community and societal level

Methods

In both studies the evaluation of the intervention effect on community and society has been given less consideration than the evaluation at individual level. Here, we consider outcomes related to all kind of communications on sexuality, sexual and gender norms, newly emerged leadership in sexuality issues, level of community participation, community power, innovative actions and sustainability. For the YOLAMI study we can only rely on unpublished results from monitoring reports and a limited qualitative study among young rural-to-urban migrants and managers. In the context of the CERCA research the evaluation of the community and societal outcomes is based on the results of qualitative research, the comments of experts at the final congress (paper 12) and a *post hoc* examination, which has recently been finalized (paper 13). Unfortunately, the conclusions mentioned hereafter on community and societal impact are not triangulated by quantitative research.

Main results

YOLAMI Only limited information on the community and societal impact of the interventions is available. Overall, the effect on outcomes at the level of the community was small. Regarding communication, we can only mention that the main research findings have been communicated to the public through one national and two local press conferences. The interest of the press, authorities and the public in general in the project and study findings was moderate. The level of participation was informational, contractual (involvement of peer educators) and to a limited extent consultative (opinion of stakeholders was asked when developing interventions.) Regarding innovation, monitoring results demonstrated that the provision of free condoms and the individual SRH counselling at workplaces were feasible interventions which were well appreciated by unmarried workers.

CERCA Participants in the qualitative studies (papers 11 - 13) clearly stated that CERCA prepared the ground for future actions in the field of adolescent SRH:

1. The CERCA interventions have prompted a societal debate on adolescent sexuality. This can be deduced not only from the results of the qualitative

research but also from the constant flow of press articles related to the topic.

2. The CERCA interventions led people and communities to reflect on their attitudes, norms and behaviours. *“I found it interesting how some teachers did not find it [CERCA] good at the beginning, but at the end they were learning and learned how to talk about these issues.”*

3. CERCA created opportunities for leaders to engage on adolescents’ sexual rights. *“We have leaders, good leaders, incredible guys that would not be discovered if this project had not been developed. They were even able to criticize a teacher if they did not give the classes properly.”*

4. At the start of the project, the level of participation can be called “colaborative”. This means that researchers and target groups worked together while the management was mainly in the hands of the researchers. At the end of the intervention period, the participation was more collegiate as both the researchers and the research population had gradually become aware that they were learning from each other. In the post-hoc phase, the project can be considered as auto-regulative to a certain extent as the newly established networks started up spin-off research and activities in Ecuador and Bolivia.

5. On a limited scale, CERCA initiated a power shift towards the community. In Nicaragua, neighbourhood committees exerted pressure on local health authorities to provide better SRH services to adolescents. In Ecuador, the newly established SRH network of local institutions started up advocacy work in defence of the SRH rights.

6. The CERCA interventions demonstrated the feasibility, acceptability and effectiveness of innovative actions: use of mobile phone messages for outreach; community interventions by trained young adults; and provision of adolescent-friendly services in primary health care centres and schools.

7. Those innovative initiatives inspired several national and local public health policies to undertake new activities. For example, in Bolivia the experience with mobile consulting rooms in school settings created a new perspective on how to proceed with adolescent SRH programmes in a more efficient and cost-effective way. From October 2014, the government and the Pan-American

Health Organization (PAHO) are structuring a way to proceed with the health programmes through schools and communities. Alliances between stakeholders and policymakers created opportunities for new initiatives. For example, in Ecuador a SRH network was established comprising 42 institutions, including the Ministry of Health and Education and the municipality of Cuenca, with the aim of promoting adolescent SRH.

In sum, CERCA contributed at the community and societal level to breaking the taboo, sensitizing people, engaging leaders, mobilizing communities and starting new initiatives. As one respondent said, *“I think CERCA opened the door for very good interventions. I think that after CERCA many other projects can go and use this openness or preparedness of communities for interventions in this field.”*

5.3 Methodological limitations

The specific strengths and limitations of each part of the study are addressed in the results chapter, but general limitations of the research will be highlighted here. In the description of determinants we appraised the complexity of interacting factors and actors that influence the sexual behaviour of young unmarried people and adolescents. Nevertheless, in the development, implementation and evaluation of the YOLAMI and CERCA projects we did not fully capture this complexity. In order to keep the global research process manageable, we made methodological choices which implied a reduction in the complexity and a loss of completeness. In the following paragraphs I will describe some of the reductive choices and the consequences for the research. For a better understanding I will break down the methodological considerations in a section on intervention development and the underlying theoretical models and a section on the effect evaluation. However, this is an artificial distinction, as many of the methodological problems encountered crossed through the global research process, and constraints of the theoretical model also had an impact on the effect evaluation.

5.3.1 Limitations related to the development of the interventions

The design, implementation and evaluation of the interventions in the YOLAMI and CERCA studies were based on theoretical models. The socio-ecological model [31][144] was the main conceptual framework of the YOLAMI research,

while the CERCA study was greatly founded on the combination of the socio-ecological model, the Theory of Planned Behaviour (TPB) [66] and the Social Cognitive Theory (SCT) [145]. Those models helped us to bring order into the complexity of sexual behaviours. However, ordering complexity into theoretical constructs automatically implies a loss of wealth as, according to theories of complexity, the whole is more than the sum of the parts [172][173]. In other words, using theoretical models as a basis for comprehensive interventions entailed limitations. Some of these limitations were intrinsic to the model itself: “A theory is a reduction of reality; that is not a shortcoming but a definition [174]”. For instance, reviews comparing the application of behavioural theories show that models only explain and predict a fraction of behaviours and that the efficiency of a theory depends on the sort of behaviour [147][175]. I will describe some of the limitations related to a too strict interpretation of the theoretical models used throughout the intervention.

In the application of the theories we disregarded interactions between determinants

In reality, determinants of behaviours interact in manifold ways. To understand the complexity of (sexual) behaviours, we should not only consider the direct effects of actors and factors but also the interdependencies. A single determinant can produce multiple effects on other components of the complex web. To illustrate this, we can consider the determinant ‘knowledge on sexuality’. Our data showed the impact of knowledge on contraceptive use. Besides the direct effect on behaviour, knowledge also influences the effect of other determinants (e.g. peer pressure, gender attitudes) and interventions on sexual behaviours. At the same time knowledge on sexuality is determined by a series of factors (e.g. interaction with teachers, taboo, moral norms, quality of sexuality education). Predictive models should ideally also consider the dynamics between determinants.

The use of theoretical models blurred our vision of unpredictable determinants and effects

Theoretical models are an attempt to predict behavioural change. However, complexity also entails unpredictability. To put it differently, known determinants might have unexpected consequences, and new unknown determinants can emerge. The implementation of interventions was modified by variable factors such as varying leadership, interpersonal interactions, casual events and human

emotions. These drivers are intrinsically coincidental, temporal and, therefore, unpredictable regarding their occurrence and effect on outcomes. A narrow focus on predictors that are supplied by the model might have prevented us from having an eye for unpredictabilities or casual opportunities. In this respect, we capitalized insufficiently on unexpected events (casual relationships with policymakers, the presence of local celebrities, elections, events or tragic incidents in the communities etc.). Another example is the focus of the interventions on personal factors that are manageable and rational such as knowledge, attitudes and skills. We did not consider, for instance, emotional factors or ‘hot processes’ such as sexual arousal and sexual pleasure, which are also influencing sexual behaviours but in a much more unpredictable way.

The theoretical models are mainly interpreted in a unidirectional way

We interpreted the models mainly from a causality perspective and conceived reality as a linear succession from cause to effect. From this perspective, we considered determinants as causative predictors of behavioural outcomes. However, complexity theories state that determinants and outcomes are interdependent and evolve simultaneously through dynamic and cyclical processes [172][173]. All constructs of the models are causes and consequences at the same time. To demonstrate this statement, I fall back on the interaction between the factors of taboo and communication. In the discussion on determinants, we stated that societal taboos influenced communication about sexuality. However, the influence has been found going both ways: talking about sexuality had an effect on societal taboos. A denial of this bi-directionality would pass over the fact that interpersonal communication (outcome) itself contributed to the change of taboo, knowledge, attitudes and norms (determinants). For instance, organizing direct encounters between health care providers and adolescents (e.g. debates, discussions, visits etc.) might have been more effective to reduce barriers among them than working separately with providers and adolescents on their personal determinants. In the same way it is likely that whether or not a person uses contraception (outcome) influences their attitudes, knowledge and norms (determinants).

5.3.2 Limitations of the evaluation research

We used controlled trials to measure the effect of the interventions in China and Latin America. We measured the evolution of health outcomes over time in the intervention group and compared this to the control group. To secure

the practicability and measurability of the evaluation research, we necessarily made some limiting choices:

The evaluation only considered a few aspects of sexual health

The outcomes measured focused on singles' behaviour related to contraceptive use. However, sexual health encompasses many more aspects such as gender equity, pleasurable sexuality and sexual identity. It is likely that the comprehensive content of the interventions also influenced other aspects of sexual well-being which were not considered in the effect evaluation.

The community and societal effects of the interventions were not measured

As mentioned already, the interventions in China and Latin America had an effect on individuals' behaviours and on community and societal outcomes. However, the quantitative evaluation focused mainly on measuring the effect on individuals and did not include outcomes at the level of the community. Consequently, we missed an opportunity to make a broader quantitative assessment of the intervention reach.

The evaluation did not include other actors besides unmarried youth and adolescents

We only assessed intervention effects among unmarried youth and adolescents, while the strategy targeted a large number of stakeholders. We did not collect data on effectiveness among parents, health care providers, policymakers or community leaders, which could have resulted in important insights into the progress of key outcomes such as parent-child communication, access barriers to SRH care or societal norms.

The evaluation focused on predictable outcomes

An experimental design entails the assumption that the effect of interventions is predictable, which leads to a narrow focus on previously defined outcomes. Consequently, unexpected and unforeseeable outcomes were missed.

Non-quantifiable outcomes were barely considered

The focus on the quantitative evaluation entailed another important reduction - namely, the neglect of non-measurable or hard-to-quantify outcomes. Intangible aspects related to behavioural intentions, emotions and interactions were hardly considered in the evaluation. This was, among other reasons, due to the absence of measurable outcomes and the limited resources allocated to the qualitative component of the evaluation process.

The evaluation scope was limited to the measurement of effectiveness

The evaluation process was mainly centred on the question ‘Does the programme work?’ However, we learned from the study of determinants that contextual factors influence the behaviour and the effect of interventions. What works in one context does not necessarily work in another environment. In the evaluation process we passed over this aspect of the interventions, as we barely addressed questions related to ‘how’ and ‘why’. Nevertheless, we collected monitoring data, and research collaborators expressed valid ideas on acceptability, barriers and facilitating factors. A more in-depth analysis and scientific processing of those aspects would have enlarged the scope of the research.

In sum, the reduction of reality had important implications for the quality of the effect assessment. Ideally we should have complemented the experimental evaluation design with other methods that focused also on other factors of the intervention implementation as processes and environmental circumstances.

5.4 Differences in results from the CERCA and YOLAMI studies

This section relates to the third specific objective of this dissertation: ‘to reflect on the results of the intervention in two different contexts’. The following content originates from personal reflections by the author. After highlighting the most salient differences in the findings I will formulate hypotheses interpreting those differences. Undoubtedly, divergences in the applied intervention design account to a great extent for the variation in research results. However, context-specific factors might also partly explain the particularities of the intervention research in the two regions. The hypotheses on the latter are subject to testing in future research.

5.4.1 Main differences

Interpersonal interaction and communication

The importance of interaction and communication differed between the two studies. The interpersonal level of the socio-ecological model weighed more in the CERCA study than the YOLAMI study. This difference was manifest throughout all phases of the research.

Interaction as determinant of unmet contraceptive need The CERCA study clearly demonstrated the influence of interpersonal factors on the sexual behaviours of individuals. This was less the case for the YOLAMI study, which might be partially explained by a less thorough assessment of the interpersonal determinants in the situation analysis. However, the relatively low interest of the researchers in interpersonal factors in the Chinese study is indicative of the lower importance of those factors in that society.

Communication as effect outcome at interpersonal level In the intervention arm of the YOLAMI study most outcomes improved except those related to communication, which might lead to the conclusion that communication about sexuality is more difficult to improve than other outcomes related to sexual behaviour.

Communication as effect outcome at community and societal level The CERCA interventions contributed to breaking the taboo and prompting societal debate on adolescent sexuality. This intervention effect was far less noticeable after the YOLAMI interventions.

Consistency of effect evaluation

The consistency of the intervention effect on individual outcomes differed between the two studies. The YOLAMI interventions showed a positive impact on individuals' contraceptive use in the different study sites. Scaling up the strategy to other workplaces will likely lead to an impact on the contraceptive use of more YUR-migrants. In contrast, the CERCA study did not succeed in demonstrating consistent effects of the comprehensive interventions on adolescents' behaviour. What works in one context (city, school, neighbourhood) does not necessarily work in another.

Community and societal impact

The interventions had a greater community and societal impact in Latin America than in China. As discussed above, the CERCA interventions aroused a sense of change among stakeholders and within communities.

5.4.2 Hypothesis 1: Societal factors influence the research process

In this dissertation, we discussed at length the impact of societal factors, such as norms and world vision, on the sexual behaviours of individuals. In addition, I hypothesize that societal factors also influence the study process and the applicability of specific research methods.

In the following paragraphs I will document this hypothesis by focusing on three methodological aspects of the research that were basically similar in both regions but in fact ended up being somewhat different in each study.

Participatory approach In both studies an attempt was made to involve stakeholders in the decision-making process on interventions. In short, the meetings in China mainly consisted of researchers informing employees and employers about aims and procedures which were not questioned by the participants. The difficulties experienced in involving beneficiaries and key persons in the research process seem logical in a hierarchically structured society where conformity and submission are highly valued. In contrast, the stakeholder meetings in Latin America were characterized by lively and never-ending discussions during which it was very difficult to achieve consensus.

Uniformity of the implementation process The uniformity of the implementation process is crucial to achieve a reproducible strategy that leads to a consistent effect. In China, the interventions were implemented in a standardized way in all factories. The research collaborators followed the protocols strictly and completed the monitoring forms uniformly. Most of the sexual health messages were identical at the different study sites. The authoritarian power of researchers and the absence of societal controversy contributed largely to the uniformity. The implementation of the strategy was hierarchically controlled without deliberation. This made it possible to maintain control of procedures and content.

By contrast, in Latin America there was a high degree of variability in the way intervention procedures were followed. Despite the standardized monitoring forms and the many efforts to maintain the uniformity of procedures, implementers and local researchers completed the forms and followed the instructions in their own way. Also, the content of the messages disseminated varied substantially between sites and project implementers. This variability among sites was a consequence of, among others, opposition by voices in the communities to some aspects of the interventions (e.g. provision of contraceptives to adolescents) and the public debate about messages on sexuality (e.g. sexual rights of adolescents, homosexuality).

Predictability of the intervention effect The predictability of the intervention effect on individual behaviours is another way to obtain consistency in the effectiveness evaluation.

In the YOLAMI project it seemed that target groups easily adopted the desired behaviours. Health professionals provided condoms to YUR-migrants, and single women agreed to access sexual health services offered at their workplaces. This predictability of behaviours likely benefits from the conformity principle of Chinese Confucianism that makes people conform to societal expectations and adhere to the norms, rules and regulations.

In the CERCA project we noticed that the activities did not necessarily lead to expected behaviours. On the contrary, prompting people to change behaviours often aroused resistance. For instance, we encountered strong opposition from health care providers to providing contraception to teens, and adolescents were reluctant to access health care services. Interventions focused on enabling behaviour change might be more effective in the Latin American context than interventions compelling people towards desirable behaviours.

Conclusion Notwithstanding the anecdotal nature of these examples, I hypothesize that experimentally designed intervention research (verifiable, static interventions, reproducible, predictable, representative) is easier in authoritarian and collective-based communities, such as in China, whereas a dynamic, contextualized and participatory research approach is more practicable in liberal, individual-based and personal-enterprise-driven societies (e.g. Latin America).

5.4.3 Hypothesis 2: Interpersonal interaction has the potential to drive societies towards improved sexual health

Whereas the intervention activities led directly to improved contraceptive use among YUR-migrants in China, I hypothesize that interpersonal interaction and communication were the main drivers in the CERCA project.

Interpersonal interaction in the CERCA research We described extensively that communication and interaction with others are important determinants of the contraceptive need of adolescents. Therefore, at the start of the CERCA project, communication about sexuality was identified as a main intervention outcome. In particular, the evaluation of community and societal outcomes showed that the interventions have generated and are still generating interpersonal and public debate at different levels (paper 11, paper 12). The actors involved (researchers, authorities, adolescents, parents, partners, health care providers etc.) keep on talking and arguing with each other about sexuality and related topics in diverse fora, even after the project has ended. This improved communication about sexuality has contributed to reducing its taboo nature.

However, when exploring the interpersonal interactions during the interventions, we also found some contradictions regarding communication about sexuality. We mentioned the possible negative effects of peer pressure, the risks of communicating in untrustworthy environments and the confusion that contradictory messages may arouse.

Interpersonal and societal differences are the fuel for interpersonal communication On the one hand, differences in knowledge, norms and attitudes between people fuel interactions. Interpersonal exchange through communication can only happen when people have different understandings. Health care providers and unmarried youth and adolescents argue with each other because they differ in opinion regarding the availability of contraceptives. Varying ideas on premarital sex are driving the discussions between parents and adolescents. Diverging norms on sexuality maintain the disputes between religious movements and health promoters on the content of messages on sexuality.

Interpersonal interaction has the potential to reduce the interpersonal and societal obstacles to meeting the contraceptive need of unmarried people On the other hand, communication and debate, when occurring in a safe and trustworthy context, might bridge gaps and make traditional partitions and fault lines between people disappear. Through interpersonal communication people start understanding each other, which can make them change their perspectives and reach consensus. Consequently, communication brings about equity and reduces opposition. Interpersonal interaction levels out the imbalances regarding knowledge and gender and sexual norms that we identified as determinants of the unmet contraceptive need among unmarried youth and adolescents. As improved communication has a simultaneous effect on several determinants, its impact is likely to extend beyond reducing the unmet contraceptive need of unmarried youth and adolescents. I argue that interpersonal communication and interaction about sexuality has the potential to drive progress towards global sexual health, in its broadest definition [120].

5.4.4 Hypothesis 3: Modifying factors accelerate (or decelerate) change towards improved sexual health

Reflecting on the results of our research, I arrive at the conclusion that the process to achieve behaviour change was influenced by the presence or absence of certain societal phenomena.

The type of leadership From the research experience in China and Latin America we learned that leaders have a determining role in the change process. The type of leadership substantially influenced the progress of interventions and research. The uptake and level of engagement in the intervention activities depended on the pioneering work of individuals. The commitment and enthusiasm of one health educator, health care provider or researcher inspired others and moved the interventions forward. Conversely, the absence of such leadership limited the progress and quality of the interventions. The existence of enthusiastic local leaders is also determining whether new initiatives, as spin-offs from the CERCA experience, are being undertaken at local level.

Subjectivity We saw that the change process depended on the overlap between the self (subject) and the content and goals of the intervention. Therefore, I hypothesize that allowing and stimulating subjectivity increases effectiveness.

In other words, the success is partially conditioned by the extent to which individuals introduce their own perspectives, feelings, beliefs and desires [176].

At the level of learning, for instance, we noticed that the subjective internalization of knowledge was key. To illustrate this, I refer to the barriers at provider level that we experienced in the CERCA interventions. We invested a lot of effort to train health care providers with the aim that they would change their counselling behaviour towards adolescents regarding contraception. This additional education did not seem to make any difference. Most providers already knew about adolescents' contraceptive needs and the contraceptive options to respond to those needs. However, this knowledge was not sufficient to improve the quality of SRH services provided. I believe that the learning process missed a critical component of subjective introspection. Health care providers did not reflect on how their own sexual norms and vocational attitudes influence their performance. Conversely, members of the research consortium stated that their involvement in the research helped them to change their opinions and attitudes. Local collaborators who were initially reluctant to provide free condoms to adolescents are currently advocating for adolescents' right to access contraception.

From our research experience we can also infer that subjective goals interfered with the interventions and that people's behaviour was regulated by specific attractors and personal interests. In the YOLAMI project, the Chinese research coordinator energetically drove the interventions and the research forward. The fact that the research project reinforced his position at the university and his renown as a national public health expert were undoubtedly strong attractors. In the CERCA project, adolescents were driven by their desire to gain control over their sexual lives; health care providers' desire to keep their job, in a context of professional and political insecurity, interfered with their willingness to provide contraception to adolescents, which could be questioned; parents' behaviour was mainly dictated by their expectations regarding their children's future; and political support or opposition depended on how policymakers thought the CERCA interventions could help them main or acquire power.

Creativity The YOLAMI study showed that the comprehensive intervention that included an innovative component (activities addressing individuals) resulted in a better outcome than the standard community-based SRH promotion. In the context of the CERCA study, we observed that innovative initiatives, whether they were successful or not, created new dynamics within communi-

ties. People were confronted with something new that incited them to define their position and communicate with each other. Innovations moved people to act in support or opposition, which induced change. For instance, the use of adolescent-friendly text messages in Bolivia resulted in an overwhelming response and mobilized adolescents. In Nicaragua, the ‘Movisex’, an adapted car aimed at reaching adolescents in the community with face-to-face information, became the talk of the town. In Ecuador and Bolivia, the provision of free condoms to unmarried adolescents generated a lot of opposition and was finally dropped. However, the initiative resulted in public debates and indirectly contributed to the outcome of increased communication and reduced taboo.

Emotionality People’s behaviour is not only driven by rational factors. Emotionality is a more difficult to handle but important modifier of individual behaviours and societal processes.

We mentioned the effect of **sexual arousal and sexual satisfaction** on behavioural decision-making. Such ‘hot processes’ (sexual arousal, sexual sensation-seeking and sexual satisfaction) easily overrule more manageable constructs, such as knowledge and self-efficacy, when in-the-moment sexual decisions have to be taken. Those constructs are important factors to consider when developing interventions aiming to influence sexual behaviours [177][58].

Throughout the CERCA experience we witnessed the modifying potential of **interpersonal feelings**. The qualitative research showed that feelings of trust or distrust influenced patterns of communication between parents and adolescents. Similarly, shame and insecurity hampered the interactions between health care providers and teenagers. During the implementation phase, we experienced how feelings of connectedness, friendship, romances and conflicts determined the success of the interventions.

5.5 Recommendations and ideas for future interventions and related research

What implications do the findings and reflections in the context of this thesis have for future interventions and research? First of all, the aforementioned hypotheses remain to be tested, which whet my appetite to pursue the research. Furthermore, the constraints experienced when implementing the stud-

ies demonstrate that complementary theoretical models would be useful. Ultimately, I made an attempt to start thinking about such a new model.

5.5.1 Need for new models to address sexual and reproductive health in complex systems

Used theoretical models The socio-ecological model [144], the Theory of Planned Behaviour (TPB) [66] and the Social Cognitive Theory (SCT) [145] served as the framework for the assessment of determinants and for the design and evaluation of comprehensive interventions. Those models helped to identify behavioural predictors at individual, interpersonal, community and societal level. With the goal to influence sexual behaviours and, ultimately, unmet contraceptive need, we developed interventions that addressed the predictors mentioned.

Constraints In the previous sections we described the main constraints that we experienced when applying those models. First, we became aware of the impossibility of mapping all the determinants. Consequently, when implementing and evaluating the strategy we continuously encountered aspects that we had neglected which interfered with the interventions and outcomes. Second, we were overwhelmed by the complexity during the implementation phase. We put a lot of effort into maintaining an overview, guarding against conflicting messages, monitoring and describing accurately and keeping pace with the variability. Third, we underestimated the reluctance to support - and even the opposition to - some aspects of the interventions, which slowed down the change process.

Complex systems The problems that we encountered are in line with the constraints that others have experienced when evaluating health promotion programmes in continuously changing contexts [178]. Using insights from complexity theories (studies of complex systems) can help to address those challenges. Gallagher and Appeneller state that a complex system is “one whose properties are not fully explained by an understanding of its component parts” [179]. Complex systems have the following properties [180]: 1) they are made up of a large number of heterogeneous elements; 2) these elements interact with each other; 3) the interactions produce an emergent effect that is different from the effects of the individual elements; and 4) this effect persists over time and adapts to changing circumstances.

Need for new models I argue that there is a need for new frameworks to guide the design of sexual health promotion interventions. Such models might add value to the existing ones and should take into account, as much as possible, the context-dependent nature of sexual behaviours; the multiplicity of factors and actors, the variability and dynamics; and the uncertainty of interfering events and modifying factors.

5.5.2 Need for new approaches to evaluate sexual health promotion programmes

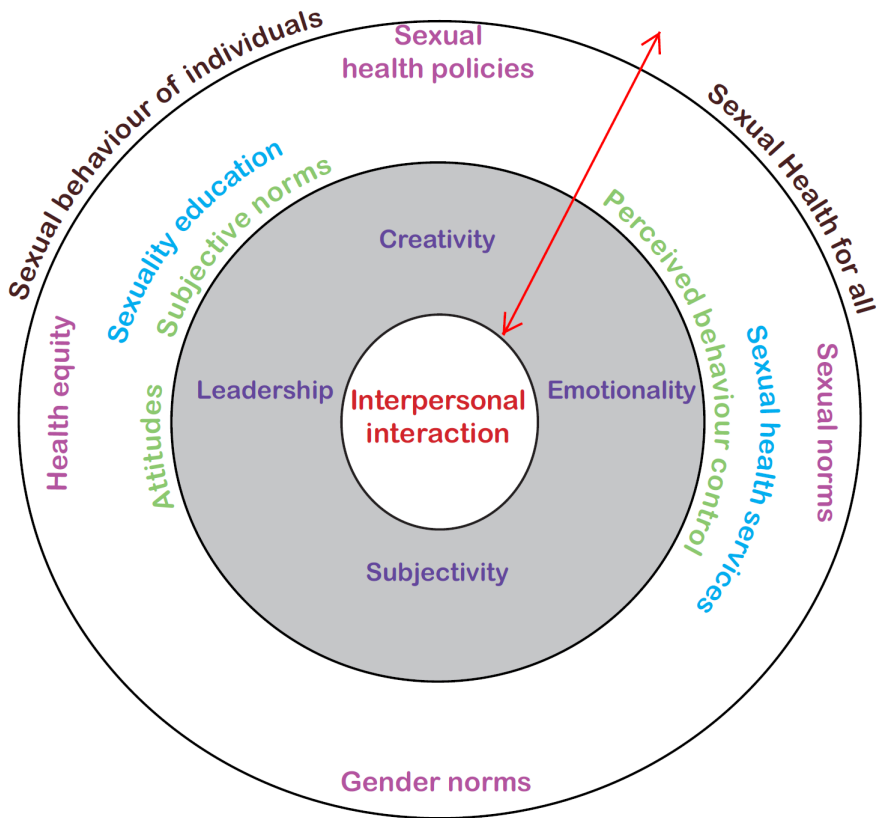
The traditional evaluation approach that is based on the assumption that the effect of interventions can be predicted and consequently reproduced might be useful in environments with verifiable and controllable conditions. To a certain extent this was the case in the YOLAMI research. However, the research experience in Latin America showed that the predictability assumption and the concomitant reductionism entail important restrictions. There is a need for complementary evaluation frameworks that focus on processes and are complementary to the traditionalist approach that aims at proving effectiveness [133][128].

The realist approach might be one such alternative framework for implementing and evaluating complex health promotion programmes [130][181][182][183]. Realist researchers recognize that all interventions only ever work for certain people in certain circumstances. Thus, the question is not whether a particular programme or intervention ‘works’, but ‘what works for whom in a particular context?’ In other words, what are the contextual drivers and modifiers in processes of change?

5.5.3 Suggestion for a complementary model as framework for future sexual health promotion and related research

The findings and perceived constraints of the research led me to think about an alternative model that could be useful as the framework for the development and assessment of similar interventions (figure 5.2). Without the intention to claim to improve or reject the existing models, I hope that the proposed model might be complementary as basis for future interventions in the field of ASRH and beyond.

Figure 5.2 Alternative model for developing SRH promotion



Interpersonal interaction is the driver towards change at personal, community and societal level and finally leads to improved sexual health. Modifying factors influence the process which is intrinsically dynamic (arrow).

Green: personal level Blue: organizational level Purple: societal level

Grey zone: transformation zone with modifying factors

Main intervention objective: promoting interpersonal interactions

The model is based on the assumption that interpersonal interaction and communication, when occurring in a safe and trustful environment, are the main drivers towards improved sexual health. Therefore, I put interpersonal interaction at the centre of the model as a transformative driver. The main strategy goal is the continuous exchange of beliefs, attitudes, knowledge and intentions regarding sexuality. Communication about sexuality should be encouraged within communities, particularly among adolescents and the former and adults. All kinds of communication media, real or virtual, are valuable and useful. However, in paper 11 we revealed some of the limitations and complexity of communication. Communication does not necessarily lead to “improved” behaviours. There are critical conditions that need to be fulfilled. Those requirements are related to respect, openness, person-centredness, and the skills to deal with contradictory and conflicting messages. The “how” of communication prevails on the “whats” of communication. The basic principle is that there is no right and wrong and that, ultimately, the agreed truth will rule when the necessary conditions for good communication are fulfilled [184].

Secondary intervention objectives: enabling societal accelerators of change

The transformative process is likely to be influenced by societal modifiers. A secondary goal of the intervention strategy would, therefore, be the creation of an enabling environment for accelerators that speed up the process of change. Those modifying factors stimulate, on the one hand, interpersonal interaction and impulse, on the other hand, the effect of this interpersonal interaction on individual, community and societal outcomes.

Intervention objectives could be formulated for different modifying factors, which are presented in the second circle (transformation zone) of the graph:

Leadership To identify and create opportunities for local leaders from the communities. Transformative leaders encourage people to communicate, inspire others as a role model and enable community initiatives.

Subjectivity To recognize that people have subjective goals (e.g. more autonomy for adolescents, more professional security for health care providers,

visibility for politicians) and to allow and even encourage them to pursue their goals.

To create opportunities for individuals to develop, adapt and express their subjective perspectives. At the level of education on sexuality, transformative learning is the most effective way to develop conscious sexual behaviour. Transformative learning aims at building one's subjective perspectives. Key aspects of such training activities are critical reflection and introspection on one's own experiences ¹ [187]. At the level of intersubjective exchange, the creation of fora for virtual or real communication will enable people to express their own perspectives.

Creativity To create an enabling environment for creative activities that emerge from the community. Innovative activities encourage debate and create solutions to overcome barriers to progress towards sexual health for all. For example, in the context of the CERCA project, a number of creative ideas emerged to circumvent the barriers presented by health care services.

Emotionality To allow and take advantage of emotional states of individuals and communities (e.g. indignation, connectedness). Emotional feelings stimulate people to talk and spur them into action. Emotional relationships between people can be used to get things done or organized.

Effect outcomes at individual, community and societal level

The next circle in the graph shows the effect outcomes at individual, community and societal level. In the short term, interpersonal interactions can be expected to lead to changes in knowledge, attitudes, beliefs and intentions among individuals. Over the longer term, it is likely that, when larger fractions of the society are involved in the interaction, changes occur at community level leading to improvements in sexuality education and in the provision sexual health care. Eventually, sexual and gender norms will change and decision-makers will adapt policies.

¹Transformative learning is the expansion of consciousness through the transformation of the basic world view and specific capacities of the self; transformative learning develops autonomous thinking [185][186]

Impact outcome: improved sexual health for all

The outer circle presents the impact outcome. The final goal is that adolescents and other actors adopt behaviours that lead to improved sexual health. I consider for this model a comprehensive definition of sexual health that goes beyond the absence of negative health outcomes and implies also positive aspects of sexuality such as sexual satisfaction, sexual self-esteem and sexual pleasure [188]. Smylie et al. validated sexual health indicators for young people and adolescents that include five dimensions [189]: 1) physical, mental, emotional and social well-being in relation to sexuality; 2) approach to sexuality; 3) sexual relationships; 4) sexual experiences; and 5) discrimination, coercion and violence.

A multi-directional and helical model

The two arrows represent the main centripetal and centrifugal forces that propel the process. Through interpersonal interaction, individuals and communities evolve towards healthier sexual behaviour. Similarly, the behaviour itself informs individuals and communities and fosters dialogue. In fact, all components of the model are interrelated. Each construct is at the same time a cause and consequence of other constructs.

In a three-dimensional representation I would opt for an upward helix to visualize the continuous and never-ending process towards improved sexual well-being.

Added value of the new model

I hypothesize that this intervention model might contribute to future sexual health promotion, as it overcomes constraints that we experienced during the CERCA intervention. Moreover, the model might have additional benefits regarding feasibility and sustainability.

Incomplete mapping of determinants The incompleteness of the picture does not prevent implementers from starting the intervention. On the contrary, organizing interpersonal interaction from the beginning will contribute to discovering new determinants and understanding dynamics.

Complexity Complexity is not a limiting factor for the implementation of interventions based on this model. Quite the reverse: variability engenders more interaction. Interventions are limited to organizing different sorts of interaction and creating an enabling environment for the modifying factors. Consequently, the planning and monitoring of activities seem quite feasible.

Opposition Rather than being an obstructing factor, opposition from individuals and subgroups might represent an opportunity. Giving opponents a forum to express their perspective will stimulate debate and discussion.

External versus internal motivations The focus of the interventions moves from motivating or inciting people to desired behaviours towards enabling and creating favourable conditions. According to the self-determination theory, internal motivations based on preferences for autonomy, competence and connection are superior to external motivations based on incentives or recommendations from others [190].

Evaluation Different evaluation methodologies can be applied within the framework of the model. Qualitative research methods might study in-depth processes of change and discover new, unexpected outcomes. The progress of effect and impact outcomes could be followed through a sequential measurement of quantifiable indicators. An experimental design is applicable to compare the effectiveness of model-based interventions with other sexual health promotion strategies. Ultimately, the model itself can be studied through a realist evaluation approach. Such an approach aims to assess conditions of implementation and understand how interventions lead to effects [181][183].

Complementarity The model can be used simultaneously with other theoretical frameworks, because models are not mutually exclusive but complementary.

Feasibility The cost of organizing activities that promote interactions is probably moderate in most contexts. Sustainability is another asset of the model, since model-based interventions support an ongoing and autonomous process that also continues when financial resources end.

English summary

Worldwide, increasing numbers of young unmarried people and adolescents are at risk of unplanned pregnancy. Studies show that such pregnancies entail significant consequences for the well-being of mother and child. Reducing the unmet contraceptive need is the most effective way to avoid unplanned pregnancies among unmarried youth and adolescents. This dissertation focuses on how this could be achieved.

In the first chapter a literature overview is given on what is known of the determinants of unmet contraceptive need among unmarried people. We used the socio-ecological model as framework for the categorization of the determinants into five different levels (individual, interpersonal, community, societal). Notwithstanding the considerable literature about unmet contraceptive needs of singles little scientific information is available on factors influencing the use of contraceptives among young unmarried adults and adolescents living in vulnerable contexts.

Literature indicates that programmes aiming to reduce unintended pregnancy among singles should go beyond delaying sexual activity and should instead address unmarried people's sexual health, including their unmet contraceptive need. Several studies tested single interventions, aiming to increase the contraceptive use among singles. Those studies assessed, amongst others, the use of new media, the promotion of youth-friendly health services or the involvement of families and communities. Such interventions seem useful but insufficient to ensure that individuals make healthy decisions about their reproductive behaviour. Therefore, public health experts and scientists consent that comprehensive and context-specific interventions are best fitted to change sexual behaviours. Up to date, only few studies assessed the development and outcomes of such multicomponent interventions.

The thesis objectives are the assessment of determinants of the unmet need for contraception among unmarried people, the effect evaluation of comprehensive interventions and the reflection on study results from diverse contexts.

To this end we described and analysed the results of two intervention studies addressing unmarried people in different regions. YOLAMI (young labour migrants in Chinese cities) was a pilot intervention study among young female rural-to-urban migrants from workplaces in two Chinese cities (Qingdao and Guangzhou). We compared a standard intervention targeting the community of migrant workers and a comprehensive intervention addressing the community and individual migrants. The interventions ran in the workplaces from August 2008 until March 2009. We assessed the differences in sexual behaviour and contraceptive use across the two study arms of the cross-sectional surveys. Interviews with migrant workers and managers provided additional information about how the interventions were perceived. The CERCA (community-embedded reproductive health care for adolescents in Latin American cities) research built on the methodological frameworks of intervention mapping, community-based participatory research and action research. The study focused on adolescents in poor neighbourhoods in Managua (Nicaragua) and secondary school students in Cuenca (Ecuador) and Cochabamba (Bolivia). The interventions, running from August 2011 until April 2013, addressed communities and individuals (teens, parents, health care providers, authorities and teachers) and were continuously adapted to the needs of the target population. Their effectiveness was evaluated through a nested cohort analysis that compared the evolution of the behaviours of adolescents in intervention and control groups before and after the intervention. A qualitative process evaluation assessed the effect of the intervention on community and societal outcomes.

The data showed that the prevalence of unmet contraceptive need is high among the study populations in Latin America and China. For each level of the socio-ecological model we studied determinants of sexual onset and contraceptive use. We found individual factors that were related to people's sex, alcohol use, knowledge and educational level. At interpersonal level, the interaction and communication of unmarried individuals with important others (parents, peers, partner, health care providers) appeared to be crucial for the contraceptive use. Poor accessibility of SRH services for unmarried people and shortcomings of sexuality education were identified as organizational barriers. Finally, the studies disclosed societal factors such as sexual and gender norms, religiosity and

world vision that obstructed the use of contraceptives among unmarried youth and adolescents. The association of those factors with unmet contraceptive need was not unidirectional and linear. We showed that determinants of sexual behaviours are interdependent and interact in manifold and complex ways.

The effect evaluation showed that the implementation of community sexual health promotion programmes at workplaces in China contributed to the contraceptive use of individual rural-to-urban migrants. Adding personal counselling to the community interventions had an additional effect on condom use and on some precursors of contraceptive behaviours. In Latin America the study did not succeed in proving consistent effectiveness of comprehensive interventions on adolescents' contraceptive use and related behaviours. Only the follow-up study in Ecuador showed a significant difference for condom use and for the outcome related to the use and knowledge of SRH services. The interventions in Nicaragua and Bolivia, on the other hand, did not result in a significant change in outcomes. Conversely to the effect on individual outcomes, the interventions had a greater community and societal impact in Latin America than in China. The CERCA interventions aroused a sense of change among stakeholders and within communities, while this was less the case in the YOLAMI study.

As a result of reflections on study results and on research limitations, three new hypotheses are formulated that are subject to testing in future research. First, societal factors influence the study process and the applicability of specific research methods. The hypothesis is that experimentally designed intervention research is easier in authoritarian and collective-based communities, such as in China, whereas a dynamic, contextualized and participatory research approach is more practicable in liberal, individual-based and personal-enterprise-driven societies (e.g. Latin America). Second, interpersonal communication and interaction about sexuality has the potential to drive progress towards global sexual health. Third, the absence or presence of certain societal phenomena (leadership, subjectivity, creativity and emotionality) modify the change process towards improved sexual health.

In the last section of this thesis, a new intervention model is proposed. Interpersonal interaction is put as pivotal driver towards sexual health. This innovative framework might be complementary to existing approaches for the development of future adolescent sexual health programmes and related research.

Nederlandse samenvatting

Een groeiend aantal adolescenten en jonge ongehuwden lopen risico op een ongeplande zwangerschap. Dit is een wereldwijd fenomeen. Studies tonen dat deze zwangerschappen negatieve gevolgen kunnen hebben voor het welzijn van moeder en kind. Het verminderen van de onvervulde behoefte aan anticonceptie is de beste manier om ongeplande zwangerschappen te vermijden. Hoe kan dit meest efficiënt gebeuren? Het is de focus van dit proefschrift.

Het eerste hoofdstuk geeft een literatuuroverzicht van factoren die van belang zijn voor de onvervulde behoefte aan anticonceptie bij singles. We gebruikten het sociaalecologische model voor de rangschikking van de determinanten in vijf niveaus (individueel, interpersoonlijk, organisatie, sociaal en politiek). Er is al veel gepubliceerd. Toch is er nog een leemte in de wetenschappelijke kennis over het gebruik van anticonceptie bij jonge ongetrouwen en adolescenten die leven in een kwetsbare omgeving.

Er is ook aanzienlijke literatuur over strategieën om ongeplande zwangerschappen bij singles te verminderen. Wetenschappers en experts zijn het erover eens dat efficiënte programma's meer beogen dan het uitstellen van seks en vooral de globale seksuele gezondheid van jonge volwassenen en adolescenten als doel stellen. Verschillende studies testten enkelvoudige interventies zoals het gebruik van nieuwe media, de aanpassing van gezondheidsdiensten op maat van jongeren en de participatie van familie en gemeenschap. Zo'n interventies zijn nuttig maar volstaan niet om het seksueel gedrag van individuen te veranderen. Daarvoor zijn ruime en context-gevoelige interventies nodig. Tot nu toe is er weinig onderzoek dat de ontwikkeling en resultaten van complexe interventies bestudeerde.

De doelen van de studies en van dit proefschrift zijn de analyse van determinanten voor het anticonceptie gebruik bij jonge ongetrouwen en adolescenten,

de effect evaluatie van complexe interventies en de reflectie over de onderzoeksresultaten uit verschillende contexten.

In deze thesis bespreken we de studieresultaten van twee interventies voor ongetrouwde jeugd in verschillende regio's. Eerst was er de YOLAMI (young labour migrants in Chinese cities – jonge arbeidsmigranten in Chinese steden) studie. YOLAMI is een piloot interventie studie in fabrieken bij jonge vrouwelijke migranten die migreerden van het platteland naar de stad. We vergeleken een standaard interventie met een meer complexe interventie in twee Chinese steden, Qingdao en Guangzhou. De standaard interventie concentreerde zich op de gemeenschap van stadsmigranten. De complexe interventie combineerde gemeenschapsactiviteiten met acties gericht op de individuele migrant. Het programma liep tussen augustus 2008 en maart 2009. We bestudeerden de verschillen in seksueel gedrag en anticonceptie gebruik over de twee studie groepen. Steekproefonderzoek voor en na de interventie leverden de kwantitatieve data. Interviews met migrant arbeiders gaven informatie over de subjectieve beleving van de interventies. In een tweede tijd kwam het CERCA onderzoek (community-embedded reproductive health care for adolescents in Latin American cities – gemeenschapsgericht reproductieve gezondheidszorg voor adolescenten in Latijns Amerikaanse steden). Methodologisch combineerde CERCA aspecten van intervention mapping, community-based participatory research en action research. De doelgroep in Nicaragua was de tiener populatie in de armenwijken van de hoofdstad Managua. In Cuenca (Ecuador) en Cochabamba (Bolivia) gebeurde het onderzoek hoofdzakelijk bij studenten van het secundaire onderwijs. De interventies liepen van augustus 2011 tot April 2013. De activiteiten waren gericht naar de gemeenschap en individuen (tieners, ouders, gezondheidswerkers, autoriteiten en leraren). De strategie was dynamisch en werd voortdurend aangepast aan de veranderende noden. Met een nested cohort studie evalueerden we de effectiviteit van de interventie. We vergeleken de evolutie in gedrag van individuele tieners uit interventie en controle groepen. Kwalitatief onderzoek evalueerde het effect op sociale parameters (communicatie, interactie, taboe).

Ons onderzoek toonde dat de on vervulde behoefte aan anticonceptie hoog was in de studie populaties. Voor elk niveau van het sociaalecologisch model bestudeerden we factoren die invloed hebben op seksueel gedrag en anticonceptie gebruik. Geslacht, alcohol gebruik, kennis en opleidingsniveau waren bepalend op het niveau van het individu. Op interpersoonlijk vlak waren de interactie en communicatie van jonge volwassenen en adolescenten met sleutelfiguren uit

de omgeving (ouders, peers, partner, gezondheidswerkers) doorslaggevend. De gebrekkige toegankelijkheid van seksuele gezondheidsdiensten voor singles en de tekortkomingen in de seksuele opvoeding kenmerkten de obstakels op het gebied van organisatie. Als sociale factoren kwamen seksuele en gender normen, religiositeit en levensvisies het sterkst naar voor. De relatie van deze factoren met anticonceptieve behoeftes waren niet eenduidig en lineair. Uit ons onderzoek blijkt dat het gedrag van de studiepopulatie wordt beïnvloed door complexe wisselwerkingen.

De effect evaluatie in China toonde een positief effect van alle interventies op het gebruik van anticonceptie door de doelgroep. De meer complexe interventies leverden een bijkomend voordeel op voor het condoom gebruik en enkele individuele gedragsparameters. De studie in Latijns Amerika kon geen consequent bewijs aantonen van de effectiviteit van de complexe interventies op het individueel gedrag. Enkel de studie in Ecuador toonde een significant verschil in condoom gebruik en in de parameter gerelateerd aan het gebruik van seksuele gezondheidsdiensten. De interventies in Nicaragua en Bolivia leidden niet tot een significante verandering in individueel gedrag. De sociale impact van de interventies, daarentegen, was groter in Latijns Amerika dan in China. De CERCA interventies brachten een gevoel van verandering in de gemeenschap. Dit was minder het geval in de YOLAMI studie.

Beschouwingen over de studie resultaten en de beperkingen van het onderzoek leidden tot drie nieuwe hypotheses die onderwerp kunnen zijn van wetenschappelijke toetsing in de toekomst. Vooreerst, sociale factoren beïnvloeden het studie proces en de toepasbaarheid van een specifieke onderzoeksmethodologie. Als hypothese stel ik dat experimenteel interventie onderzoek beter haalbaar is in een autoritaire en collectivistisch samenleving zoals China en dat een dynamisch, contextueel en participatief onderzoek meer geschikt is in een liberale, geïndividualiseerde en op persoonlijk initiatief gerichte maatschappij (vb. Latijns Amerika). Ten tweede, interpersoonlijke interactie en communicatie over seksualiteit zijn potentiële stuwende krachten voor een globale seksuele gezondheid. Ten slotte, de aan- of afwezigheid van sociale fenomenen (leiderschap, subjectiviteit, creativiteit en emotionaliteit) moduleren het veranderingsproces naar een verbeterde seksuele gezondheid.

In het laatste hoofdstuk van dit proefschrift wordt een nieuw interventie model voorgesteld. Interpersoonlijke interactie is hierin de motor van de evolutie naar seksuele gezondheid. Deze innovatieve benadering kan een aanvulling zijn

voor bestaande denkkaders en bijdragen in de ontwikkeling van toekomstige seksuele gezondheidsprogramma's en gerelateerd onderzoek.

Epilogue

The thoughts for the last section of the manuscript bobbed up when I was struggling with the stubborn data in the development process of this dissertation. They are the result from personal reflections and discussions with promoters, colleagues, friends, and especially with my wife and children. The fuel for these reflections were -amongst others- the study results, the research process itself, my position as researcher, project coordinator and physician and ultimately personal life experiences.

I am aware that the statements and assumptions of the last section might be sensed as unscientific. However, I consider this thesis not as an endpoint but rather as an intermediate result of a work in progress that generates continuously new food for study. I hope to be able to pursue the research in some way and to find opportunities to scientifically test the hypotheses and the validity of the proposed model in varying contexts.

The sense that interpersonal interaction is a crucial driving force for change surfaced when I was trying to interpret the research data. I discussed the grounds for this assumption at length in the last chapter. My interest in “interpersonal interaction”, as the main driver of positive change in the study interventions, coincided with a gradual awareness about the importance of interaction and communication in my personal and professional life as researcher, project coordinator and physician:

1. The development process of our research and this dissertation is a testimony of how the interaction with important others (supervisors, colleagues, jury, study population, friends and family) is crucial for a better and more balanced outcome. Many times we felt that we got stuck. However, through (sometimes heated) discussions we got things back on track.

2. There were multiple fault lines within the multi-country consortia of both the YOLAMI and CERCA studies: cultural, linguistic, ethical, philosophical, methodological etc.. This divergence brought along discussions, conflicts, irritations, misunderstandings, distrust, and . . . many worries for the coordinators. However, communication was the only way out and the final result was always better than before the start of the interaction.
3. I am continuously learning from the contacts with patients. I have the firm conviction that finally the patient him/herself is the cue for diagnosis and optimal treatment. I consider my main role as physician to help disclose what he or she needs for improving health. The most important tool we have as physician is communication. In my opinion, good quality health care can only be person-centred.

The jury asked me to describe my own epistemology. Epistemology (or theory of knowledge) is defined as the philosophical analysis of the nature of knowledge and how it relates to connected notions such as truth, belief, and justification [191]. The central question is “how we know what we know”. Notwithstanding my large interest for those kind of questions, I feel that the request of the jury goes beyond my area.

I can only make a short and poor attempt to describe some of my underlying thoughts and beliefs. As to me, every belief, opinion, view, consideration, reaction that a person may have is meaningful, deserves respect and is worth to be understood. Disclosure of those meanings contributes to knowledge and is enriching. Interpersonal communication is the only medium we have to discover those meanings. This is something I experience, for example, clearly when interacting with patients. Every single communication (verbal and non-verbal) might be useful. Exploring underlying meanings in communication with patients often yields important information about his or her physical and mental health.

Without having a deep understanding of his philosophical theories I feel attracted to the ideas of Habermas [184] [192]. He relates the meaning of truth with the outcome of a universal, rational consensus (consensus theory). To disclose this truth, we should focus on “communicative action”. These ideas rest on the assumptions that all communications have an inherent purpose and that we have the communicative competence to discover the understanding of those purposes.

Dankwoord

In de beginne was er chaos. . .
Een veelheid aan data, brute cijfers, ruwe statistieken, onafgewerkte artikels, tegenstrijdige resultaten en het gevoel dat we de kern misten. Toen besloten we orde te scheppen. Dit moest een doctoraat worden. Het is bijna twee jaar geleden. Olivier en Kristien sprongen enthousiast mee.

En na één jaar, was er nog meer chaos . . .
Een veelheid aan data, brute cijfers, ruwe statistieken . . . en daar bovenop een volle prullenbak kladversies. Ik had Olivier en Kristien horendol gemaakt met ideeën, structuren, hypotheses die alleen in mijn hoofd klopten. Ik zag het in hun ogen. Ik had de complexiteit alleen complexer gemaakt.

En toen kwam het kantelpunt. . . ,
tijdens de reis naar onze zoon in Jordanië. Ik besprak een nieuw opborrelend idee met Griet, mijn vrouw. Zij luisterde, probeerde te begrijpen, kroop in mijn hoofd en hielp ordenen. Zij was en is mijn “tipping point”.

En nu is de thesis er . . .
Het heeft vóór mij de deur op een kiertje gezet naar een nieuwe kamer. Ik popel om die deur verder open te duwen.

Alleen zou ik het nooit hebben gekund. Ik ben veel mensen dank verschuldigd. Eerst en vooral Griet en de kinderen. Ik ben maandenlang de afwezige echtgenoot en vader geweest, opgesloten in mijn hoofd met DE thesis. Zij blijven mijn prioriteit, ook al leek het soms anders. Olivier en Kristien waren de beste promotoren die ik mij kon wensen. Zij

bespeelden meesterlijk de grens tussen kritiek en ondersteuning. Heel professioneel, en toch voelde steeds ik dat tikkeltje meer. Laat ik het – op gevaar af melig te klinken - genegenheid noemen.

Sara De Meyer blijft, na vier jaar gezamenlijk gezwoeg, mijn CERCA maatje. Ik heb onnoemelijk veel van haar geleerd. Dit gaat nooit meer weg.

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Acht jaar geleden hebben Patricia (ik hoor haar nog hartelijk lachten) en Marleen het risico genomen om mij als, groentje op leeftijd, aan te werven op het ICRH. Dit vertrouwen heeft mij toegelaten om nieuwe wegen te verkennen. Ik voelde me thuis op het ICRH. Ik kon altijd wel bij iemand terecht voor advies of als het emotioneel lastig was. Voor de praktische regelingen heeft Cindy mij uitstekend geholpen, met een warme glimlach. Ik zal het ICRH missen. Ik hoop dat onze wegen blijven kruisen.

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