Factors influencing unmet need for contraception amongst adolescent girls and women in Cambodia (#48994)

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Factors influencing unmet need for contraception amongst adolescent girls and women in Cambodia

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Background: Unmet need is the gap between women's need and their practice of using contraception. Unmet need for contraception in female youth in Cambodia is a public health concern which may lead to unintended pregnancies or abortions that can contribute to maternal morbidity and mortality. Methods: Bronfenbrenner's Social Ecological Model was used as a theoretical framework to analyze data from the 2014 Cambodian Demographic and Health Survey to ascertain demographic and social factors potentially associated with unmet need for contraception. Bivariate and weighted multiple logistic regression analyses with adjusted odds ratios (AOR) were conducted for 4,823 Cambodian, sexually active females aged 15-29 years. Results: The percentage of unmet need for contraception was 11.7%. At the individual level of Social Ecological Model, there was an increased likelihood of unmet need in adolescent girls 15-19 years and women 20-24 years. Unmet need was decreased in currently employed women. At the microenvironment level, there was an increased likelihood of unmet need with husband's desire for more children and when the decision for a woman's access to healthcare was made by someone else in the household. At the macroenvironment level, unmet need was decreased in women who could access a health facility near their residence to obtain medical care. There were no urban rural differences found in the Cambodian sample population. Conclusion: Unmet need for contraception in Cambodian females is associated with younger age, unemployment and low personal autonomy for accessing healthcare but not with education or wealth status. There is a need to implement culturally appropriate reproductive and sexual health literacy programs to increase access to modern contraception and to raise women's autonomy.

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Abstract

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Methods: Bronfenbrenner's Social Ecological Model was used as a theoretical framework to analyze data from the 2014 Cambodian Demographic and Health Survey to ascertain demographic and social factors potentially associated with unmet need for contraception. Bivariate and weighted multiple logistic regression analyses with adjusted odds ratios (AOR) were conducted for 4,823 Cambodian, sexually active females aged 15-29 years.

Results: The percentage of unmet need for contraception was 11.7%. At the individual level of Social Ecological Model, there was an increased likelihood of unmet need in adolescent girls 15-19 years and women 20-24 years. Unmet need was decreased in currently employed women. At the microenvironment level, there was an increased likelihood of unmet need with husband's desire for more children and when the decision for a woman's access to healthcare was made by someone else in the household. At the macroenvironment level, unmet need was decreased in

women who could access a health facility near their residence to obtain medical care. There were no urban rural differences found in the Cambodian sample population.

Conclusion: Unmet need for contraception in Cambodian females is associated with younger age, unemployment and low personal autonomy for accessing healthcare but not with education or wealth status. There is a need to implement culturally appropriate reproductive and sexual health literacy programs to increase access to modern contraception and to raise women's autonomy.

Key words: Adolescent; Contraception; Personal Autonomy; Family Planning; Reproductive and Sexual Health; Unintended Pregnancies

Introduction

Unmet need for contraception is the gap between women's desire for family planning and their practice of using contraception methods (1). The international conference on population and development (ICPD) as coordinated by the United Nations Population Fund (UNFPA) was held in 1994 in Cairo (2). At the centre of the ICPD consensus has been the call for a global commitment to sexual and reproductive health rights and access to family planning for women, - gender equality, and women empowerment which are pivotal for sustainable development (3). In 2015, the United Nations proposed the Sustainable Development Goals (SDGs) which include a set of 17 goals with 169 associated targets to be reached by 2030 (4). Universal access to sexual and reproductive health (SRH), including accessibility to contraception is an important goal for SDGs 2030 (4). Sustainable Development Goal (SDG) 3 focuses on good health and well-being at all ages and the target 3.7 of SDG 3 specifically focuses on providing SRH services (4).

Cambodia is a low income, agricultural country located in the South-East Asian region, bordering Thailand, Laos, and Vietnam (5). Cambodia's turbulent political history in the past

few decades (6) has been a major reason for a slow progress towards improving the country's reproductive health parameters (7). The birth spacing policy in Cambodia was introduced in 1995 as part of the national family planning program (8) in the wake of the ICPD 1994 (2). The Cambodian national population policy was introduced in 2003 (9). Despite the efforts made by the Cambodian family planning program, the current contraception prevalence rate for modern contraception methods is 39% (5). This indicates a large gap between women's knowledge and their practice of contraception use (7). World Health Organisation (WHO) reports that 30% of married Cambodian women do not want to become pregnant, but they either do not use any contraception methods or use traditional methods (8).

Unmet need for contraception (UC) in Cambodian females is associated with unintended pregnancies (10) and unsafe abortions as a result of risky sexual behavior (11) or unsafe sex which contribute to maternal morbidity and mortality (12). Bradley et al in 2012 proposed a revised algorithm to calculate UC for the Demographic Health Surveys which includes a complex measurement of 15 survey items (13). The result was described as the percentage of sexually active women of childbearing age which is 15-49 years, and couples who would prefer to space or limit the next pregnancy but are not using any contraception methods (1).
The disproportionate burden of SRH issues amongst female adolescents and young people in Cambodia (11) and the Asia-Pacific region is often made worse by lack of health literacy, and non-existent SRH services (14). Identification of multiple factors influencing UC in Cambodian females presents an opportunity to implement a holistic SRH program to improve contraception rates for reducing unintended pregnancies (15). This is linked to improving universal access to SRH and contraception in particular, which is an objective for the SDG 3 for good health and wellbeing (4). The comprehensive definition of SRH and rights proposed by Starrs et al (2018)

(16) in the Lancet states that "good sexual and reproductive health is a state of complete physical, mental and social wellbeing in everything associated with sexuality and the reproductive system. All individuals have a right to make informed decisions about their body and be able to access the SRH services" (16). The definition of SRH rights encompasses women's autonomy, eradication of gender violence, respect for reproductive body functions, and the relevant services and interventions which are required to address individuals' SRH needs for their overall well-being (16, 17).

Theoretical Framework

This study is theory based and uses the modified social ecological model (SEM) by Koren and Mawn (2010) (18) and Rizvi et al (2019) (19) as adapted from Bronfenbrenner's SEM (20). The social ecological model for UC includes factors operating at three levels including individual, microenvironment, and macroenvironment (19, 20). These multiple factors at different levels can influence a woman's behaviour patterns for using contraception methods (20). The individual level includes personal characteristics like age, sociodemographic details including area of residence (urban or rural), occupation, and education. The microenvironment level includes interpersonal and societal factors like family, friends and partners; and the macroenvironment level includes relevant policy laws and regulations, media messages for family planning, distance from the health care facilities (19, 20). Using the SEM model provides an understanding of the various factors concurrently functioning at multiple levels and their association with the UC, as well as the identification of prospective gaps in knowledge.

Aim

The primary aim was to determine the social and demographic factors influencing UC amongst Cambodian sexually active 15-19 years old adolescent girls and 20-29 years old women using the social ecological model.

Materials & Methods

The 2014 Cambodian Demographic and Health Survey (CDHS) is the latest national survey which provides countrywide data (5). This is the first study in Cambodia to use the dataset from the 2014 CDHS for weighted data analyses to ascertain factors influencing UC in 4823 Cambodian sexually active females aged 15-29 years, while using the revised 2012 Demographic and Health Survey (DHS) definition for UC (1). The sampling frame including the list of enumeration areas (EAs) was provided by the Cambodian National Institute of Statistics (5). Two-stage stratified sampling and probability systematic sampling were used for participants selection (5). All the details of the 2014 CDHS methodology, study design, questionnaires, and sampling techniques have been published by the Cambodian National Institute of Statistics (5). The survey interviewed a total of 17,578 women and 5,190 men aged 15-49 years (5). The field team units were made up of one team leader, a field editor, a male interviewer, and 2-3 female interviewers (5). The questionnaires were initially in the English language which were translated into Khmer language. The survey response rate was 99.8% (5). All the details for the survey methodology are already mentioned by Rizvi et al (2019) (19). The data used in our study came from the 2014 CDHS questionnaire '*DHS7-Womans-QRE-EN KHIR72FL'* (5). Those females who gave a positive response to the question 'age at first sex' were classified as sexually active. Most surveys ask married females questions about the unmet need for modern contraception, missing the huge cohort of unmarried, sexually active young females (21). It is important to include the unmarried sexually active as well as married adolescent girls and young women in

137 the SRH surveys to obtain a complete picture (21). A set of 15 different questions from the DHS
138 made up the complex calculation of UC and the questions used can be accessed from the
139 'MEASURE family planning and reproductive health indicators database 2015' (13).

140 **Ethics**

141 The 2014 CDHS dataset is freely available with deidentified information from the website for
142 DHS program 'https://www.dhsprogram.com/data/available-datasets.cfm' (22). The dataset was
143 analysed after receiving approval from MEASURE head office for the DHS program (22), and
144 ethics exemption was obtained from the 'Deakin University Human Research Ethics Committee
145 (DUHREC)', Victoria, Australia (project no 2018-157). The 2014 CDHS adhered to the legal
146 requirements of Cambodia and received ethics permission from the Cambodian Ministry of
147 Health and written informed consent was obtained from all participants before undertaking the
148 survey. Additional information about 2014 CDHS can be obtained from the CNIS (23).

149 **Important definitions**

150 **Contraceptive prevalence rate (CPR)**

151 Percentage of sexually active women of reproductive age group aged 15-49 years (married or in
152 a sexual union), who are currently using, or whose partner is currently using any family planning
153 (FP) method at a specific point in time (1).

154 **Unmet need for contraception (UC)**

155 Percentage of sexually active women of reproductive age group aged 15-49 years (married or in
156 sexual union) and couples who would prefer to space or limit the next pregnancy but are not
157 using any contraceptive methods (1). Unmet need for contraception is the sum of both the UC for

158 spacing and for limiting pregnancies (1, 13). Women with an 'UC for spacing' wish to delay the
159 next birth for a specified time (at least two years) but they are not using any contraception (13).
160 Women with an 'UC for limiting' do not want any (more) children but they are not using any
161 contraception (13).

162 **Outcome (dependent) variable**

163 The indicator unmet need for contraception (UC) is calculated as; UC= UC spacing + UC
164 limiting (1, 13), and used as a binary variable 'Yes/No'. The 2014 CDHS with the revised
165 definition of UNC provides the following categories (1); *No UC* if women want a birth within
166 two years; ***'UC for spacing'*** for all women who are sexually active, and want to space their next
167 pregnancy but are not using any contraceptive methods; ***'UC for limiting'*** for women who want
168 to limit the next pregnancy but are not using any contraceptive methods; as 'no UC' for women
169 who want to delay next pregnancy and are using a family planning method so termed *'using for*
170 *spacing'*; 'no UC' if women do not want to have any more births and are using any form of
171 contraception so termed as *'using for limiting'*; If women are using contraception but they say
172 that they are sterilized or do not want any more births or cannot get pregnant, they are
173 categorized as "using for limiting", hence 'no UC'; If women are using any contraception but
174 they say that they want to become pregnant shortly, or after some time, or are unsure about either
175 the timing of a pregnancy, or not certain if they want to have a baby, are all categorized as 'using
176 for spacing', hence termed as 'no UC' (1).

177 **Multiple independent variables**

178 The following independent categorical variables were identified in the literature as likely
179 predictors (24, 25) and are included in the multiple logistic regression model. The variables at

the individual level of SEM (20) included; three age groups in years (15-19, 20-24, 25-29), area of residence (rural and urban), current employment status (yes/no), parity (continuous variable). The variables under microenvironment level included; person in the household deciding about woman's access to healthcare and person in the household deciding about major household items purchase (woman herself, joint decision of woman and husband, husband only, someone else in the household indicating the mother-in-law/parents-in-law), husband's wish for children (both husband and wife want same number of children, husband wants more children, husband wants less children, husband does not know). Variables under the macroenvironment included; listening to any government sponsored media messages about family planning on radio (yes/no), and on television (yes/no) in the past three months, ability to access a nearby health care facility (not difficult/very difficult), participant told about family planning at the health facility (yes/no).

Statistical analyses

The sample size included 4823 sexually active adolescent girls and women aged 15-29 years in Cambodia. The analyses included descriptive, bivariate and multiple logistic regression using the Stata SE version 15.1 (26). A p-value <0.05 was considered statistically significant. Pearson's chi square tests were used for cross-tabulations to determine the degree of association between UC and each categorical variable. To adjust for survey cluster sampling, survey weights were applied. The odds ratios (OR) with 95% confidence interval (CI) were reported for multiple logistic regression analyses showing Crude OR (COR) and adjusted OR (AOR). We used a forward and backward elimination approach for our model and started with a null/empty model, where all candidate variables were included one by one after univariate analyses (Crude OR). The variables which passed the multicollinearity test were included in our final model. There were 407 women missing in the data for two of the independent variables, 'person who decides

for access to healthcare for the woman' and 'person who decides to purchase the major household items'. These missing values were listwise deleted and the AOR were reported for a total of 4416 sexually active women. There was no significant difference in UC in urban or rural regions. Post-estimation diagnostic tests such as ROC curves and Hosmer-Lemeshow's goodness of fit tests were also applied so that probabilities more than 0.05 using the 95% confidence interval were taken as a good fit (27).

Results

The personal, social and demographic characteristics of participants are presented in Table 1. The sample included 4823 participants, including 1329 (27.5%) urban and 3494 (72.4%) rural females (15-29 years). The results after applying multiple logistic regression are shown under the social ecological model (SEM) (20) in a flow chart in Fig 1.

It was noted that Chi-square test, and Crude Odds Ratio (COR) were non-significant for the variables, 'education', and 'wealth index', so these two variables were not included in the final multiple logistic regression analyses. The multiple logistic regression analyses results (n=4416) (Model I) as in Table 2 are presented under the individual, microenvironment and macroenvironment levels of SEM (20).

Individual level of SEM

a. Knowledge of contraceptive methods and menstrual cycle

Ninety-nine percent participants had heard of at least two to three family planning methods including modern and traditional methods. However, 76.5% participants either did not know or had incorrect information about their menstrual cycles and ovulation days.

b. Contraceptive prevalence rate (CPR)

The contraceptive prevalence rate (CPR) for traditional and modern methods was 49%. Modern contraceptive prevalence rate was 35.3% and traditional contraceptive prevalence rate was 13.7%.

c. Unmet need for contraception (UC)

The UC was 11.7% which was the sum of UC for spacing (9.4%) plus UC for limiting (2.3%). The highest UC was in adolescents aged 15-19-years (15.2%), followed by women aged 20-24 years (12.1%), and 25-29 years (10.5%). Descriptive analyses show that amongst adolescents, UC for spacing was 13.5% and UC for limiting was 1.7%. Amongst young women (20-24 years), UC for spacing and limiting was 10.6% and 1.5% respectively, and amongst 25-29-year-old women, UC for spacing and limiting was 7.5% and 3% respectively.

Multiple regression analyses show that there was an increased likelihood of UC in the younger age groups including adolescent girls aged 15-19 years (AOR=1.8, 95% CI=1.2-2.5) and women 20-24 years (AOR=1.4, 95% CI=1.1-1.8) compared to the women in their late twenties (25-29 years) (see Table 2).

d. Total number of children ever born/parity

There was an increased likelihood of UC with multiparity (see Table 2).

e. Employment

There was a decreased likelihood of UC in currently employed females aged 15-29 years (AOR=0.6, 95% CI=0.4-0.8) (see in Table 2).

Microenvironment level of SEM

a) Person making decision for women's access to healthcare

There was an increased likelihood of UC when someone else in the household decided about the woman's access to healthcare (AOR=1.9, 95% CI=1.02-1.38). That person could be either the mother-in-law or the parents-in-law (see Table 2).

b) Husband's desire for children

There was an increased likelihood of UC if the woman's husband wanted more children (AOR=1.3, 95% CI=1.01-1.8) (see Table 2).

c) Woman's lack of autonomy to ask her husband to use a condom

Three hundred and twenty-three (7.2%) participants reported that they could not demand condom use from their husbands at the time of sexual intercourse, and 316 (7.1%) were not sure if they could ask their husbands to use condoms.

Macroenvironment level of SEM

a) Listening to media messages for contraception on radio and television

There was no significant association between UC and listening to media messages on either radio or television about contraception in the last three months (see Table 2).

b) Distance to health care facility and getting medical help

Descriptive analyses show that 1663 (34.5%) women 15-29 years reported accessing a nearby health care facility for medical help was very difficult, compared to 3160 (65.5%) women reporting that it was not a big problem. There was a decreased likelihood of UC in females aged 15-29 years who could easily access health care facility nearby to obtain medical care for themselves (AOR=0.7, 95% CI=0.6-1.0) (see Table 2).

c) Information given about family planning at the health centre

Descriptive analyses show that 2209 (45.8%) females were not told about family planning and contraception by the health care personnel. There was no significant association between UC and information provided about family planning at the health centre.

Discussion

Adolescent girls and younger women 15-24 years in Cambodia are more susceptible to having UC. The likelihood of UC is also increased in adolescent girls and women under 30 years of age with accessibility issues to a nearby health care facility and low personal autonomy when their access to healthcare is decided by someone else such as the mother-in-law, or the parents-in-law. Unmet need is increased in women with low financial autonomy who are unemployed, and with low reproductive health autonomy when their husbands want more children. This indicates a lack of communication about family size between the couples.

Individual level of SEM

There is an increased trend of UC (15.2%) in Cambodian adolescent girls aged 15-19 years. Similar findings were shown in an analysis of the 2011 Bangladesh DHS data with a higher trend of UC (17%) in female adolescents 15-19 years and youth 20-24 years (28). Wulifan et al (2015) in a scoping review of UC in 34 quantitative and qualitative studies in low to middle income countries (LMICs) reported that UC is increased in adolescent girls and women below the age of 34 years, especially in Zambia and Nepal (29).

Our results show increased UC in women with multiparity. We propose that Cambodian younger women have an increased likelihood of UC as they are married either in their teen years or early twenties and are under social pressure to have early and repeat pregnancies. In Cambodia, one in

four women are already married by age 18 years, and half of the women are married by age 20.5 years (5). Coll et al (2019) analysed data from 73 LMICs and reported that many of the married adolescent girls wish to delay the first birth, or want birth spacing, but they are influenced by the society norms for early child bearing (30). Rizvi et al (2019) report that Cambodian adolescent girls and women 15-29 years have low personal autonomy to access healthcare which can lead to an increased likelihood of having an unintended pregnancy (19).

Women who have current, paid employment have a decreased likelihood of having UC. We posit that women who are currently employed could have an intrinsic motivation to use contraception to avoid an unintended pregnancy or abortion, thus ensuring their earning potential. This is an indicator of financial autonomy and could translate to an improved reproductive health autonomy in the women and result in the use of modern contraceptive methods. Wulifan et al (2015) and Rizvi et al (2019) suggest that women who are currently employed may want to space or limit their future pregnancies to allow continued gainful employment, especially in urban families (19, 29). Conversely, Sedgh et al (2014) show that unemployed women usually have limited or no financial autonomy, which can translate into increased gender inequality and low reproductive health autonomy (21). Studies suggest that unemployed women usually depend on their husband or partner's income and may have low decision-making ability for their SRH matters including non-use, or infrequent use of contraception (21, 29).

Our study did not show any significant association of formal education levels and wealth status with UC. The reason could be an absence of a holistic SRH literacy program inculcated in the Cambodian schools' curriculum. So, these youth could not make an informed decision to use contraception as they did not have the SRH literacy despite attaining formal education. Some studies from LMICs show different results. Haq et al (2017) (31) from Bangladesh report that

higher education level and wealth status in adolescent girls and women was significantly associated with increased contraception use. In contrast, Ngome et al (2014) (32) reports that in Zimbabwe, adolescents 15-19 years with a higher education level were less inclined to use contraception.

Microenvironment level of SEM

Unmet need for contraception is significantly increased in women when someone else in the household decided about their access to healthcare, thus reducing their personal autonomy. We posit that these younger females' health seeking behaviours are deeply influenced by the ingrained societal norms which originate from a patriarchal culture. Studies from Cambodia (19, 24), as well as from many LMICs in Asia (33), and some African countries (34) show that women's decision to access health care, including contraception, are usually made either by their husband or by another family member (elder) in the household (34). In many situations it is the mother-in-law, or their father-in-law (34) who make these decisions. As a result, these females have low or non-existent decision-making ability regarding contraceptive use (30). Phan (2016) used DHS data from four South-East Asian countries including the Philippines, Cambodia, Indonesia, and Timore-Leste, and reported that employment, education status, and house-hold decision making autonomy were the three factors which consistently affected women's empowerment (35). The Sustainable Development Goals (SDGs) especially SDG 3 and 5 put emphasis on human rights, women empowerment and the right of young girls and women to achieve gender equality and access to health (36).

Our results show an increased likelihood of UC if the husband wanted more children, indicating that the desire for birth spacing or for a smaller family size amongst married adolescent girls and women is not considered. We posit a lack of communication about the desired family size

between the husband and wife. Melese et al (2016) found in a study in Ethiopia that the husband's wish for children is significantly associated with increased UC and subsequent unintended pregnancy (37). The reason could be sociocultural as children are considered as wealth in the community (37). A study in Cambodia by Hukin (2014) reported similar perceptions amongst most men and elders noting that having more children was considered to increase the financial support and family networking, and it balances the burden of care for the parents (38). Similar findings are reported by Samandari et al (2010) (24) who noted that the likelihood of Cambodian women using effective contraception increased three times if their husbands wanted a smaller family (24). We recommend a holistic SRH program which involves the couples, and the elders in the household to improve awareness and communication about desired family size and use of effective modern contraception. Gupta et al (2016) (34) and Samandari et al (2010) (24) suggest that health education programs need to take a collective decision-making approach by the wives, husbands and elders in the household into consideration when designing SRH and FP campaigns. Studies from Cambodia (24) and multiple qualitative studies from LMICs in South-East Asia and Central Asia (29) have also reported that communication amongst the husband and wife about the ideal number of children, and the husband's support for use of effective contraception can decrease the UC (29).

Macroenvironment level of SEM

In our study, females aged 15-29 years had low UC if they could physically access a nearby health care facility to obtain SRH care. A proportion of women (34.5%) found it very difficult to access a health care facility close to their place of residence. Previous studies from Cambodia show that some young women due to their migrant status reside in the low socioeconomic peri-

urban areas with limited access to modern contraception and SRH services at the health care facilities (39, 40).

In Cambodia and most other LMICs, there is a social stigma pertaining to the adolescents sexual behaviour and pre-marital sex (39, 40). This manifests as reluctance on the part of the healthcare personnel in providing SRH information and services to the adolescents and youth (39, 40). There is a dearth of person-centred SRH and counselling at the health care facilities for the women in Cambodia. This indicates an opportunity to train the health care personnel at various government and private health care facilities by increasing their communication skills for SRH education. There is a need to provide mandatory education about SRH and modern contraception to the male and female youth coming into the health centres. Peou (2016) suggests that young Cambodian females face a number of personal, social, psychological and physical challenges in accessing SRH including modern contraceptive methods at the health care facilities due to the rapid rural to urban migration and industrialization (39).

There is a good window of opportunity for a targeted SRH program for Cambodian youth through awareness campaigns about the advantages of family planning and modern contraception disseminated via the electronic media. This could include awareness campaign in the form of mobile text messages by Cambodian government sponsored family planning program. At the moment, there is no SRH literacy program for adolescents and youth, especially the out-of-school adolescents and young people in Cambodia (41). It is imperative to ensure that adolescents and young people are given a place at the table to discuss their SRH needs, make informed decisions and that they are provided with accurate SRH information (14).

Conclusions

Multiple factors influence UC in Cambodian females, including younger age groups, unemployment, and decreased accessibility to SRH services. The social norms in Cambodian society dictate a low or non-existent personal and reproductive health autonomy amongst sexually active adolescent girls and women in their twenties. In the married women, this could be partly explained by a lack of communication amongst the couple for SRH, contraception use, and desired number of children which is influenced by the role of husband or parents-in-law. Our study results concur with the existing literature for LMICs and contribute to the gaps in literature on UC amongst sexually active single and married Cambodian females.

Limitations

The study is based on cross sectional data which cannot determine causality. However, the results help us to ascertain the factors influencing UC amongst Cambodian females at different levels of the social ecological model. The study focus has been on females only, which includes sexually active single and married adolescents and women who are under 30 years, as the negative consequences of UC in terms of unintended pregnancies and induced abortions are higher in these age groups. Future studies should include the perspectives of Cambodian males about SRH and contraception to better understand the factors that may play a role in UC.

Recommendations

A culturally sensitive, accessible and multipronged SRH literacy program is important for increasing the accessibility of women and couples to make informed choices for using modern contraception methods. Cambodia can achieve the targets set for Sustainable Development Goal 3 as proposed by the United Nations for gender equality, and improved personal, financial and

reproductive health autonomy of women by increasing social awareness amongst youth, women, and couples in the Cambodian society.

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Table 1(on next page)

Sociodemographic details of adolescent girls and women under 30 years in Cambodia

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2 **Table 1: Sociodemographic details of Cambodian urban and rural sexually active females 15-29 years**

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No	Independent variables	Age group 15-19 years (n and %)		Age group 20-24 years (n and %)		Age group 25-29 years (n and %)	
		Urban	Rural	Urban	Rural	Urban	Rural
1.	**Number of participants**	108 (8.1%)	404 (11.5%)	489 (36.8%)	1404 (40.2%)	732 (55%)	1686 (48.2%)
2.	**Unmet need for contraception (UNC)****	19 (17.6%)	59 (14.6%)	61 (12.5%)	169 (12%)	65 (8.9%)	191 (11.3%)
3.	**Education level**						
	No education	4 (3.7%)	38 (9.4%)	27 (5.5%)	124 (8.8%)	22 (3%)	274 (16.2%)
	Primary	39 (36.1%)	186 (46%)	142 (29%)	658 (46.8%)	232 (31.7%)	897 (53.2%)
	Secondary	63 (58.3%)	179 (44.3%)	268 (54.8%)	598 (42.6%)	360 (49.2%)	482 (28.6%)
	Higher	2 (1.8%)	1 (0.2%)	52 (10.6%)	24 (1.7%)	118 (16.1%)	33 (1.9%)
4.	**Marital status**						
	Never in a union or not married	8 (7.4%)	7 (1.7%)	22 (4.5%)	2 (0.1%)	6 (0.82%)	2 (0.1%)
	Married/living with a partner	93 (86.1%)	373 (92.3%)	424 (86.7%)	1319 (93.9%)	664 (90.7%)	1577 (93.5%)
	Widowed/Divorced/Separated	7 (6.5%)	24 (5.9%)	43 (8.8%)	83 (5.9%)	62 (8.5%)	107 (6.3%)
5.	***Wealth Index***						
	Poorest	46 (43.4%)	88 (22.1%)	150 (31.2%)	321 (23.3%)	187 (25.9%)	351 (21%)
	Poorer	16 (15.1%)	91 (22.8%)	120 (25%)	278 (20.1%)	158 (21.9%)	381 (22.8%)
	Middle	21 (19.8%)	82 (20.6%)	84 (17.5%)	275 (19.9%)	150 (20.8%)	314 (18.8%)
	Richer	16 (15.1%)	62 (15.5%)	83 (17.3%)	243 (17.6%)	122 (16.9%)	311 (18.6%)

	Richest	7 (6.6%)	75 (18.8%)	43 (8.9%)	262 (19%)	105 (14.5%)	315 (18.8%)
6.	**Number of children ever born**						
	0	58 (53.7%)	223 (52.2%)	160 (32.7%)	293 (20.8%)	98 (13.4%)	143 (8.5%)
	1	47 (43.5%)	164 (40.6%)	240 (49%)	772 (55%)	280 (38.2%)	537 (31.8%)
	2	3 (2.8%)	16 (3.9%)	81 (16.5%)	292 (20.8%)	271 (37%)	662 (39.2%)
	>3	0 (0%)	1 (0.2%)	8 (1.6%)	47 (3.3%)	81 (11%)	401 (23.7%)
7.	**Current contraception use**						
	No contraceptive use	77 (71.3%)	309 (76.5%)	281 (57.4%)	738 (52.5%)	323 (44.1%)	731 (43.3%)
	Traditional contraceptive methods	14 (12.9%)	21 (5.2%)	87 (17.7%)	158 (11.2%)	162 (22.1%)	216 (12.8%)
	Modern contraceptive methods	17 (15.7%)	74 (18.3%)	121 (24.7%)	508 (36.2%)	247 (33.7%)	739 (43.8%)
8.	**Current employment status**						
	No current employment	51 (57%)	157 (38.8%)	186 (38%)	517 (36.8%)	169 (23%)	511 (30.3%)
	Current employment yes	47.2 (52.8%)	247 (61.1%)	303 (61.9%)	887 (63.2%)	563 (76.9%)	1174 (69.6%)
9.	**Person who decides for respondent's access to healthcare**						
	Woman herself	30 (32.2%)	145 (39%)	157 (37.1%)	552 (41.8%)	268 (40.3%)	664 (42.1%)
	Joint decision of husband and respondent	55 (59.1%)	189 (50.8%)	213 (50.3%)	649 (49.2%)	326 (49.1%)	808 (51.2%)
	Husband only	6 (6.4%)	32 (8.6%)	45 (10.6%)	108 (8.2%)	63 (9.5%)	101 (6.4%)
	Someone else	2 (2.1%)	6 (1.6%)	8 (1.9%)	10 (0.7%)	7 (1%)	4 (0.2%)

**Unmet need for contraception (UNC) is the sum of unmet need for spacing and limiting

Dataset obtained from 2014 Cambodian Demographic and Health Survey (n=4823)

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Table 2(on next page)

Multiple Logistic Regression showing factors influencing unmet need for contraception in sexually active Cambodian females (15-29 years)

Table 2: Multiple logistic regression analyses showing factors influencing unmet need for contraception in sexually active Cambodian females (15-29 years)

Factors influencing unmet need for contraception	Crude Odds Ratio (COR), 95% Confidence Interval (CI) with p-values (n=4823)	Adjusted Odds Ratio (AOR), 95% Confidence Interval (CI) with p-values (n=4416) Model I
Individual level of Social Ecological Model*		
Age Group		
15-19 years	1.4 (1-1.9) **p=0.04**	1.7 (1.2-2.6) **p=0.004**
20-24 years	1.2 (0.9-1.5) p=0.08	1.4 (1.1-1.8) **p=0.01**
25-29 years (base)		
Region		
Urban	0.9 (0.6-1.3) p=0.7	1.05 (0.7-1.4) p=0.7
Rural (base)		
Employment		
Yes	0.5 (0.4-0.7) **p=0.001**	0.6 (0.5-0.8) **p=0.001**
No (base)		
Parity (continuous variable)	1.2 (1.06-1.3) **p=0.02**	1.3 (1.1-1.4) **p=0.001**
Microenvironment level of Social Ecological Model*		
Decision for family size		
Husband wants more children	1.4 (1.03-1.8) **p=0.02**	1.3 (1.0-1.8) **p=0.03**
Husband wants fewer children	1.1 (0.6-1.9) p=0.6	1.1 (0.6-1.9) p=0.6
Do not know	1.1 (0.8-1.6) p=0.4	1 (0.7-1.4) p=0.9
Both want same number of children (base)		
Person deciding about woman's access to healthcare (n=4448 for		

Model I)		
Respondent and husband together	0.8 (0.7-1.1) p=0.2	0.9 (0.7-1.1) p=0.4
Husband alone	0.8 (0.5-1.2) p=0.3	0.8 (0.5-1.3) p=0.4
Someone else in the family	2.4 (1.2-4.9) **p=0.01**	1.9 (1.0-3.8) **p=0.03**
Respondent alone (base)		
Person deciding about major household items purchase (n=4446 for Model I)		
Respondent and husband together	0.9 (0.6-1.2) p=0.4	0.9 (0.6-1.2) p=0.6
Husband alone	0.6 (0.3-1.1) p=0.1	0.6 (0.3-1.0) p=0.08
Someone else in the family	1.9 (1.01-3.8) **p=0.04**	1.9 (0.9-3.9) p=0.06
Respondent alone (base)		
Macroenvironment level of Social Ecological Model*		
Participants heard about family planning media messages on radio in the last three months		
Yes	0.9 (0.7-1.1) p=0.2	0.9 (0.7-1.2) p=0.6
No (base)		
Participants heard about family planning media messages on television in the last three months		
Yes	0.9 (0.7-1.1) p=0.3	1.1 (0.9-1.4) p=0.2
No (base)		
Accessible distance to health facility and getting medical help for herself (n=4823 for Model I)		
Not difficult	0.7 (0.6-0.9) **p=0.04**	0.7 (0.6-1.0) **p=0.05**
Very difficult (base)		
At the health facility, participants told about family planning (n=4822 for Model I)		
Yes	1.1 (1.01-1.5) p=0.03	1.1 (0.9-1.4) p=0.2

No (base)		

Model I: Number of strata = 38; Number of PSUs = 608; Number of observations = 4416; Degree of freedom (df) = 570, F= 3.96, Prob > F= 0.000, p-value significant (shown in bold) if p <0.05

*Bronfenbrenner's social ecological model used as theoretical framework with three levels (Individual level, microenvironment level, macroenvironment level

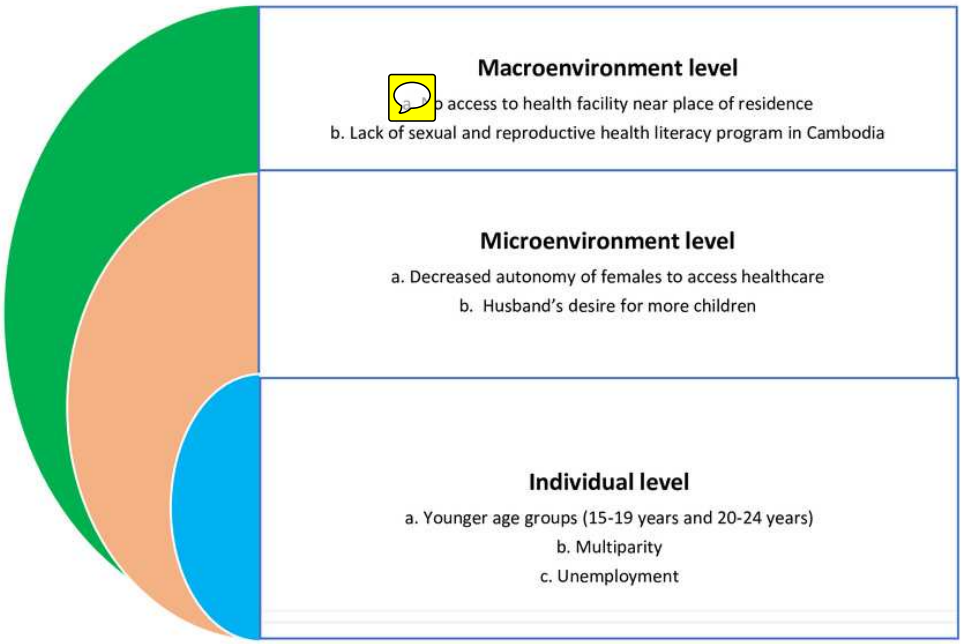
**Hosmer-Lemeshaw goodness-of-fit test for logistic model: F (9,562) = 0.8, Prob > F = 0.6

***Data used from 2014 Cambodian Demographic and Health Survey (CDHS)

Figure 1

Social Ecological Model for factors influencing unintended pregnancies in sexually active, single, in union, or married adolescent girls and women aged 15-29 years in Cambodia

Figure 1 Social Ecological Model for factors influencing unintended pregnancies in sexually active, single, in union, or married adolescent girls and women aged 15-29 years in Cambodia



*Analyses of data for 4823 sexually active females from 2014 Cambodian Demographic and Health Survey to determine associations by using multiple logistic regression analyses

Adapted from:

nfenbrenner, U 1979, The ecology of human development, Harvard university press.

b) Koren A, Mawn B. The context of unintended pregnancy among married women in the USA. BMJ Sexual & Reproductive Health. 2010;36(3):150-158.