MINISTRY OF HEALTH

UNIVERSITY OF HEALTH SCIENCES, FACULTY OF PUBLIC HEALTH

and

MINISTRY OF EDUCATION AND TRAINING - MINISTRY OF HEALTH

HANOI UNIVERSITY OF PUBLIC HEALTH

PHONEVILAI SANTISOUK

PREGNANCY HEALTH LITERACY AMONG TEENAGERS IN KAYSONE DISTRICT, SAVANNAKHET PROVINCE, LAO PDR

MASTER THESIS

MASTER OF PUBLIC HEALTH

CODE: 8720701

HANOI, 2019

MINISTRY OF HEALTH

UNIVERSITY OF HEALTH SCIENCES, FACULTY OF PUBLIC HEALTH

and

MINISTRY OF EDUCATION AND TRAINING - MINISTRY OF HEALTH

HANOI UNIVERSITY OF PUBLIC HEALTH

PHONEVILAI SANTISOUK

PREGNANCY HEALTH LITERACY AMONG TEENAGERS IN KAYSONE DISTRICT, SAVANNAKHET PROVINCE, LAO PDR

MASTER THESIS

MASTER OF PUBLIC HEALTH

CODE: 8720701

Assoc. Prof. Nguyen Thanh Huong, PhD **Dr. Visanou Hansana**

HANOI, 2019

Acknowledgements

This independent study would not have been possible without the help and support of many people.

I am very thankful to the Ministry of Health of the Lao PDR and to the LEARN programme for funding my studies at the University of Health Sciences and Hanoi University of Public Health.

The help of the Faculty of Public Health is also gratefully acknowledged for allowing me to study in this programme.

My sincere and deep gratitude go to my major advisor, Assoc. Prof. Nguyen Thanh Huong of Hanoi University of Public Health (HUPH), Vietnam and to my co-advisor, Dr. Visanou Hansana of the University of Health Sciences (UHS), Laos for their constructive suggestions, guidance and encouragement in the course of my study.

I am most grateful to the directors of Kaysone District Hospital, the heads of villages and the teenagers who kindly agreed to help and participate in this research. This study could not have been completed without their generous assistance.

I am grateful to all the lecturers, teachers and staff of the UHS, Laos and HUPH, Vietnam for their continuous assistance and helpful advice.

I would also like to thank my classmates for their kindness during the period of my studies at the UHS, Laos and HUPH, Vietnam.

Finally, I must express my profound gratitude to my parents and to my husband for providing me with unfailing support and continuous encouragement throughout my years of study in this Masters programme and through the process of researching and writing this thesis. This accomplishment would not have been possible without them. Thank you.

Ms. Phonevilai Santisouk

Contents

Abbreviations

AIDS	Acquired immune deficiency syndrome
DHHS	Department of Health and Human Services
DHV	Department of Health of Vientiane Capital
EHF	European Humanist Federation
Lao PDR	Lao People's Democratic Republic
LSB	Lao Statistics Bureau
LSIS	Lao Social Indicator Survey
LYU	Lao People’s Revolutionary Youth Union
MMR	Maternal Mortality Ratio
MOH	Ministry of Health
TPHL	Teenage Pregnancy Health Literacy
SRH	Sexual Reproductive Health
SRHL	Sexual Reproductive Health Literacy
UAP	Universal Access Project
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization
YFS	Youth Friendly Service

List of tables

List of figures

Abstract

Pregnancy health literacy especially among teenagers is a major protective factor for teenage pregnancy. In Lao PDR, 15% of mother mortality cases are teenage mothers while 18% of girls aged 15-19 have begun child bearing and are more common in rural than urban areas. Based on the concept of sexual and reproductive health literacy (SRHL), the concept of teenage pregnancy health literacy (TPHL) has been developed focusing on the ability of an individual to access, understand, appraise and apply the information to informed decision making for teenage pregnancy prevention. The aim of this study was to describe pregnancy health literacy and its related factors among teenagers in Kaysone district.

This was a cross-sectional study conducted in two villages: Oudomvilay and Kheuakhaokat of Kaysone district, Savannakhet Province, Lao PDR. The TPHL score was collected in face to face interviews with 262 adolescents using 33 items in January 2019. Calculation of the TPHL index score was based on the HL-EU index formula. The TPHL index was also based on the HL-EU standard level and descriptive statistics were used to explain the score and levels. Descriptive analyses were performed to analyse the individual, family, peer and school variables and to investigate the level of TPHL and linear regression was used to identify factors related to TPHL.

The overall score of TPHL was a mean of 27.07. Most (60%) of the adolescents had problematic TPHL levels and only 0.4% had excellent TPHL levels. There were 15 independent variables in the model of TPHL and after multivariate analysis, TPHL was positively associated with living in urban areas (β=2.42; p=0.002), higher education (β=3.89; p<0.001), schooling (β=0.96; p=0.001), being single (β=1.9; p<0.001), higher education of father and mother (β=0.72; p=0.007; β=0.37; p=0.001) and attending classes where sex education content was included (β=5.12; p<0.001).

The study results showed that most adolescents had problematic TPHL levels. Low TPHL scores show the importance of sexual education for adolescents to be improved and also of increasing TPHL for a good health situation in Lao PDR.

Introduction

Worldwide maternal deaths associated with pregnancy and childbirth are significant components of mortality for girls aged 15–19 (Conde-Agudelo, Belizán, & Lammers, 2005). Eleven percent of all pregnancies are among adolescents aged 15–19 years and one in four women have had a live birth before age 18 (UNFPA, 2015). Notably about 95% of these pregnancies occur in low- and middle-income countries (WHO, 2012). Many adolescent girls have difficulties with accessing and understanding information about sexual and reproductive health (SRH) and are less likely to use contraceptives than adults (Chandra-Mouli, McCarraher, Phillips, Williamson, & Hainsworth, 2014).

Maternal health literacy (MHL) is defined as a woman's knowledge, skill, and ability to gain access to, understand, and use information in ways that promote and maintain her health and that of her children (Thomas et al., 2018). The need for MHL in female adolescents is attributed to the increasing prevalence of teenage pregnancies. Adolescents who had a higher frequency of getting health information were found to have a higher level of health literacy (Ghaddar, A Valerio, Porta, & Hansen, 2012; Naigaga, Guttersrud, & Pettersen, 2015). Inadequacy of health literacy has been related to frequent poor health outcomes, such as poor overall health status and higher mortality (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Education about pregnancy health literacy especially among teenagers is a major protective factor for teenage pregnancy (WHO, 2012). Health literacy at an early age can help develop one's ability to understand health information and improve interactions with the health care system (Manganello, 2007).

In Lao PDR, teenage pregnancy is still a problem: the maternal mortality rate was 197 deaths per 100,000 live births (WHO, 2015). Seventy percent of the young population reside in rural areas with the largest number in the major provinces of Savannakhet, Vientiane and Champasak (LYU & UNFPA, 2014). According to LSB and MOH, 15% of mother mortality cases was comprised of teenage mothers

and 18% of girls aged 15-19 had begun child bearing and these girls were more common in rural than urban areas (LSB & MOH, 2017). The high teenage pregnancy rate in Laos indicates that there is a lack of sexual knowledge and effective sexual education among adolescents (UNICEF, 2011). Adolescents who study in rural areas had a lower sexual and reproductive health literacy (SRHL) score (16.2) and those who rarely or never attended SRH subject classes regularly had lower SRHL (17) (Vongxay et al., 2019).

Therefore, education is very important because the level of education is a strongly related factor and a low level of education has been identified as a contributing factor to the occurrence of adolescent pregnancy (Wallace, 2011).The higher the level of education one attains, the higher the level of health literacy. Further, access to reproductive health information has been found to have a positive impact on the health literacy in adolescents (Paek, Reber, & Lariscy, 2011). SRHL goes beyond knowledge and behavior and reflects the motivation and competences to access, understand, appraise and apply SRH information into informed decision making. Based on the concept of SRHL (Vongxay et al., 2019), Teenage pregnancy health literacy (TPHL) focuses on the ability of an individual to access information, understand the information, and appraise and apply the information into informed decision making for teenage pregnancy prevention.

In recent years, more research focused on the situation of health literacy and its association with adverse health behaviors and outcomes (Sørensen et al., 2012). That is why there is shortage of information related to what is the real situation of TPHL and the related factors among teenagers aged 15-19. Therefore this study has been conducted to provide information based on responses to these questions. The aim of this study is to describe pregnancy health literacy and its related factors among teenagers (15-19 years old) in Kaysone district, Savannakhet Province, Lao PDR. Findings of this research can help the health provider and other stakeholders to improve reproductive health services for this target population.

Research objectives

1. To describe pregnancy health literacy among teenagers (15-19 years old) in Kaysone district, Savannakhet Province, Lao PDR 2019.
2. To identify some factors related to pregnancy health literacy among teenagers (15-19 years old) in Kaysone district, Savannakhet Province, Lao PDR 2019**.**

Chapter 1

Literature review

This study measures pregnancy health literacy among teenagers aged 15-19 in two villages in Kaysone district of Savannakhet Province, Lao PDR. The researcher reviewed definitions, theories and researches that were related to this study. Based on the literature review the conceptual framework of this study was formulated. This chapter is divided into 6 parts.

1.1 Concept of health literacy

1.1.1 The development of the concept of health literacy

Health literacy first appeared in a medical seminar in the United States in 1975 (Mancuso, 2009) and began to spread widely under a broad definition until the World Health Organization (WHO)'s definition was disseminated in 1998, encouraging member countries to cooperate in developing and promoting healthy people. Health literacy later appeared in a research paper that highlighted the importance of health education in promoting health policies related to health, education and mass communication to improve health literacy of the population (Starfield, Shi, & Macinko, 2005). Since then health literacy has been on the public health agenda of the world.

1.1.2 Definition of health literacy

Health literacy is a multidimensional, dynamic construct that is defined in various ways:

WHO defines it as follows: “Health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health” (WHO, 1998)

Kinding et al., define health literacy as the degree to which individuals have the ‘‘capacity to obtain, process, and understand basic health information and

services needed to make appropriate health decisions.'' (Kindig, Panzer, & Nielsen-Bohlman, 2004)

The U.S. Department of Health and Human Services defines it as follows: "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions" (DHHS, 2000)

Health literacy is also defined as the degree to which individuals have the ''capacity to access, appraise, and understand and apply health information to make appropriate health decisions' (Peerson & Saunders, 2009)

1.1.3 Definition of pregnancy health literacy among teenagers

Based on the concept of a previous study, "SRHL is the self-perceived ability of an individual to access the needed information, understand the information, [and] appraise and apply the information into informed decision making for a good way to contribute to sexual and reproductive health" (Vongxay et al., 2019). The concept of TPHL has been developed focusing on the ability of an individual to access the needed information, understand the information, and appraise and apply the information for decision making.

According to WHO, which defines the term "adolescent" synonymously with "teenager", "Teenage pregnancy, also known as adolescent pregnancy, is pregnancy in a female under the age of 20". Teenage pregnancies among girls less than 18 years of age have irreparable consequences (WHO, 2004).

Adolescence is also referred as a phase of rapid physical and cognitive growth. This is a sensitive stage of life where both girls and boys experience hormonal changes in their body. Not only do their bodies starts taking adult shape, they also become sexually mature. In most statistics the age of the woman is defined as her age at the time the baby is born. Because a considerable difference exists between a 12- or 13-year-old girl, and a young woman of say 19, authors sometimes

distinguish between adolescents aged 15–19 years, and younger adolescents aged 10-14 years (WHO, 2004).

In low and middle income countries, complications from pregnancy and childbirth are one of the primary causes of death for girls aged 15-19. Apart from the increased health risk, teenage pregnancy has immediate and long-lasting socio-economic consequences (UNFPA, 2013).

This study will focus on health, with the target group being the teenagers in Kaysone district, Savannakhet Province between 15 and 19 years of age, commonly referred to as late adolescents. While they have not already acquired major physical changes, they have obtained cognitive maturity; the typical adolescence features of risk taking, curiosity, and anxiety are less prevalent among late adolescents.

1.2 Measurement of health literacy and pregnancy health literacy

1.2.1 Measurement of health literacy

Health literacy has been increasingly recognized as one of the most important social determinants for health. The HLS-EU-Q47 was a satisfactory and comprehensive health literacy survey tool used in Asia (Duong et al., 2017). The HLS-EU-Q47 contained 47 items measuring health literacy. The perceived difficulty of each item was rated on a 5-point Likert scale (0=don’t know, 1=very difficult, 2=difficult, 3=easy, and 4=very easy), with a possible lowest mean score of 1 and a possible highest mean score of 4 (Sørensen et al., 2013). The HLS-EU-Q47 was based on a conceptual model of health literacy and measures four competencies to deal with health relevant information (access/obtain, understand, appraise/judge/evaluate, and apply/use health information) in three domains: health care, disease prevention, and health promotion (Sørensen et al., 2012). See table 1.1 for more details.

Table 1.1: Description of health literacy measures across domains

Measure	Description	Scoring
HLS-EU-Q47 (Sørensen et al., 2013)	The perceived difficulty of each item was rated on a 5-point Likert scale (0=don't know, 1=very difficult, 2= difficult, 3=easy, and 4=very easy), with a possible lowest mean score of 1 and a possible highest mean score of 4.	Total points = 50 Inadequate: 0-25, Problematic: >25-33 Sufficient: >33-42 Excellent: >42-50
HLS-EU-Q47 (Duong et al., 2017)	The perceived difficulty of each item was rated on a 5-point Likert scale (0=don't know, 1=very difficult, 2= difficult, 3=easy, and 4=very easy), with a possible lowest mean score of 1 and a possible highest mean score of 4.	Total points = 50 Inadequate: 0-25, Problematic: >25-33 Sufficient: >33-42 Excellent: >42-50
HLS-Asia (Created by HLS-EU-Q47) (Runk, Durham, Vongxay, & Sychareun, 2017)	The perceived difficulty of each item was rated on a 5-point Likert scale: 0=don't know, 1=very difficult, 2=fairly difficult, 3=fairly easy and 4=very easy	Total points = 50 Inadequate: 0-25, Problematic: >25-33 Sufficient: >33-42 Excellent: >42-50

1.2.2 Measurement of pregnancy health literacy

The existing tools that purport to measure pregnancy health literacy vary in their approach and design as well as in terms of their purpose. Some tools have been

developed for the purpose of screening and serve to divide people into categories with low or high levels of health literacy (Sørensen et al., 2015).

The Lao government has made efforts to improve the health literacy and to ensure the wellbeing of adolescents by introducing SRH policies such as providing family planning services, sexual education and prohibiting child marriages. However, evaluation of the impact of these actions was difficult until last year since there was no tool to measure the sexual health literacy.

The measurement of pregnancy health literacy used the measurement tool according to Vongxay (Vongxay et al., 2019). This scale tool includes pregnancy, contraception and abortion contents. In this study, the focus is on pregnancy and contraception contents. Questions regarding abortion were not used in the current study.

The scale items were conducted to reflect the TPHL, focusing on four components, namely, accessing, understanding, appraising and applying information to make health decisions. The items were examined and developed through discussions with experts, clinicians, and health care providers working in related fields and with focus group discussions with teenagers. Cognitive interviews were conducted with schooling and non-schooling teenagers in communities in Vientiane capital. The target group was teenagers, male and female, and respondents between 15 and 19 years old were selected. They were divided into two groups (15-17 years and 18-19 years), and there were seven in each group. The tool consisted of 33 questions divided into four components, namely, accessing (seven items), understanding (eight items), appraising (six items) and applying (12 items) information to make health decisions. Details of the TPHL questionnaire are in Annex 2.

The scale measuring pregnancy health literacy among teenagers in this study was developed and validated among teenagers in Lao PDR. The TPHL questionnaire includes 33 items divided into four components (access, understand, appraise and apply information to make health decisions), using a 4-point Likert

scale (see annex 2). Individual characteristics of each study participant was obtained via a short structured section of the questionnaire including items on age, sex, education, schooling status, marital status and relationship status.

1.3 Situation of health literacy and pregnancy health literacy among teenagers

1.3.1 Situation of health literacy

1.3.1.1 Situation of health literacy among teenagers around the world

Health literacy has become an increasingly important issue, especially as it is associated with health care (Parker, Wolf, & Kirsch, 2008). The consequences of inadequate health literacy include poorer health status, lack of knowledge about medical care and medical conditions, decreased comprehension of medical information, lack of consideration and use of preventive services, poorer self-reported health, poorer compliance rates, increased hospitalizations, and greater health care costs (Berkman et al., 2011). There are many researches related to health literacy. In the U.S., low health literacy was associated with decreased understanding of indications for, timing of, and contraindications of taking emergency contraception (Raymond et al., 2009). Also, low health literacy is associated with earlier sexual debut, unprotected intercourse at first sexual encounter, and more sexual partners in the in Scotland (Rutherford et al., 2006).

1.3.1.2 Situation of health literacy among teenagers in Lao PDR

In Lao PDR, health literacy also has become an increasingly major concern. Health literacy in students were in the ‘inadequate’ range with scores lower than 25 (36.1%), in the ‘problematic’ range (56.6%) and only 17 (7.0%) in the ‘adequate’ range (Runk et al., 2017). Other research showed adolescents had inadequate (64%) and problematic (31%) SRHL levels. Lower levels of SRH-literacy were found among adolescents with less actual knowledge of sexuality and reproduction (Vongxay et al., 2019). See table 1.2 for more details.

1.3.2 Situation of pregnancy health literacy among teenagers

1.3.2.1 Situation of pregnancy health literacy among teenagers around the world

Related to pregnancy health literacy is maternal health literacy (MHL) in female adolescents, the need for which is attributed to the increasing prevalence of teenage pregnancies. It is of key importance therefore that the factors associated with the variability of MHL in these adolescents are isolated and used as premises to devise approaches aimed at reducing the undesirable health-related outcomes of pregnancy during adolescence. Adolescents who had a higher frequency of getting health information were found to have a higher level of health literacy (Naigaga et al., 2015).

1.3.2.2 Situation of pregnancy health literacy among teenagers in Laos

In the Lao People's Democratic Republic (Lao PDR), teenage pregnancy has been prevalent for decades. In 2012, approximately 14% of the girls aged 15-19 had given birth to a child and 17.8% had begun childbearing (LSB, MOH, UNPFPA, & UNICEF, 2012). The high teenage pregnancy rates indicate that there is lack of sexual knowledge and effective sex education in adolescents in Laos (WHO, 2012). Lower levels of SRHL were found among adolescents with less actual knowledge on sexual and reproduction (Vongxay et al., 2019). Information on TPHL was lacking in similar low-income countries; nevertheless, SRHL remains important for adolescents' health in the future (Berkman et al., 2011). As such, the Lao government has made efforts to improve the health literacy and to ensure the wellbeing of adolescents by introducing SRH policies such as providing family planning services and sexual education and prohibiting child marriages.

1.4 Factors of associated with pregnancy health literacy among teenagers

Among the demographic and social factors which impact on SRHL one notes socioeconomic status, age, living area, sex, attending sexual and reproductive subject class (Vongxay et al., 2019). Level of education is a factor strongly related

to “basic literacy skills” and a low level of education has been identified as a contributory factor to the occurrence of adolescent pregnancy (Wallace, 2011). In addition, peer and parental influences may impact on the health literacy of adolescents (Wasike, 2017). Lack of good health will also lead to many problems, especially in young people, such as having unprotected sex, teenage pregnancy, lack of access to or use of contraception, forced bullying, complications until the death of a young mother,. Factors related to reproductive health, reproduced by review of the material, can be summarized as follows:

1.4.1 Individual factors

Age: Previous studies had found that age is one of the factors that were associated with reproductive health literacy. Young adults had a 1.3-fold chance of risk (95% CI: 0.84- 2.03) based on a comparison between the 16-19 and the 14-15 year age groups (Sychareun & Phengsavanh, 2011). The data from these reviews has shown that "age" is one of the factors in reproductive health literacy.

Sex is found to be one of the key factors in reproductive health in the course of the review. Previous studies have shown that individual males had lower health literacy than females (β=-7.7*; p* = 0.01) (Martin et al., 2009). Men or women have an increased chance of having sexually active behavior. Young men are at risk 2.2 times higher risk (95% CI: 1.33 - 3.60) (Sychareun & Phengsavanh, 2011). Some studies have found that "sex" is a barrier to access, recognition, communication and reproductive health, particularly for women with limited conditions such as poor, migrant workers, members of ethnic groups and others (Svensson & Agardh, 2013). Closely related to the cause ‘little value on education, especially for girls’ at the family level, are the obstacles to girls’ attending or staying in school at the peer/school level (Vongxay et al., 2019). The data from these reviews has shown that "sex" is one of the most important factors in reproductive health literacy.

Living area is also considered a factor strongly associated with health literacy. It is more likely that health literacy is lower, on average, among individuals residing in rural areas (β=-1.76; *p*=0.02)(Martin et al., 2009). The study found a

significant association between SRHL level and where adolescents lived in that those who study in urban environments had a higher SRHL score (21) than those who study in rural areas (16.2) (β=3.21; p< 0.001) (Vongxay et al., 2019).

Education: The Secretariat of the 65th World Health Assembly in 2012 called education "a major protective factor for early pregnancy: the more years of schooling the fewer early pregnancies" (UNFPA, 2013). Educational attainment was strongly positively associated with health literacy, with a 40.7 point mean difference between the lowest and highest categories. Lower educational attainment was associated with lower estimated health literacy at ($p<0.05$) (Martin et al., 2009). Level of education was associated with "basic literacy skills", and those who had a higher level of education were found to score higher on health literacy (Wallace, 2011). In addition, the health literacy measurement in first-year university students in Vientiane produced a problematic health literacy score (26.38) (Runk et al., 2017).

Marital status: This is one of the factors that are associated with health literacy in young people. Previous studies have shown that individuals who were not married also had a lower health literacy than who were married, separated and widowed, although the association was much weaker (β=-4.03; p=0.01) (Martin et al., 2009).

Living status: Living with both parents when compared to living with others or alone suggested that those living with both parents were one-and-a half times more likely to state that they had more knowledge of sexual reproductive health than their counterparts (OR: 1.5; 95% CI: 1.0-2.2; p=0.06) (Wasike, 2017).

1.4.2 Family factors

Parent education: Parent influences are especially relevant for youth (Kindig et al., 2004). Parents play central roles, both directly and indirectly, in determining the future of their adolescents. They may impart information about sexuality and prevention of pregnancy, or they may withhold vital information

(UNFPA, 2013). The factor of significant association was that parents' level of education also influenced adolescents' perceived knowledge level. Parents who had no education were 2.5 times less likely to have SRH knowledge than parents who had secondary or tertiary education (OR: 0.4; 95% CI: 0.3-0.6; p< 0.0001) (Wasike, 2017). Health literacy of parents can also directly impact health outcomes for adolescents. A previous study found that parents with a higher literacy level were more likely to use medication correctly for their children (Leyva, Sharif, & Ozuah, 2004).

Family income: Some teenagers are not continuing education because they are taking care of the family, have low parental income, travel long distances to school, work at a factory or farm to earn money for the family, place a small value on education, and are married early or pregnant (Vongxay et al., 2019). Low- and middle-income nations are consistently at a disadvantage in regard to access to health services. In Lao PDR, for instance, out-of-pocket expenses makeup the majority of health care expenditures (WHO, 2012). Generally, lower income was associated with lower estimated health literacy at ($p<0.05$) (Martin et al., 2009).

1.4.3 Peer factors

Peers: As presented in many studies, influential persons that students most like to communicate with are friends (50.5%), followed by mother, sister, teacher and father. While few peer and partner factors have consistently been reported in the literature from developing countries, one worth noting is that where a teen has a friend who has been pregnant, her own risk for pregnancy significantly increases (Vundule, Maforah, Jewkes, & Jordaan, 2001). Peers have also been shown to have a direct influence on literacy as well as health behavior, given their growing prominent role in the lives of youth as they transition into adolescence (Prinstein, Meade, & Cohen, 2003). Peers can influence how adolescents view becoming pregnant. Thus, peer pressure can either discourage early sexual debut and marriage or can reinforce the likelihood of early and unprotected sexual activity (Chandra-Mouli, Camacho, & Michaud, 2013).

1.4.4 School factors

Classes with sex education content included: On average, among individuals residing in rural areas, teens who attended sexual reproductive health subject classes regularly had higher sexual reproductive health literacy than those who attended such classes rarely or never. (β=2.43; p=0.01) (Vongxay et al., 2019). Moreover, sex education is more likely to have a positive impact when it is comprehensive and implemented by trained educators. Through school-based comprehensive sexuality education programmers, educators have an opportunity to encourage adolescents to delay sexual activity and encourage them to behave responsibly when they eventually engage in consensual sexual activity, particularly by using condoms and other modern methods of contraception (UNFPA, 2013).

Course or activity related to sex education taken 1 month before: Sexual health education is more likely to have a positive impact when it is comprehensive and implemented by trained educators. In this regard, routine literacy instruction offers opportunities to enhance health literacy through accompanying health education classes, which provide an excellent opportunity to facilitate the development of skills specific to sexual health literacy (Manganello, 2007).

1.5 Introducing the research place

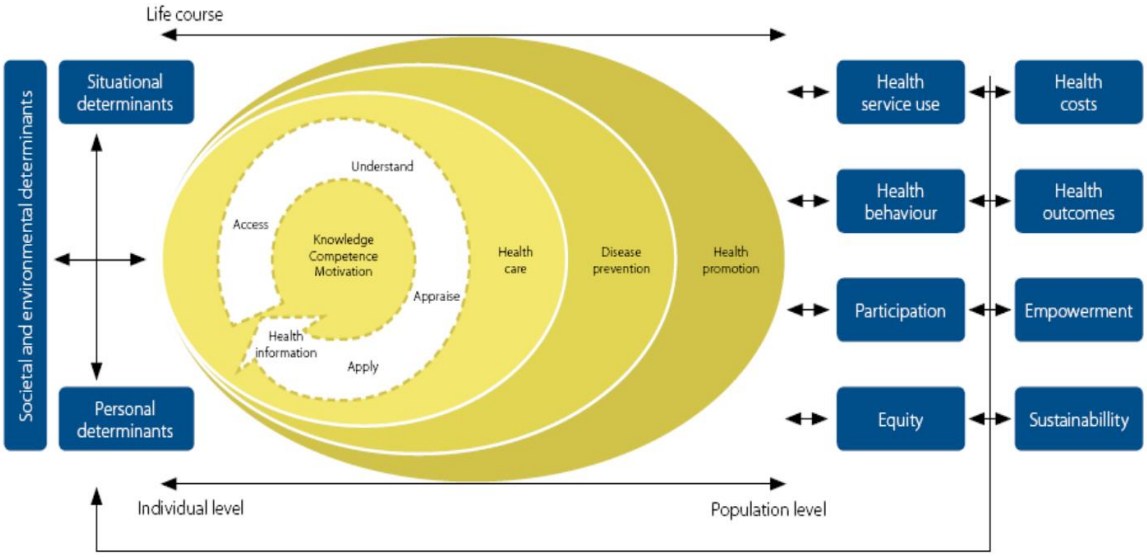
Kaysone district is a city in western Laos and the capital of Savannakhet Province. With a population of 130,000 it is the second-largest city in Laos, after Vientiane. Adolescents (aged 15-19 years) are estimated at 13,000 or 10% of the population of the province(LSB & MOH, 2015). There are 67 villages, 31 urban and 36 rural. 12% of women aged 15-19 years have had a live birth in Savannakhet (LSB & MOH, 2017). One YFS running in this district is aiming to strengthen the capacity of service providers to respond to specific needs of adolescents more effectively and with greater sensitivity and to make services more accessible, appropriate and effective (UNFPA, 2008). As of 2015, the literacy rate of the

population aged 15-19 was 78 %. The adolescent birth rate (age-specific fertility rate for women aged 15-19) has been 69 per 1,000 women and twelve percent of women aged 15-19 years have had a live birth (LSB & MOH, 2017).

The third most mentioned cause of teenage pregnancies in Lao PDR was the limited availability of youth friendly services (YFS). Many respondents illustrated that teenage girls and boys do not have easy access to information on sexually transmitted diseases and pregnancy prevention and do not have access to contraceptive methods (Vongxay et al., 2019). Furthermore, Laos is still struggling to increase the availability of youth friendly services for sexual health (UNICEF, 2011). Access to these services and quality of care is low, especially for unmarried women, and this can increase the problems for youth to apply their knowledge into practice (Sychareun, Phongsavan, Hansana, & Phengsavanh, 2010).

1.6 Conceptual framework

This study focused on the situation of pregnancy health literacy among teenagers and some factors related to pregnancy health literacy among teenagers. This study will follow the conceptual model developed by the European Health Literacy Consortium for the European Health Literacy Survey. See figure 1.1 for more details.



Source: adapted from: Sørensen K et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*, 2012, 12:80.

Figure 1.1: Conceptual model of health literacy of the European Health Literacy Survey

The model identifies the factors associated with health literacy from individual level to whole population level. It shows the competencies related to the process of accessing, understanding, appraising and applying health-related information. According to the 'all inclusive' definition this process requires four types of competencies:

- Access refers to the ability to seek, find and obtain health information
- Understand refers to the ability to comprehend the health information that is accessed
- Appraise describes the ability to interpret, filter, judge and evaluate the health information that has been accessed
- Apply refers to the ability to communicate and use the information to make a decision to maintain and improve health.

This study focused on pregnancy (health care) and contraception (prevention) but not health promotion. It identifies eight sub dimensions of health literacy related to the four competencies of accessing, understanding, appraising and

applying health-related information within pregnancy (health care) and contraception (prevention) (Sørensen et al., 2012). See table 1.2 for more details.

Table 1.2: The European Health Literacy Survey: the 08 sub dimensions as defined by the conceptual model

Health literacy	**Access or obtain information relevant to health**	**Understand information relevant to health**	**Appraise or evaluate information relevant to health**	**Apply or use information relevant to health**
Pregnancy (Health care)	1)Ability to access information on medical or clinical issues (Q 2.3, 2.4, 2.5, 2.6, 2.7)	2)Ability to understand medical information and derive meaning (2.12,2.13, 2.14, 2.15)	3)Ability to interpret and evaluate medical information (Q 2.17, 2.18, 2.19, 2.20, 2.21)	4) Ability to make informed decisions on medical issues (Q 2.22, 2.23, 2.24, 2.25, 2.26, 2.29, 2.30, 2.31, 2.32, 2.33)
Contraception (prevention)	5)Ability to access information on risk factors (Q 2.1, 2.2)	6)Ability to understand information on risk factors and derive meaning (Q 2.8, 2.9, 2.10, 2.11)	7)Ability to interpret and evaluate information on risk factors (Q 2.16)	8) Ability to judge the relevance of risk factors (Q 2.27, 2.28)

The conceptual framework of this study has three factors associated with pregnancy health literacy among teenage, suggesting that different levels of influence contribute to individual development (individual characteristics, family, peer and school).

- Individual factors: These factors in this study are to determine whether sex, age, education, living status and status of school are factors associated with pregnancy health literacy or not.

- Family factors: These factors in the study are to determine parent occupation, parent education, and family income.

- Peer factor: This factor in the study discusses whether pregnancy and use of contraception among peers are factors related to TPHL or not.

- School factors: These factors look at whether attendance of classes where sex education content is included and the number of participants taking a course or activity related to sex education one month before are factors associated with TPHL or not.

The dependent variables in the conceptual framework of this study are the variables focused on the measurement of TPHL and whether teenagers are able to access, understand, appraise and use information to make health decisions. See figure 1.2 for the concept framework.

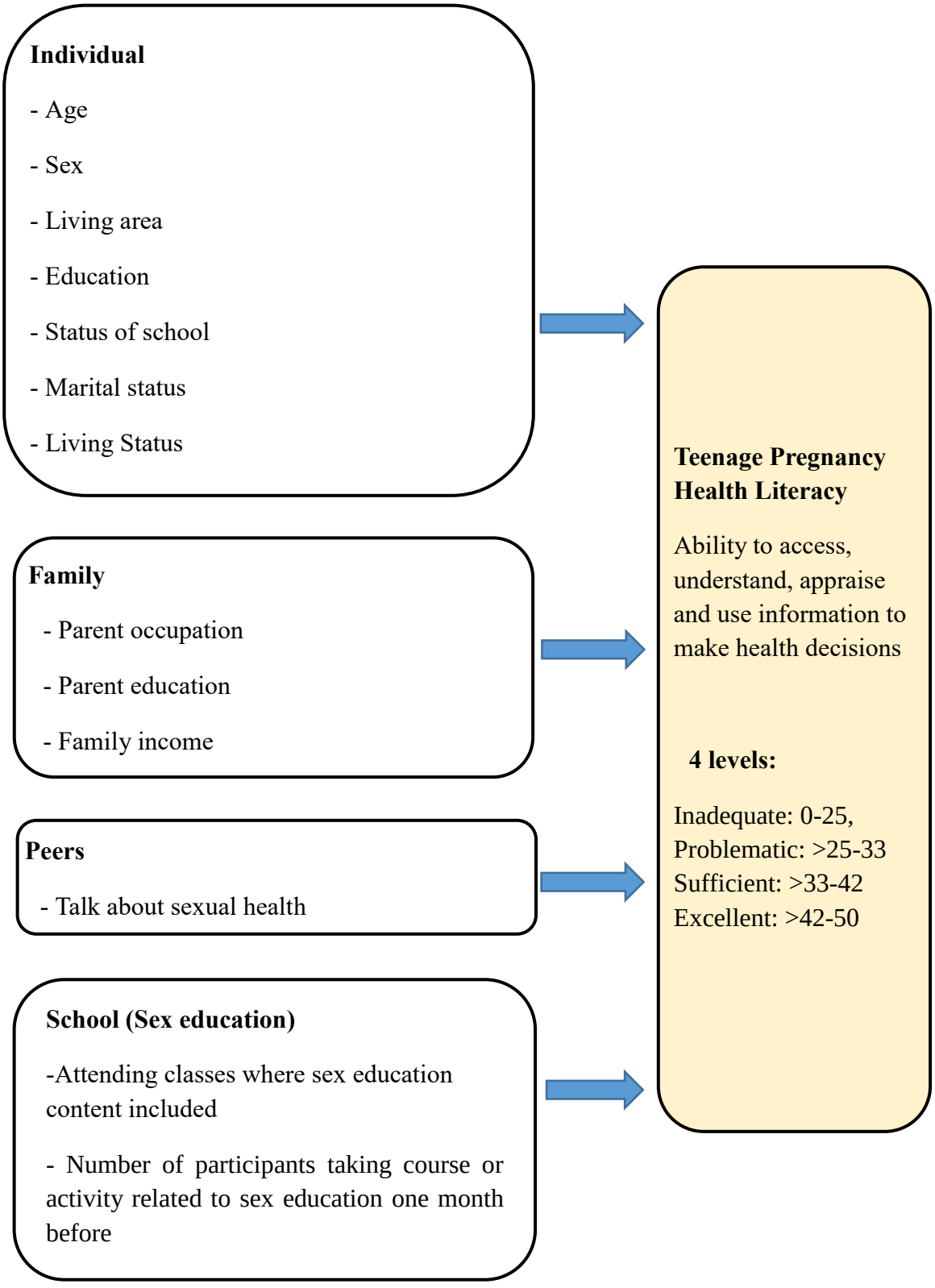


Figure 1.2: Concept framework of Teenage Pregnancy Health Literacy

Chapter 2

Methods

2.1 Study subjects

The target of this study was teenagers aged 15-19 in community, male and female, unmarried or married and schooling or non-schooling Kaysone district, Savannakhet Province, Laos PDR. Only young Buddhist monks or novices were excluded from this study as it was thought to be inappropriate to ask them about sexuality and because they were not representative of the general youth in this study.

2.2 Study site and duration

This study was carried out in Oudomvilay village and Kheuakhaokat village in Kaysone district, Savannakhet Province, Lao PDR. The period of study was from 2018 August to 2019 May. According to the 2015 Census, the whole area of Savannakhet Province is 21,774Km^2 and it has a population of 969,697 (LSB & MOH, 2015). With a population of 130,000, Kaysone district is the second-largest city in Laos, after Vientiane, with 31 villages in urban areas and 36 villages in rural areas, some with road access and some without.. This indicates that although it is the capital city, some villages within the city's administrative boundaries may lack basic infrastructure such as piped water, regular markets or passable roads. The literacy rate of the population aged 15-19 was 78 percent. The birth rates of this age group was 69 per 1,000 women and 12% of women in this age group had had a live birth (LSB & MOH, 2017). Only this district in the province has a Youth Friendly Service (YFS), which has been running since 2012. With a YFS, one would expect that there would be consultation services, providing information in schools and in the community about SRH, including the topics of pregnancy and contraception, and also providing health services for adolescents. However, there had been no formal surveys or research in this district related to SRH. Hence people in the health service departments in Savannakhet and I wanted to conduct this study in the

district to provide an empirical basis for knowledge and measures taken regarding SRH among its young people as well as for an assessment of the of the comprehensiveness and effectiveness of the services of the YFS.

2.3 Design

This study employed a quantitative method with a cross-sectional design. The questionnaire was structured for a quantitative survey in face to face interviews to assess the self-capacity of teenagers in Kaysone district, Savannakhet Province, Lao PDR in accessing, understanding, appraising, and applying information on SRH for decision making.

2.4 Sample size

Teenagers aged 15-19 years, both male and female, unmarried and married, schooling and non-schooling, were the study population. We found 262 teenagers through multi-step sampling from 332 teenagers from the two villages (Oudomvilay 180, Kheuakhaokat 152). For the population size, a calculation was made based on the estimation that teenagers aged 15-19 made up 10% of everyone living in Kaysone district, Savannakhet Province, Lao PDR (LSB & MOH, 2017). The sample size was then determined by using a formula on this total target population of 13,000 young people whereby 50% of the teenagers were estimated to have inadequate levels of TPHL, a confidence level of 95% should be applied and the result was a critical sample size of 262 teenagers aged 15-19.

N: Population size (13,000)

$Z_{\alpha/2}$: Confidence Level 95% (1.96)

p: The estimation that 50% of the teenagers had inadequate levels of TPHL

e: Confidence limits as a percentage: 6% (0.06)

$$n = \frac{N Z^2_{\frac{\alpha}{2}} p(1-p)}{e^2(N-1)+Z^2_{\frac{\alpha}{2}} p(1-p)}$$

$$n=\frac{13000(1.96)^2 0.5(1-0.5)}{(0.06)^2(13000-1)+(1.96)^2 0.5(1-0.5)}=\frac{12485.2}{47.7568}=262$$

Thus the sample size needed for this study was **262 participants**.

2.5 Sampling method

Savannakhet Province has 15 districts, from which Kaysone district was purposely selected because of the existence of the Youth Friendly Service (YFS). The YFS has been implemented in this district since 2012. Next, two villages (one urban and one rural) across this district was randomly selected ('lottery' pick up). A list of all the adolescents aged 15-19 living in these two villages was obtained, after which a systematic random sampling technique was used to select the study participants (Figure 2.1).

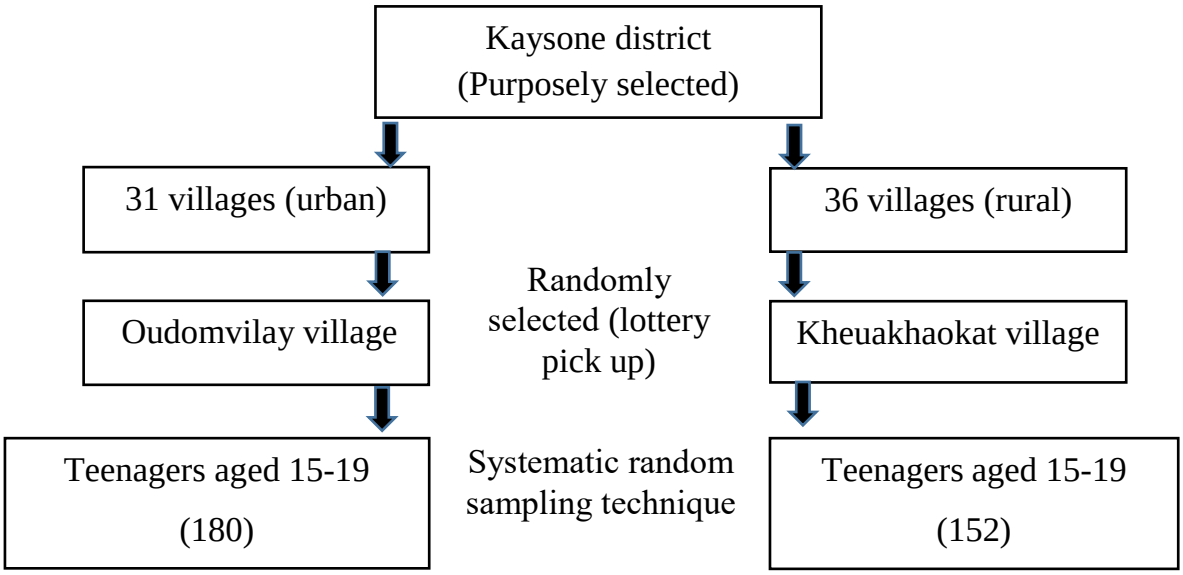


Figure 2.1: Diagram of sampling method

2.6 Data collection method

Data was collected by women (interviewing girls) and men (interviewing boys) who worked in the health care service. Both men and women were engaged as interviewers due to the sensitive information related to adolescents, and an extensive one-day training session was held to standardize the data collection

procedures. The training included a review of the study objectives, the legal context and its implications for the confidentiality of research participants, interpersonal issues, ethics, confidentiality, informed consent, interviewing techniques and detailed instructions on the structured TPHL questionnaires.

The questions included in the questionnaire were prepared based on various related reviews found in the literature, and variables to be measured were identified. The questionnaire was prepared in English in the beginning and then translated into Lao and back to English to ensure consistency. A pretest with 40 respondents in a community was carried out about two weeks before the actual data collection.

2.7 Variables

Individual traits plus peer, parental and system factors all combine to influence one's health literacy. Three groups of independent variables were included in this study: individual variables (age, sex, area, education, status of school, marital status and living status), family, peer variables (education of mother and father, occupation of mother and father, family income and talking about pregnancy or contraception with friends), and school variables (attending classes where sex education content is included and number of courses or activities related to sex education one month before). The one dependent variable was pregnancy health literacy measured by the TPHL scale mentioned above (see Table 2.1).

Table 2.1: List of variables of the study

Variable	Definition	Measurement	Data collection method
Level of pregnancy health literacy among teenagers (15-19 years old) in Kaysone district, Savannakhet Province, Lao PDR 2019			
Teenage Pregnancy Health Literacy (TPHL)	**TPHL** focuses on the ability of an individual to access, understand, appraise and apply information for SRH decision making	33 items measuring health literacy, each rated on a 4-point Likert scale (1=very difficult, 2= difficult, 3=easy, and 4=very easy)	Face to face interview
Factors related to pregnancy health literacy among teenagers (15-19 years old)			
Individual teenage variables			
Age	In years	Continuous	Face to face interview
Sex	Male or female	Bivariate (male, female)	Face to face interview
Living area	Part of a town or district…	Bivariate (urban, rural)	Face to face interview
Education	Highest education level achieved	Category (Never went to school, primary, lower secondary, upper secondary, vocational school, university)	Face to face interview
Schooling status	Whether in school or not	Bivariate (Out of school, schooling)	Face to face interview

Variable	Definition	Measurement	Data collection method
Marital status	Whether married or in other relationship with partner	Category (Single, married/divorced/ separated/in-union)	Face to face interview
Living status	Who participant lives with	Category (living father/mother, living with others)	Face to face interview
Family			
Father's occupation	Father's occupation is a job or profession	Category (Gov./private staff, laborer, farmer, merchant)	Face to face interview
Father's education	Highest educational level father has achieved	Category (Never went to school, primary, lower secondary, upper secondary, vocational school, university)	Face to face interview
Mother's occupation	Mother's job or profession	Category (Gov./private staff, laborer, farmer, merchant)	Face to face interview
Mother's education	Highest educational level mother has achieved	Category (Never went to school, primary, lower secondary, upper secondary, vocational school, university)	Face to face Interview
Household income	Combined income of entire household	Continuous	Face to face interview

Variable	Definition	Measurement	Data collection method
Peer			
Talk about sexual health with friends	Whether participant talks about sexual health with friends	Bivariate (No, yes)	Face to face interview
School			
Attended sex education classes	Whether participant has attended classes with sex education content	Bivariate (No, yes)	Face to face interview
Course or activity related to sex education one month before	Number of times participant has taken course or activity related to sex education one month before	Bivariate (Nil/ 1 time, > 1 time)	Face to face interview

2.8 Measures, assessment criteria and definitions of operational terms

2.8.1 Measures

Based on a previous study by Vongxay et al (2019), which included pregnancy, contraception and abortion, this study focuses on pregnancy and contraception among a sample of adolescents in community. The validity of the questionnaire was first tested in a pilot survey among 40 adolescents in Vientiane. Completing the questions took the adolescents 30-35 minutes. The design was assessed as complete and sufficient; only small adjustments were made. The response rate for the TPHL questions was good. Internal consistency calculated met a level of 0.85 on Cronbach's alpha.

2.8.2 Assessment criteria

The measurement of the TPHL level employed 33 items under four components: accessing (7 items), understanding (8 items), appraising (6 items) and applying (12 items) vis-à-vis health related information using a 4-point Likert scale: 1=very difficult, 2=fairly difficult, 3=fairly easy and 4=very easy. The measurements were divided into four categorical levels: Inadequate literacy, problematic literacy, sufficient literacy and excellent literacy. The cut-off points of these categories follow those categorical of the TPHL, inadequate: 0-25, problematic: >25-33, sufficient: >33-42 and excellent: >42-50 (Sørensen et al., 2013).

These indices for health literacy were standardized to unified metrics from 0 to 50 (0 representing the lowest health literacy and 50 the highest health literacy) using the formula as follows:

$$TPHL = (mean - 1)*(50/3).$$

where TPHL was the specific index calculated, mean was the mean of all participating items for each individual, 1 is the minimal possible value of the mean (leading to a minimum value of the TPHL of 0), 3 was the range of the mean and 50 was the chosen maximum value of the new metric (Sørensen et al., 2013).

2.8.3 The definitions of the operational terms

Teenagers: The boys and girls who were 15-19 years old and living in Kaysone district, Savannakhet Province, Lao PDR.

Health literacy: The capacity of teenagers aged 15-19 to access, appraise, understand and apply health information to make appropriate health decisions.

Teenage pregnancy health literacy (TPHL): The ability of an individual to access sources of information, understand the information, appraise the information and apply the information in informed decision making for teenage pregnancy prevention.

2.9 Data analysis methods: cleaning, entering and analyzing data

The researcher has archived the information with a team as well as tracked the data collection to ensure the accuracy of the process, which also served to ensure the quality of the information. Monitoring was done especially to see that questionnaires were completely answered before data entry.

For data entry, students assisted in keying the figures into a Database Excel Program for it to be easy to check, edit, and submit to other analytic programs. All information was kept confidential and for educational purposes only.

This study used STATA v 14.2 to analyze the data. Descriptive analyses were performed to analyse the individual, family, peer and school variables and to investigate the level of TPHL. Linear regression was used to identify the factors related to TPHL. Comparisons between groups were made with independent Chi-square tests, t-tests (2 variables) and one-way ANOVA (more than 2 variables).

Bivariate and multivariate linear regression models were used to identify predictors of TPHL. First, all factors of interest were tested with univariate linear regression (age, sex, living area, education, schooling status, marital status, living status, father's occupation, mother's occupation, father's education, mother's education, family income, talking about sexual health with friends, having attended sexual training outside school and number of times participant has attended a course or activity related to sex education in the previous month. Only factors with a p-value of 0.05 or lower on these tests were included in the multiple linear regression model. For this model, a backward elimination strategy was used, with a p-value of 0.05 as the cut-off level of significance. Linear regression results were presented as unstandardized regression coefficients.

2.10 Ethical issues

This research was reviewed and approved by the National Ethics Committee for Health Research, Ministry of Health, Lao PDR and the International Review

Board of the Hanoi University of Public Health. Verbal and written consent was obtained from the father, mother or guardian of each participant prior to interviews with the approval of the National Ethics Committee for Health Research. Due to the sensitive nature of the topics in the questionnaire, participants were informed about confidentiality agreements to ensure their privacy. Participants were guaranteed anonymity during and after the research. When conducting the interviews, the interviewers did not record the names and addresses of participants but only their participant identification numbers.

Chapter 3

Results

3.1 Basic information of study subjects

3.1.1 General information

Table 3.1: Individual factors

Characteristics of teenagers	Number(n=262)	Percentage (%)
Age (years) Mean=17.66 ± 1.3 min=15 max=19		
Sex		
Male	99	37.8
Female	163	62.2
Living area		
Urban	148	56.5
Rural	114	43.5
Highest level of education completed		
Primary	46	17.6
Lower secondary	122	46.5
Upper secondary	94	35.9
Schooling status		
Out of school	51	19.5
Lower secondary school	27	10.3
Upper secondary school	103	39.3
University	81	31
Marital status		
Single	237	90.5
In-union	4	1.5
Married	19	7.2
Divorced/separated	2	0.8
Living Status		
Living with father and mother	219	83.6
Living with others	43	16.4

A total of 262 teenagers completed the questionnaire, with no teenagers in attendance refusing to participate. Table 3.1 shows an overview of the individual characteristics of the 148 (56.5%) respondents from the urban area and the 114 **(**43.5%) from the rural area**.** Almost two-thirds (62.2%) of the teenagers were females and the age of the adolescents ranged from 15 to 19, with a mean age of 17.66±1.3. Almost half of the participants had completed lower secondary school and nearly one-fifth of them (17.6%) had completed primary school. At the time of conducting the survey almost two in five or 103 of the teenagers were in upper secondary school, 81 (31%) were in university, 27 (10.3%) were in lower secondary and 51 were out of school. Approximately 91% of teenagers were single, 1.5% were in-union, 7.2 % were married and only 0.8% of them were divorced/separated.

Table 3.2: Family, peer and school factors

Characteristics of teenagers	**Number(n=262)**	**Percentage (%)**
Family factors		
Father's occupation		
Gov. staff/Private staff	55	21
Laborer	54	20.6
Farmer	123	47
Merchant	30	11.4
Highest level of father's education		
Never went to school	23	8.8
Primary	72	27.5
Lower secondary	45	17.2
Upper secondary	65	24.8
Vocational school	15	5.7
University	42	16
Mother's occupation		
Gov. staff/Private staff	23	8.8
Laborer	20	7.6
Farmer	159	60.7
Merchant	60	22.9

Characteristics of teenagers	Number(n=262)	Percentage (%)
Highest level of mother's education:		
Never went to school	38	14.5
Primary	77	29.4
Lower secondary	64	24.4
Upper secondary	59	22.5
Vocational school	7	2.7
University	17	6.5
Family income		
Mean=265 ± 187.6, min=$11.7, max=$1,176		
Peer factor		
Talk about sexual health with friends		
No	176	67.2
Yes	86	32.8
School factors		
Ever attended class in school where sex education content included		
No	33	12.6
Yes	229	87.4
Taken course or activity related to sex education one month before		
Nil / 1 time	33	12.3
More than 1 time	229	87.4

Based on the descriptive family and peer factors the study sample was reasonably representative, with a mean family income ($) of 265±187.6, a minimum of $11.7 and a maximum of $1,176. Most of the fathers and mothers were farmers 123 (47%), and 156 (61%) respectively. The fathers in 20.6% of cases were laborers, while 23% of the mothers were merchants. More than one-fifth (21%) of the fathers but only 8.8% of the mothers were staff of government or private organizations. The fathers' education level was similar with that of the mothers':

Nearly 28% of the fathers had completed primary school and 29.4% of the mothers had the same academic credentials. Fathers and mothers who had completed lower secondary school were 17.2% and 24.4%, those who had completed upper secondary school were 25% and 22.4%, and those who had completed university were 16% and 6.5% respectively. A considerable 16% of fathers and 6.5% of mothers had never gone to school. Most of the teenagers (67.2%) talked about sexual health (pregnancy and contraception) with friends.

For the descriptive school factors, a high proportion of 229 (87%) of the teenagers had attended classes with sex education content included while 33 (12%) had not. A large majority (87%) of the teenagers had taken a course or done an activity related to sex education one month before and only 12% had not taken such a course in that time (Table 3.2).

3.1.2 Teenage pregnancy health literacy information

The TPHL scale over the 33 items included four components: accessing (7 items), understanding (8 items), appraising (6 items) and applying (12 items) health related information. These are then divided into four categorical levels: inadequate literacy, problematic literacy, sufficient literacy and excellent literacy. The standard Health Literacy classification and cut-off points are applied to the TPHL scores of this study: inadequate 0-25, problematic >25-33, sufficient >33-42 and excellent >42-50 (Sørensen et al., 2013).

Table 3.3: Results of TPHL scale by component of accessing information

Characteristics	TPHL			
	1	2	3	4
	n(%)	n(%)	n(%)	n(%)
Finding information about contraceptives they can use	1(0.4)	60(22.9)	160(60)	41(15.7)
Finding information about possible side-effects of contraceptives	20(7.6)	129(49.2)	100(38.2)	13(5)
Finding information about early symptoms of pregnancy and pregnancy testing	6(2.3)	79(30.1)	154(58.8)	23(8.8)
Finding information about living healthily during a pregnancy	8(3)	89(34)	146(56.1)	18(6.9)
Finding information about where to get (professional) help when she/his girlfriend is pregnant	3(1.2)	55(21)	151(57.6)	53(20.2)
Finding information about problems that can occur during a teenage pregnancy	22(8.4)	151(57.6)	80(30.5)	9(3.5)
Finding information about activities that they can join about contraceptives, TP	65(24.8)	150(57.2)	41(15.7)	6(2.3)

*TPHL scale: 1= Very difficult, 2= Difficult, 3= Easy and 4=Very easy

In table 3.3 showed three-fifths of teenagers (60.0%) found it easy to find information about which contraceptives to use. More than a half of them (58.8%) said it was easy to find information about early symptoms of pregnancy and pregnancy testing. Most or 58% of the study subjects indicated it was easy to find information on where to get (professional) help for a pregnancy, while 57.6% thought it was difficult to find information about problems that could occur during a teenage pregnancy. About 57.2% of them found it difficult to find information about activities that they could join about contraceptives, teenage pregnancy and

almost half (49.2%) said it was difficult to find information about the possible side-effects of contraceptives.

Table 3.4: Results of TPHL's scale by component of understanding information

Characteristics	**TPHL**			
	1	2	3	4
	n(%)	**n(%)**	**n(%)**	**n(%)**
Understanding doctor's/pharmacist's instructions on how to use contraceptives/medicine	4(1.5)	60(22.9)	162(61.8)	36(13.8)
Understanding information that comes with leaflet/product packages	8(3)	101(38.6)	131(50)	22(8.4)
Understanding information in the media about pregnancy, contraceptives	5(1.9)	68(26)	163(62.2)	26(9.9)
Understanding sexual intercourse without contraceptive methods	10(3.8)	45(17.2)	159(60.7)	48(18.3)
Understanding how they can test if she/his girlfriend is pregnant and what symptoms occur in the first stage of pregnancy	5(1.9)	83(31.7)	156(59.5)	18(6.9)
Understanding why pregnant teenage girls need to live healthily and see a professional doctor regularly during their pregnancy	8(3.1)	59(22.5)	162(61.8)	33(12.6)
Understanding what to do in case she/his girlfriend has a dangerous problem related to pregnancy	10(3.8)	175(66.8)	71(27.1)	6(2.3)
Understanding the problems that can occur if she/his girlfriend is pregnant	34(13)	170(64.9)	49(18.7)	9(3.4)

Frequency distributions of the TPHL scale by the 'understanding' component (table 3.4) showed 67% of teenagers found it difficult to understand what to do in case they/their girlfriend had a dangerous problem related to pregnancy. Almost 65% indicated it was difficult to understand the problems that could occur if they/their girlfriend was pregnant, while more than three-fifths of them (62.2%) felt it was easy to understand information in the media about pregnancy and contraceptives. About 61.8% of the study subjects responded that it was easy to understand their doctor's or pharmacist's instructions on how to use contraceptives or medicine. Half of them (50.0%) felt it was easy to understand information on leaflets or that came with product packages.

Table 3.5: Results of TPHL scale by component of appraising information

Characteristics	**TPHL**			
	1	2	3	4
	n(%)	**n(%)**	**n(%)**	**n(%)**
Judging what the advantages and disadvantages are for them of using contraceptives	5(1.9)	83(31.7)	146(55.7)	28(10.7)
Judging if it is necessary for her to go to the doctor if she/his girlfriend has questions about pregnancies, contraceptives	9(3.4)	99(37.8)	134(51.1)	20(7.6)
Judging the quality of information in the media about pregnancies, contraceptives	4(1.5)	87(33.2)	147(56.1)	24(9.2)
Judging the quality of information from their family and friends about pregnancies, contraceptives	6(2.3)	79(30.1)	157(60)	20(7.6)
Judging the quality of information from doctor or pharmacist about pregnancies, contraceptives	1(0.4)	51(19.5)	146(55.7)	64(24.4)
Judging the quality of information from their teacher or outside- of school sources (health staff, friends, media, etc.)	6(2.3)	81(30.9)	161(61.5)	14(5.3)

* TPHL scale: 1= Very difficult, 2= Difficult, 3= Easy and 4=Very easy

The results in table 3.5 show that 61.5% of the adolescents found it was easy to judge the quality of information from their teacher or outside-of-school sources. Three-fifths (60.0%) felt it was easy to judge the quality of information from their family and friends about pregnancies and contraceptives. More than half of them (56.1%, 55.7% and 56.1, respectively) said it was easy to judge the quality of information in the media about pregnancies and contraceptives, to judge what the advantages/disadvantages were for them in using contraceptives and to judge the quality of information from their doctor or pharmacist about pregnancies and contraceptives.

Table 3.6: Results of TPHL scale by component of applying information

Characteristics	**TPHL**			
	1	2	3	4
	n(%)	**n(%)**	**n(%)**	**n(%)**
Using contraceptives before having sex	1(0.4)	45(17.2)	160(61)	56(21.4)
Using the doctor's or pharmacist's instructions about pregnancies, contraceptives	0	66(25.2)	170(64.9)	26(9.9)
Following the instructions on leaflets or in product packages	1(0.4)	93(35.5)	155(59.1)	13(5)
Deciding what to do when she /his girlfriend discovers a pregnancy	35(13.4)	132(50.4)	79(30.1)	16(6.1)
Deciding what to do when she /his girlfriend has a problem related to pregnancy	24(9.2)	174(66.4)	62(23.7)	2(0.7)
Deciding what to do when she /his girlfriend has a problem related to contraceptives	12(4.6)	125(47.7)	116(44.3)	9(3.4)
Talking/negotiation with her sexual partner about using a	9(3.4)	91(34.7)	148(56.5)	14(5.4)

Characteristics	TPHL			
	1	2	3	4
	n(%)	**n(%)**	**n(%)**	**n(%)**
contraceptive method before having sex				
Talking with her friends about teenage pregnancies, contraceptive methods	3(1.1)	71(27.1)	164(62.6)	24(9.16)
Talking with their family about teenage pregnancies, contraceptive methods	12(4.6)	94(35.9)	141(53.8)	15(5.7)
Consulting their health provider about teenage pregnancies, contraceptives	6(2.3)	48(18.3)	152(58)	56(21.37)
Consulting their teacher about teenage pregnancies, contraceptives	26(9.9)	152(58)	79(30.2)	5(1.9)
Joining or taking part in sexual education activities, family planning and teenager support activities	58(22.1)	125(47.7)	66(25.2)	13(5)

*TPHL scale: 1= Very difficult, 2= Difficult, 3= Easy and 4=Very easy

Table 3.6 demonstrates that 66.4% of the respondents found it difficult to decide what to do when they or their girlfriend had a problem related to pregnancy, while nearly 64.9% felt it was easy to use the doctor's or pharmacist's instructions about pregnancies and contraceptives. More than half (58%) of the teenagers said it was easy to consult their health provider about teenage pregnancies and contraceptives and 53.8% talked with their family about teenage pregnancies and contraceptive methods. Just below half of the adolescents (47.7%) indicated it was difficult to take part in sexual education activities, family planning, and teenager support activities.

3.2 Teenage pregnancy literacy

Table 3.7: Results of TPHL by the four components (n=262)

TPHL Index Score		TPHL n(%)	Access n(%)	Understand n(%)	Appraise n(%)	Apply n(%)
Inadequate	0–25	**78 (29.8)**	106 (40.5)	100 (38.2)	91 (34.7)	116 (44.3)
Problematic	25<33	**157 (59.9)**	103 (39.3)	114 (43.5)	68 (26)	120 (45.8)
Sufficient	33<42	**26 (9.9)**	49 (18.7)	68 (26)	98 (37.4)	5 (1.9)
Excellent	42<50	**1 (0.4)**	4 (1.5)	120 (45.8)	120 (45.8)	0
Mean score		**27.07**	26.06	27.52	29.38	26.22

The overall score of TPHL was a mean of 27.07 (table 3.7). Most of the adolescents had scores in the range of 'problematic' TPHL level, ranging between 25 and 33 based on the HLS-EU interpretation. Further inspection revealed that 78 respondents fell in the 'inadequate' range with scores lower than 25 (29.8%), 158 had a health literacy score in the 'problematic' range (59.9%) and only 26 (9.9%) were in the 'sufficient' range. Only one respondent (0.4%) showed 'excellent' TPHL. Examination of individual components also revealed 'problematic' levels of TPHL: accessing (26.06), understanding (27.52), appraising (29.38) and applying (26.22).

3.3 Factors related to TPHL

3.3.1. Relationship between individual, family, peer and school factors and TPHL

Bivariate linear regression models were used to identify the predictors of TPHL. The individual, family, peer and school factors investigated in this study were tested with univariate linear regression for a frequency analysis. The

relationship between TPHL and these individual, family, peer and school factors was determined by comparisons between groups by testing with the Chi-square test, independent t-test (2 variables) and one-way ANOVA (more than 2 variables) at $p<0.05$.

Table 3.8: Individual factors related to TPHL score

Characteristics of teenagers variables	**Total teenagers n=262**	**TPHL score**	**p-value**
	Freq. (%)	**Mean**	
Age[(a)] (years) Mean=17.66	-	-	-
Mean=17.66 ± 1.3, min=15, max=19, Pearson's correlation (0.156)			
Sex			0.078
Male	99(38)	27.8	
Female	163(62)	26.6	
Living area			<0.001*
Rural	114(43.5)	24.7	
Urban	148(56.5)	28.9	
Highest level of education completed			<0.001*
Primary	46(17.5)	21.8	
Lower secondary	122(46.6)	27.5	
Upper secondary	94(35.9)	29.3	
Schooling status			<0.001*
Out of school	51(19.5)	22.3	
Lower secondary school	27(10.31)	22.5	
Upper secondary school	103(39.31)	28.3	
University	81(30.92)	28.7	
Marital status			<0.001*
Single	237(90.5)	27.6	
In-union	4(1.5)	22.4	
Married	19(7.2)	21.9	
Divorced/separated	2(0.76)	23.7	
Living status of adolescent			0.56
Living with parents	219(83.6)	27	
Living with sibling/spouse/alone	43(16.4)	27.5	

(a) Mean age of teenager was 17.66 ± 1.3 min=15 max=19. Based on spearman's correlation, age was not found to be correlated with TPHL score.

(*) The *p*-value of less than 0.05 was used to determine the statistical significance of the tests with regression coefficient to predict the strength and direction of the association

The results present the relationship between pregnancy health literacy among teenagers aged 15-19 and individual factors (table 3.8). A significant association between adolescents' living area and TPHL score (p<0.001) was found. A Positive association was found in the higher scores of TPHL for those respondents living in an urban area (28.9) than those living in the rural area (26.6). There was a significant association between the education level of teenagers and TPHL (p<0.001) in that the higher the level of education of the adolescents, the higher their TPHL score: primary school (21.8), lower secondary school (27.5) and upper secondary school (29.3). A significant association between the schooling status and TPHL level (p<0.001) was found, indicating that adolescents with schooling had higher TPHL than those out of school: university (28.7), upper secondary school (28.3), lower secondary school (22.5) and out of school (22.3).

In addition, there was a significant association between the marital status of teenagers and TPHL score (p=0.006): adolescents who were single had a higher TPHL score (27.6) than adolescents who were married, divorced, separated or in-union (22.1).

In this study, no significant associations were found between TPHL scores and age (mean=17.66 ± 1.3, min=15, max=19, Pearson's correlation 0.156), gender (p= 0.078) or living status of adolescent (p=0.56).

Table 3.9: Family and peer factors related to TPHL score in Kaysone district

Characteristics of teenager variables	**Total no. of teenagers n=262**	**TPHL score**	***p*-value**
	Freq.(%)	**Mean**	
Father's occupation			0.006*
Gov./private staff	55(21)	28.8	
Laborer	54(20.6)	26.7	
Farmer	123(47)	26	
Merchant	30(11.4)	28.6	
Father's educational level			0.003*
Never went to school	23(8.8)	25.1	
Primary school	72(27.5)	25.7	

Characteristics of teenager variables	Total no. of teenagers n=262	TPHL score	*p*-value
	Freq.(%)	Mean	
Lower secondary school	45(17.2)	26.2	
Upper secondary school	65(24.8)	28.4	
Vocational school	15(5.7)	29.3	
University	42(16)	29.6	
Mother's occupation			0.002*
Gov./private staff	23(8.8)	28.9	
Laborer	20(7.6)	24.9	
Farmer	159(60.7)	26.4	
Merchant	60(22.9)	28.4	
Mother's educational level			0.043*
Never went to school	38(14.5)	25.6	
Primary school	77(29.4)	26.2	
Lower secondary school	64(24.4)	27.2	
Upper secondary school	59(22.5)	27.9	
Vocational school	7(2.7)	29.3	
University	17(6.5)	30.2	
Family income [(a)] Mean=265 ± 187, min=$11.7, max=$1,176, Pearson's correlation			0.1
Talk about sexual health (pregnancy/contraception) with friend			0.537
Yes	86(32.8)	26.7	
No	176(67.2)	27.2	

(a) Mean age of teenagers was 265 ± 187, min=11.7 max=1176. Based on spearman's correlation, family income wasn't found to be correlated with TPHL score.

(*) The *p*-value of less than 0.05 was used to determine the statistical significance of the tests with a regression coefficient to predict the strength and direction of the association

Table 3.9 shows the relationship between teenage pregnancy health literacy and family or peer factors. A significant association between father's occupation and TPHL (p=0.006) was found. Positive associations were also shown in the higher TPHL scores of respondents whose fathers were staff of government or private organisations (28.8) or merchants (28.6) than those who were farmers (26).

In terms of mother's occupation and TPHL, a significant association (*p*=0.002) was also seen. Similarly, positive associations were demonstrated in the higher TPHL scores of participants whose mothers were staff of government or private organizations (28.9) or merchants (28.4) than those who were laborers (24.9).

In addition, there was a significant association between father's education and TPHL level (*p*-value 0.003). Respondents who had more highly educated fathers had higher TPHL scores: University education (29.6), Vocational school (29.6), upper secondary school (28.4), lower secondary school (26.2), primary school (25.7) and never went to school (25.1). Likewise, there was a significant association between mother's education and TPHL level (*p*=0.043). Participants whose mothers had a higher level of education (30.2) had a TPHL score higher than those whose mothers who had a lower level of education (25.6).

No statistically significant relationship was found between the TPHL score and family income (Pearson's correlation 0.1) and marital status of parent (*p*=0.537).

Table 3.10: School factors related to TPHL score in Kaysone district

Characteristics of teenager variables [(a)]	**Total teenager n=262**	**TPHL score**	***p*-value**
	Freq.(%)	**Mean**	
School factors			
Attended classes where sex education content was included			<0.001*
No	33(12.6)	20.4	
Yes	229(87.4)	28	
Number of times participant had taken a course or activity related to sex education in the month before			0.104
Nil/1 time	234(89.3)	26.8	
More than 1 time	28(10.7)	28.6	

(*) The p-value of less than 0.05 was used to determine the statistical significance of the tests with a regression coefficient to predict the strength and direction of the association

The table 3.10 demonstrates the relationship between teenage pregnancy health literacy and school factors. There was a significant association between attending of classes where sex education content was included and TPHL level (p<0.001): Teenagers who had attended these classes had a higher TPHL level (28) than those who had not attended such classes (20.4).

In this study, no statistically significant relationship was found between TPHL score and number of times participants had taken a course or activity related to sex education in the month before.

3.3.2. Multivariate linear regression analysis

The significant factors with a p-value of 0.05 or lower on these tests were included in the multiple linear regression model (Noymer, 2008), factors such as living area, education, schooling status, marital status, father's and mother's educational levels, father's and mother's occupations, whether ever attended classes where the sex education content was included and number of times participants had taken a course or activity related to sex education in the month before. Seven independent variables (p-value indicated by **) had significantly correlated with TPHL, with p<0.05. See table 3.11 for more details.

Table 3.11: Factors associated with level of TPHL in Kaysone district

Variable	**Regression coefficient (β)**	***p*-value**	**95%CI**	
			Lower	**Upper**
Individual				
Area				
Rural	Ref.			
Urban	2.42	0.002**	0.879	3.962
Highest level of education completed:				
Primary school	Ref.			
Lower/Upper secondary school	3.89	<0.001**	2.784	5.005

Variable	Regression coefficient (β)	*p*-value	95%CI	
			Lower	Upper
Schooling status				
Out of school	Ref.			
Schooling	0.96	0.001**	0.404	1.518
Marital status				
Married/divorced/separated/in-union	Ref.			
Single	1.9	<0.001**	0.842	2.927
Family				
Father's occupation				
Farmer/laborer	Ref.			
Gov./private staff/merchant	0.47	0.205	-1.263	1.223
Father's education				
Never went to school	Ref.			
Some level of education	0.72	0.007**	0.201	1.245
Mother's occupation				
Farmer/laborer	Ref.			
Gov./private staff/merchant	0.72	0.207	1.393	2.927
Mother's education				
Never went to school	Ref.			
Some level of education	0.37	0.001**	0.206	0.949
School				
Attended class where sex education content included				
No	Ref.			
Yes	5.12	<0.001**	6.034	10.792

*significant association (p<0.05)

**significant association (p<0.01)

The multivariate linear regression model showed that TPHL was associated with living in urban areas (β=2.42; p=0.002), higher education (β=3.89; p<0.001), schooling (β=0.96; p=0.001), being single (β=1.9; p<0.001), higher education of father (β=0.72; p=0.007), higher education of mother (β=0.37; p=0.001) and attendance of classes where sex education content was included (β=5.12; p<0.001). However, father's occupation (β=0.47, p=0.205) and mother's occupation (β=0.72, p=0.207) were not significant direct predictors for TPHL scores in this study.

Chapter 4

Discussion

This study described pregnancy health literacy among teenagers (15-19 years old) in Kaysone district, Savannakhet Province, Lao PDR and identified some factors related to pregnancy health literacy among teenagers. The subject of the study was 262 adolescents aged between 15 and 19 years old residing in two villages. The statistical method in this study ensured that the sample size was a good representation of the population to be studied and that it was generalized enough to minimize selection bias.

Based on a previous study (Vongxay et al., 2019), which surveyed pregnancy, contraception and abortion among teenagers in schools, the current study focused on pregnancy and contraception among adolescents in the community. The previous study used a self-administered structured questionnaire in schools and did not recruit adolescents already out of school. This study on the other hand used face to face interviews in the community to ensure privacy when answering the questions by giving enough physical space between participants and requesting silence and by recruiting teenagers already out of school or even those who did not finish school as they might have very different knowledge and experiences in this issue.

The descriptors to measure TPHL in this study and the formula used were adopted from the European health literacy survey (HLS-EU-Q47) method (Sørensen et al., 2013; Vongxay et al., 2019). The 33 items were grouped under accessing (7 items), understanding (8 items), appraising (6 items) and applying (12 items) health related information. TPHL was then arrived at using the formula “Index score = mean-minimal value of mean*(50/3)” and scaled over four categorical levels: inadequate literacy, problematic literacy, sufficient literacy and excellent literacy, the formula and scale were. Thus in analyzing the data from the sample, the researcher had to follow the standard and classification in the European health

literacy survey (HLS-EU-Q47). In the analysis, we included relevant characteristics that might influence TPHL, for example, household income and parental educational level.

High teenage pregnancy health literacy has a positive impact on a teenager's health status and use of the health care system. TPHL can directly or indirectly transmit values and lifestyles to adolescents. Teenagers with inadequate levels of TPHL have had situations of frequent poor health outcomes, such as teenage pregnancy and higher mortality.

The results in our study showed that most adolescents have a 'problematic' TPHL level. As this was the first time TPHL was measured, comparative literature was lacking, so the most closely related parameters by a previous study (Vongxay et al., 2019), on SRH rather than TPHL, were used for this study. Overall, 89.7% (n=235) of teenagers were found to have a 'problematic' or less than sufficient TPHL on the index. However, adolescents were able to formulate fairly complex responses in the interviews to demonstrate ability in accessing, understanding, appraising and applying health information. This study showed that the four components (accessing, understanding, appraising and applying) also revealed less than sufficient TPHL (79.8%, 81.7%, 63.7% and 90.1%). Similar to those in the study by Sørensen et al (2012), these scores indicated that the adolescents studied did not possess the competence to maintain and improve their quality of life.

In contrast, the previous study by Vongxay et al (2019) had inadequate SRHL among adolescents aged 15-19. Thus it seems possible that the slightly higher TPHL of the teenagers in Kaysone district in Savannakhet is due to the YFS implemented and running there, with its activities providing information about SRH (including pregnancy and contraception) in schools and the community and also providing health services for adolescents. Adolescents thus had access to resources at the YFS in addition to access to other information sources like libraries, print media, television, radio and the Internet. Such access can have an impact on the literacy patterns and the overall health of the society.

Even if the 15 to 19 years age range selected for this study meant that the younger respondents would not have received sex education in school and might not have started a sexually active life yet, educational levels in the sample population were probably the most relevant factor in TPHL. The study by Vongxay et al (2019) looked at schooling adolescents in three provinces (Houaphanh, Vientiane capital and Champasak) with only Vientiane capital running a YFS. The mean adolescent age in that study was lower than in this study (16.9 vs 17.66). The adolescents studied were in upper secondary school whereas those in this study included youth who had already completed upper secondary school (35.9%) and most of the participants were 18-19 years old (61.8%), thus having higher education and being closer to adulthood.

The Secretariat of the 65th World Health Assembly in 2012 called education "a major protective factor for early pregnancy: the more years of schooling the fewer early pregnancies" (UNFPA, 2013). This reinforces the findings in this study; however, more research in this area of TPHL will confirm the importance of education as a factor.

When looking at predictive factors for TPHL levels, seven significant ones were identified: living area, education, schooling status, marital status, father's education, mother's education and attendance of classes with sex education content. Apart from father's occupation and mother's occupation, which proved not to be significant factors for TPHL levels in this study, individual, family, peer and school factors contributed to the predictive model. This finding was consistent with those in the literature (Martin et al., 2009; Runk et al., 2017; UNFPA, 2013; Vongxay et al., 2019; Zahnd, Scaife, & Francis, 2009). Those previous studies as well as this study did not found associations between age and health literacy because the samples of teenagers was smaller in age range (Duong et al., 2017; Martin et al., 2009; Vongxay et al., 2019).

The discussion of these significantly related factors to TPHL among teenagers aged 15-19 is as follows:

Living area

One finding of this study is that more than half of the adolescents with a problematic TPHL level lived in an urban area (56.5%). This is consistent with the previous study (Vongxay et al., 2019), which indicated that adolescents who lived in urban areas showed a significant association with SRHL level (β=3.21*:* p<0.001). Individuals residing in rural areas, on the other hand, were more likely to have low health literacy (Martin et al., 2009). It may be inferred that urban conditions facilitate access to information, which in turn enables better care, treatment, health protection and health promotion than rural areas. Area, whether urban or rural, is thus considered a factor strongly associated with health literacy. Being healthy suggests having the opportunity to recognize health problems, which comes with access to information on health, including sexual reproductive health and thereby pregnancy health literacy.

Education

This study revealed that there was a statistically significant relationship between adolescents' education and TPHL, a finding corroborated by the results of previous studies that adolescents with a lower educational attainment were associated with lower estimated health literacy (Duong et al., 2017; Martin et al., 2009). In general, level of education is a factor associated with "basic literacy skills", and in a study by Wallace, those who had a higher level of education were found to score higher on health literacy (Wallace, 2011). Higher education also comes with more knowledge on sexuality and reproductive health. In Savannakhet, the Ministry of Education and Sports have been able to bring education and health into reproductive health education at the end of the SE course. In all, it means that higher education itself is a major protective factor for teenage pregnancy: more years of schooling is associated with less teenage pregnancies (WHO, 2012).

Schooling status

Adolescents who are in school have a greater chance of higher TPHL scores. The results of previous studies indicate that there is significant association between

school status and TPHL score. In a study by Martin et al., adolescents who were still in lower primary school or in General Education Development (GED) were associated with lower estimated health literacy ($p<0.01$) (Martin et al., 2009). Given that literacy, or the ability to read and write, is an integral part of health literacy, schools therefore play a central role in the development of TPHL skills. With school-based comprehensive sexuality education programmes, teachers have an opportunity to encourage adolescents to delay sexual activity and encourage them to behave responsibly when they eventually engage in consensual sexual activity, particularly by using condoms and other modern methods of contraception (UNFPA, 2013).

Marital status

In this study, most of the adolescents were single (90.5%), with a small minority in-union, married, divorced or separated (9.5%). The adolescents who were single were more likely to have higher TPHL score (27.5) than the others (22.1), thus indicating a significant association between TPHL and marital status. The results of the research by previous studies demonstrate that individuals who were not married also had lower health literacy, on average, although the association was much weaker (Martin et al., 2009).The difference in this study that may be explained by the fact that the single teenagers had the greater opportunity to study in school and thus to receive sexual health information and teenage pregnancy health information. Moreover, this research showed that most of the adolescents who were single had attended classes in school with sex education content included.

Parent education

This research has found that there was a significant association between educated parents and TPHL. Education levels of parents in this study were found be quite high. More than 90% of parents were schooling and less than 10% had never been to school. In addition, the results also reveal that higher TPHL scores happened in the group of parents with high education and were found to be an important predictor for the TPHL of the study participants. These findings

corroborate the results of previous studies that parents who had no education were 2.5 times less likely to have SRH knowledge than the parents who had secondary or tertiary education (Wasike, 2017). Parents play central roles, both directly and indirectly in determining the future of their adolescents. They may impart information about sexuality and prevention of pregnancy or they may withhold vital information (UNFPA, 2013). But higher educational levels of parents may enhance communication between them and their adolescents. Better-educated parents may also have more time to care for their children, which would in turn have an effect on the TPHL scores of their children.

Attending classes where sex education content is included

Attendance of classes where sex education content is included is one of the key factors in TPHL because such participation exposes and the adolescents to specific SRH matters that are related to pregnancy and contraception. The finding of this study showed that almost all of the adolescents had attended classes with some sex education content (89.3%). The relationship between such class attendance and TPHL score was significant. Similar to the findings of Vongxay V. (Vongxay et al., 2019), this research found that there was an association between TPHL score and attending these classes. Such education on sexuality is more likely to have a positive impact when it is comprehensive and implemented by trained educators and educators who have the opportunity to encourage adolescents to delay sexual activity and encourage them to behave responsibly when they eventually engage in consensual sexual activity (UNFPA, 2013). Such input from these educators can have an impact on literacy patterns and societies' health at large.

This study has limitations. Firstly, participant recruitment and data collection were confined to one geographical area. This means that the sample may not be representative of all the adolescents in Lao PDR and does not address different contexts. This study is of a cross-sectional study design, so it prevents us from being able to assess the temporal order of TPHL. Thirdly, a questionnaire on TPHL would elicit rather sensitive information of the issue among adolescents. Fourthly,

data collection was planned to avoid school hours, taking place during the early morning, evening hours and weekends. This was problematic because some adolescents, especially those who had to help on their family farms, were not able to stay at home much later than usual and so missed the sampling process. In an effort to address this issue, a small number of sites were replaced after those working on the farms arrived. The other issue was that the responses from adolescents which have been from perceptions of TPHL from the influence of what their parents might really have perceived, so this is important for future researchers to ask the adolescents about how much they have talked to their parents about pregnancy prevention or sex related topics.

Conclusion

From this study, most teenagers in Lao PDR have either a problematic TPHL level (60%) or an inadequate one (30%). Lower levels of TPHL were found among teenagers with less actual education, living in a rural area, out of school, married/divorced/separated/in-union, or who have attended classes where the sex education was included. These teenagers also had lower scores if their fathers and mothers had lower education. The results also identified seven predictors that were significant ($p<0.001$), namely, living area, education, marital status and status of school as individual factors, father's and mother's education as parental factors and attended classes where sexual education content was included as school factors.

Recommendations

This research adds understanding to the pregnancy health literacy situation of adolescents in Lao PDR and emphasizes the importance of good quality, curriculum-based sex education programs which include pregnancy prevention among teenagers in secondary schools (education sector). Therefore, there is a need for more training of teachers and the development of sustainable sex education programs (with a focus on pregnancy prevention) in schools. There is a need to enhance pregnancy prevention among adolescents. School curricula may provide common pregnancy prevention classes for all students and activities related to pregnancy prevention in school and in the community which are needed to achieve and maintain a high level of TPHL and good sexual health to prevent adverse health outcomes such as teenage pregnancies.

In the health sector, there is the ongoing need to enhance the availability of youth-friendly services for pregnancy prevention. In relation to that, there is a need to strengthen the capacity of service providers to respond to specific needs of adolescents more effectively with greater sensitivity.

Parents are the sexual educators of adolescents. Parents should be educated on the importance of offering helpful advice for pregnancy prevention to their adolescents and giving correct information on pregnancy prevention issues according to their ages. This will bring about a level of family connectedness and effective positive changes in the TPHL in the country. In this respect, there is a need to further consider the capacity of health services in support of families. Qualitative research should be further embarked on and be more in-depth to get clearer insight into parents' and their adolescents' specific problems and TPHL.

References

Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: an updated systematic review. *Annals of internal medicine, 155*(2), 97-107.

Chandra-Mouli, V., Camacho, A. V., & Michaud, P.-A. (2013). WHO guidelines on preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries. *Journal of Adolescent Health, 52*(5), 517-522.

Chandra-Mouli, V., McCarraher, D. R., Phillips, S. J., Williamson, N. E., & Hainsworth, G. (2014). Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reproductive health, 11*(1), 1.

Conde-Agudelo, A., Belizán, J. M., & Lammers, C. (2005). Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: Cross-sectional study. *American journal of obstetrics and gynecology, 192*(2), 342-349.

DHHS. (2000). US Department of Health and Human Services: Healthy People 2010. *http://www/health/gov/healthypeople/*.

Duong, T. V., Aringazina, A., Baisunova, G., Pham, T. V., Pham, K. M., Truong, T. Q., & Nguyen, K. T. (2017). Measuring health literacy in Asia: Validation of the HLS-EU-Q47 survey tool in six Asian countries. *Journal of epidemiology, 27*(2), 80-86.

Ghaddar, S., A Valerio, M., Porta, C., & Hansen, L. (2012). *Adolescent Health Literacy: The Importance of Credible Sources for Online Health Information* (Vol. 82).

Kindig, D. A., Panzer, A. M., & Nielsen-Bohlman, L. (2004). *Health literacy: a prescription to end confusion*: National Academies Press.

Leyva, M., Sharif, I., & Ozuah, P. (2004). *Spanish health literacy of inner-city Latino parents.* Paper presented at the PEDIATRIC RESEARCH.

LSB, & MOH. (2015). *The 4th Population and Housing Census (PHC) 2015*.

LSB, & MOH. (2017). Lao social indicator survey (LSIS) 2017: (multiple indicator cluster survey/demographic and health survey). Vientiane: Lao PDRMoH, LSB/MPI and MoES. *Vientiane, Lao PDR: MoH, LSB/MPI and MoES*.

LSB, MOH, UNPFPA, & UNICEF. (2012). Lao social indicator survey (LSIS) 2011–12 (multiple indicator cluster survey/demographic and health survey). *Vientiane, Lao PDR: MoH, LSB/MPI and MoES*.

LYU, & UNFPA. (2014). *Adolescent and Youth Situation Analysis Lao People's Democratic Republic "Investing in young people is investing in the future".* . file:///C:/Users/User/Downloads/Documents/Final_Eng_AYSA%20Report_2.pdf.

Mancuso, J. M. (2009). Assessment and measurement of health literacy: an integrative review of the literature. *Nursing & health sciences, 11*(1), 77-89.

Manganello, J. A. (2007). Health literacy and adolescents: a framework and agenda for future research. *Health education research, 23*(5), 840-847.

Martin, L. T., Ruder, T., Escarce, J. J., Ghosh-Dastidar, B., Sherman, D., Elliott, M., . . . Culbert, A. (2009). Developing predictive models of health literacy. *Journal of general internal medicine, 24*(11), 1211.

Naigaga, M. D., Guttersrud, Ø., & Pettersen, K. S. (2015). Measuring maternal health literacy in adolescents attending antenatal care in a developing country–the impact of selected demographic characteristics. *Journal of clinical nursing, 24*(17-18), 2402-2409.

Noymer, A. (2008). Alpha, significance level of test. *Encyclopedia of survey research methods, 18*.

Paek, H.-J., Reber, B. H., & Lariscy, R. W. (2011). Roles of interpersonal and media socialization agents in adolescent self-reported health literacy: a health socialization perspective. *Health education research, 26*(1), 131-149.

Parker, R. M., Wolf, M. S., & Kirsch, I. (2008). Preparing for an epidemic of limited health literacy: Weathering the perfect storm. *Journal of general internal medicine, 23*(8), 1273-1276.

Peerson, A., & Saunders, M. (2009). Health literacy revisited: what do we mean and why does it matter? *Health promotion international, 24*(3), 285-296.

Prinstein, M. J., Meade, C. S., & Cohen, G. L. (2003). Adolescent oral sex, peer popularity, and perceptions of best friends' sexual behavior. *Journal of pediatric psychology, 28*(4), 243-249.

Raymond, E. G., L'Engle, K. L., Tolley, E. E., Ricciotti, N., Arnold, M. V., & Park, S. (2009). Comprehension of a prototype emergency contraception package label by female adolescents. *Contraception, 79*(3), 199-205.

Runk, L., Durham, J., Vongxay, V., & Sychareun, V. (2017). Measuring health literacy in university students in Vientiane, Lao PDR. *Health promotion international, 32*(2), 360-368.

Rutherford, J., Taylor, A., Holman, R., MacDonald, J., Jarrett, D., & Bigrigg, A. (2006). Low literacy: a hidden problem in family planning clinics. *BMJ Sexual & Reproductive Health, 32*(4), 235-240.

Sørensen, K., Pelikan, J. M., Rothlin, F., Ganahl, K., Slonska, Z., Doyle, G., . . . Brand, H. (2015). Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). *European journal of public health, 25*(6), 1053-1058.

Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC public health, 12*(1), 80.

Sørensen, K., Van den Broucke, S., Pelikan, J. M., Fullam, J., Doyle, G., Slonska, Z., . . . Brand, H. (2013). Measuring health literacy in populations: illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q). *BMC public health, 13*(1), 948.

Starfield, B., Shi, L., & Macinko, J. (2005). Contribution of primary care to health systems and health. *The milbank quarterly, 83*(3), 457-502.

Svensson, P., & Agardh, A. (2013). Breaking down the barriers to Health Literacy in Sexual and Reproductive Health and Rights. *A qualitative study of the experience of culture sensitive health communication among newly arrived refugees in Sweden. Lunds universitet*.

Sychareun, V., & Phengsavanh, A. (2011). Youth Sexual and Reproductive Health Situation and Programmes in Laos: Challenges and Some Recommendations:

Asian-Pacific Resource & Research Centre for Women (ARROW). Retrieved from www.arrow.org.my

Sychareun, V., Phongsavan, K., Hansana, V., & Phengsavanh, A. (2010). Policy maker and provider knowledge and attitudes regarding the provision of emergency contraceptive pills within Lao PDR. *BMC health services research, 10*(1), 212.

Thomas, S., Mobley, S., Hudgins, J., Sutherland, D., Inglett, S., & Ange, B. (2018). Conditions and dynamics that impact maternal health literacy among high risk prenatal-interconceptional women. *International journal of environmental research and public health, 15*(7), 1383.

UNFPA. (2008). *Assessment of the Referral and Counselling Network Youth-Friendly Services (2008)*. http://lao.unfpa.org/en/resources/assessment-referral-and-counselling-network-youth-friendly-services-2008.

UNFPA. (2013). *Motherhood in Childhood. The State of World Population 2013*. Retrieved from http://www.unfpa.org.br/Arquivos/EN-SWOP2013-Report-Final.pdf:

UNFPA. (2015). Adolescent Birth Rate (UNFPA/UN Population Division).

UNICEF. (2011). Rapid assessment: Most-at-risk adolescents and young people to HIV in Lao PDR. *Bangkok: UNICEF Lao PDR and the Ministry of Health*.

Vongxay, V., Albers, F., Thongmixay, S., Thongsombath, M., Broerse, J. E., Sychareun, V., & Essink, D. R. (2019). Sexual and reproductive health literacy of school adolescents in Lao PDR. *PLoS One, 14*(1), e0209675.

Vundule, C., Maforah, F., Jewkes, R., & Jordaan, E. (2001). Risk factors for teenage pregnancy among sexually active black adolescents in Cape Town. *South African Medical Journal, 91*(1), 73-80.

Wallace, A. (2011). Adolescent pregnancy and policy responses in Uganda. *Backgrounder, 14*, 1-9.

Wasike, H. N. (2017). Parent-adolescent communication on sexual and reproductive health among secondary school students in SRIsia sub contry, Kenya

WHO. (1998). *Health Promotion Glossary*: http://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf.

WHO. (2004). *Adolescent Pregnancy: Issues in Adolescent Health and Development*.

WHO. (2012). *Early marriages, adolescent and young pregnancies. Report No. Sixty-fifth world health assembly, Provisional agenda item 13.4*.

WHO. (2015). *Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: executive summary*. who.int/iris/bitstream/handle/10665/193994/WHO_RHR_15.23_eng.pdf;sequence=1.

Zahnd, W. E., Scaife, S. L., & Francis, M. L. (2009). Health literacy skills in rural and urban populations. *American journal of health behavior, 33*(5), 550-557.

Annex 1: Consent form

CONSENT FORM FOR PARTICIPATION IN RESEARCH

Research Title: Teenage Pregnancy Health Literacy for Lao teenagers in Kaysone district, Savannakhet Province, Lao PDR

My name is _____ and I am from the Ministry of Health. We would like to ask you some questions. The answers to the questions will be compiled in a report, but it will not be possible for anyone to identify your responses because we will not be using any names in the report. There is no direct benefit to you in answering the questions, but we hope the answers to the questions will help to improve the quality of health sector devices and services. Kindly affirm the following statements as you sign below to provide consent for your participation in our study:

1. I have read the information provided, and details of procedures have been explained to me.

2. I consent voluntarily to participate as a participant in this research.

3. I understand that I am free to refuse to take part in this research and withdraw from it at any time. I acknowledge that whether I participate or not, or withdraw after participating, it will have no effect on me.

4. I am fully aware that my individual information collected will remain confidential, and that it will be shared for academic purposes only.

5. I have obtained a signed copy of the Consent Form.

_____	_____	_____
Participant's Name	Signature	Date (YY/MM/DD)
_____	_____	_____
Interviewer's Name	Signature	Date (YY/MM/DD)
_____	_____	_____
Researcher's Name	Signature	Date (YY/MM/DD)

CONSENT FORM FOR PARENT OF PARTICIPANT IN RESEARCH

Research Title: Teenage Pregnancy Health Literacy for Lao teenagers in Kaysone district, Savannakhet Province, Lao PDR

My name is _____ and I am from the Ministry of Health. We would like to ask your child some questions. The answers to the questions will be compiled in a report, but it will not be possible for anyone to identify your child or their responses because we will not be using any names in the report. There is no direct benefit to your child in answering the questions, but we hope the answers to the questions will help to improve the quality of health sector devices and services.

By signing below, I am agreeing that my child, named _____, can be a participant in this study, and I affirm that:

1. I have read and understood the Participant Information Sheet for this research study.

2. Questions about my child's participation in this study have been answered satisfa ctorily.

3. I am willing for my child to take part in this study voluntarily.

4. I will receive one copy of the two copies of the written agreement.

_____ _____ _____

Parent's Name Signature Date (YY/MM/DD)

_____ _____ _____

Interviewer's Name Signature Date (YY/MM/DD)

_____ _____ _____

Researcher's Name Signature Date (YY/MM/DD)

Annex 2: Questionnaire

Teenage Pregnancy Health Literacy for Lao teenagers in Kaysone district, Savannakhet Province, Lao PDR

(Questionnaire for interview surveys with young people)

ID: …….

Please answer these questions by filling in the answers or putting a check **(√)** against the answers accordingly, based on truthful information about yourself, If you have filled in a wrong answer, use a big cross (X) for the wrongly indicated answer and use circle the correct answer.

Part 1: Independent variables: individual, family or peer and school information

Individual		
Q1.1	What is your date of birth? What is your age?	Date of birth…/…../……(dd/mm/ yyyy) Age……..years
Q1.2	What is your sex?	□ 1. Female □ 2. Male
Q1.3	What is your place of birth?	District…… Province…….. Country…….
Q1.4	Where do you currently live?	Village…….
Q1.5	Which of the following best describes the area you live in?	□ 0. Rural □ 1. Urban
Q1.6	What is your ethnicity?	□ 1. Lao tai □ 2. Hmong-mien □ 3.Mon-Keummu □ 4. Chinese tibetan □ 99. Other specify……..

Q1.7	What is your primary language?	□ 1. Lao □ 2. Minority ethnic language □ 99. Other specify……..
Q1.8	What is your religious belief?	□ 1. Buddhism □ 2. Spiritual belief □ 3. Islam □ 4.Christian □ 99. Other specify……
Q1.9	What is the highest level of education you have completed? ***If "None/…" skip to Q1.11***	□ 0. None/never went to school □ 1. Primary □ 2. Lower secondary school □ 3. Upper secondary school □ 4. Vocational school □ 5. Higher education (university)
Q1.10	What is your schooling status?	□ 0. Out of school □ 1. Primary □ 2. Lower secondary school □ 3. Upper secondary school □ 4. Vocational school □ 5. Higher education (in university) □ 99. Other (please specify)……
	Q1.10a Which level are you in?	……

Q1.11	Do you have a job?	□ 0. No □ 1. Yes
Q1.12	What is your job?	□ 1. Student □ 2. Gov./private staff □ 3. Laborer □ 4. Farmer □ 5. Merchant □ 99. Other (please specify)……
Q1.13	What is your relationship status?	□ 1. Single □ 2. In a relationship/in union □ 3. Married □ 4. Divorced/separated □ 99. Other (please specify)……
Q1.14	Have you had sexual intercourse?	□ 0. No **if No skip to q1.17** □ 1. Yes
Q1.15	Do you have children?	□ 0. No □ 1. 1 child □ 2. 2 children □ 3. 3 or more
Q1.16	For girls, are you currently pregnant?	□ 0. No □ 1. Yes
Q1.17	Who are you living with?	□ 1. living with parent

		□ 2. living with relatives □ 3. living with spouse/partner □ 4. living alone
Family		
Q1.18	Is there anyone in your family who works in a medical-related career?	□ 0. Nobody □ 1. Yes, father □ 2. Yes, mother □ 3. Yes, spouse □ 4. Yes, sibling
Q1.19	What is the marital status of your parents?	□ 1. Married □ 2. Divorced □ 3. Separated □ 4. Widowed /Widowered
Q1.20	What is your father's occupation?	□ 1. Gov./private staff □ 2. Laborer □ 3. Farmer □ 4. Merchant □ 99. Other (please specify)……
Q1.21	What is the highest level of education your father has completed?	□ 0. Never went to school □ 1. Primary □ 2. Lower secondary □ 3. Upper secondary □ 4. Vocational school

		□ 5. Higher education (university) □ 99. Other (please specify)……
Q1.22	What is your mother's occupation?	□ 1. Gov./private staff □ 2. Laborer □ 3. Farmer □ 4. Merchant □ 99. Other (please specify)……
Q1.23	What is the highest level of education your mother has completed?	□ 0. Never went to school □ 1. Primary □ 2. Lower secondary □ 3. Upper secondary □ 4. Vocational school □ 5. Higher education (university) □ 99. Other (please specify)……
Q1.24	What is your current combined household income per month? (of all persons living in your household)	□ ……..$ (Estimate in Lao kip the total income from all persons living in your household)
Peers		
Q1.25	Do you talk with friends about sexual health (pregnancy/ contraception…)?	□ 0. No □ 1. Yes

School		
Q1.26	Have you attended classes where sex education content was included?	□ 0. No ***Skip to q1.29*** □ 1. Yes
Q1.27	What the sex topic(s) did education content cover in the class (es) that you had in school? **(Tick more than one)**	□ 1.Contraception □ 2. Pregnancy, maternal & child health care □ 3. Changes during puberty □ 4. STIs (HIV/AIDs) □ 5.Families, gender and human rights □ 99 Others (please specify)…….
Q1.28	Which subject(s) in school have included sex education content?	□ 1. Biology □ 2. Geography □ 3. Population sciences □ 4. World around us □ 99. Others (please specify)……
Q1.29	Have you taken a course or participated in an activity related to sex education within the last month?	□ 0. No/1 time □ 1. More than 1 time

Part 2: Dependent variable: Teenage Pregnancy Health Literacy

This part of the questionnaire is used to measure the teenage pregnancy health literacy based on the self-perception of the respondents. Some questions in this section may have to be assumed (according to the interviewer's training) for those who have never had sexual experience, to comfortably answer the question.

On a scale from 'very easy' to 'very difficult', how easy would you say it is to: …		**Circle the answer number**			
		Very Difficult	Difficult	Easy Very	Very Easy
Accessing					
2.1	…find information about which contraceptive you can use?	1	2	3	4
2.2	…find information about possible side-effects of contraceptives?	1	2	3	4
2.3	…find information about early symptoms of pregnancy and pregnancy testing?	1	2	3	4
2.4	…find information about how you can live healthily during a pregnancy?	1	2	3	4
2.5	…find information on where to get (professional) help when you are/your girlfriend is pregnant?	1	2	3	4
2.6	…find information about problems that can occur during a teenage pregnancy?	1	2	3	4
2.7	…find information about activities (in your community or school) that you can join about contraceptives, teenage pregnancies?	1	2	3	4

Understanding					
2.8	…understand your doctor's/pharmacist's instructions on how to use contraceptives/medicine?	1	2	3	4
2.9	…understand information that comes with your leaflet/product packages (e.g. condom or medicine packaging).	1	2	3	4
2.10	…understand information in the media (e.g. Facebook, Google, television, brochures, and posters) about pregnancy, contraceptives?	1	2	3	4
2.11	…understand how sexual intercourse without contraceptive methods (e.g. condoms, etc.) can lead to pregnancy?	1	2	3	4
2.12	…understand how you can test if you are/your girlfriend is pregnant and what symptoms occur in the first stage of pregnancy?	1	2	3	4
2.13	…understand why pregnant teenage girls need to live healthily and see a professional doctor regularly during their pregnancy?	1	2	3	4
2.14	…understand what to do in case you have/your girlfriend has a dangerous problem related to pregnancy?	1	2	3	4
2.15	…understand the problems that can occur if you are/your girlfriend is pregnant?	1	2	3	4
Appraising / Thinking					
2.16	…judge what the advantages and	1	2	3	4

	disadvantages are for you of using contraceptives?				
2.17	…judge if it is necessary for you to go to a doctor if you have questions about pregnancies, contraceptives?	1	2	3	4
2.18	…judge the quality of information in the media about pregnancies, contraceptives?	1	2	3	4
2.19	…judge the quality of information from your family and friends about pregnancies, contraceptives?	1	2	3	4
2.20	…judge the quality of information from your doctor or pharmacist about pregnancies, contraceptives?	1	2	3	4
2.21	…judge the quality of information from your teacher or out-school/work activities?	1	2	3	4
Applying					
2.22	…use contraceptives before having sex?	1	2	3	4
2.23	…use the doctor's or pharmacist's instructions about pregnancies, contraceptives?	1	2	3	4
2.24	…follow the instructions that come with your leaflet/product packages (e.g. condom or medicine packaging)?	1	2	3	4
2.25	…decide what to do when you discover/your girlfriend discovers a pregnancy? (Keeping the baby, adoption)?	1	2	3	4
2.26	…decide what to do when you have/ your girlfriend has a problem related to pregnancy?	1	2	3	4

2.27	…decide what to do when you have/ your girlfriend has a problem related to contraceptives?	1	2	3	4
2.28	… talk/negotiate with your sexual partner about using a contraceptive method before having sex?	1	2	3	4
2.29	…talk with your friends about teenage pregnancies, contraceptive methods?	1	2	3	4
2.30	…talk with your family about teenage pregnancies, contraceptive methods?	1	2	3	4
2.31	…consult your health provider (e.g. doctor or nurse) about teenage pregnancies, contraceptives?	1	2	3	4
2.32	…consult your teacher about teenage pregnancies, contraceptives?	1	2	3	4
2.33	… join/take part in sexual education activities, family planning, and teenager supportive activities	1	2	3	4

Thank you

Annex 3: Ethical approved (Vietnam and Laos)

MINISTRY OF HEALTH
HANOI UNIVERSITY OF PUBLIC HEALTH

SOCIALIST REPUBLIC OF VIETNAM
Independence – Freedom - Happiness

No.:465/2018/YTCC-HD3
Subject: Ethical Approval

Hanoi, December 14th, 2018

DECISION
On Ethical approval for research involving human subject participation

THE CHAIR OF THE ETHICAL REVIEW BOARD FOR BIOMEDICAL RESEARCH
HANOI UNIVERSITY OF PUBLIC HEALTH

- Based on Decision No. 560/QĐ-ĐHYTCC by the Dean of Hanoi School of Public Health on Establishment of The Institutional Ethical Review Board of Hanoi School of Public Health; 16 May 2016;
- Based on decision No. 651/QĐ-ĐHYTCC by the Dean of Hanoi School of Public Health on the Issuing Regulation of the Institutional Ethical Review Board of Hanoi School of Public Health; 26 June 2015;
- Based on the minutes of meeting to review ethics application No. **018-465/DD-YTCC** dated December 14th, 2018,

DECIDED:

Article 1. Grant ethical approval for ethnographic study project:

- Project Title**: Pregnancy Health literacy among teenage in Kaysone district, Savannakhet, Lao PDR**
- Principal Investigator**: Phonevilai Santisouk,** Hanoi University of Public Health
- Supervisors: Assoc. Prof. Nguyen Thanh Huong – Hanoi University of Public Health
  Dr. Visanou Hansana
- Project time: from 01/09/2018 to 30/04/2019
- Data collection time: from 16/12/2018 to 21/12/2018
- Review type: Expedited review

Article 2. This decision is effective from **14/12/2018** to **30/04/2019**

Article 3. Principal Investigator has to send progress report once each year and a final report upon the study completion to the Institutional Ethical Review Board of Hanoi University of Public Health (IRB of HUPH).

Article 4. Principle Investigator should notify (IRB of HUPH) immediately of any adverse effects arising from this study (e.g. unexpected adverse outcomes, unexpected community/subject risk factors or complaints, etc.). Active research projects are subject to random audit by the IRB of HUPH.

CHAIR OF HUPH IRB
(Signature and full name)

Ha Van Nhu

SECRETARY
(Signature and full name)

Nguyen Thi Minh Thanh

Lao's People Democratic Republic
Peace Independence Democracy Unity Prosperity
****

Ministry of Health
University of Health Sciences
Ethic Committee

No: 107 /19

Tel: 021 245820

Vientiane, Date 07/02/19

Ethical Clearance

- According to the Ethic Committee's declaration of the University of Health Sciences Number: 3809/UHS.15, dated 1 Sep, 2015.
- According to the letter of request for Ethical Clearance of Ms Phonevilai SANTISOUK, Master of Public Health, Faculty of Public Health, University of Health Sciences. for research entitled: « **Pregnancy health literacy among teenage in kaysone district, Savannakhet Province, LAO PDR** »

The Ethic Committee of the University of Health Sciences approved the research proposal of this study before it is initiated. This study is committed in compliance with local requirements, to confirm that it is without the physical and psychological harm of the participants as well as the ethical issues for health research. However, we believed that this study/project will contribute to a great importance of health promotion; it will also be a direct and indirect participants' beneficial and to be a crucial database in the further research of the University of Health Sciences and Health sectors in the country.

Hence, the Ethic Committee of the University of Health Sciences sincerely agreed to approve in term of ethical clearance for this study/project.

V.President of the
University of Health Sciences

Assoc. Prof. Dr. Mayfong Mayxay

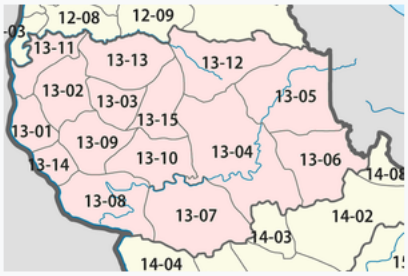
President of the
Ethical research committee

Dr. Bansa OUPATHANA

Annex 4: List of research team members

No	Full name	Office address/Position	Position	Contact number
1	Dr. Visanou Hansana	Vice Dean, FPS	Supervisor	020-22225685
2	Mrs. Soudalat Misavath	Staff at Chanthabouly district hospital	Data collector	020-55119525
3	Mrs. Khamphew Saysouliyong	Staff at Mother and Child hospital	Data collector	020-55639521
4	Mrs. Dalyvanh Phasayyaseng	Student	Data collector	020-58211999
5	Mr. Phoutthasone Namsena	Student	Data collector	020-22215198
6	Mr. Anousone Lorvanhsay	Student	Data collector	020-22117721
7	Ms. Vanhtha Kongmala	Staff at Kaysone district hospital	Contributor	020-28084350
8	Ms. Phonepaseuth Vannasinh	Staff at Kaysone district hospital	Contributor	020-78261748

Annex 5: Map of Savannaket province and pictures

Map	Code	Name
	13-01	Kaysone Phomvihane, former Khanthabouly
	13-02	Outhoumphone
	[redacted]	Atsaphangthong
	13-04	Phine
	13-05	Sepone
	13-06	Nong
	13-07	Thapangthong
	13-08	Songkhone
	13-09	Champhone
	13-10	Xonnabouly
	13-11	Xaybuly
	13-12	Vilabuly
	13-13	Atsaphone
	13–14	Xayphouthong
	13–15	Phalanxay


โรงพยาบาล 2 ทัมวา

Annex 6: Biography of researcher

Name: Phonevilai SANTISOUK

Date and place of birth: 07/11/1980, Vientiane Capital

Address: Hongkha Village, Chanthabouly District, Lao PDR

Work position: Academic staff

Telephone: 00856 20 58 111 998, e-mail: mysantisouk@gmail.com

Professional experience

1. Aug 2009-present Faculty of Postgraduate Studies, University of Health Sciences

• Coordinator of NCD on "Strengthening Research Capacity and EWHA-UHS Partnership by conducting needs assessment, program development, and evaluation of Laos Local Integrated NCD Management System" EWHA Women's University (Korea) in 2015.

• Research assistant for collecting and entering data on "TADDS" WHO in 2014, COPE Client Satisfaction Survey in 2014, "Knowledge, Attitude Award for Reproductive Health, Perception on Infection Risk due to STI/AIDS and Accessibility to Services among Youth Aged 14-19 Years in Luangnamtha, Lao PDR" NGO in 2011, "Knowledge, Attitude and Practice Award for HIV/AIDS and Migrant Work in Savannakht Province" NGO in 2011.

• Research assistant for collecting data on "Southeast Asia Initiative on Tobacco Tax" in Lao PDR 2011.

• General administration

2. Jul 2011-Oct 2012 Studied at Jeonju University (South Korea)

3. Jan 2007-Mar 2007 Kids Smile Project, Japan International Cooperation Agency (Patients' satisfaction with service obtained from health care workers in Lao PDR)

• Data collector and data entry

4. Feb 2005-May 2006 Worked at Pany Pharma Company

• Medical representative for advertisements, medical brochure creator and workshop organizer.

5. Apr 2004-May 2006 Part time medical staff in Export Garment Factory

6. Dec 2005-Jan 2006 Kids Smile Project, Japan International Cooperation Agency (Patients' satisfaction with service obtained from health care workers in Lao PDR)

- Data collector

7. Sep2004-Oct 2004 Field medical staff for ASEAN submitted 25th, Vientiane Capital, Lao PDR.

8. July 2004 Graduated with bachelor degree of general medical doctor, National University of Laos.

Annex 7: Thesis comment

HANOI UNIVERSITY OF PUBLIC HEALTH

THESIS COMMENT FORM OF MASTER PROGRAM
(For reviewer of thesis defence committee – Master Program)

Thesis topic:

PEGNANCY HEALTH LITERACY AMONG TEEANAGERs IN KAYSONE DISTRICT SAVANAKET PROVINCE LAO PDR

Thesis code: *(Written on the right corner of thesis cover page)*

June 17th, 2019

1. Thesis topic has correct orientation and specialized codes (Master of public health applied science orientation/ Master of public health applied research orientation)

Yes.

2. **Thesis topic:**
3. **Research summary:**

4. **Introduction:**

- concepts/definitions of Teenage Health Literacy, Sexual Reproductive Health, Maternal Health literacy should be given clearly. As different terms were used, explanations of using these terms (exchangeable or not,..) should be given.
- the problem statement: more evidences supporting low TPHL in the world and in Lao PDR should be provided (from references).
- guideline for writing abbreviations should be followed (e.g: TPHL, SRH?).

5. **Research Objectives:**

Objectives are clear and appropriate (in terms of writing, however they may be revised after the following sections have been revised)

6. **Literature review:**

1. Comments: (structure and content of literature review are coherent with objectives and research topic, use updated reference and citation correctly, and other comments (if any):

.....

- **Structure of the literature review is clear and appropriate.**
- Pregnancy Health Literature definition is not clear (section 1.1.3). This concept/definition should be clearly stated, because this is key concept and the centre of this research.
- "Measurement of PHL" (section 1.2.2) is not clear. The author develops "the HL measure that relate to pregnancy and contraception"? **if the author develops …, this**, firstly, should not be included in the literature review chapter, but may be included in Methodology Chapter; secondly reliability, scientific issues of the measurement developed by the author are a major question. It will be clear/relevant if questionnaires, measurement methods that have been applied by other authors are reviewed.
- Section 1.3.2: very few evidence (from references) of PHL among teenagers around the world and in Lao PDR. More references should be reviewed.
- Section 1.4. references provided are not specific for PHL among teenagers, but for Health Literature in general (Paasche et al (2007) or HL and adolescence (Manganello (2007) or Guidelines on preventing early pregnancy (WHO, 2011), for examples. **The question is that the author want to study PHL among teenagers or Health Literature among teenagers or Reproductive/sexual Health literature among teenagers?** Most of references are not specific for PHL.

7. Subjects and research methods:

1. Comments: (i) Subjects are suitable to objectives; (ii) Sample size and sample selection are appropriate and feasible; (iii) Variables/contents are suitable to objectives, orientation and specialized codes; (iv) Data collection is clear, feasible and appropriate with research content; (v) Data analysis and research ethic are written clearly and appropriately; (vi) Other comments (if any):

Structure of Method chapter should be revised following the guidelines of the HUPH, e.g.

2.1. Study subjects

(Including selection and exclusion criteria)

2.2. Research place and time

(not during January 2019)

2.3…..

2.4….

Selection of villages: more information/reasons for random selection of villages should be provided.

Section 2.8: more detail information on how questionnaire have been developed, adapted for TPHL. What do you mean "Adaptations of TPHL questionnaires will be valid"? (or validated – if it is true, please present your validation). Also see the comments in the Literature review chapter.

8. Research results:

1. Comments: (i) Research results are suitable with objectives, orientation and specialized codes; (ii) Research result is presented clearly and followed by objectives; (iii) Using data analysis appropriately and ensuring confidence of these methods; and other comments (if any): .....

Structure revision is needed. Results should be divided in two main sections, following the tow study objectives. Numbering sections should be revised, for example: number 3. Results, then:

3.1. Basic information of study subjects

3.1.1.....

3.1.2.....

...

3.2. Teenage pregnancy literature

3.2.1....

...

3.3. Factors related to.....

3.3.1....

.....

Summary only key findings/results presented in each table and not discussion.

Some titles of sections should be revised, e.g the title of section 3.1.2 should be "Teenage pregnancy health literature", instead of "Results of ...".

The author should be looking for more appropriate way of presentation of tables, particularly titles of tables; titles and contents of first columns of a tables.

9. Discussion:

As a result of lack of specific references for TPHL, the comparison and discussion the current study results and results of other references are weak. Few relevant references were quoted.

10. Conclusion:

- Conclusions should be shortened and more concise, not only repeating the results.
- The first paragraph should be deleted.

11. Recommendations

- Recommendations are not specific for TPHL but for sexual health in general.
- Recommendations should be based on the study results and provide solutions/suggestions to improve TPHL.
- No more discussion in the recommendation.

12. **FINAL CONCLUSION: (NEED TO BE CLEARLY STATE):**

[x] Approval with some conditions

Reviewer

Ha Van Nhu

HANOI UNIVERSITY OF PUBLIC HEALTH

THESIS COMMENT FORM OF MASTER PROGRAM
(For reviewer of thesis defence committee – Master Program)

Thesis topic: Pregnancy Health Literacy among Teenage in Kaysone District, Savannakhet province, Lao PDR

Thesis code: *(Written on the right corner of thesis cover page)*

MPH 1790054

.... Date..... Month......year 2019

1. Thesis topic has correct orientation and specialized codes (Master of public health applied science orientation/ Master of public health applied research orientation)

2. Thesis topic:

1. Comments .... appropriate, but some minor typographic mistake ... Teenage ⇒ Teenagers

2. Which part need to be edited, (if any): ....

3. Research summary:

1. Comments: ... - 2 villages of study sites should be named ? which one is urban / rural

2. Which part need to be edited, (if any): ....

4. Introduction:

1. Comments: Acceptable

2. Which part need to be edited, (if any): /

5. Research Objectives:

1. Comments: The potential factors of Pregnancy Health Literacy should be elaborated

2. Which part need to be edited, (if any): To include potential factors to PHL such as Individual, family, Peer, Social, Cultural factors

6. Literature review:

1. Comments: (structure and content of literature review are coherent with objectives and research topic, use updated reference and citation correctly, and other comments (if any):

relevant

2. Which part need to be edited, (if any): /

7. Subjects and research methods:

1. Comments: (i) Subjects are suitable to objectives; (ii) Sample size and sample selection are appropriate and feasible; (iii) Variables/contents are suitable to objectives, orientation and specialized codes; (iv) Data collection is clear, feasible and appropriate with research content; (v) Data analysis and research ethic are written clearly and appropriately; (vi) Other comments (if any):

- Study area: 2 Villages (urban / rural) should be explained clearly

2. Which part need to be edited, (if any): .....

.....

.....

.....

8. Research results:

1. Comments: (i) Research results are suitable with objectives, orientation and specialized codes; (ii) Research result is presented clearly and followed by objectives; (iii) Using data analysis appropriately and ensuring confidence of these methods, and other comments (if any): .....

.....acceptable.....

.....

2. Which part need to be edited, (if any): .....

.....

.....

.....

.....

.....

.....

9. Discussion:

1. Comments: (i) Structure/Content of this part are suitable to objective and research results; (ii) Reference citation is correct: .....

.....

.....Acceptable.....

.....

2. Which part need to be edited, (if any) .....

.....

.....

.....

.....

10. Conclusion:

1. Comments: (The main research result are given in this part and suitable to objectives)

.....

.....Acceptable.....

.....

2. Which part need to be edited, (if any): .....

.....

.....

.....

11. Recommendations

1. Comments: The recommendation is given appropriately and based on research results:

.....

..... Accept the .....

.....

2. Which part need to be edited, (if any): .....

.....

.....

.....

12. FINAL CONCLUSION: (NEED TO BE CLEARLY STATE):

[ ] **Approval** [✓] **Approval with some conditions** [ ] **Reject**

..... Approval with minor changes .....

.....

.....

Reviewer

Annex 8: Minutes of explanation

MINISTRY OF HEALTH
HANOI UNIVERSITY OF PUBLIC HEALTH

FORM

MINUTES OF EXPLANATION
AFTER THESIS/PROPOSAL DEFENCE

Full name: Phonevilai SANTISOUK

Thesis title: PREGNANCY HEALTH LITERACY AMONG TEEANAGERs IN KAYSONE DISTRICT SAVANAKET PROVINCE LAO PDR .....

TT	**Comments** *(List all comments followed by outline/dissertation/thesis/thematic structure)*	**Student's explanations detail** *(Clearly state how, which part, page that student edits. if students disagree, reasons should be indicated)*
1	Orientation and specialized codes	
	.....	
2	Thesis topic	
	....	
3	Abstract	
	- Summary: have to draw instrument of measure health literacy and references	I added the explanations of instrument of TPHL score was collected by using face to face interview with 33 items (262 adolescents) during the period of January 2019. Calculation of TPHL index score was based on the HL-EU index formula. Level of TPHL index was also based on HL-EU standard level' (p vii)
4	Introduction	
	...	
5	Objectives	
	- No need to repeat Research objective	I did cut off some words repeated research objectives (p3)
6	Review of Literature/Theoretical framework	
	- Literature in figure 1-2 (p27) have to cut or thinking about not put in framework (edit arrow of) don't put family and peer in the same box	I did cut off the arrow of the box of independent variables to variables and divided the box of family and peers (p19)
7	Objects and research methods	

	- Methodology: revise sample size number not clear (TPHL) - Add clearly number in sample size of each area in location of study	I added clearly number in sample size of each area in location of study and explanation of p-value: The estimation that 50% of the teenagers had inadequate levels of TPHL (p21)
8	Study results	
	- Chapter 3: repeat content need to revise. Revise meaning of some questionnaire	I revised meaning of some questionnaire and revised some of repeated content (p34-39)
9	Discuss	
	- Limitation: why you select urban and rural but not mention in literature (should write intention not comparison) - Recheck some number which has 100% of respondents results	I did write the limitation for intention not comparison and also recheck some number of respondents results (p 54)
10	Conclusions	
	- Conclusion: explain more predictor	I added the explanations of percentage of problematic TPHL level (60%) and inadequate (30%) (p55)
11	Recommendations	
	- Recommendation: revise this paragraph should be representative for whom... - should consider on capacity of service and family	I revised the paragraph for each representative for health sector (Ministry of Health, Youth Friendly Services), education sector (Ministry of education and Sport, school, teachers) I added more information on capacity of service and family in the recommendations (p 56)
12	References	
	...	
13	Questionnaire	
	...	
14	Other comments	
	- Revise template	I did revise template

Notes:

- Use lines to separate each comments and explanations. Comments and equivalent explanations stay at the same row.

- Explanations should be written by following thesis structure (if any). Students do not mention the examiners' name

Day month year 2019

Student

(Sign and full name)

1st supervisor

(Sign and full name)

2nd supervisor

(Sign and full name)

Supporting lecture (if any)

(Sign and full name')

Examiners' comments *(if any)*:

.....

.....

Day month year

On behalf of the committee

(Sign and full name)

Dr. Wanhpianom SYCHAREUN