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Impact of Short Message Service (SMS) and Social Media on Sexual Intercourse of High School Students in Cambodia

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Purpose: This study was conducted to investigate the relationship between short message service and social media use, and sexual intercourse of high school students in Cambodia. **Methods:** Four hundred and eighty-three high school students from three schools in rural provinces were interviewed with structured questionnaires. **Results:** Sexual intercourse was found significantly more frequent among male students than among female students (p=.001), among alcohol drinkers than among non-drinkers (p<.001), among those who were not taking pictures with mobile phones than among those who were (p=.045), and among those who were exchanging SMS between boyfriend and girlfriend than among those who were not (p=.006). The students who were sending SMS by mobile phones were 5.83 times as likely to have sexual intercourse as their counterparts (p=.020), who were taking pictures with mobile phone were 0.04 times as likely as those who were not (p=.045) and the odds ratio was 15.19 times as high in alcohol drinkers as in non-drinkers (p=.001). **Conclusions:** Efforts should be made to encourage positive and effective use of social media among adolescents to maintain their sexual health.

Key Words: Adolescent; Coitus; Social media; Text messaging; Cambodia

INTRODUCTION

1. Background

Adolescence is characterized by rapid physical, mental and social development and it is the time when adolescents become autonomous and independent from their parents. As their sexual identity develops, adolescents naturally get to explore sex. These sexual curiosities of adolescents lead to tolerance for exposure to pornography and sexual behavior, and they may result in sexual intercourse and the development of diseases such as sexually transmitted disease (STD) and human immunodeficiency virus (HIV) infections. In the United States, a half of 20 million new STD infections occurring each year are reported to occur among youth aged 15 to 24 [2]. Having multiple sex partners, having sex with a stranger, and unprotected sexual intercourse without using protective devices such as condoms may result in HIV infections, STD infections and unwanted pregnancies, inflicting deleterious effects on the health of youth [3].

The use of Short Message Service (SMS) and social media such as the Social Network Service (SNS) (services that enable communication or interaction with others online [4]) affects thoughts and behavior of youth and plays an important role in the formation of social relations [5]. Social media usage can be defined as the use of a kind of web service that collects most contents from users or other web sites [4]. Today, for most young people, the use of social media which enables social interaction through Internet access on a smart phone becomes an indispensable part of their daily activities [6].

Cambodia has shown considerable growth in digital technology in the last few years. As a result, in 2016, the

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number of Internet users increased to 2.1 million, and social media users and mobile phone users were estimated to be 4.9 million and 4.4 million, respectively. In addition, among youth aged 18 to 24, 44% are Facebook users and 56% are Instagram users, showing the active use of social media among Cambodian youth [7]. Among Cambodians aged 15 to 24, the accessibility level of mobile phones is 98% in urban areas and 96% in rural areas [8]. These data show that the use of social media via the Internet is becoming general among all youth in Cambodia regardless of their residence areas.

The various forms of the use of SMS and social media give many advantages to young people, but these means of communication also have some drawbacks [9]. For example, SMS is an inexpensive and easy way to communicate and coordinate events with friends and is also used as a way to maintain friendship [10]. However, at the same time, it involves the risk that it may affect sexual intercourse since it enables youth to exchange sexually explicit pictures or messages with each other (sexting) [11]. In addition, youth can use social media to write about their favorite movies and events, hobbies and experiences in text or images, receive feedback from their peers, and expand relationships through communication and interaction with their peers [5]. Social media play an important role in sexual socialization by enabling youth to establish their sexual identity and produce sexual expression [12]. In addition, adolescents acquire important and sensitive sexual health information through social media rather than traditional health information services such as books [13]. However, sex-related information shared on social media has low reliability because the accuracy of contents is uncertain, and the use of SMS and social media involves potential risks, such as the behavior of sending sexually explicit SMS messages or pictures on a mobile phone, exposure to inappropriate contents, and cyberbullying [9]. Previous studies have shown that the uses of SMS and social media are linked to sexual intercourse in young people. In a study of Latino teenagers in 12 public high schools in Maryland, USA, the score for sexual intercourse was 2.0 times higher in teenagers using SMS 100 or more times than those using SMS less than 100 times, and teenagers accessing social media at least once per day had a 2.1 times higher score for sexual intercourse than those accessing social media less often [14]. In addition, in a study of Nigerian adolescents, the score for sexual intercourse experience was found to be higher in adolescents using social media frequently (58.8%) compared to those not using them frequently (47.5%) [15]. This can be attributed to the fact that the social media platform provides more ways and opportunities for youth to interact with others and SMS and social media increase the dynamics of such relationships.

Cambodia is one of the countries with the highest percentage of the youth population in Southeast Asia and the population aged 10~24 accounts for 28.4% of the total population of Cambodia [16]. In 2010, among Cambodian youth aged 10 to 24, 4% of men and 14% of women reported having sexual intercourse experience before the age of 18, and the percentages increased to 5% for men and 18% for women in 2014 [16,17]. Especially, the rate of sexual intercourse experience for teenagers aged 18 to 19, which are the ages of third-year high school students in Cambodia, has been increasing from 19.3% in 2010 to 29.8 % in 2014 for boys and from 8.1% in 2010 to 10.6% in 2014 for girls [18]. Social media usage among teenagers in Cambodia is increasing actively [7], and since Cambodia has a culture in which talking about sex in public is taboo [20], young people share inaccurate information about sex through SMS or social media in an indiscreet manner, which may jeopardize the sexual health of adolescents, so there is a need to pay attention to and conduct research about the impact of social media use on sexual behavior in terms of health aspects. According to a United Nations (UN) report in 2018, out of a total of 67,000 people infected with HIV in Cambodia, 3,400 persons are 10~19 years old and 4,100 persons are 15~24 years old, with the population aged 10~24 accounting for 11.2% of the total HIV-infected people [21], so it is important to identify factors affecting sexual health in Cambodian youth and to find solutions.

The majority of adolescents begin to have sexual intercourse when they are in high school and the rate of sexual intercourse experience increases with the school year [19]. Although youth in Cambodia are exposed to open sexual culture through the increased use of the Internet and social media, it is difficult to share information on healthy sex due to the culture forbidding open discussions about sex in public, and especially, for youth in rural areas, a conversation about sex is a more sensitive issue [20]. In addition, in Cambodia, the fertility rate of teenagers attending high school is twice higher in rural areas than in urban areas (26 persons in urban areas and 52 persons in rural areas per 10 million people), and the average age when girls experience sexual intercourse for the first time is lower in rural areas (21.0 years in urban areas and 23.8 years in rural areas) [17,18]. In this context, considering the negative effects of sharing inaccurate and inappropriate information about sex and exposure to pornography in relation to the recent active use of SMS and social media among Cambodian youth, research is required to inves-

tigate the relationship between the degree of the use of SMS and social media and sexual intercourse in Cambodian adolescents in order to develop and apply programs for sexual health of adolescents. However, there have been few studies on the influencing factors for sexual intercourse of youth in rural areas of Cambodia. Especially, there is no study on the effects of the use of SMS and social media on sexual intercourse. Therefore, this study aimed to investigate the relationship between SMS and social media and sexual intercourse in high school students in rural areas of Cambodia and to examine the effects of the use of SMS and social media on sexual relationships to provide basic data necessary for future program development and education for HIV prevention and sexual health promotion for Cambodian youth.

2. Purpose

The purpose of this study is to examine the effect of the use of SMS and social media on sexual intercourse in high school students in rural areas of Cambodia and the specific objectives of this study are as follows:

- To identify the general characteristics of participants;
- to investigate the degree of the use of SMS and social media of participants;
- to examine general characteristics of participants and the relationship between the use of SMS and social media and sexual intercourse;
- to investigate the impact of the use of SMS and social media on sexual intercourse in participants.

METHODS

1. Study Design

This study is a descriptive research to investigate the effects of the use of SMS and social media on sexual intercourse in third-year high school students in rural areas in Cambodia.

2. Participants

The participants of this study were third-year high school students in three rural regions of Cambodia, Kampong Cham, Kampong Chhnang, and Koh Kong. The specific inclusion and exclusion criteria for selection of participants were as follows:

Inclusion criteria

- Cambodian adolescent who is a third-year student attending a high school in Kampong Cham, Kampong Chhnang or Koh Kong
- Person who understands the purpose of this study and voluntarily agreed to participate in the study

Exclusion criteria

- Person who immigrated from other countries such as China and Vietnam and does not have Cambodian nationality
- Married person

The minimum sample size for this study was calculated using the statistical method for multiple regression analysis of G*Power 3.1 Program by assuming the significance level α=.05, medium effect size of .15, power of .95, and the number of factors of 20. As a result, the minimum sample size was determined to be 222 persons, and 483 copies of the final questionnaires were used in the analysis, so the minimum sample size was satisfied.

3. Measures

1) General characteristics

General characteristics which were identified as factors affecting sexual intercourse experience in youth in previous studies, such as sex, age, religion, drinking status, occupation and education level of parents, coresidence with parents, and frequency of having dinner with the family, were included in the questionnaire.

2) The use of SMS and social media

In this study, we used the questionnaire open to the public through the survey of teens and young adults [6] conducted by the Pew Research Center, which conducts surveys of public opinions, demographic surveys, media content analysis, and other social science research. The questionnaire was used after obtaining the approval for using it after explaining the purpose and intent of the study by e-mail. The specific questions used to assess the degrees of the use of SMS and social media were the following 10 questions: Do you use a mobile phone?; Do you do SMS, email, photo, video, Internet, and game activities on your mobile phone?; How many times a day do you exchange SMS messages with your parents, friends, and boyfriend/girlfriend?; Do you use SMS 100 or more times a day?; Do you use the Internet?; How many times a day do you use the Internet?; Do you have any social media accounts such as Facebook, Twitter, YouTube, and Instagram accounts?; If you have a social media account, how many times do you log in each day?

3) Sexual intercourse

In order to investigate the presence or absence of sexual

intercourse experience of the participants, they were asked to answer 'Yes' or 'No' to the question 'Have you ever had sexual intercourse before?'.

4) Translation of the instrument and the preliminary survey

The questionnaire including all the questions about general characteristics, the use of SMS and social media, and sexual intercourse experience were first translated by a bilingual expert fluent in both English and Cambodian, and this translated version was translated into Cambodian again by another expert who did not read the original English version. Then, two experts met together to compare the original version with the translated version, and completed the translated version through discussions so that the translated version would reflect the original version as much as possible. Afterwards, a preliminary survey was conducted with 30 high school students with the translated version, and the final translated version was completed through identification and revision of words the participants found difficult to understand.

4. Data Collection and Analysis Methods

Three rural areas, Kampong Cham, Kampong Chhnang, and Koh Kong, were randomly selected. Kampong Cham is located 124 km to the north east of the capital, Phnom Penh, and the region has the largest population of 1.75 million and has 41 high schools. Kampong Chhnang is located 91km to the north of Phnom Penh and has 523,000 residents and 16 high schools. Lastly, Koh Kong is located in the southwestern part of the country, 271 km away from Phnom Penh, and has 122,000 residents and 21 high schools in the region [22]. For this study, one high school was randomly selected in each region. 97 out of 102 persons (agreement rate: 95.1%) in Kampong Cham, 300 out of 307 persons (agreement rate: 97.7%) in Kampong Chhnang and 103 out of 105 persons in Koh Kong (agreement rate: 98.1%) agreed to participate in the study. A total of 500 copies of the questionnaire were collected, but 483 people were included in the final analysis excluding 17 copies with missing data.

Before collecting the data, the research purpose and intent and participation methods were explained to the principal of each school and approval for the recruitment of participants among students was obtained. According to the formal procedures, a document with the descriptions of the school name, the school principal's contact information, and the research schedule was submitted to the Ministry of Education, and after explaining the research purpose and method through a meeting with officials of the Ministry of Education, the final approval was obtained from the minister of the Ministry of Education. Then, after arriving at each school, we met with the school principal and staff in charge to explain about the research in detail and discussed the schedule and methods not to disturb classes before conducting data collection.

The data collected in this study were analyzed using the SPSS/WIN 23 program and specific procedures are as follows.

- The general characteristics of the participants were calculated as real numbers and percentages.
- The degree of the use of SMS and social media of the participants was calculated as the mean and standard deviation.
- The general characteristics of the participants and the relationship between the use of SMS and social media and sexual intercourse experience were analyzed by cross-tabulation analysis.
- In order to examine the relationship between the use of SMS and social media and sexual intercourse experience, among variables which may affect sexual intercourse according to the use of SMS and social media, gender and drinking status were selected as covariates, and they were analyzed by logistic regression analysis.

5. Ethical Considerations

Two trained Cambodian research assistants, one person with a master's degree in nursing and a doctoral student in nursing, entered the classroom and provided sufficient explanations about the study to students. After obtaining informed consent from the students who agreed to participate in the questionnaire survey, the participants were asked to complete a self-administered questionnaire. Before conducting the questionnaire survey, participants were informed about confidentiality of their responses of the questionnaire and that if they wanted to withdraw from the survey while completing the questionnaire, they could do anytime without any disadvantages. Considering private and sensitive contents of survey questions such as sex intercourse experience, the homeroom teacher was asked not to be in the classroom and students were seated apart from each other with the maximum space between tables to secure confidentiality of individuals. After the questionnaire survey was completed, prepared gifts were given to the participants to express appreciation. The data collection was carried out after obtaining the approval from the IRB of the university which the researcher belongs to (2017-06-013-001).

RESULTS

1. General Characteristics of Participants

The general characteristics of the participants are shown in Table 1. Male students were 42.2% of the total participants, and female students were 57.8%, and the average age was 18.24±1.06 years (male: 18.53±1.15 years; female: 18.03±0.94 years). 99.2% had religion and 11.8% drank alcohol. As for parents' occupation and education level, 93.0% had a father with a job and 69.8% had a mother with a job. Regarding the education level of parents, the highest proportion of parents had no formal education and 40.8% of fathers and 42.9% of mothers had no formal education. 67.1% of the participants lived with their parents, and 20.5% lived with a single parent. In addition, with respect to the frequency of having dinner with the family per week, the percentage for 5~7 times a week was highest (53.8%).

Table 1. Demographic Characteristics among Participants (*N*=483)

Characteristics	Categories	n (%) or M±SD
Gender	Male	204 (42.2)
	Female	279 (57.8)
Age (year)	(range: 17~21)	18.24±1.06
Religion	Yes	479 (99.2)
	No	4 (0.8)
Drinking	Yes	57 (11.8)
	No	426 (88.2)
Father's job	Yes	449 (93.0)
	No	34 (7.0)
Mother's job	Yes	337 (69.8)
	No	146 (30.2)
Father's education (year)	No formal	197 (40.8)
	1~9	145 (30.0)
	≥10	141 (29.2)
Mother's education (year)	No formal	207 (42.9)
	1~9	177 (36.6)
	≥10	99 (20.5)
Living together	Two parents	324 (67.1)
	Single-parent	99 (20.5)
	Step parent	6 (1.2)
	Relatives	38 (7.9)
	Others	16 (3.3)
Dinner (times/week)	0~1	68 (14.1)
	2~4	155 (32.1)
	5~7	260 (53.8)

2. The Degrees of the Use of SMS and Social Media

Table 2 shows the degrees of the use of SMS and social media. 97.9% of the students used mobile phones and 2.1% did not. 86.3% used the Internet and 8.3% used SMS more than 100 times a day. As for the mean frequency of SMS use, the participants used SMS 2.39±10.47 times a day with parents, 20.63±128.81 times a day with friends, and 15.72±146.34 times a day with opposite gender friends. 94.4% had a social networking account but 5.6% had no social networking account, and 73.5% had two or more accounts. Among them, 86.7% had a Facebook account.

3. Sexual Intercourse according to the Use of SMS and Social Media in Participants

Table 3 shows the results of cross-tabulation analysis of the relationships of the general characteristics of participants and sexual intercourse according to the use of SMS and social media. The score for sexual intercourse was higher in male students than female students (x^2=11.17, p=.001), in students who drink alcohol than non-drinkers

Table 2. SMS/Social Media Use among Participants (*N*=483)

Variables	Categories	n (%) or M±SD
Mobile phone use	Yes	473 (97.9)
	No	10 (2.1)
Internet use	Yes	417 (86.3)
	No	66 (13.7)
Frequency of SMS use	More than100 SMS per day	40 (8.3)
Average of SMS per day	With parents	2.39±10.47
	With friends	20.63±128.81
	With boy/girlfriend	15.72±146.34
Social networking account †	Any accounts Yes	456 (94.4)
	No	27 (5.6)
	More than 2 accounts	355 (73.5)
Facebook account	Yes	419 (86.7)
	No	64 (13.3)
Twitter account	Yes	40 (8.3)
	No	443 (91.7)
YouTube account	Yes	277 (57.3)
	No	206 (42.7)
Instagram account	Yes	147 (30.4)
	No	336 (69.6)
Others account	Yes	26 (5.4)
	No	457 (94.6)

SMS=short message service; † Plural response.

Table 3. Sexual Intercourse based on the Participants' Characteristics and SMS, Social Media Usage (*N*=483)

Variables	Categories		Ever had sex		x^2	*p*
			Yes	No		
			n (%)	n (%)		
Gender		Male	12 (5.9)	192 (94.1)	11.17	.001
		Female	2 (0.7)	277 (99.3)		
Drinking		Yes	9 (15.8)	48 (84.2)	38.16	< .001
		No	5 (1.2)	421 (98.8)		
Activity	SMS	Yes	10 (3.9)	246 (96.1)	1.97	.184
		No	4 (1.8)	223 (98.2)		
	E-mail	Yes	4 (2.9)	136 (97.1)	0.00	> .999
		No	10 (2.9)	333 (97.1)		
	Picture	Yes	2 (0.9)	227 (99.1)	6.35	.013
		No	12 (4.7)	242 (95.3)		
	Video	Yes	2 (1.3)	150 (98.7)	1.95	.243
		No	12 (3.6)	319 (96.4)		
	Internet	Yes	7 (2.4)	284 (97.6)	0.63	.581
		No	7 (3.6)	185 (96.4)		
	Game	Yes	3 (2.1)	140 (97.9)	0.46	.571
		No	11 (3.2)	329 (96.8)		
SMS	≥100 (times/day)	Yes	1 (2.5)	39 (97.5)	0.03	> .999
		No	13 (2.9)	430 (97.1)		
SNS	Facebook	Yes	11 (2.6)	408 (97.4)	0.84	.412
		No	3 (4.7)	61 (95.3)		
	Twitter	Yes	1 (2.5)	39 (97.5)	0.03	> .999
		No	13 (2.9)	430 (97.1)		
	YouTube	Yes	7 (2.5)	270 (97.5)	0.32	.594
		No	7 (3.4)	199 (96.6)		
	Instagram	Yes	1 (0.7)	146 (99.3)	3.69	.074
		No	13 (3.9)	323 (96.1)		
SMS with	Parents	Yes	7 (3.5)	192 (96.5)	0.46	.585
		No	7 (2.5)	277 (97.5)		
	Friends	Yes	13 (3.3)	380 (96.7)	1.26	.329
		No	1 (1.1)	89 (98.9)		
	Boy/girl friends	Yes	12 (5.0)	228 (95.0)	7.49	.006
		No	2 (0.8)	241 (99.2)		

SMS=short message service; SNS=social networking service.

(x^2=38.16, p < .001), and in students taking photos with a mobile phone than those who do not (x^2=6.35, p=.013). Among youth using SMS, the score for sex intercourse was statistically significantly higher in the group exchanging SMS messages with opposite gender friends than in the group exchanging SMS messages with same gender friends (x^2=7.49, p=.006). However, in the case of the use of SMS, e-mail, watching videos, surfing the Internet or playing games, the use of SMS 100 or more times a day, and the use of social media through Facebook, Twitter, YouTube or Instagram on a mobile phone, exchanging SMS with parents and exchanging SMS with friends, the comparison between participants doing each type of activity and those not doing it showed that there was no statistically significant difference in sexual intercourse.

Table 4. Association between SMS, Social Media and Sexual Intercourse among Adolescents (*N*=483)

Variables	Categories	AOR	95% CI	*p*
Activity	SMS	5.83	1.32~25.78	.020
	E-mail	1.99	0.44~9.10	.375
	Picture	0.04	0.00~0.92	.045
	Video	2.70	0.12~60.82	.531
	Internet	0.98	0.24~3.98	.977
	Game	0.73	0.14~3.82	.713
SMS	≥100 (times/day)	0.57	0.06~5.22	.621
SNS	Facebook	0.93	0.16~5.40	.934
	Twitter	1.46	0.05~43.30	.828
	Youtube	2.10	0.48~9.15	.322
	Instagram	0.11	0.01~1.11	.061
SMS with	Parents	1.24	0.28~5.41	.780
	Friend	2.33	0.19~28.97	.510
	Boy/girl friend	0.39	0.06~2.37	.303
Gender	Male	2.33	0.36~15.12	.376
Drinking	Yes	15.19	2.85~80.81	.001

Reference: No activity, SMS < 100, No SNS, No SMS with parents, No SMS friend, No SMS with boy/girl friend, Female, No alcohol.; Adjusted for gender, drinking; AOR=adjusted odds ratio; CI=confidence interval; SMS=short message service; SNS=social networking service.

4. The Effects of the Use of SMS and Social Media on Sexual Intercourse

Table 4 shows the effects of the use of SMS and social media on sexual intercourse among participants after controlling for gender and drinking status of the participants.

To examine the impacts of SMS and social media use on sexual intercourse among participants, logistic regression analysis was performed and the results showed that the regression model was significant (x^2=47.28, p < .001).

Students using SMS on a mobile phone was 5.83 times (p = .020) more likely to have sexual intercourse experience and students taking pictures with a mobile phone was 0.04 times (p = .045) more likely to have sexual intercourse experience, compared to students who do not do such activities using a mobile phone. In addition, students drinking alcohol were 15.19 times more likely to have sexual intercourse experience compared to non-drinkers (p = .001). However, the use of SMS more than 100 times a day or the use of social media such as Facebookwith was found to have no significant relationship with sexual intercourse.

DISCUSSION

This study was conducted with a total of 483 third year high school students attending high schools in rural areas in Cambodia to investigate the effects of the use of SMS and social media on sexual intercourse among high school students in Cambodia.

In Cambodia, the use of mobile phones among adolescents has been continuously rising as in other countries. According to a BBC research report published in 2014, the percentage of mobile phone users was 96% among people aged 15 to 19, and the percentage of people having access to the Internet using a mobile phone was 35%[8]. In this study, 97.9% of the respondents used mobile phones, and 86.3% had access to the Internet using mobile phones. This high Internet penetration rate can be attributed to the fact that although Cambodia has a low wired Internet access rate, most of Cambodian adolescents have mobile phones and Cambodians can use the Internet by putting a Mobile SIM card in a mobile phone at a low price; for example, it is possible to use 7GB 4G/LET for 10 USD.

In addition, adolescents can use their mobile phones autonomously without being supervised by their parents, thereby securing their identities in the relationships with their peers and increasing individual prestige, and another attractive feature of mobile phones is that they allow individuals to use their disposition and skills. These advantages of mobile phones may account for a high mobile phone usage rate among adolescents. Among the social media accounts of the participants, the proportion of Facebook accounts (88.6%) was highest, followed by YouTube (68.7%) and Instagrams (33.1%), and 73.5% of the participants were found to have two or more accounts. The use of these diverse types of social media can be seen as daily activities for communication with others and improvement of social relations [5].

In the present study, the average numbers of exchanges of SMS with parents, friends of the same gender and friends of the opposite gender were 2.39±10.47, 20.63±128.81, and 15.72±146.34, respectively. These results showed that people have more exchanges with the peer group or friends of the opposite gender than family members during adolescence. In particular, the cross-tabulation analysis of this study revealed that as the frequency of SMS exchanges with friends of the opposite gender was higher, the degree of sexual intercourse was statistically significantly increased. These results are similar to those of a study of high school students in LA which reported that the score for sexual intercourse was 7.17 times higher in high school students sending sexually explicit messages or photos by mobile phones than those who did not. In a study of 428 Latino teenagers in the United States to investigate the relationship between SMS and social media use and sexual intercourse, adolescents using SMS 100 or more times a day had a higher score for risky sexual intercourse [15]. It is believed that using SMS with friends of the opposite gender during adolescence with a lot of sexual curiosity increases the opportunities for more risky sexual attitudes and behaviors by freely communicating about sexuality without temporal or spatial constraints and without the supervision of a parent or teacher.

In this study, participants exchanging SMS messages using mobile phones were 5.83 times more likely to have experience of sexual intercourse than those who did not (p=.020). In a study of 948 high school students in the United States, teenagers sending sexually explicit messages or pictures on their mobile phones via SMS or e-mail were found to start dating earlier and have a higher degree of sexual intercourse. These findings are thought to be related to the fact that smartphones are the most commonly used means to share sexual photos and they allow people to exchange sexual expressions in romantic relationships by sharing or posting sexual images between men and women and people can communicate and exchange information about sex through social media without others' interference. In addition, the likelihood of sexual experience was found to be higher in teenagers sending more SMS and accessing social media sites more frequently [15], and this result is attributed to the fact that SMS and social media provide young people with more opportunities to interact with friends or others. Therefore, in future studies, there is a need to investigate the contents of SMS messages and the uses of social media among young people.

In this study, the frequency of sexual intercourse was significantly higher in male students than female students (p<.001). This result is consistent with the outcomes of a study of middle school and high school students in the United States showing that the score for sexual intercourse was higher in boys than girls [25]. Cambodia has traditional culture where male chauvinism is dominant, and a woman who is submissive to her husband and reticent is defined as the image of ideal women in Cambodia, so it is likely that boys have easier access to sexual issues and have more sexual intercourse experience than girls. On the other hand, our society has still double standards in relation to sexual behaviors, so sexual behaviors of boys and girls are judged differently. In addition, there is a tendency of socially negative perception for girls with early sexual intercourse experience [26], and these perceptions are thought to be related to the result that the level of sexual intercourse experience was found to be lower in female students that male students. In other words, that a lower frequency of sexual intercourse in female students is thought to be due to the fact that they have less sex-related benefits and feel more shameful and guilty about sexual intercourse compared to male students [27]. On the other hand, male students were shown to have a higher frequency of sexual intercourse, which is believed to be due to the fact that male adolescents generally autonomously choose their sexual behaviors and having a lot of sexual intercourse experience sometimes gives them a better reputation among male peers [25].

In this study, students who drank alcohol were found to have a 15.19 times higher likelihood of sexual intercourse than students who did not drink alcohol (p=.001). A study of Norwegian adolescents [28] also showed that the likelihood of early sexual intercourse experience was higher in adolescents drinking alcohol. These findings can be attributed to the fact that drinking can reduce self-control and expose individuals to risky sexual behaviors, and drinking also increases the risk of unplanned sexual intercourse by reducing judgement and the ability to predict negative outcomes. Therefore, it is necessary to consider policies for assessment and prevention of teenagers' risky sexual behaviors such as sexual behaviors of not using condoms after drinking and having multiple sex partners.

Teenagers' increased use of social media through the Internet is accompanied by many changes in their daily life. Therefore, it is important to understand the potential risks and benefits of social interaction resulting from the universal use of SMS and social media among young people. While social media has the advantage of expanding peer relationships, it has an impact on risky behaviors [26]. In other words, adolescents interact with people they know well or those they do not know well through SMS or social media such as SNS in order to establish and main-

tain social relationships [6]. In particular, even through social media, adolescents can express themselves, communicate friendliness or closeness, and share their private life in a similar manner to the way people directly meet together and interact with each other. Moreover, by freely using a mobile phone without any temporal restrictions for various purposes with the mobile phone turned on all the time, they can explore information about sex through social media and use it as a source of information about sex [29]. However, adolescents can also experience damage due to sexual behaviors, such as sending SMS messages containing sexual contents and as a result, they can experience depression or suffer from cyberbullying [9]. Adolescence is a time when young people are in the process of forming their sexual identity. Therefore, guidance and supervision are required to lead youth to positively use social media which may affect their attitudes, identities, and peer relationships.

Various methods can be used to improve the sexual health of adolescents, but web-based health programs can be used positively for adolescents in rural areas. For example, a study of the effects of computer and internet-based interventions for prevention of pregnancy, STDs and HIV among 320 high school students in rural areas reported that students in the experimental group showed a lower likelihood of sexual intercourse, a higher level of self-efficacy for condom use negotiation, and better attitudes toward delayed sexual intercourse [30]. Based on the results of previous studies which demonstrated positive effects of web-based health programs, if sex education is provided through web-based interventions in Cambodia where many young people do not get correct information about sex due to the culture where discussion about sex in public is taboo, the interventions are expected to result in positive effects. In this regard, the findings of this study suggest that there is a need to make efforts to maintain the positive use of social media by establishing effective social media activity strategies for sexual health of young people and encouraging the participation of youth.

This study has some limitations. First, it is not possible to exclude social desirability bias due to the possibility that participants reported lower frequencies of sexual experience than actual degrees regarding questions about sensitive sexual contents. Second, in order to measure the use of SMS and social media, we used a tool developed by the Pew Research Center in the United States, and although the final items were determined through repeated discussion, reviews and preliminary tests, specific reliability and validity of the instrument were not presented.

However, this is the first study which collected data by visiting high schools in rural areas in order to understand the relationship between the use of SMS and social media and sexual intercourse in high school students in rural areas of Cambodia, and it is a meaningful outcome that the study results can serve as basic data for program development and education for healthy sex of Cambodian youth.

CONCLUSION

The purpose of this study was to investigate the relationship between the use of SMS and social media and sexual intercourse in high school students in rural areas of Cambodia. Most of the participants were found to use mobile phones and the Internet (97.9%, 86.3%), and 94.4% of the students had SNS accounts. Thus, the level of the use of social media among the participants was found to be high even though they resided in rural regions. The investigation into the frequency of sexual intercourse according to the use of SMS and social media showed that the degree of sexual intercourse was higher in students using SMS with mobile phones and in those consuming alcohol. Therefore, it is necessary to make efforts to promote positive uses of social media by inducing effective social media activities for sexual health of adolescents.

Therefore, based on the results of this study, we make the following suggestions regarding follow-up studies. First, since parents' and teachers' monitoring of teenagers' use of SMS and social media is critical, there is a need for research to investigate the moderating effects of monitoring of parents and teachers on the relationship between the use of SMS and social media and sexual intercourse. Second, we propose a comparative study to measure the relationship between SMS and social media use and sexual intercourse in urban youth in Cambodia in order to establish strategies to maintain desirable uses of SMS and social media and sexual health of Cambodian youth in the future. Finally, it is necessary to conduct qualitative research through methods such as personal interviews and focus group interviews about specific contents that may affect sexual intercourse as well as frequencies of SMS and social media activities used by adolescents and to explore specific nursing intervention strategies.

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