The Effect of Varying Short Message Service (SMS) Intervention for Promoting Safe Sex among Army Conscripts in Lopburi Army Area, Thailand

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Abstract
This study examined the effectiveness of self-regulation and mobile phone SMS intervention to promote safe sex among army conscripts in a central province, Thailand. Conscripts (n=192) were recruited by multi-stage sampling and stratified into 3 groups: 1-way SMS, 2-way SMS and a control group. Data were collected at baseline, 1, 3 and 6 months after intervention. Repeated measurement ANOVA was used to statistically compare significant differences of theoretical variables and safe sex practices between 3 groups overtime, while all theoretical variables were significantly different among 3 groups ($p<.05$), overtime, safe sex with condom use, abstinence from alcohol drinking before or during sex were not different between 1-way and 2-way SMS group ($p>.05$). The study showed the benefits of SMS intervention in promoting safer sex practices either 1-way or 2-way SMS, but a strengthening program for safer sex behavior is required for creating a safe sex behavior among army conscripts.

Keywords: self-regulation, Short Message Service (SMS), safe sex, conscripts

Introduction

At present, sexual risk behavior is threatening the health status of Thai population and undermining quality of life of the population all ages. As they are in the young age and their career, the army conscripts are particularly at sexual risk behavior compared with the other groups. Data showed that 48.8% of Thai conscripts having sex outside marriage, 22.3% having sex with female sex workers, and 3.8% having sex with men (Kanokwan S. et al, 2010). For several causes of these military have more chance to infected Sexual Transmitted Infectious (STIs) and HIV/AIDS. HIV prevalence of Royal Thai Army RTA military conscripts from 2008 to 2012 are 0.47, 0.51, 0.57, 0.47, and 0.56 respectively, meanwhile, HIV incidence in the past 5 years were 0.32, 0.30, 0.49, 0.15, and 0.23 respectively (Armed Forces Research Institute of Medical Sciences, 2012). Although HIV prevalence is stable for many years, there is still no evidently declinedSMS intervention was found a significant improvement in sexual health knowledge and an increase in the proportion of STIs testing (Gold J, et al, 2010). It was well established that tailored health messages were more engaging and effective at changing behavior than untailored or bulk message (Fjeldsoe S. B., Marshall L.A., Miller D. Y., 2009). There are many factors limiting health system capacity in developing countries. Therefore, SMS is a challenge method for health information and health behavior change intervention because it has a high penetration of all of the population even though they are lower in socioeconomic position. The highest rate for using a mobile phone is amongst the adolescents, younger adults, less educated young adults, people who always change address, and people who are socioeconomically disadvantaged (Koivusilta, Lintonen, & Rimpela, 2007). In spite of the potential of SMS interventions delivered by mobile technologies in worldwide, there are few literatures on SMS-based programs in Thailand. The study of the effectiveness of squad leader mentors through short message services on mobile phone in promoting safe sex among first (central) army area conscripts of Thailand showed the treatment group was significantly increased in knowledge, practice in condom use and perceived advantage and frequency of using SMS. The mentors' message through SMS via mobile phone provided health education information to promote safe sex and awareness regarding HIV and other communicable disease (Kaoaiem, Taneepanichskul, Somrongthong, Saengdidtha, & Lertmaharit, 2012).

Mobile phone and short message service (SMS) are one of the important newly techniques that can be directly given any information to individuals at any time and setting. In particular, SMS intervention has positive short-term behavioral outcomes corresponding to a military inducted situation. Because of conscripts are among the most vulnerable people with HIV infection, they are far away from their family and more directed by peer pressure (UNAIDS, 1998; UNAIDs 2004). Conscripts in this specific condition need for appropriate intervention for promoting their sexual health behavior. Therefore, it is expected that SMS technologies will be effective for improving health outcomes in recruitment of the armed forces period. It is important to further investigate the effectiveness of tailoring the content in SMS intervention.

The purposes of this study were examined and compared the effectiveness of self-regulation and mobile phone SMS communication to promote safe sex in terms of

theoretical characteristics, condom use and abstain from substance use prior or during having sex among 1-way SMS communication, 2-way SMS communication and control groups.

Methods

Participants

Participants were military conscripts who allocated to Lopburi army area. Lopburi province was selected in this study due to a large number of conscripts and a high number of army camps in the area (Royal Thai Army, 2013). The estimated sample size was calculated by G*Power 3 (Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A, 2007). A total of 192 army conscripts were enrolled in the study. Multi-stage sampling was performed to recruit 3 army battalions into the study. Conscripts of each battalion were randomized separately into 3 groups. The two intervention groups were comprised of 1-way SMS (n=64) and 2-way SMS (n=64), the other was control group (n=64). Participants in the 1-way and the 2-way SMS groups were excluded conscripts who were unable to send and receive text message. Inclusion criteria were voluntary conscripts who were in Lopburi military camps during the study period, not diagnosed as HIV positive *(Data from each Army Battalion)*, having a mobile phone and using SMS throughout the study period.

Research tools

Self-administered questionnaire were used. It consisted of 8 parts as follows: Part 1 Socio-demographic characteristics, Part 2 Self-regulation, Part 3 Self-efficacy, Part 4 Outcome expectancy, Part 5 Risk perception, Part 6 Intention to practice, Part 7 Action plan, Part 8 Sexual behavior Part 2-8 were a Likert type scale questionnaire measured theoretical characteristics and safe sex practices. Theoretical characteristics included self-regulation (total score = 4), self-efficacy (total score = 4), outcome expectancy (total score = 4), risk perception (total score = 5), intention to practice (total score = 5) and action plan (total score = 4). Safe sex practices in the past 3 months included condom use (total score = 3) and abstain from substance use in terms of alcohol drinking and drugs use prior or during having sex (total score= for both variables). Content validity of professional agreement was filled in the Index of Item-Objective Congruence (IOC) formula, the overall IOC was 0.80. The pilot study for reliability testing was performed among 45 army conscripts in the Saraburi province. The Alpha Cronbach's coefficient test for reliability was 0.866.

Procedures

This study is a quasi-experimental design conducted from November 2013 to October 2014. Written informed consent was obtained from subjects prior to conduct any related procedures. All study protocols and related documents were approved by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University. After recruitment, the 2-intervention groups were

trained about self-regulation and practiced to receive SMS. Two different text messages were sent to participants per week in 1-way and 2-way SMS groups during 3 months of the program. All participants who received the SMS must reply by sending "OK" back within 24 hours after reading text messages, but it should not be longer than 72 hours. If this was not done, they were excluded from the study. In addition, the 2-way SMS participants were allowed to send SMS back to the researcher to inquire about safe sex and sexual risk when they needed more information. The answers would be sent back to those who asked immediately. All questions and answers were kept. In the control group, participants were provided only leaflet of safe sex after recruitment. Data collection was conducted at baseline and post-test at 1, 3, and 6 months after intervention.

Statistical analysis

The statistical analysis was conducted by using SPSS version 16.0. Baseline data were analyzed for differences among 3 groups, by using Chi-square and one-way analysis of variance (ANOVA). Repeated Measures ANOVA was used to determine the difference for four times of measurement. (p-value <.05 was considered to be statistically significant)

Results

A total of 192 participants were enrolled in the study. Thirty conscripts were excluded due to withdrawal and some of them did not reply "OK" in time. The participants in each group were 55, 55, and 52 in 1-way, 2-way SMS, and control groups respectively. Total average age of participants was 21.53±0.92 years old, 66.1% of them were 21 years old. At the baseline, there were no significant different among 3 groups for socio-demographic characteristics (p>.05), except education level (Table 1).

Table 1 Baseline of socio-demographic characteristics among 3 groups

Variables	1-way SMS n (%)	2-way SMS n (%)	Control n (%)	Total n (%)	*P* Value
1. Age group (years)					0.058[a]
Mean±S. D.	21.34±0.72	21.75±1.14	21.48±0.82	21.53±0.92	
21	49 (76.6)	39 (60.9)	39 (60.9)	127 (66.1)	
≥22	15(23.4)	25(39.1)	25 (39.1)	65 (33.9)	
Total	64 (100)	64 (100)	64 (100)	192 (100)	
2. Education					0.000
Early secondary and lower	30 (46.9)	2 (3.1)	38 (59.4)	70 (36.5)	
Late secondary, early and high vocational school and sub-bachelor	26 (40.6)	48 (75.0)	24 (37.5)	98 (51.0)	
Bachelor's degree and higher	8 (12.5)	14 (21.9)	2 (3.1)	24 (12.5)	
Total	64 (100)	64 (100)	64 (100)	192 (100)	

3. Religion					0.086
Buddhist	60 (93.8)	64 (100)	64 (100)	188 (97.9)	
Christ	3 (4.7)	0 (0)	0 (0)	3 (1.6)	
Islam	1 (1.6)	0 (0)	0 (0)	1 (0.5)	
Total	64 (100)	64 (100)	64 (100)	192 (100)	
4. Marital status					0.057
Never married	38 (59.4)	50 (78.1)	39 (60.9)	127 (66.1)	
Married or living with someone	25 (39.1)	13 (20.3)	21 (32.8)	59 (30.7)	
Others	1 (1.6)	1 (1.6)	4 (6.2)	6 (3.1)	
Total	64 (100)	64 (100)	64 (100)	192 (100)	
5. Employment status (Before recruitment)					0.358
Do not have any occupation	7 (10.9)	9(14.1)	8(12.5)	24(12.5)	
Studying	5 (7.8)	12(18.8)	7(10.9)	24(12.5)	
Having an occupation	52 (81.2)	43(67.2)	49(76.6)	144(75.0)	
Total	64 (100)	64 (100)	64 (100)	192 (100)	
6. Estimated income per month					1.639[a]
No income or revenue	19 (29.7)	23(35.9)	14(21.9)	56(29.2)	
< 10,000 Baht	15 (23.4)	16(25.0)	21(32.8)	52(27.1)	
10,000-19,999 Baht	21 (32.8)	17(26.6)	28(43.8)	66(34.4)	
≥ 20,000 Baht	9 (14.1)	8 (12.5)	1 (1.6)	18 (9.4)	
Total	64 (100)	64(100)	64(100)	192(100)	

[a] Age and income per month using ANOVA , other variables using Pearson's Chi-square test.

Theoretical characteristics of the study among 3 groups were compare. There was significantly difference among 3 groups for 4 times of repeated measure on self-regulation, self-efficacy, outcome expectancy, risk perception, intention to practice and action plan (p-value<0.05)

Table 2 Self-regulation, self-efficacy, Outcome expectancy, Risk perception, Intention to practice and Action plan comparison among 3 groups by using Repeated Measure ANOVA

Outcome variable	**Baseline** (n) **Mean±S.D**		**1- month FU** (n) **Mean±S.D**		**3-month FU** (n) **Mean±S.D**		**6-month FU** (n) **Mean±S.D**		**p-Value[a]**
1. Self-regulation									0.000
1-way SMS	(64) 2.93	±0.55	(55) 2.84	±0.61	(55) 2.80	±0.59	(55) 3.08	±0.49	
2-way SMS	(64) 3.01	±0.45	(55) 3.19	±0.49	(55) 3.19	±0.44	(55) 3.19	±0.42	

Control	(64) 2.85	±0.44	(52) 2.82	±0.45	(52) 2.71	±0.50	(52) 2.58	±0.47	
2. Self-efficacy									0.001
1-way SMS	(64) 3.04	±0.57	(55) 2.91	±0.64	(55) 2.91	±0.63	(55) 3.14	±0.51	
2-way SMS	(64) 3.17	±0.50	(55) 3.25	±0.45	(55) 3.23	±0.56	(55) 3.23	±0.39	
Control	(64) 3.01	±0.47	(52) 2.91	±0.46	(52) 2.76	±0.50	(52) 2.69	±0.44	
3. Outcome expectancy									0.000
1-way SMS	(64) 3.21	±0.40	(55) 3.03	±0.48	(55) 3.02	±0.52	(55) 3.31	±0.42	
2-way SMS	(64) 3.20	±0.39	(55) 3.34	±0.36	(55) 3.30	±0.43	(55) 3.28	±0.34	
Control	(64) 3.06	±0.34	(52) 3.02	±0.34	(52) 2.78	±0.40	(52) 2.75	±0.33	
4. Risk perception									0.000
1-way SMS	(64) 3.79	±0.48	(55) 3.56	±0.60	(55) 3.63	±0.59	(55) 3.91	±0.52	
2-way SMS	(64) 3.80	±0.47	(55) 3.95	±0.49	(55) 3.97	±0.49	(55) 3.95	±0.45	
Control	(64) 3.75	±0.42	(52) 3.45	±0.43	(52) 3.35	±0.51	(52) 3.06	±0.50	
5. Intention to practice									0.005
1-way SMS	(64) 3.83	±0.78	(55) 3.84	±0.79	(55) 3.77	±0.79	(55) 4.05	±0.69	
2-way SMS	(64) 4.01	±0.61	(55) 4.12	±0.70	(55) 4.12	±0.53	(55) 4.11	±0.54	
Control	(64) 3.70	±0.87	(52) 3.66	±0.71	(52) 3.38	±0.87	(52) 3.27	±0.94	
6. Action plan									0.001
1-way SMS	(64) 2.76	±0.70	(55) 3.07	±0.78	(55) 2.96	±0.73	(55) 3.16	±0.52	
2-way SMS	(64) 2.88	±0.63	(55) 3.18	±0.52	(55) 3.21	±0.48	(55) 3.28	±0.49	
Control	(64) 2.64	±0.65	(52) 2.94	±0.53	(52) 2.46	±0.71	(52) 2.60	±0.69	

[a]Using Repeated Measure ANOVA, data are descriptive statistics

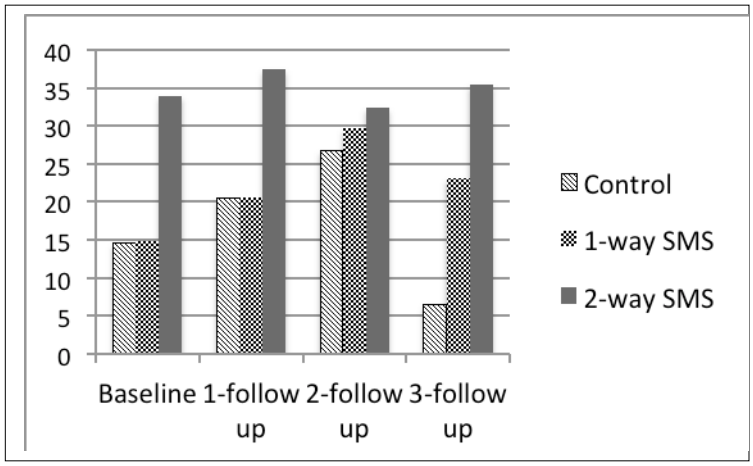
Condom use comparison among 3 groups

Statistical analysis by Chi-square was used for significant differences testing among 3 groups. The results showed that there was significant difference for condom use before or during having sex only the 1-way SMS group ($p < 0.036$). Comparing between group found that there was significant difference at the follow-up 3 (p-value = 0.012).

Table 3 Condom use comparison among 3 groups by using chi-square test

Condom use in the past 3 months	Baseline data n (%)	Follow-up 1 n (%)	Follow-up 2 n (%)	Follow-up 3 n (%)	Chi-square	p-value
1-way SMS					8.528	0.036
Never	14(29.8)	8(20.5)	2(5.4)	6(15.4)		
Sometimes	26(55.3)	23(59.0)	24(64.9)	24(61.5)		
Every time	7(14.9)	8(20.5)	11(29.7)	9(23.1)		
Total	47(100.0)	39(100.0)	37(100.0)	39(100.0)		
2-way SMS					2.116	0.548
Never	5(10.0)	6(18.8)	5(14.7)	7(20.6)		
Sometimes	28(56.0)	14(43.7)	18(52.9)	15(44.1)		
Every time	17(34.0)	12(37.5)	11(32.4)	12(35.5)		
Total	50(100.0)	32(100.0)	34(100.0)	34(100.0)		
Control group					7.371	0.060
Never	14(29.2)	12(30.8)	4(9.8)	8(17.4)		
Sometimes	27(56.2)	19(48.7)	26(63.4)	35(76.1)		
Every time	7(14.6)	8(20.5)	11(26.8)	3(6.5)		
Total	48(100.0)	39(100.0)	41(100.0)	46(100.0)		

Figure 1 Used condom every time of having sex compared among 3 groups at baseline and follow-ups.



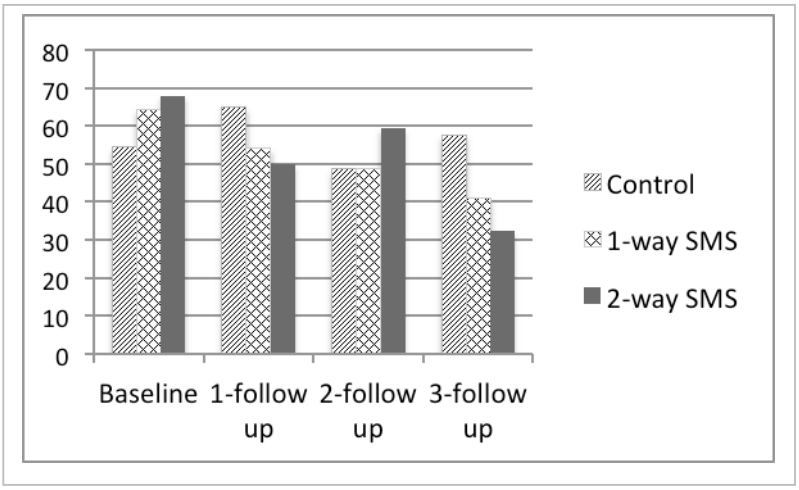
Alcohol drinking before or during having sex

The participants of the 1-way SMS group who never drank alcohol before or during having sex during the past 3 months were 46.6%, 51.4%, and 59.0% (follow-up 1, 2 and 3 respectively). Participants of the 2-way SMS group who never drink alcohol before or during having sex during the past 3 months were 50.0%, 40.6%, and 67.6% (follow-up 1, 2, and 3 respectively). Meanwhile, the percentages of participants of the control group who never drink alcohol before or during having sex during the past 3 months were 35.1, 51.4, and 42.5 (follow-up 1, 2, and 3 respectively). At the last follow-up, the vast majority percentage of alcohol drinking before or during having sex of both intervention groups was "never" (67.6 % and 59.0 % in 2-way and 1-way SMS groups respectively) followed by "sometimes" (38.5 % and 32.4% in 1-way and 2-way SMS respectively). None of participants in the 2-way SMS group drank alcohol before or during having sex at follow-up 2 and follow-up 3. Statistical analysis by Chi-square was used for significant differences testing among 3 groups. The results showed that there was significant differences among 3 groups at follow-up 3 (p-value = 0.009) (Table 37).

Table 4 Alcohol drinking comparison among 3 groups

Alcohol drinking	Baseline data n (%)	Follow-up 1 n (%)	Follow-up 2 n (%)	Follow-up 3 n (%)	Chi-square	p-value
1-way SMS group					5.529	0.477
Never	16(35.6)	18(46.2)	19(51.4)	23(59.0)		
Sometimes	25(55.6)	19(48.7)	16(43.2)	15(38.5)		
Every time	4(8.8)	2(5.4)	2(5.4)	1(2.5)		
Total	45(100.0)	39(100.0)	37(100.0)	39(100.0)		
2-way SMS group					14.341	0.026
Never	16(32.0)	16(50.0)	13(40.6)	25(67.6)		
Sometimes	31(62.0)	15(46.9)	19(59.4)	12(32.4)		
Every time	3(6.0)	1(3.1)	0	0		
Total	50(100.0)	32(100.0)	32(100.0)	37(100.0)		
Control group					9.349	0.154
Never	20(45.5)	13(35.1)	19(51.4)	17(42.5)		
Sometimes	24(54.5)	20(54.1)	14(37.8)	22(55.0)		
Every time	0	4(10.8)	4(10.8)	1(2.5)		
Total	44(100.0)	37(100.0)	37(100.0)	40(100.0)		

Figure 2 Alcohol drinking before having sex compared among 3 groups at baseline and follow-ups.



Discussion

Baseline characteristic of the samples

Conscripts in the 2-way SMS had a higher education level than the other groups. The majority of the 1-way SMS and the control groups graduated in early secondary and lower level, in contrast, the 2-way SMS graduated in late secondary, vocational and sub-bachelor level. The different of the conscripts' education level possibly due to the different of battalion's mission. The conscripts who have long periods (1.5 years or more) were inducted to the operation for combat readiness battalion. Meanwhile, the conscripts who have shorter periods (1 year or less) were designated to the non-operational for combat readiness battalion such as a service battalion or school battalion. The conscripts who have been inducted for 1 year derived from 2 conditions i.e. voluntary and lottery methods. The conscripts who graduated in high vocational school and sub-bachelor or upper have a chance to reduce the serving period in the RTA. Since duty of the Special Warfare Service Battalion is non-operations for combat readiness and the unit serve the army as technical services therefore, the designated of recruitment have more chance of recruiting people who have a high education level. Along with, the conscripts in the 1-way SMS group that was a non-operational for the combat readiness battalion, which is higher education level than the sample in the control group that a combat force battalion. Most samples used a mobile phone in the past 3 months and about 52% of them used smart phone. Nevertheless, a study on mobile phones for health education in the developing world: SMS as a user interface revealed that literacy did not appear to be a significant problem of SMS intervention (Danis M. et al., 2010)

Safe sex practices in terms of condom use, abstinence from alcohol before or during having sex after the end of the intervention

After the end of the intervention, condom use was significant difference among 3 groups at follow-up 3 (p-value = 0.012). Participants of the 2-way SMS group had highest percentage of using condom "every time" when they had sex. Meanwhile, the percentage of using condom "every time" of participants of the 1-way SMS and the control group were similar at follow-up 1 and follow-up 2 but at follow-up 3, the percentage of participants of the control group who using condom "every time" were declined. Abstinence from alcohol drinking before or during having sex were also significant differences at follow-up 3 (0.009).

SMS allowed the exchange of short text messages between fixed line or mobile phone devices. A most benefit of SMS quickly sends information in near-real time for many people as recipients of standardized, a large number of a messages or even personalized or specific messages. Participants of the 1-way and 2-way could reach health information via SMS that lead to safer sex practices. The previous studied revealed that SMS can be used effectively with untrained users for health education where errors are tolerable. The study of Hatairat K. et al., (2010) on the effect of squad leader mentors through short message services on mobile phone in promoting safe sex among first (central) army area conscripts of Thailand. Which was shown the significant increase in condom use with risky partners such as sex worker and other men (p-value < 0.001). The project of Text me Flash me that aimed at HIV/AIDS prevention for MSM and female sex workers presented an increasing of knowledge and intention to use condoms furthermore, voluntary counseling and testing uptake increased after the launch of the campaign (site in De'glise, Suggs, and Odermatt, 2012). Short Message Service are a highly promising method of health promotion for multiple reasons which can be can sent to multiple recipients simultaneously and delivered immediately (Gold J, et al, 2010). Although many various types of technology, for example telephone, e-mail, interactive websites and other social networking sites such Facebook have been the potential health delivery portal to reach adolescents and young adults, Short Message Service (SMS) via mobile phone has appeared as a promising and cost-effective gateway to reach health behavior. Among the emerging health care delivery technologies, mobile phone currently provides the greatest opportunity to be personal, private, and easy access information through the use of SMS (Preston K, 2011). The delivery of messages to individuals can be tracked and guaranteed.

The potential of SMS may be particularly significant among population groups most likely to use mobile phone as their primary means of communication. The mobile phone use is popular among adolescents, young adults, socioeconomically disadvantaged people, less educated young adults, and people who frequently change addresses. Therefore, SMS exists a prime delivery channel for health behavior change interventions, especially in populations of lower socio-demographic status and populations with poorer health (Fjeldsoe S. B., Marshall L.A., Miller D. Y., 2009). Most mobile phone users have their phones turned on and message can be sent to multiple recipients simultaneously and immediately, although without internet access. Mobile phone is

widely available and accessible. The survey of information and communication technology (Households) of National Statistical Office, Thailand 2012-2013 found that 70.2% of population age over 6 years had mobile phone in 2012 and increased to 73.3% in 2013 (Bureau of Policy and Strategy, MoPH, 2014). A meta-analysis of the efficacy of HIV/AIDS prevention intervention in Asia during 1995-2009 revealed the importance of understanding the particular socio-ecological structures of the target site in order to determine the key ingredients of intervention success. Especially, at local level, utilizing existing social structures were most efficacious for HIV/AIDS prevention (Tan et al., 2011).

Although Danis M. et al., (2010) reported that education difference had no effect on SMS intervention, a higher educational level of the 1way and 2-way SMS groups in this study may have a chance to affect the non-significance on the 1st and 2nd follow-ups. Also during the last 3 months of data collection, the Lop Buri provincial Health office and the partners had started Voluntary Counseling and Testing (VCT) in military program, that might encourage the conscripts to have more awareness and sexual practice carefully.

The effectiveness of the 1-way SMS compared with the 2-way SMS communication

A chance to respond messages or seek specific advice from researchers has been the key component of the 2-way SMS group. Nevertheless, there was not much questions that sent back to the researcher during the intervention period (approximately 5-10 questions per week). This is concordance with previous study on SMS-based intervention to provide tailored health communication message for HIV-positive MSM which was low response rate to the questions administered via SMS (Furberg et al., 2012). This may be because they have not received much concentration on the message and possibly due to many questions from the samples during training period has been already answered before SMS's allocation. Sending back SMS to the researchers might be burden because the military services will have more routine responsibilities. The effectiveness comparison found the different of theoretical characteristic scores on self-regulation, self-efficacy, outcome expectancy, risk perception, and intentional to practice. The Repeated Measure of ANOVA showed a significant increase from baseline only for an action plan characteristic in both 1-way and 2-way SMS groups. The action plan is accounted for the last process of volitional phase in the Health Action Process Approach, when individual adopt a particular health behavior or intention to change has been designed, the intention has to be transformed into detailed action plans of when, where, and how to behave. Self-efficacy is powerfully influenced by the quantity and quality of action plans because self-efficacious personnel have experienced mastery through former planning, and they imagine to the successful scenarios. Once the new action has been initiated, self-regulatory cognitions to control and maintain the behavior must be activated, and the action needs to be protected from former habits, obstacles, or diverting secondary action tendencies (Schwarzer, 1999). An action plan was the only one of theoretical characteristics in both intervention groups that significantly changed. Action plan is the joint between motivation and volitional phase of The Health Action Process Approach (HAPA). Motivation phase is initial start with increasing risk awareness, outcome expectancies and perceived task self-efficacy that lead to the formation of an intention.

The volitional phase that involved in the process of implementing the intention to actual behaviors, however, good intention will not guarantee corresponding actions. Even though conscripts had a good intention and plan, to have a safer sex, they would fail to perform a safe sex behavior. Overall, military personnel have been a significant high risk for STD and HIV infection (UNAIDS, 2004). However, safe sex in terms of condom use, abstinence from alcohol drinking before or during having sex were not different between the 2 groups. Noteworthy that condom used percentage in the 2-way SMS group was higher than the 1-way SMS and control group at every follow-up. The results on abstinence from alcohol before or during having sex were not difference between the 2 intervention groups. The exploitation on sending messages back to the researcher probably the key to success for safer sex practice. Really seek benefits in the sending question of the 2-way SMS group may not achieve much different from the 1-way SMS group. A text-message can have positive short term behavioral effect for those who received and reading a text-message. The study revealed the effectiveness of SMS intervention via mobile phone equally 1-way SMS or 2-way SMS communication.

Conclusion

The results of this study showed significant outcomes for theoretical characteristics and safe sex practices, especially in the 3rd follow-up. Measuring the changes of the intervention for multiple times presented significant difference among 3 groups only at 6 months for the theoretical characteristics. The effectiveness of SMS intervention via mobile phone for self-regulation, self-efficacy, outcome expectancy, risk perception, intention to practice and action plan for safe sex practices were presented in both 1-way SMS and 2-way SMS groups at every follow-up. However, safe sex practices in terms of condom use, abstinence from alcohol drinking before or during having sex were significant differences among 3 groups at 6 months after the end of intervention (3rd follow-up). Therefore, implementing the self-regulation and SMS intervention program for promoting safe sex among conscripts can enhancing the benefits of safe sex practices.

Limitations

This study has somewhat limitations of the method as follow:

1. A variation on an efficacy of mobile phone devices of army conscripts who have participated in the study due to the researcher cannot provide a device for the participants.
2. A different speed of sending and receiving a text message that depends on velocity of each mobile phone operator.
3. The difficulty of laboratory test to assess the effectiveness of the program due to after intervention an army conscript may assign into the conflict situation where too inconvenient for the testing.
4. There is also the limitation of generalization of the intervention to other groups as the conscripts are the specific group to obey the command.

Recommendations

The finding of this study found the duration of joining the armed forced possibly to get more sexual risk behaviors. The RTA should play more attention and launch a health innovation in promoting safe sex practice among military conscripts. A new advance information and communication technologies enable to change behavior and improve their health. The study showed the benefits of SMS intervention either the 1-way SMS or the 2-way SMS communication for promoting safer sex practices, but a strengthening program for safer sex behavior is required for creating a safe sex behavior among army conscripts. In addition to SMS via mobile phone that wildly use of a previous time, there is the most popular chance with social network application to transfer health information. Newly technology such as Facebook and LINE that are generally available and access to virtually all of the country will enhance for reduce risky behavior. These modern communication channels through social network enable to automatically transmit the 2-way communication. It should be created a social network group or the specific applications to access and exchange information among conscripts. At present, self-regulation with SMS may not achieve to safe sex practice. The new application may be necessary to strengthen the programs that influence on safer sex practices, for example peer pressure for condom use program and abstinence from substance use especially alcohol drinking. For future study, the researcher recommends that SMS intervention should encouragement the samples to seeking the benefit of receiving and sending text-message should be done. Moreover, an evaluation of bio-marker form the samples such as HIV and STIs testing should be concerned for the exactly result.

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References

1. Kanokwan S. et al. *Thailand Behavioral Surveillance System in male conscripts 2010*. http://www.boe.moph.go.th/reportphp?cat=82. Accessed April 5, 2013
2. Armed Forces Research Institute of Medical Sciences. HIV prevalence and demographic data of male conscripts who inducted in May, 2012. Accessed October 4, 2013
3. Vohs, K.D. & Baumeister, R.F. Understanding self-regulation: An introduction. In:R.F.
Baumeister and K.D. Vohs (Eds), Handbook of Self-regulation. Research, Theory, and Applications. New York: Guilford; 2004: 1-9.
4. UNAIDS. *AIDS and the military: UNAIDS point of view*,1998. http://www.unaids.org/sites/default/files/media_asset/militarypv_en_0.pdf. Accessed March 28,2013.
5. UNAIDS. Engaging uniformed services in the fight against AIDS. Case study 3, HIV/AIDS prevention and control: an experience of the Royal Thai Army in Thailand , 2004, http://www.unaids.org/sites/default/files/media_asset/jc890-thaiarmy_en_0.pdf. Accessed March 15,2013.
6. Royal Thai Army. Name list of Royal Thai Army Fort of the 1st Regional Area. http://www.rta.mi.th/2161ou/data/Data_pro/.../Page_comp1.html. Accessed March 30,2013.
7. Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. G*3Power3: A flexible Statistical powe analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Method.*2007; 39: 175-191.
8. Schwarzer, R. Self-efficacy in the adoption and maintenance of health behaviors: Theoretical approaches and a new model. In R. Schwarzer (Ed.), Self-efficacy: Thought control of action. Washington, DC: Hemisphere. 1992:217-243
9. Schwarzer, R. & Renner, B. Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*. 2000; 19: 487-495.
10. Schwarzer, R. Social-cognitive factors in changing health-related behavior. Current Directions in Psychological Science. 2001;10: 47-51.
11. Furberg R, Uhrig J, Bann C, et al. Technical implementation of a multi-component, text message-based intervention for persons living with HIV.JMIR Res Protoc. 2012;1:e17.
12. Kaoaiem H, Taneepanichskul S, Somrongthong R, Saengdidtha B and Lertmaharit S. The effect of squad leader mentors through short message services on mobile phone in promoting safe sex among first (central) army conscripts of Thailand. *Journal of Medical Associaton Thai*. 2012; 95(2): 249-56.
13. Déglise C, Suggs S, and Odermatt P. (2012). Short Short Message Service (SMS) Applications for Disease Prevention in Developing Countries. *Journal of Medical Internet Research*. 2012; 14 (1):e(3).

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