Determinants of Mobile Voluntary Counselling and Testing of HIV Use among Gay in Surakarta, Central Java

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ABSTRACT

Background: HIV infection remains a major global health problem, especially among bisexuals, men who have sex with men (MSM), and homosexuals. The number of AIDS patients in Indonesia from January to March 2017 was 673 people, the number of HIV infections was 10,376 people, and number of AIDS death was 61 people. The purpose of this study was to analyze the determinants of the use of mobile VCT of HIV in MSM community in Surakarta, Central Java.
Subjects and Method: A cross sectional study was conducted in Surakarta, Central Java, from October to November 2018. A sample of 200 MSM was selected by fixed disease sampling, including 50 MSM who used mobile VCT service and 150 MSM who did not use mobile VCT service. The dependent variable was mobile VCT of HIV use. The independent variables were intention, attitude, cues to action, perceived benefit, perceived barrier, and perceived susceptibility. The data were collected by questionnaire and analyzed by path analysis.
Results: Mobile VCT of HIV use was directly and positively affected by intention (b= 1.67; 95% CI= 0.73 to 2.56; p<0.001), attitude (b= 1.47; 95% CI= 0.43 to 2.52; p= 0.006), cues to action (b= 1.22; 95% CI= 0.29 to 2.14; p= 0.009), and perceived benefit (b= 1.99; 95% CI= 1.04 to 2.95; p<0.001). It was negatively affected by perceived barrier (b= -1.58; 95% CI= -2.49 to -0.67; p= 0.001). Mobile VCT use was indirectly affected by cues to action, perceived seriousness, and perceived susceptibility.
Conclusion: Mobile VCT of HIV use is directly and positively affected by intention, attitude, cues to action, and perceived benefit, but is negatively affected by perceived barrier.

Keywords: mobile VCT use, HIV infection, determinants, men who have sex with men, Health Belief Model

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BACKGROUND

HIV infection remains a major global health problem, especially for bisexuals and men who have sex with men (MSM) or homosexuals (Damian et al., 2015). The number of AIDS patients in Indonesia from January to March 2017 was 673 people and the number of HIV infections was 10,376 people. AIDS deaths in that period were 61 people. In Central Java Province, there were 1,171 HIV infections, whereas since January 2018, there were 111 MSM in Surakarta who were infected with HIV. The highest percentage of HIV risk factors is risky sex in MSM (28%), heterosexual (24%), others (9%), and the use of non-sterile needles in IDU (2%) (Ministry of Health, 2017).

Based on the accumulation of the number of HIV / AIDS sufferers and the risk factors that are dominated by groups of female sex workers (FSW) and MSM including transgender, HIV prevention efforts in this group are the key to the success of overcoming the HIV epidemic (WHO, 2016). Transmission of HIV infection can

be associated with unprotected anal intercourse and drug use through needles (Adam et al., 2015). Other factors that can influence the incidence of HIV infection among MSM are economic inequality, sexual and physical abuse, and alcohol use (Stefan et al., 2015).

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 87 of 2014, globally it is estimated that half of PLWHA do not know their HIV status, even PLWHA who know their HIV status are often late to check. Lack of access to the relationship between HIV counseling and testing and treatment leads to a delay in HIV treatment that is already at the stage of AIDS. The delay in treatment reduces the possibility of getting good results and the transmission rate remains high. In the national policies and strategies, the concept of universal access has been established to determine HIV status, access to HIV prevention, care, support and treatment services with a vision of getting 3 zeroes, namely zero new HIV infection, zero stigma and discrimination, and zero AIDS related death (RI Ministry of Health, 2014).

HIV VCT is one of the HIV / AIDS prevention strategies. VCT aims to identify PLWHA as early as possible and provide access to the main entrance for prevention, care, treatment and support services. However, little is known about the factors that determine the use of VCT services (Gedefaw, 2016). The predisposing factors associated with the low participation of MSM communities in HIV testing are living in remote rural areas with health facilities (Hubach et al., 2015), low socioeconomic and educational levels (Obermeyer et al., 2013), fear of following HIV testing (Ana et al., 2015), considered themselves not at risk of HIV infection, perception of stigma and discrimination (Stefan, 2015), lack of trust in service providers and quality of counseling, and lack of support from family and society (Shrestha, 2015).

In a preliminary study conducted by researchers at the Surakarta Mahardika Style Society Social Institution in March 2018, there were 3,387 MSM in Surakarta. MSM who have attended VCT services are 2,153 people, while those who have not participated in VCT services are 1,234 people.

Based on the problems above, the researchers wanted to examine "The determinants of the Use of Services for Mobile Voluntary Counseling and Testing in the Community of Men Who Have Sex with Men or homosexuals in Surakarta".

SUBJECTS AND METHOD

1. Study design

This was an analytic observational study with a cross sectional design. The study was conducted in Surakarta in November 2018.

2. Population and sample

The population of this study was MSM community in Surakarta. The case group in this study was MSM who used mobile VCT services amounting to 50 subjects and the control groups were MSM who did not use mobile VCT services amounting to 150 subjects. The sampling technique used in this study was fixed disease sampling.

3. Study variables

The dependent variable was mobile VCT service use. The independent variables were perceived seriousness, perceived susceptibility, perceived benefits, perceived barrier, cues to action, intention to use mobile VCT service, and attitude toward mobile VCT service.

4. Operational definition of variables

Perceived seriousness was defined as individuals consider the severity of the organic and social consequences that will occur if they continue to allow HIV / AIDS to be experienced without developing treatment

from health practitioners. The more individuals believe that a consequence will worsen, then they will feel it as a threat and take preventive action. The measurement scale was continuous, transformed into dichotomous, 0 for low and 1 for high.

Perceived susceptibility was defined as individual experiencing HIV/AIDS is that individuals will evaluate the possibility of other health problems that will develop. The more individuals perceive that HIV infection is at risk, it will make the individual perceive it as a threat and take treatment actions. The measurement scale was continuous, transformed into dichotomous, coded 0 for low and 1 for high.

Perceived benefit of using VCT mobile services means that individuals judge that they will benefit when using VCT services. Benefit perception refers to a person's judgement about the value or efficacy of doing healthy behavior to reduce the risk of experiencing illness. The measurement scale was continuous, transformed into a dichotomous, coded 0 for low and 1 for high.

Perceived barrier in using VCT services was individual feel obstacles when obtaining VCT services, for example in terms of cost considerations, psychological consequences (fear of VCT test results), physical considerations (distance from VCT services that are difficult to achieve). Perceived barrier includes negative aspects of a healthy behavior and the feasibility of healthy behavior to be or cannot be done. The measurement scale was continuous, transformed into dichotomous, coded 0 for low and 1 for high.

Cues to action was defined as the stimulus needed to trigger the decision-making process so that health behavior occurs, namely the use of VCT services. Cues to action was not only external (for example, mass media communication, personal interactions, information from health personnel), but can also come from within/internally (for example, symptoms of HIV/AIDS). The measurement scale was continuous, transformed into dichotomous, coded 0 for low and 1 for high.

Intention in the use of mobile VCT services was defined as the desire or inclination of someone to use or not to use VCT services. The measurement scale was continuous, transformed into a dichotomous, coded 0 for low and 1 for high.

The attitude toward mobile VCT service was defined as the opinion or judgment of a person towards VCT service. Attitude had three components, namely affective which refers to the emotional reaction (feeling), behavior, and cognitive which refers to one's thoughts and beliefs. The measurement scale was continuous, transformed into a dichotomous, coded 0 for negative and 1 for positive.

The use of mobile VCT services was defined as MSM ever (≥1x) uses mobile VCT service. The measurement scale was dichotomous, code 0 for no and 1 for yes.

5. Study Instrument

The data collection is done using a questionnaire that has been tested for reliability. The reliability test was carried out with Alpha Cronbah test on 20 research subjects.

6. Data Analysis

The results of the characteristics analysis of the research subjects and univariate analysis in the form of categorical/ dichotomous data are described in the form of frequency (n) and percentage (%). The bivariate analysis was carried out using the Chi Square test. The multivariate analysis was done using path analysis with following stages: (1) Model specification, (2) Model identification, (3) Model suitability, (4) Estimation, and (5) Model re-spesification.

7. Research ethics

The research ethics was obtained from the Research Ethics Committee at the Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Central Java with number 361/UN27.6/KEPK/2018. Research ethics in this study include informed consent, anonymity, and confidentiality.

RESULTS

1. Sample characteristics

Table 1 showed sample characteristics. Most of the sample were at age ≥25 years old, education ≥Senior high school (61%), and low income (65.5%). Most of the study subjects did not using mobile VCT service (75%). Half of the study subjects had strong intention (51%). As many as 128 study subjects had positive attitude (64%), 114 (57%) had low perceived seriousness, low perceived barrier (54.5%), high perceived susceptibility (52.5%), high perceived benefit (53%), and high cues to action (52%).

Table 1. Sample characteristics

Characteristics	n	%
Perceived seriousness		
High	86	43
Low	114	57
Perceived susceptibility		
High	105	52.5
Low	95	47.5
Perceived benefit		
High	106	53
Low	94	47
Perceived barrier		
High	91	45.5
Low	109	54.5
Cues to action		
High	104	52
Low	96	48
Intention		
Strong	102	51
Weak	98	49
Attitude		
Positive	128	64
Negative	72	36
Mobile VCT service use		
Yes	50	25
No	150	75

2. Bivariate analysis

Table 2 showed bivariate analysis on the determinants of mobile VCT service use. Table 2 showed that perceived seriousness (OR= 7.77; 95% CI= 3.66 to 16.49; p<0.001), perceived susceptibility (OR= 5.23; 95% CI= 2.44 to 11.24; p<0.001), perceived benefit (OR= 7.06; 95% CI= 3.10 to 16.06; p<0.001), cues to action (OR= 5.38; 95% CI= 2.50 to 11.55; p<0.001), intention (OR= 5.68; 95% CI= 2.64 to 12.21; p<0.001), and attitude (OR= 5.76; 95% CI= 2.32 to 14.34; p<0.001) increased mobile VCT service use.

Strong perceived barrier reduced mobile VCT service use among MSM community (OR= 0.25; 95% CI= 0.12 to 0.52; p<0.001).

3. Path Analysis

The structural model with estimation of path analysis was shown in Figure 1. The data were analyzed using the Stata 13. The observed variables were 8, the endogenous variable was 6, the exogenous variable was 2, and the parameter was 8. The formula for determining the degree of freedom, as follows: df = (observed variable x (observed variable + 1)) / 2 - (endogenous variable + exogenous variable + parameter) = (8 x (8 + 1)) / 2 - (6 + 2 + 8) = 20 so that path analysis can be done. The results of path analysis are shown in Table 3.

Table 3 showed the results of path analysis on the determinants of mobile VCT service use. Mobile VCT service use was directly affected by intention, attitude, perceived benefit, perceived barrier, and cues to action.

Mobile VCT service use was directly and positively affected by cues to action and it was statistically significant. High cues to action have a logodd score for mobile VCT service use by 1.22 units higher than low cues to action (b= 1.22; 95% CI= 0.29 to 2.14; p= 0.009).

Table 2. Bivariate analysis on the determinants of mobile VCT service use

Variable	Mobile VCT service use				OR	95% CI	p
	Yes		No				
	n	%	n	%			
Perceived seriousness							
High	39	45.3	47	54.7	7.77	3.66 – 16.49	<0.001
Low	11	9.6	103	90.4			
Perceived susceptibility							
High	40	38.1	65	61.9	5.23	2.44 – 11.24	<0.001
Low	10	10.5	85	89.5			
Perceived benefit							
High	42	39.6	64	60.4	7.06	3.10 – 16.06	<0.001
Low	8	8.5	86	91.5			
Perceived barrier							
High	11	12.1	80	87.9	0.25	0.12 – 0.52	<0.001
Low	39	35.8	70	64.2			
Cues to action							
High	40	38.5	64	61.5	5.38	2.50 – 11.55	<0.001
Low	10	10.4	86	89.6			
Intention							
High	40	39.2	62	60.8	5.68	2.64 – 12.21	<0.001
Low	10	10.2	88	89.8			
Attitude							
Good	44	34.4	84	65.6	5.76	2.32 – 14.34	<0.001
Poor	6	8.3	66	91.7			

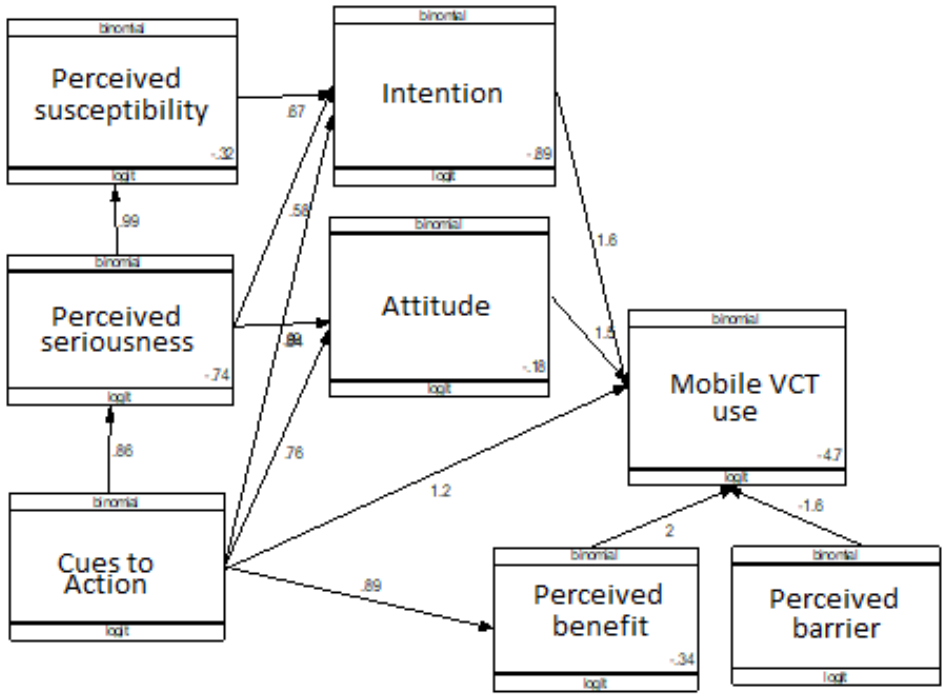

Figure 1. Path model of mobile VCT service use determinants

Mobile VCT service use was directly and positively affected by perceived benefit. High perceived benefit has a logodd for mobile VCT service use 1.99 higher than low perceived benefit (b= 1.99; 95% CI= 1.04 to 2.95; p< 0.001).

Mobile VCT service use was directly and positively affected by perceived barrier. High perceived barrier has a logodd for mobile VCT service use 1.58 higher than low perceived barrier (b= -1.58; 95% CI=-2.49 to -0.67; p= 0.001).

Mobile VCT service use was directly and positively affected by intention. High intention has a logodd for mobile VCT service use 1.67 higher than low intention (b= 1.67; 95% CI= 0.73 to 2.56; p<0.001).

Mobile VCT service use was directly and positively affected by attitude. Positive attitude has a logodd for mobile VCT service use 1.47 higher than negative attitude (b= 1.47; 95% CI= 0.43 to 2.52; p= 0.006).

Table 3. The results of path analysis on the determinants of mobile VCT service use

Dependent Variables		Independent Variables	Path Coefficient	CI 95%		p
				Lower Limit	Upper Limit	
Direct effect						
Mobile VCT service use	←	Cues to action	1.22	0.29	2.14	0.009
	←	Perceived benefit	1.99	1.04	2.95	<0.001
	←	Perceived barrier	-1.58	-2.49	-0.67	0.001
	←	Intention	1.64	0.73	2.56	<0.001
	←	Attitude	1.47	0.43	2.52	0.006
Indirect effect						
Perceived Seriousness	←	Cues to action	0.86	0.28	1.43	0.004
Perceived Benefit	←	Cues to action	0.89	0.32	1.46	0.002
Intention	←	Cues to action	0.64	0.55	1.23	0.032
	←	Perceived seriousness	0.58	-0.02	1.19	0.059
	←	Perceived susceptibility	0.67	0.08	1.26	0.027
Attitude	←	Cues to action	0.76	0.02	1.38	0.015
	←	Perceived seriousness	0.99	0.00	1.63	0.003
Perceived Susceptibility	←	Perceived seriousness	0.99	0.00	1.58	0.001
N observation= 200						
Log likelihood= -718.19						

Mobile VCT service use was indirectly affected by cues to action through perceived seriousness (b= 0.86; 95% CI= 0.28 to 1.43; p= 0.001).

Mobile VCT service use was indirectly affected by of cues to action through perceived benefit (b= 0.89; 95% CI= 0.32 to 1.46; p= 0.002).

Mobile VCT service use was indirectly and positively affected by cues to action mobile VCT services through intention (b= 0.64; 95% CI= 0.55 to 1.23; p= 0.032).

Mobile VCT service use was indirectly and positively affected by perceived seriousness through intention (b= 0.58; 95% CI= -0.05 to 1.19; p= 0.059).

Mobile VCT service use was indirectly and positively affected by perceived susceptibility through intention (b= 0.67; 95% CI= 0.08 to 1.26; p= 0.027).

Mobile VCT service use was indirectly and positively affected by cues to action through attitude (b= 0.76; 95% CI= 0.02 to 1.38; p= 0.015).

Mobile VCT service use was indirectly and positively affected by perceived seriousness through attitude (b= 0.76; 95% CI= 0.01 to 1.63; p= 0.003).

Mobile VCT service use was indirectly and positively affected by perceived seriousness through perceived susceptibility (b= 0.99; 95% CI= 0.01 to 1.58; p= 0.001).

DISCUSSION

1. The effect of cues to action on the use of mobile VCT service

The result of this study showed that high cues to action could increase the use of mobile VCT services. Cues to Action was a part of Health Belief Modelwhich was something that support the decisions in changing a behavior (Horne *et al.*, 2013). Cues to actioncan come from people or events that were the reasons of behavioral or habit changes in individuals or communities. For example, the experience of previous illness or healthy individuals who became someone's role model in acting. An MSM who knew that his community members were infected by HIV and have received information from health personnel was a strong encouragement for the MSM to use VCT service (Nareswara *et al.*, 2016).

2. The effect of perceived benefit on the use of mobile VCT service

The result of this study showed that high perceived benefit could increase the use of mobile VCT service. Perceived benefit refer to individual perceptions related to perceived benefits or advantages in reducing the risk of an illness. Individuals or communities would conduct health behaviors if they felt the benefit from these actions to reduce threats. Perceived benefits played an important role for individuals or groups in conducting secondary prevention behaviors, for example the use of VCT to detect HIV. Individuals or groups who felt the benefits of VCT were more likely to use VCT services than those who did not see VCT services as a benefit (Abolfotouh, 2015).

3. The effect of perceived barrier on the use of mobile VCT service

The result of this study showed that high perceived barrier could reduce the use of VCT services. This perception refer to the perception of individuals or groups about barriers in conducting health behavior. Individuals who felt embarrassed, lazy, afraid of being mocked by others and afraid of being gossiped by health care providers could inhibit the use of VCT services (Qiao et al,. 2018). Other barriers including low perceived HIV risk and privacy concerns (Murphy et al., 2017; Logie et al., 2017).

4. The effect of intention on the use of mobile VCT service

The result of this study showed that high intention could increase the use of VCT services. Intention would be a behavior under the control of willingness. Willing control was the ability of a person to decide to do or not to conduct a behavior. The intention to use VCT services was mainly due to attitude and norm (Abamecha, Godesso, Girma 2013).

5. The Effect of Attitude on the Use of Mobile VCT Services

The result of this study showed that good attitude toward VCT and HIV/AID service could increase the use of VCT services. Attitude was the readiness or willingness to act. Attitude was an action predisposition of a behavior. Attitudes were divided into two, namely positive attitudes and negative attitudes. A positive attitude mean the tendency of actions to approach, like, and expect certain objects. Negative attitude was indicated by a tendency to stay away from, avoid, hate, and dislike certain objects. The majority of respondents agreed with the statement that AIDS was a disease that caused embarrassment, fear, and also could lead to death, so that the respondents were afraid to come to VCT services and find out the results of HIV test. Respondents were afraid to meet their family or friends if they come to VCT services because they thought that they would be shunned and got bad treatment if the results of HIV test were positive or risky. The result of this study was also supported

by Pharr, Lough, and Ezeanolue (2016) who stated that Respondents said that if their family or even friends knew they would spread to other friends that the respondent had sexually transmitted diseases and it would affect the respondent's daily activities.

6. The effect of cues to action on the use of mobile VCT services through perceived seriousness

The result of this study showed that high cues to action could increase perceived seriousness. Health personnel support was a supporting factor in the utilization of VCT services. The result of this study was in line with a study done by Wang et al. *(*2017) which stated that support was in the form of information support about HIV and AIDS and also giving a motivation to conduct every step of VCT services. Support from health personnel regarding HIV/AIDS could increase perceived seriousness of an individual on the danger of HIV/AIDS infection.

Another supporting factor was family. Family was two or more than two individuals who were affiliated because of blood relations, marital relations or adoption and they live in one household, interact with each other, create and maintain the culture in their respective roles. Family support can be in the form of information support, assessment support, instrumental support, and emotional support, so that family members could give attention (Washington *et al.*, 2010).

7. The effect of cues to action on the use of mobile VCT service through perceived benefit

The result of this study showed that high cues to action could increase perceived benefit. Perceived benefit would tend to use VCT services. Most of MSM did not know the benefits of VCT services so they did not conduct VCT checks. Thus, health personnels were expected to be able to actively promote health regarding the importance of conducting VCT tests. This was in line with research by Obermeyer, Makhlouf, and Osborn (2007) which stated that future health promotion must strengthen the confidence among MSM. Health promotion must target MSM and service providers. Service providers must understand the concerns of MSM who did not know the benefits of VCT services. Interventions were targeted to service providers to increase their knowledge of MSM sub-culture and reduce the stigmatization of MSM.

8. The effect of cues to action on the use of mobile VCT service through intention

The result of this study showed that high cues to action could increase the intention in using VCT services.

This study was in line with a study by Wang et al. (2017) which stated that communication with NGO staff related to HIV test might have reduced their concerns and increased their self-efficacy to conduct HIV test. The perceived self-efficacy was another construct of health belief model which was significantly related to behavioral intention to use VCT services.

9. The effect of perceived seriousness on the use of mobile VCT service through Intention

The result of this study showed that high perceived seriousness could increase the intention in using VCT services. The result of this study was in line with a study done by Lau et al. (2013) which stated thatgood knowledge about HIV/ADIS and VCT could affect someone's desire to visit a VCT clinic. The better the knowledge about HIV and VCT, the more able to assess the risky behavior of HIV infection and also assume that HIV/AIDS as a serious disease that could lead to death. The ability to assess the risk of infection and the seriousness of

HIV/AIDS would encourage someone to know their HIV status, therefore, the person would have the intention to conduct VCT.

10. The effect of perceived susceptibility on mobile VCT use through intention

The result of this study showed that high perceived susceptibility could increase the intention in using VCT services. Health behavior change theory showed that perceived susceptability to disease preceded intentions and health protection and behaviors. Individuals used their past behaviors combined with perceived susceptibility to AIDS to adjust for subsequent HIV risk behaviors (Adams et al., 2013).

11. The effect of cues to action on mobile VCT use through attitude

The result of this study showed that high cues to action could increase the attitude in using VCT services. Friend's encouragement and invitation was one of the reasons for MSM in conducting VCT. This was in line with Scott et al. (2015) who stated that MSM who did not conduct VCT tests were more likely to happen in those who did not have cues to action. MSM got information about HIV/AIDS and VCT from those who were engaged in HIV/AIDS prevention, namely from NGO, KPA, and the health office. Information obtained in the form of HIV/AIDS were prevention, transmission, and treatment of HIV with various media, one of them was leaflets, as well as information about the benefits of VCT, VCT process, and service place.

12. The effect of perceived seriousness on the use of mobile VCT service through attitude

The result of this study showed that high perceived seriousness could increase the attitude in using VCT services. According to Rosenstock (1980), in line with Health Belief Model theory,someone would take medication or prevention if they were threatened by a severe diseases than not severe ones. Similarly, high perceived seriousness about HIV/AIDS would make a person take precautions or early detection of the disease. This was in line with Wang (2017) who stated that perceived seriousness was needed to form a threat,so that it could provoke a hazard control response (for example, preventive behavior adoption).

13. The effect of perceived seriousness on mobile VCT use through perceived susceptibility

The result of this study showed that high perceived seriousness could increase perceived susceptibility. The result of this study was in line with a study done by Bock (2009) which stated that High-risk people who used VCT felt a strong vulnerability to HIV/AIDS. Preventive behavior toward HIV/AIDS would arise if someone felt that he/she was at risk of developing the disease. Susceptibility was a subjective condition so that the acceptance of individuals, especially those at high risk of susceptibility to infection with HIV/AIDS might vary. Someone might be declared to have a very strong vulnerability to HIV/ AIDS if they have the belief that they were at risk of suffering from HIV/AIDS, have friends or partners who were infected with HIV/AIDS, or have a history of behavior that was at risk of contracting to HIV/AIDS. On the contrary, someone might be able to be declared to have a very weak vulnerability to HIV/AIDS if he/she did not have the belief that he/she was at risk of suffering from HIV/AIDS, has no friends or partners who were infected, and did not have a history of risky behavior. High risk people who have a very strong vulnerability to HIV/AIDS were likely to be encouraged to use VCT services.

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