



Original Research

HIV/AIDS-Related Knowledge and Willingness to Participate in Voluntary Counseling and Testing among Health Sciences University Students

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ABSTRACT

Introduction: Health sciences university students (HSUS) are susceptible to HIV infection due to frequent contact with patients whose HIV status is unknown. This study aimed to compare the HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS, analyzing the differences between groups, and correlation and effect between variables.

Methods: This cross-sectional study involved 357 HSUS from the faculty of nursing, pharmacy, psychology and medicine at an accredited university. Samples were selected using simple random sampling. Data analysis used descriptive statistic, Pearson correlation, one-way ANOVA test, and linear regression test ($\alpha < 0.05$).

Results: Most respondents were 20-21 years old single female who still live with parents, exposed to HIV/AIDS material twice/more via academic activities; lack of HIV/AIDS-related knowledge (51.5%), highest mean found in medical students (73.1%); willing enough to participate in VCT (83.5%), highest mean found in nursing students (86.4%). No correlation found between variables ($p = 0.101$), and the regression model was not significant ($p = 0.101$). HIV/AIDS-related knowledge contributed only 0.8% influence on the willingness to participate in VCT among HSUS ($R^2 = 0.008$), other unidentified factors possibly play a more important role.

Conclusion: Beside knowledge, other factors like demographic factors, social determinants, close person, health education, fear, and HIV-related stigma may affect the willingness to participate in VCT among HSUS. HSUS's knowledge about HIV/AIDS was low but their willingness to participate in VCT was quite high. HIV/AIDS-related knowledge has a slight contribution in determining HSUS's willingness to participate in VCT. Further analysis of other potential factors is needed to determine stronger predictors.

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INTRODUCTION

Young generations of both men and women aged 15-24 are particularly vulnerable to infection with the HIV because young people / teenagers are in the experimental phase including in sexual matters (Moore, 2000). Students are particularly vulnerable to HIV infection due to lack of knowledge and also lack of parental supervision, especially students living far away from parents, giving them the opportunity to try new things including the sex experience (Shiferaw, 2014). Health sciences university students (HSUS) are even more

susceptible to HIV infection due to frequent contact with patients whose HIV status is unknown, especially in a clinical setting.

Globally, there were approximately 36.9 million people living with HIV at the end of 2017 with 1.8 million people becoming newly infected and 940,000 people died from HIV-related causes (WHO, 2018). In Indonesia, the data from Directorate General of Disease Control and Environmental Health of Ministry of Health (MOH, 2017) showed that from January to April 2017 there were new cases of HIV found amounted to 10,376 and new cases of AIDS amounted to 673 individuals. The highest prevalence

of HIV was in the age group of 25-49 years old (69.6%), followed by a group of 20-24 years old (17.6%), and a group of ≥ 50 years old (6.7%). The highest prevalence of AIDS was in the age group of 30-39 years old (38.6%), followed by a group of 20-29 years old (29.3%), and a group of 40-49 years old (16.5%). The proportion of male: female for HIV/AIDS was 2:1 (MOH, 2017).

Since last quarter of 2015 until now, WHO in collaboration with four top universities in Indonesia (Udayana University, Gadjah Mada University, Padjadjaran University, and Atma Jaya Catholic University of Indonesia) established and implemented the HATI study (HIV Awal/Early Test and Treatment Indonesia). The objective is to evaluate the feasibility of interventions aimed at increasing HIV testing and immediate Anti Retroviral Therapy (ART) initiation in key populations in Indonesia, including men who have sex with men (MSM), female sex workers (FSW), waria (shemale or ladyboy) and people who inject drugs (PWID). Unfortunately, young generation in term of university students especially HSUS was not considered as key population, therefore was not included in those study (WHO, 2018).

Men and women are equally likely to be infected with HIV, due to a lack of knowledge about HIV / AIDS and prevention of transmission. Based on the Basic Health Research data, only 13% of youth / adolescent girls and 12% of youth / adolescent boys have comprehensive knowledge about HIV / AIDS, while the Millennium Development Goals (MDGs) target for youth knowledge is 95% (Central Bureau Statistic, 2012). Understanding how the mechanism of HIV transmission is the first step in the process of controlling or preventing HIV / AIDS infection.

Voluntary Counseling and Testing (VCT), Provider Initiating Test and Counseling (PITC), and Home-based HIV Counseling and Testing (HBCT) are the means by which people can know their HIV status. HBCT offers a novel approach to complement facility-based PITC and VCT, and could greatly increase HIV prevention opportunities (Kimaiyo, et al, 2010). VCT is one method that is quite effective in reducing and controlling HIV transmission. VCT is the key entry point to prevention, care, treatment and support services, where people learn whether they are infected or not and to understand the implications of their HIV status and make informed choices for the future (Tsegay, et al, 2013). A study conducted by the World Health Organization (WHO, 2004) revealed that the number of people who do VCT is very low in countries with high HIV / AIDS cases. It is estimated that currently only 75% of people with HIV know their status (WHO, 2018).

Availability of access to VCT and public awareness of VCT are keys so that patients with HIV/AIDS receive antiretroviral therapy (ART), and prevent transmission with behavioural changes. Counselling is designed to assist patients in interpreting the results of laboratory tests, to change behaviour aiming at prevention of HIV infection and

transmission. One area that is the focus of WHO nowadays is testing and counselling which greatly play a role as the entrance of preventive and treatment stages (WHO, 2004).

The main targets of a national strategy for sexual and reproductive education are to increase youth knowledge about reproductive health and safe sex, to promote and facilitate changes in young people's behaviour, including raising awareness about respect for others, and the ultimate goal is to provide young people with comprehensive knowledge, and motivation for good behaviour especially related to reproductive health (National AIDS Commission, 2009). Young people especially HSUS have increased susceptibility to HIV infection due to age, low parental supervision, frequent contacts with patients whose HIV status is unknown, and several other factors. This study aimed to compare the HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS, analyzing the differences between groups, and correlation & effect between variables.

MATERIALS AND METHODS

This study used a cross-sectional design. This design was implemented because it will produce a prevalence or effect of a phenomenon that is associated with a particular cause (Nursalam, 2008). In the context of this study, the research team conducted a health survey at an accredited university in Surabaya, Indonesia. Self-administered questionnaires were used for data collection. The target population was HSUS who were active in even semester of 2016/2017 academic year. Inclusion criteria were age ≥ 18 years old and willing to be respondent proved by informed consent. The sample size was 357 generated by specific formula measurement for known population size as proposed by Nursalam (2008). Simple random sampling was implemented. There were 137 nursing students, 115 psychology students, 71 pharmacy students, and 34 medical students became study respondents (4 groups of students).

The independent variable was the HIV-related knowledge assessed with the KQ-18 instrument (Carey & Schroder, 2002). The KQ-18 instrument initially consisted of 45 items developed by Carey, Morrison-Beedy and Johnson (1977), then taken only 18 items by Carey & Schroder (2002) and was named KQ-18 after instrument testing procedure. The answer choices are right, wrong, and no idea. Each correct answer will be given a score of 5.55; score range was 0-100. The result of instrument retesting to 42 university students in Surabaya showed only 4 valid items with $r = -0.333 - 0.336$, and medium reliability with Chronbach Alpha = 0.588. The researcher team decided to keep using the 18 items of KQ-18 because very few valid items indicated low levels of knowledge. The data scale was an interval, but to ease the data presentation in results section then the data of knowledge was

categorized into three knowledge level: 1) low (total score 0-49), 2) sufficient (total score 50-74), and 3) high (total score 75-100).

The dependent variable was the willingness to participate in VCT assessed by the General Attitudes to VCT instrument (Mwangi, et al, 2014). This instrument was originally developed by Boshamer & Bruce (1999) and Peltzer & Mpofu (2002); then later revised by Mwangi, et al (2014). Initially the instrument consisted of 41 items in the Likert scale format that examined 5 determinants of attitudes toward HIV testing that could indicate a person's willingness to participate in VCT, namely: 1) self-perception and community, 2) assumptions of friends, 3) values related to HIV testing, 4) support and confidence, and 5) self-perceived vulnerability. Response ranges provided were strongly disagree (score 1), disagree (score 2), relatively agree (score 3), agree (score 4), and strongly agree (score 5). Score range was 32-160. Instrument testing in Kenya showed that there were 9 invalid items, so formed a new instrument consisting of 32 items. Instrument retesting to 42 university students in Surabaya showed only 18 valid items with $r = 0.295 - 0.671$, and high reliability with Chronbach Alpha = 0.728.

The researcher team decided to keep using the 32 items to maintain the integrity of the attitude domain so that comprehensive data could be obtained. The data scale was interval, but to ease the data presentation in results section then the data of willingness to participate in VCT was categorized into three willingness level: 1) less/low (total score 32-74), 2) enough/sufficient (total score 75-117), and 3) greatly/high (total score 118-160).

Ethical clearance issued by the Faculty of Nursing, Universitas Airlangga, Surabaya (Certificate Number 360-KEPK). Other ethical aspects included informed consent, anonymity, and confidentiality. There was no conflict of interest between authors and study funder regarding this study and publication. Before filling out the questionnaires, the respondents were given an explanation of the purpose and benefits of the study then they were asked to sign the informed consent sheet. Researcher acted as a facilitator during the data collection process. Data analysis used descriptive statistic, Pearson correlation test, one-way ANOVA test, and linear regression test ($\alpha < 0.05$).

RESULTS

Table 1. Demography characteristic (n = 357)

Characteristic	Faculty of Nursing*		Faculty of Pharmacy		Faculty of Psychology		Faculty Medicine	
	Frequen cy (n=137)	Percen tage (%)	Frequen cy (n=71)	Percen tage (%)	Frequen cy (n=115)	Percen tage (%)	Frequen cy (n=34)	Percenta ge (%)
Age (years old)								
18	11	8.03	3	4.23	9	7.83	0	0
19	26	18.98	9	12.68	37	32.17	1	2.94
20	38	27.74	18	25.35	29	25.22	8	23.53
21	37	7.01	22	30.99	23	32.39	18	58.06
22	17	12.41	14	19.72	7	6.09	4	11.76
>22	8	5.84	5	7.04	10	8.70	2	5.88
Gender								
Male	25	18.25	19	26.76	28	24.35	8	23.53
Female	112	81.75	52	73.24	87	75.65	26	76.47
Religion								
Catholic	60	43.80	25	35.21	39	33.91	14	41.18
Christian	34	24.82	23	32.39	53	46.09	13	38.24
Islam	40	29.20	22	30.99	20	17.39	7	20.59
Others	3	2.19	1	1.41	3	2.61	0	0
Ethnic origins								
Java, Sunda, Madura	62	44.53	52	73.24	61	53.04	12	35.29
Batak, Padang, Mentawai	4	2.92	2	2.82	4	3.48	0	0
Chinese	1	1.46	7	9.86	31	26.96	10	29.41
Bali, Dayak, Toraja	11	8.03	5	7.04	9	7.83	5	14.71
NTT, Maluku, Papua	42	30.66	5	7.04	10	8.70	7	20.59
Others	17	12.41	0	0	0	0	0	0
High School Location								
Surabaya	42	30.66	46	64.79	66	57.39	17	50.00
East Java outside Surabaya	23	16.79	11	15.49	26	22.61	7	20.59
Java outside East Java	2	1.46	2	2.82	4	3.48	3	8.82
Outside Java	70	51.09	12	16.90	19	8.70	7	20.59

Marital status								
Single	107	78.10	52	73.24	80	69.57	27	79.41
In a relationship	28	20.44	18	25.35	35	30.43	7	20.59
Married	2	1.46	1	1.41	0	0	0	0
Living with								
Parents	52	37.96	28	39.44	62	53.91	15	44.18
Sibling	5	3.65	2	2.82	7	6.09	1	2.94
Extended family	21	15.33	4	5.63	17	14.78	4	11.76
Friends	20	14.60	15	21.13	12	10.43	1	2.94
Alone	38	27.74	19	26.76	11	9.57	13	38.24
Spouse	1	0.73	0	0	0	0	0	0
Others	0	0	3	4.23	6	5.22	0	0
Parents monthly income (IDR)								
500,000 – 1 million	6	4.38	0	0	1	0.87	0	0
> 1 – 3 million	91	66.42	48	67.61	66	57.39	0	0
> 3 – 5 million	25	18.23	19	26.76	35	30.43	4	11.76
> 5 million	13	9.49	4	5.63	12	10.43	30	88.24
None	2	1.46	0	0	0	0	0	0

*Study result of Nursing Faculty referred to Sari & Parut (2017).

Table 2. Primary Data

Characteristic	Faculty of Nursing*		Faculty of Pharmacy		Faculty of Psychology		Faculty Medicine	
	Frequen- cy (n=137)	Percen- tage (%)	Frequen- cy (n=71)	Percen- tage (%)	Frequen- cy (n=115)	Percen- tage (%)	Frequen- cy (n=34)	Percen- tage (%)
Exposure to HIV/AIDS material								
Never	9	6.57	7	9.86	22	19.13	1	2.94
Once	41	29.93	14	19.72	41	35.65	7	20.59
Twice or more	87	63.50	50	70.42	52	45.22	26	76.47
Media of Information**								
Printed media (book, journal, poster, etc)	13	9.49	20	28.17	16	13.91	2	5.88
Electronic media (social media, TV, etc)	46	33.58	33	46.48	33	28.70	10	29.41
Academic activity (class, lecture)	49	35.77	58	81.69	34	29.57	34	100.00
Seminar/workshop	58	42.34	19	26.76	54	46.96	13	38.24
Student activities (non-curricular)	4	2.92	1	1.41	8	6.96	0	0
Close person (family, friend, teacher, etc)	28	20.44	15	21.13	16	13.91	2	5.88
Health education from health care professional (hospital, primary care unit, etc)	43	31.39	10	14.08	19	16.52	2	5.88
HIV/AIDS-related knowledge***								
High	8	5.84	4	5.63	0	0	20	58.82
Sufficient	63	45.99	39	54.93	28	24.35	11	32.35
Low	66	48.18	28	39.44	87	75.65	3	8.82
The willingness to participate in VCT***								
Greatly/high	3	2.19	0	0	0	0	1	2.94
Enough/sufficient	121	88.32	57	80.28	92	80.00	28	82.35
Less/low	13	9.49	14	19.72	23	20.00	5	14.71

* Study result of Nursing Faculty referred to Sari & Parut (2017).

** Respondents were allowed to choose more than 1 answer.

*** This category was made in order to ease the data presentation, and not for purposes of statistical analysis.

Most respondents were 2nd-year students (54.90%), except for nursing students which mostly were freshmen. Table 1 showed that in total the majority of respondents were aged 20-21 years old (54.06%)

except Psychology Faculty (19 years), female sexuality (77.59%), single / unmarried / not in any relationship (74.51%), Catholic (38.66%) except Psychology Faculty (Christian), Javanese (52.38%),

Table 3. Descriptive Statistics

Faculty	N	HIV/AIDS-related knowledge		Willingness to participate in VCT	
		Mean	SD	Mean	SD
Nursing	137	50.14	17.19	86.37	10.60
Pharmacy	71	43.23	17.30	81.99	10.24
Psychology	115	47.20	17.05	81.98	9.57
Medicine	34	73.12	19.08	83.35	15.26

Table 4. Least Significant Difference (LSD) Test Results: multiple comparison

Faculty	Nursing	Pharmacy	Psychology	Medicine
HIV/AIDS-related Knowledge				
Nursing	0.000	0.007	0.182	0.000
Pharmacy	0.007	0.000	0.130	0.000
Psychology	0.182	0.130	0.000	0.000
Medicine	0.000	0.000	0.000	0.000
The Willingness to participate in VCT				
Nursing	0.000	0.006	0.001	0.143
Pharmacy	0.006	0.000	0.998	0.542
Psychology	0.001	0.998	0.000	0.514
Medicine	0.143	0.542	0.514	0.000

high school alumni of HS in Surabaya (47.90%) except Nursing Faculty (HS of outside Java), living with parents (43.98%), and total parent's income per month more than IDR 1 - 3 million (57.42%) except medical students (> IDR 5 million).

Table 2 showed that in total the majority of respondents had been exposed to HIV / AIDS material twice or more (59.94%). The majority of media used by respondents to obtain health information about HIV / AIDS was seminar / workshop activity for students of Faculty of Nursing and Psychology (44.44%), while through academic activities for students of Faculty of Pharmacy and Medicine (87.62%).

Most respondents of Medical Faculty possess high HIV/AIDS-related knowledge (58.82%). Table 3 showed that the highest Mean of HIV/AIDS-related knowledge was found in Medical Faculty (73.12 or sufficient), but the data is the most varied among all (SD=19.08). Majority of low HIV/AIDS-related knowledge was found in the Faculty of Nursing and Psychology (48.18% and 75.65% respectively). All data of HIV/AIDS-related knowledge was normally distributed ($p = 0.138-0.719$), except Faculty of Nursing ($p = 0.014$). Most respondents were willing enough to participate in VCT (83.47% in total). Table 3 also showed that the highest Mean of the willingness to participate in VCT was found in Faculty of Nursing (86.37 or sufficient), but the least varied data was found in Faculty of Psychology (SD=9.57). All data of the willingness to participate in VCT was normally distributed ($p = 0.091-0.963$).

Data variance was homogeneous for both variables ($p = 0.527-0.817$). The data of HIV/AIDS-related knowledge was linear to the data of the willingness to participate in VCT ($p = 0.597$). Therefore parametric test may be used for data analysis (Pearson correlation test, one-way ANOVA test, and linear regression test). The result of the Pearson correlation test showed that there was no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT

among HSUS ($p = 0.101$). Therefore there was no strong basis for pursuing linear regression analysis since this is an important assumption for the use of regression analysis. But, researchers need to make sure that HIV/AIDS-related knowledge even has no slight influence on the willingness to participate in VCT. Results turned out to the model of regression [Y (willingness) = 86.288 - 0.050 X (knowledge)] was not significant ($p=0.101$). HIV/AIDS-related knowledge contributed only 0.8% influence on the willingness to participate in VCT among HSUS ($R^2=0.008$), other unidentified factors possibly play a more important role.

The result of one-way ANOVA test showed that significant differences found among four groups of HSUS regarding measured variables ($p < 0.05$), therefore LSD test was needed to specifically found those differences.

Table 4 showed that there was no significant difference of HIV/AIDS-related knowledge found between nursing and psychology students ($p = 0.182$), but this knowledge was significantly different with pharmacy and medical students ($p = 0.007$ and $p = 0.000$ respectively). Knowledge of medical students was significantly different among the other faculties ($p = 0.000$ for each). Also, there was no significant difference in the willingness to participate in VCT found between medical students and the other faculties ($p = 0.143 - 0.542$). Nursing students' willingness to participate in VCT was significantly different with pharmacy and psychology students ($p = 0.006$ and $p = 0.001$ respectively).

DISCUSSION

Table 1 showed that most respondents were aged 20-21 years (54.06%). Adolescents aged 15-24 are vulnerable to HIV infection due to the strong influence of peer pressure and the development of their sexual and social identity that often culminates in experiments (Shiferaw, 2014). The majority of young people in this age group are at risk of HIV

infection due to their involvement in unsafe sex, injecting drug use, blood exposure and viral contaminated blood products or unsterile piercing procedures (WHO, 2004). A descriptive study in Kenya proved that age is associated with the implementation of HIV testing (Mugoya, 2012).

Table 1 showed that most respondents were females (77.59%). Studies in Kenya showed that there were significant differences between men and women in previous HIV testing status and HIV testing. HIV knowledge is higher in men than women. Differences are found in stigma against HIV, with women reporting more stigmatization stance than men (Mugoya, 2012). VCT participants were more likely to be men in Namibia (Soroses, 2006). Men were relatively more likely to take HIV testing than women through VCT in rural Ethiopia (Teklehaimanot, et al, 2016). In this study, differences in knowledge about HIV / AIDS among male and female respondents were not analyzed further, given the proportion of male-to-female samples is highly imbalanced.

Table 1 showed that most respondents are single (78.10% in total). Marital status was found to be associated with VCT participation in Namibia (Soroses, 2006). The pattern of behaviour change seems to be consistent with marital status (Oster, 2012). Premarital sex among unmarried couples and high prevalence of HIV among men is associated with a willingness to be tested for HIV (Wang, et al, 2010). Only 2.52% of unmarried respondents ever had premarital sex in this study.

Table 1 showed that the study respondents vary in terms of ethnic and religious affiliation. In addition to gender, ethnicity and religion can affect the stigma against HIV that potentially affects willingness to participate in VCT. Study in Namibia showed that cultural groups are significantly associated with VCT participation (Soroses, 2006); while another study in Burkina Paso showed that Bwaba ethnicity was significantly associated with high HIV risk (Sarker, et al, 2005). The broad cultural norms surrounding gender and stigma against HIV influence the behaviour of HIV testing and diagnosis seeking behaviour from marginalized risk populations (Lofquist, 2012). Cultural group or ethnic need to be further studied in connection to VCT utilization, especially in the developing country.

Table 1 showed that most respondents completed their primary education outside Java (30.25% in total). A cross-sectional study in rural Ethiopia showed that behavioural factors and health services affect the utilization of VCT in rural people. Rural people who are better educated and have comprehensive knowledge without stigmatization are more likely to be willing to utilize VCT. The origin of the state or province is also strongly associated with the utilization of VCT in both men and women (Teklehaimanot, et al, 2016).

Table 1 showed that most respondents still live with their parents (43.98% in total). University students are particularly vulnerable to HIV infection

due to lack of knowledge and lack of parental supervision. Students who stay away from their parents have the potential to have more opportunities to try new things, including the sex experience (Shiferaw, 2014). If most of the study respondents are still living with their parents currently, it can be assumed that the respondents still get enough parental supervision. Therefore the possibility to experience premarital sexual activity is less; only 2.52% respondents reported premarital sex.

All respondents were not working at the time of data collection, not even being a part-timer. Most of their time was spent on campus. The main financial supporters were their parents. Individuals who have households with high socioeconomic status and work in non-agricultural sectors are more likely to use VCT (Teklehaimanot, et al, 2016). Table 1 shows that most respondent parents earn a monthly salary of IDR 1-3 million (57.42% in total, with the type of occupation, was not identified). This is below the regional minimum wage of Surabaya in 2017 (IDR 3.2 million). The residential status of respondents is mostly self-owned (46.78% in total). It can be assumed that the socio-economic or social status of the study respondents is lower middle-class. This can affect the accessibility of VCT information and services that have the potency to cause fear and stigma against HIV in the community.

Table 2 showed that most respondents experienced health education of HIV/AIDS twice or more so far (59.94% in total). The seminar/workshop proved to be the easiest way to obtain HIV/AIDS-related knowledge among nursing and psychology students (44.44%) and via academic activities for pharmacy and medical students (87.62%). Only 20.73% of respondents received health education from a health care professional. HIV-related topics were covered in their academic syllabus but in the different portion for each study program; medical students got more credits for HIV-related topic, followed by the pharmacy, nursing, and psychology students. This is confirmed by the results presented in Table 3a which showed that the highest Mean of HIV/AIDS-related knowledge was found in Medical Faculty (73.12). Majority of low HIV/AIDS-related knowledge was found in the Faculty of Nursing and Psychology (48.18% and 75.65% respectively). These two faculties need to more encourage HIV-related topics in their academic syllabus.

A study at Debre Markos University, North West Ethiopia (2011), showed that knowledge of HIV, suspected stigma, perceptions of risk, and having heard of the secrecy aspect in VCT were associated with the use of VCT services among students. Their main sources of information are mass media and health care workers (Tsegay, et al, 2013). Information on HIV is most likely to be more effective if disseminated through mass media (printed or electronics) based on Tsegay's study (2013) compared to health education activities alone

because of the scope and accessibility of young people today. Dissemination of information mainly due to the asymptomatic nature of HIV infection has the potential to be very important in shaping the perceptions of risk, awareness, and willingness to participate in HIV testing (Sarker, et al, 2005).

Most respondents were willing enough to participate in VCT (83.47% in total). Table 3b showed that the highest Mean of the willingness to participate in VCT was found in Faculty of Nursing (86.37). VCT proves to be one of the most powerful weapons to stop the spread of HIV / AIDS. VCT is known to be a very important component of HIV/AIDS prevention strategies, but some studies show low use of VCT services especially in developing countries (Tsegay, et al, 2013). Several studies have also shown that knowledge of HIV is often associated with the individual's desire to participate in VCT. Table 2 showed that 51.54% of respondents have low HIV knowledge (in total), although most claimed to have been exposed to health education about twice or more so far. Table 2 showed that only 1.12% of respondents indicated a strong willingness (greatly) to participate in VCT. This is potentially due to low knowledge (51.54%), fear of HIV testing (expressed) and possible stigma against HIV. Students who are knowledgeable about HIV have a 3.69 times higher likelihood of using VCT services than those without or less knowledge (Tsegay, et al, 2013). A study in KwaZulu-Natal, South Africa, showed that despite having a very good knowledge of HIV, a large number of patients referred for VCT did not perform HIV testing at the end (Orisakwe et al., 2012). This is consistent with this study finding as shown in Table 4 that no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS ($p = .101$).

Results showed that significant differences found among the four groups of HSUS regarding HIV-related knowledge and the willingness to participate in VCT ($p = 0.000$ and $p = 0.005$ respectively). This result was confirmed in Table 4. Table 4a showed that there was no significant difference of HIV/AIDS-related knowledge found between nursing and psychology students ($p = 0.182$), but this knowledge was significantly different with pharmacy and medical students ($p = 0.007$ and $p = 0.000$ respectively). Knowledge of medical students was significantly different among the other faculties ($p = 0.000$ for each). However as shown in Table 4b, it was shown that there was no significant difference in the willingness to participate in VCT found between medical students and the other faculties ($p = 0.143 - 0.542$). Nursing students' willingness to participate in VCT was significantly different with pharmacy and psychology students ($p = 0.006$ and $p = 0.001$ respectively).

Results also showed that there was no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS ($p = 0.101$). One reasonable explanation is that the

knowledge level is very low for most except for medical students, and the willingness result is not as varied. This result was found because knowledge only contributed 0.8% influence in determining HSUS willingness to participate in VCT, as confirmed by linear regression test results which showed that knowledge of HIV/AIDS has very slight influence/effect on the willingness to participate in VCT among HSUS ($R^2 = 0.008$; it means 0.8% influence); 51.54% respondents in total possess low HIV/AIDS-related knowledge and 15.41% respondents in total have low willingness to participate in VCT.

A cross-sectional study in Northeastern China supports this finding, where greater knowledge about HIV transmission and the awareness that apparently healthy people can transmit HIV significantly associated with greater willingness to participate in free HIV testing (Yuan et al, 2012). Another descriptive study utilizing data from the Demographic Health Survey in Kenya in 2009/2010 also showed that knowledge of HIV, knowing someone who is infected with HIV/AIDS, and education level was positively associated with the use of HIV testing services and HIV-related stigma (Mugoya, 2012). Stigma potentially became one of the key factors determining a person's willingness to participate in VCT, especially in young people, but unidentified in this study; 99.2% influences still in the hand of other unidentified factors. Further study related to stigma towards HIV in young generations, especially HSUS, is needed to prove this proposition.

HSUS is the young generation of health care professionals in the future. Awareness of high HIV vulnerability among health care workers should make them more motivated to increase their knowledge about HIV/AIDS, avoid high-risk behaviours and adopt a healthy lifestyle. Increased HIV/AIDS-related knowledge potentially has implications for lowering stigma against HIV, increasing the willingness to participate in VCT, and providing high-quality health care services to the patients, especially for people who are living with HIV/AIDS.

This study has some limitations also. The nature of cross-sectional study with a single time point data collection has made the pattern, consistency, and intensity of variables' values over time was not assessed. Future study needs to incorporate a longitudinal cohort design to improve the present research methodology. In addition, in Indonesia there are two types of higher education institutions, one is a private university in which it is charity-funded, and the other is a public university which is government-funded. This study set was confined only to one of the charity-funded institution. Therefore, a generalization of the results should be cautioned. Dimensions of both questionnaires do not address local issues such as culture and habits. A modification and validation of scale study may be needed.

CONCLUSION

HIV/AIDS-related knowledge and the willingness to participate in VCT differed significantly among the four groups of HSUS in this study. Medical students had the highest knowledge level compared to other faculties. Most low knowledge levels was found in the faculty of nursing and psychology. As for the willingness to participate in VCT, most sufficient willingness was found in all faculties. HIV/AIDS-related knowledge is uncorrelated with the willingness to participate in VCT among HSUS, but it has a slight influence on it. Many other factors unidentified in this study possibly play a more important role in determining HSUS's willingness to participate in VCT.

The use of printed and electronic mass media should be more considered to be a means of sharing information on HIV/AIDS and VCT service utilization to HSUS along with seminar/ workshop events on this topic useful for increasing their HIV/AIDS-related knowledge. Faculty of nursing and psychology needs to encourage more HIV-related topics in their academic syllabus. Another study contains further analysis of other potential factors determining individuals' willingness to participate in VCT should be conducted to identify stronger predictors than knowledge itself, such as stigma against HIV/AIDS, and provide a greater chance for factors' modification, so that intervention could be developed to address this issue.

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