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HIV Knowledge, Attitude, and Perception among University Students

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Abstract

Young people aged between 13 to 29 years old make up 34% of the cumulative number of Human Immunodeficiency Virus (HIV) sufferers in Malaysia. The purpose of this study is to determine the level of knowledge, attitude, and perception of HIV among students in University. The research design is cross-sectional. Questionnaires were distributed to 372 respondents. Results found that 52.4 percent students had a good knowledge. There was a positive but weak correlation between KA ($r=0.23$) and KP ($r=0.19$) with significance ($p<0.05$). In conclusion, increases in the level of knowledge of HIV contributed to a positive attitude and perception while also reducing the stigma and discrimination towards people living with HIV/AIDS.

Keywords: Human Immunodeficiency Virus (HIV), Knowledge, Attitude, Perception

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1.0 Introduction

Human Immunodeficiency Virus (HIV) was first discovered in 1981 in the United States, nearly 35 million people are infected worldwide, and 39 million people have died due to this virus (WHO, 2015). HIV does not have a cure but can be controlled by antiretroviral therapy (ART). Despite this, Acquired Immunodeficiency Syndrome (AIDS) can occur when HIV attacks and destroys a specific cell of the immune system called CD4 cell or T cell. Once infected, the immune system becomes weaker. Thus, the body cannot fight against any infection or disease (Centre of Diseases Control (CDC), 2015).

Malaysia has reported HIV/AIDS cases since 1986 by the Ministry of Health. In 2013, 101, 672 Malaysians were confirmed HIV infected and 16,360 deaths were reported. Joint United Nations Program (UNAIDS), (2014) stated that AIDS-related mortality increased by about 20% in Malaysia between 2005 and 2013. This number increased when, between January to June 2014, 1,676 cases of HIV and 598 cases of AIDS as well as 402 related deaths were recorded. Hence, 79.7% is the new infection rate for males. Moreover, this case also increased rapidly among young people (Wong, Chin Low, & Jaafar, 2008). According to statistics provided by the Malaysian AIDS Council (MAC), in 2013, there were 3,393 new cases of HIV infection reported in Malaysia. Of this number, young people aged 13 to 29 contributed 34% of the total (Wong et al., 2008). In 2010, 312 HIV cases involving students were recorded with 69 cases of AIDS (MAC, 2010).

The number of new cases of HIV infection steadily decreased over the past decade. However, the number of young people infected with HIV rapidly increased (Wong et al., 2008). Therefore, in the year 2010, 312 HIV cases involving students were recorded with 69 cases of AIDS (MAC, 2010). At this point, the estimation for the age group between 15 to 49 years old that has been infected with HIV is 73,005 (UNAIDS, 2014). These facts will be a nightmare for our country if no prevention steps are taken since the young are the future

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generation of our country. From now, preventive measures should be taken to reduce the spread of these harmful diseases to save young people from getting HIV infections.

The assessment of knowledge regarding HIV infection plays a major role in the prevention of the virus (Ungan & Yaman, 2003). This is important because knowledge can prevent a person from being infected by HIV. Most of the people with adequate knowledge will protect themselves better from getting the virus (Petros, 2014). Lack of knowledge can form a negative attitude towards people living with HIV (Khan, 2015).

Negative attitudes toward people living with HIV (PLH) affects the prevention efforts (Rahnama, Rampal, Lye, & Abdul Rahman, 2011). HIV cases may increase if people continue to have negative perceptions and attitudes toward people with HIV. This is due to the people who are at high risk of HIV will be unwilling to go for a HIV test and spread the virus unconsciously.

Briefly speaking, the assessment of knowledge, attitude, and perception are important to plan appropriate strategies as preventive measures to battle HIV. For this reason, this study was carried out to identify the level of knowledge, attitude, and perception of HIV among UiTM students.

2.0 Methodology

2.1 Research Design

This study was conducted in a cross-sectional design study due to it involving only one contact with the study population (Kumar, 2014) and the output from this study showed the problem in a population at a certain point in time to develop effective preventive measures to tackle HIV/AIDS.

2.2 Study setting

This study was conducted in Universiti Teknologi Mara (UiTM) Selangor, Campus Puncak Alam which consists of seven faculties: the Faculty of Architecture, Planning, and Surveying, Faculty Art and Design, Faculty of Business Management, Faculty Health Sciences, Faculty Hotel and Tourism Management, Faculty of Pharmacy, and Faculty of Accountancy.

2.3 Sample design and sample size

The study population is 11,371 university students from all respective faculties in Universiti Teknologi Mara's Puncak Alam Campus. The sampling method was convenience sampling. It is a non-probability sampling and provides convenient accessibility and proximity to determine the sample size. Sample size was calculated by using Raosoft Sample Size Calculation software where 11,371 total population is equal to 372 with 95% confidence level and 5% margin for error.

2.4 Instrument and Scoring

The instrument used in this study was a validated questionnaire adopted from "Knowledge and Risk Perception towards HIV/AIDS among Students of the University by Prishtina "Hasan Prishtina" (Zefi, 2015). The permission to adopt the questionnaire was obtained from the author. The questionnaire was in English. There are four sections of this questionnaire which are Section A consisting of demographic data while Section B, Section C, and Section D are about investigating the level of knowledge of HIV, attitude towards HIV, and perception towards HIV, respectively.

Scoring for knowledge, attitude, and perceptions was adapted from a study among male high school in Lao People's Democratic Republic (Thanavanh, Harun-Or-Rashid, Rashid, Kasuya & Sakamoto, 2013). Based on that study's method of determining the level of knowledge, score of 1 was given for a correct answer and 0 for a wrong answer. The total score was then calculated and categorised the level of knowledge. Accordingly, level of knowledge was categorized into "low" for respondents who scored $\leq 50\%$, "average" for those who scored between 51% and 74%, and "high" for those who scored $\geq 75\%$.

In determining the level of attitude and perception, a score of one was given for every positive answer in the attitude and perception section and 0 for negative answers. The scores were then summed up to generate an overall score for each participant. The scores of attitudes and perceptions were categorized into two segments based on their mean and total score. Those scoring less than mean scores for attitude and perception were classified as "negative" and those scoring equal and more than mean scores were classified as "positive" attitudes and perception.

2.5 Pilot study of the Instrument.

A pilot study was conducted to ensure the adapted questionnaire has a good internal consistency. 37 students were involved, the Cronbach alpha was analyzed, and they were excluded from the study. The score was 0.702, indicating the questionnaire is good.

2.6 Ethical consideration

The study was ethically approved by the Research Ethic Committee, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM). Written consent, after explanation on the study, were obtained from the study participants. Participants were advised that they could withdraw from the study at any point of time without penalty. The participants were informed that the data would be handled confidentially. The results obtained at the end of the study would be reported in an aggregated group rather than on an individual.

2.7 Data collection and analysis

The data collection was conducted by distributing the questionnaire equally among the seven faculties. Self-introduction and a brief explanation about the research were given to the respondents before the research was conducted. The data is analysed using SPSS version 21.0. For each variable (demographic data, knowledge, attitude, and perception), descriptive statistics was used to analyse the general description of the data including mean, median, frequency, standard deviation, and percentage. Significance value was set at $p < 0.05$, and only significant results were discussed. Chi-Square test was used to determine the relationship between demographic data and level of knowledge of HIV. The Pearson's Correlation Coefficient is used to correlate demographic data towards knowledge, attitude, and perception towards HIV infection and to determine the relationship between knowledge, attitude, and perception of HIV infection.

3.0 Results

3.1 Socio-demographic characteristics

Most of the respondents were female, 92.7% ($n=345$) while the rest were male, 7.3% ($n=27$). The mean age of the participants was 21.94 (SD 1.252) with an age range between 19-27 years old. The highest number of respondents are from the Faculty of Health Science, 37.6% ($n=140$). Majority of the subjects are in year 2, 41.9% ($n=156$). (Table 1)

Table 1 Demographic Data of Students

Variable	n (%)
Response rate	372(100)
Gender:	
Male	27(7.3)
Female	345(92.7)
Age	
19 - 22	251(67.5)
23 – 27	121(32.5)
Faculty	
Health Sciences	140(37.6)
Business Management	112(30.1)
Accountancy	42(11.3)
Art and Design	30(8.1)
Pharmacy	30(8.1)
Hotel Management	18(4.8)
Year of student	
1	69(18.5)
2	156(41.9)
3	124(33.3)
4	20(5.4)
5	3(0.8)

3.1 Student's knowledge regarding HIV

Table 2 shows the items that were used in assessing the knowledge of students regarding HIV. Data shows that most of the students know about the transmission of HIV. Hence, most of students can answer the question correctly. However, there is a high number of students who were uncertain whether HIV can be transmitted through mosquito bites with 43.8% of the students answering the question wrongly. Although, 154(41.4%) number of students also answered wrongly related to whether HIV transmission occurring by eating from the same plate with a person living with HIV/AIDS. However, for the item on whether people can get infected with HIV by using the same toilet seat with someone who has HIV/AIDS, 135 (35%) of the students answered wrongly. Overall, respondents had a mean ($\pm SD$) score for knowledge of 2.26(± 0.85) from 6 knowledge-related questions. Accordingly, 52.4% were classified as having a high level of knowledge. Another 21.2% have average knowledge and 26.4% have low knowledge regarding HIV.

Table 2 Knowledge students on HIV infection n=372

Items	Correct response n(%)	Wrong response (n%)
People can get infected with HIV by using the same toilet seat with someone who has HIV/AIDS	237(63.7)	135 (35)
People can get infected with HIV by injecting drugs with HIV by injecting drugs with used needles	337(90.6)	35 (9.4)
HIV can be transmitted from infected mother to child	310(83.3)	62(16.7)
People can get infected with HIV through social contacts	306(82.3)	66 (17.7)
People can get infected with from mosquito spite	209(56.2)	163 (43.8)
People can get infected with HIV being fed from the same plate with a person living with HIV/AIDS	218(58.6)	154 (41.4)

The respondents have a mean (\pm SD) score for knowledge of 2.26 (\pm 0.85) from 6 knowledge items. Accordingly, 52.4% were classified as having good knowledge. 21.2% were average and 26.3% have low knowledge regarding HIV. The results show that most of the students have good knowledge on HIV. Refer to Table 3

Table 3. Student's level of knowledge.

Level of knowledge	n	%
Good knowledge	195	52.4
Low knowledge	98	26.3
Average	79	21.3
Total	372	100

3.2 Students' Attitude towards HIV

Table 4 shows the results for levels of attitude the students have on HIV. Most of the students are classified as having positive attitudes towards HIV at about 61% compared to a negative attitude at 38.4%. The mean scores ranged from 0 to 8 with mean score =3.29, $SD \pm 1.89$ from 8 items.

Most of the students showed positive attitudes towards willingness to take care of their family if they were infected with HIV/AIDS. Students also preferred to keep it a secret if they were infected with HIV. Some of them were uncertain whether to keep it as a secret or not. Students showed negative attitude towards eating from the same plate with a person with HIV at 316 (84.9%). Most of the students were positive to share the same class with someone with HIV at 226 (60.8%). They also agreed that, if a professor is infected with HIV, they should be allowed to continue teaching. However, students showed negative attitudes towards health care workers and food sellers with HIV to continue working. They were also reluctant to buy from a HIV-infected food seller at 331(89.0%) (Table 5). From eight of the questions that addressed attitudes toward HIV, the scores ranged from 0 to 8 (mean score = 3.29, $SD \pm 1.89$). Accordingly, 61.6% of students scored equal or more than the mean and were classified as having a positive attitude towards HIV. A total of 38.4% were classified as having a negative attitude toward HIV because they scored less than the mean.

Table 4. Levels of Attitude of Student

Level of attitude	n	%
Positive	229	61.6
Negative	143	38.4
Total	372	100

Table 5 Attitude towards HIV

Items	Positive (n%)	Negative (n%)
If one of your family members infected with HIV would you be willing to care for him/her	283(76.1)	89(23.9)
If you are infected with HIV would you prefer that this information to remain a secret?	168(45.2)	204(54.8)
Would you be ready to eat from the same plate with a person you know has HIV/AIDS?	56(15.1)	316(84.9)
If a student lives with HIV/AIDS should he/her be allowed to continue to attend school/studies?	209(56.2)	163(43.8)
Would you accept to share the same class at school/college with someone who you know is infected with HIV?	226(60.8)	146(39.2)
If a professor is infected with HIV/AIDS should she/he be allowed to continue to teach in the school/college?	188(50.5)	184(49.5)
If a health worker (doctor, nurse) is infected with HIV should she/ he be allowed to continue to work with patients?	53(14.2)	319(85.8)
If you know a food seller living with HIV, would you buy from him/her?	41(11)	331(89.0)

3.3 Students' Perception towards HIV

Table 6 shows that most of the students believe that HIV can be transmitted from people who are seemingly healthy 188 (50.5%). A lot of the students disagree that HIV is a punishment for one's behavior, 204 (54.8%). They were certain of the variable that HIV patients

tend to hide their infection from others, 306(82.3%). A great number of students think that HIV/AIDS patients are normally sex workers, 265 (71.2%). Most of the students are uncertain whether HIV patients are dying very quickly. The 5 items addressed perception toward HIV; the scores ranged from 0 to 5 (mean score=1.77, $SD \pm 1.28$). Table 7 illustrates the results accordingly with 82.3% of students scoring equal or more than the mean and were classified as having a positive attitude towards HIV. A total of 17.7% were classified as having a negative attitude toward HIV because they scored less than the mean.

Table 6 Perception of Students towards HIV

Items	Negative (n%)	Positive (n%)
Can people be infected with HIV from person who is seemingly healthy?	184(49.5)	188(50.5)
Person living with HIV is a punishment for his/her behaviours?	168(45.2)	204(54.8)
HIV/AIDS patients tend to hide their infection from others?	306(82.3)	66(17.7)
HIV/AIDS patient are normally sex workers?	265(71.2)	107(28.8)
HIV/AIDS patients are dying very quickly?	275(73.9)	97(26.1)

Table 7. Level of Students perception on HIV

Level of Perception	n	%
Positive	306	82.3%
Negative	66	17.7%
Total	372	100%

3.4 The association of demographic data with level of knowledge of HIV

In order to analyse the association between the different faculties with the level of knowledge, the faculties were divided into two groups such as Healthcare fields (Faculty of Health Science and Faculty of Pharmacy) and Non-Health care fields (Faculty of Business Management, Faculty of Art and Design, Faculty of Accountancy and Faculty of Hotel Management). The faculties were divided into two categories which are healthcare fields and non-health care fields since a previous research stated that health care fields included nursing, pharmacy, and medicine as well as health sciences faculties (Brody, Edelman, Siegel, Foster, Bailey, Bryant & Bond, 2016). Chi-square test for independence indicates there is a significant association between faculty and level of knowledge, $X^2(1, n=372) = 8.86, p = .03$ ($p < 0.05$). Table 8 shows that there was a higher proportion of science-based faculties who have high HIV knowledge compared to non-science. Since the p -value is significant, the null hypothesis has been rejected. The other demographic data has no association with the level of knowledge. Results in this study show that only the faculty variable has a significant association with the level of knowledge.

Table 8. Association between Demographic Data and Level of Knowledge

Faculty	Low Knowledge	High Knowledge	$X^2 (df)$	p-value
Health care	61(38.)	97(61.4)	8.8661(1)	0.03
Non-health care field	116(54.2)	98(45.8)		

3.5 Correlation between knowledge with attitude and perception

Pearson correlations were conducted analyse the correlation between the level of knowledge with their attitude and perception towards people living with HIV (PLH). Table 9 shows that there is a positive correlation between the two variables, $r(372) = 0.23, p = .01$. There is a weak but positive correlation between level of knowledge and attitude. There is also a positive correlation between level of knowledge and perception, $r(372) = 0.19, p = .01$. There is a weak but positive correlation between level of knowledge and perception. Thus, this result proves that an increased level of knowledge is correlated with positive attitude and perception towards HIV.

Table 9. Correlations between knowledge towards attitude and perception

	Knowledge n=372	
	Pearson Correlation	Sig (2-tailed)
Attitude	0.230	0.01
Perception	0.198	0.01

4.0 Discussion

4.1 Level of Knowledge, attitude, and perception of HIV

4.1.1 Level of Knowledge

More than half of the students have good knowledge regarding the transmission of HIV. Most of them were able to answer the variables regarding knowledge on HIV. This shows that UiTM Puncak Alam students have adequate knowledge in preventing HIV/AIDS contrasting with other studies which found that university students only had average knowledge about HIV transmission (Al-Rabeei, Dallak, & Al-Awadi, 2012; Ahmed, Hassali, & Aziz, 2009). However, there were still misunderstandings about the transmission of HIV, with some students answering that HIV can be transmitted through mosquito bites and eating from the same plate with PLH. The result is similar with studies conducted in China (Thanavanh et al., 2013) and Iran (Tavoosi, Zaferani, Enzevaei, Tajik, & Ahmadinezhad, 2004).

However, the opposite concept was reported in a study in India. Most of the students in that study were aware that HIV cannot be transmitted through mosquito bites and sharing a toilet seat (Banerjee & Keller, 2015). It was significant that students need more information regarding the mode of HIV transmission to prevent misconceptions. Most of the students know that HIV can be transmitted through intravenous drugs using needles and mother-to-child transmissions from pregnancy, childbirth, or breastfeeding. The same results were reported by studies in Korea (Sohn & Park, 2012) and Xinjiang (Maimaiti, Shamsuddin, & Nurungul Tohti, & Maimaiti, 2010). Most of the respondents were aware that HIV cannot be transmitted through social contact. Again, the same results were found in the studies in Korea (Sohn & Park, 2012) and Xinjiang (Maimaiti et al., 2010).

4.1.2 Attitude towards HIV/AIDS

More than half of the students indicated a positive attitude towards PLH. This finding is higher compared to findings by Maimaiti et al., (2010). Only a small number of students in that study had a positive attitude towards HIV. Despite the higher positive attitude among students, they were still reluctant to allow health care providers with HIV to treat patients. The same reaction is also seen towards food sellers who have HIV. A lot of students are unwilling to buy food from an HIV-infected seller. This finding is similar to the findings in a previous study conducted among male high school students in Lao People's Democratic Republic (Thanavanh et al., 2013) and China, where the statistics showed that more than half of the students disagreed to allow a HIV positive professor to continue to teach. They also disagreed to enable students with HIV to continue with their studies in school. Previous studies also show that most of the students were unwilling to eat from the same plate with an HIV-infected person. This is similar to a study conducted among Korean adolescents who showed discriminating attitudes toward PLH by being reluctant to share a meal with PLH (Sohn & Park, 2012). This is contradicting with a study in Namibia on the prevalence of knowledge and attitude towards HIV which showed a higher percentage of students willing to allow an HIV-infected professor to continue teaching (Kiderlen, Conteh, Roll, Seeling, and Weinmann, 2015). The study also found that females were less discriminating toward PLH compared to males in terms of sharing meals (Sohn & Park, 2012).

One of the studies in Malaysia revealed that a small percentage of students will inform their partner or family about their disease which is analogous to the finding that a large percentage of students would prefer that their disease remain secret if they were infected. However, the study shows contradictory results regarding the willingness of the students to care for infected family members since most of the students are willing to care for their infected family members (Rahnama et al., 2011). Most of the students also show positive attitudes toward PLH as they are willing to share classes at school or college with an infected person. On the other hand, the findings of a study in Sanaa City revealed a low percentage of students were willing to accept the infected person in the same community and thought that the infected children should be isolated even from attending schools (Al-Rabeei, Dallak, & AlAwadi, 2012).

4.1.2 Perception towards HIV/AIDS

Overall result displays a positive perception toward HIV among undergraduate students in UiTM Puncak Alam. Analysis reveals only a small percentage of students thought HIV is a curable disease. The results are consistent with a current study among Malaysian young adults. However, misinformation about HIV being a curable disease should be corrected as this can lead to another risk factor for contracting the disease. The literature also states that an infected person can be recognised by their appearance (Wong, Chin, Low, & Jaafar, 2008). This contradicts with the result that students have a positive perception that people may be infected with HIV from a person who is seemingly healthy as students think that HIV-infected people may be asymptomatic.

The study also discovered that a majority of the students disagreed that HIV is a punishment to people living with HIV/AIDS (PLWHA) because of their behaviour. On the other hand, a research in Nigeria also illustrated the same results, but some students still agree that HIV/AIDS is a punishment from God (Muoghalu & Jegede, 2013). The studies also conveyed that there are some students who want to keep their diseases as secret. The review in UiTM Puncak Alam found that a majority of the students believe PLWHA tend to hide their infection from others because of stigma and discrimination from the community (Saki, Mohammad Khan Kermanshahi, Mohammadi, & Mohraz, 2015).

While the results display a positive perception towards PLH, a great number of students thought that people infected with HIV are normally sex workers. Petersen (1993) stated that the stigmatization towards sex workers was expected from their actions like having sex with multiple partners. Thus, this lead to sexually transmitted diseases especially HIV (Wong, Holroyd, & Bingham, 2011). This reveals that students risk perceptions which lead to HIV infection. Most of students also believed HIV/AIDS patients die very quickly.

Life expectancy of infected persons depends on the time the PLWHA start antiretroviral therapy. Furthermore, late diagnosis and treatment can reduce the life expectancy of the infected person (May, Gompels, Delpech, Porter, Post, Johnson, Sabin, 2011).

4.1.3 The correlation of demographic data with level of knowledge of HIV

Demographic data shows significant correlation with knowledge of HIV among undergraduate students in UiTM Puncak Alam. Thus, the field of study, which were divided into the healthcare field (Faculty of Pharmacy and Faculty of Health Science) and non-health care field

(Faculty of Agriculture, Planning and Surveying, Faculty of Art and Design, Faculty of Business Management, Faculty of Accountancy, and Faculty of Hotel and Tourism Management), does affect the level of knowledge about HIV.

The finding is consistent with other studies. For example, a study in Guyana found that health sciences students have a high level of knowledge about HIV infection and their training curriculum does improve HIV knowledge. Furthermore, knowledge is important to reduce stigma because it can be an obstacle in delivering care to HIV patients. Health sciences students are most probably the front-line health care worker who will typically have direct contact with HIV patients as they will deliver health care services in the future (Balfour, Corace, Tasca, Best-Plummer, MacPherson & Cameron, 2010).

A study by Violeta Zefi (2015) in the University of Prishtina discovered that the field of study also influences a person's level of knowledge on HIV as the research illustrated that students from the Faculty of Medicine had a higher level of knowledge regarding HIV infections as compared to students from the Faculty of Chemistry and the Faculty of Electrical Engineering and Computer. This may be due to education programmes and clinical practice which provided exposure to students in the health care field. (Sung, Huang, & Lin, 2015). Also, professionals' knowledge and attitudes towards HIV and AIDS may affect their ability to care for patients in the future (Bell & Bray, 2014).

4.1.4 The correlation between knowledge, attitude, and perception of HIV

There is a positive correlation between knowledge and attitude which indicates that the level of knowledge can influence the attitude of the respondents. However, the strength of the correlation was weak but the results revealed that the relationship was statistically significant. The results revealed that an increased level of knowledge led to positive attitude toward PLWHA. Thus, knowledge via education is vital to change the perception and attitudes of undergraduate students on HIV infection.

This finding supports a previous research conducted by Majelantle, Keetile, Bainame, and Nkawana (2014) that suggested that young people who have insufficient knowledge about HIV/AIDS transmission and prevention are less likely to have positive attitudes towards PLWHA compared to those who have sufficient knowledge about HIV transmission and prevention. This explains the finding which shows a weak correlation between knowledge and attitude toward PLWHA among undergraduate students in UiTM Puncak Alam. The strength of association also appeared weak with a positive correlation which indicated that level of knowledge does affect students' perception towards PLWHA. The result is the same with other studies which also demonstrated a strong correlation between perception and knowledge about HIV (Magcai, du Plessis, & Pienaar, 2013).

In general, the analysis shows that knowledge has a large impact towards attitude and perception regarding HIV infection among undergraduate students. Previous studies also demonstrate that high knowledge can induce positive attitudes and perceptions toward HIV infection.

5.0 Conclusion

University students who consist of young people should be inspired to help people with HIV. Since positive attitude and perception is in combination with good knowledge on HIV, students should be given exposure to programmes that could provide more information on HIV. The findings of this study show that there are students who have good knowledge, attitude, and perception towards HIV/AIDS, however, some misunderstanding of the information do raise concerns. A health education program should be held to help these students to understand HIV better so they can learn to avoid themselves from being dragged into transmitting the HIV disease and contribute to the already increasing statistic of young adults infected with HIV.

As a conclusion, it is crucial for young people to seek knowledge about HIV infection to correct the misconceptions regarding HIV transmission. A lot of students did not know about the impossibility of contracting HIV from the sharing of toilet seats and from getting a mosquito bite. This study has also proven that attitude and perception have a relationship with level of knowledge as positive attitude and perception reflects a high level of knowledge. Knowledge can increase awareness about HIV infection, thus, reducing stigma towards PLWHA.

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