



# Determining of Knowledge Level of Nursing Students on HIV/AIDS

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## Research Article

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## Abstract

**Background:** Nurses play a key role in HIV prevention and caring of individuals living with HIV/AIDS. Nursing students are the future nurses who may eventually find them dealing with individuals with HIV/AIDS. Additionally, receiving a comprehensive education on HIV/AIDS and related issues assists nurses accomplish nursing care appropriately. The purpose of this study was to discover the extent of knowledge of HIV/AIDS among Turkish undergraduate nursing students.

**Methods:** A pre-tested-structured questionnaire, which included the demographic information, knowledge of HIV/AIDS were utilized in this descriptive cross-sectional study. A total of 808 nursing students from two universities were included in this study. IBM SPSS version 22.0 statistical software with 95% interval of significance was applied for data analysis. Descriptive statistics, chi-square test, student t-test, one-way analysis of variance and Pearson correlation were applied during data analysis.

**Results:** Nursing students displayed a fairly decent degree of knowledge in the aspects of nature and causes, diagnosis and treatment, and prevention of HIV/AIDS. As the educational year increased the students showed decent knowledge ( $P < 0.05$ ). Gender and age difference weren't associated with knowledge of the students ( $P > 0.05$ ). Higher level students showed increased knowledge and understanding in the study when it comes to HIV/AIDS prevention and misconceptions.

**Conclusion:** It was determined that students in this study scored good knowledge of HIV/AIDS prevention. However, there was also a need of improvement in respect of pathophysiology and the transmission ways of the disease. Training strategies such as group or panel discussions are suggested to assist students improve their knowledge about HIV/AIDS.

**Keyword:** Knowledge; Attitude; HIV/AIDS; Nursing; Students

**Abbreviations:** AIDS: Acquired immunodeficiency syndrome; MoH: Ministry of Health; ERU: Erciyes University; NNYU: Nuh Naci Yazgan University.

## Introduction

Acquired immunodeficiency syndrome (AIDS) has been recognized as one of the most important pandemic diseases we have ever faced [1,2]. According to 2017 report released

by WHO, approximately 36.7 million people were afflicted by HIV/AIDS worldwide [3]. However, the disease has been ignored from being fatal disease, and has become a chronic disease that requires a lifelong medication use [2,4,5].

The WHO reported an estimated of 560,000 People Living with HIV/AIDS as well as 82,000 newly infected cases were from Mediterranean region, signifying the rapid HIV epidemics in the region. Despite the fact that there have

been increased HIV/AIDS programs globally, the region scored the lowest coverage in HIV testing, treatment and prevention [6]. Similarly, the ministry of health (MoH) of Turkey indicated that the number of seropositive individuals has ascended from 1,802 in 2005 to 13,181 in 2016 [7,8]. Study indicated the role of health education in reduction of HIV/AIDS prevalence [9]. Bektaş & Kulakaç suggested urgent implementation of large-scale HIV training programs with special emphasis on building well-trained nurses with positive attitude [10]. In doing so, health professionals particularly nurses have a potential in disseminating health education to their community on HIV/AIDS routes of transmission, manifestations, treatment methods and protective measures [11,12].

Nurses are the principal health care givers and advocates for people infected with HIV/AIDS [13]. Although nurses are the nucleus of healthcare team, various studies discovered poor knowledge of nurses on HIV/AIDS [14]. The dearth of knowledge on HIV/AIDS poses to erroneous nursing practice and avoids provision of quality care [15]. Thus, nursing students definitely require a comprehensive education on HIV/AIDS and related issues to broaden their perspective and properly operate their caring responsibilities [16,17].

A couple of previous studies aimed at assessing the knowledge and attitude of health sciences' students about HIV/AIDS revealed inadequate knowledge of nurses [18-20]. Health professionals are expected to have adequate knowledge of the infection that has an integral role during providing care to HIV/AIDS patients. Hatipoğlu, et al. [19] discovered unpromising finding that more than two-third of nurses and doctors showed unsatisfactory knowledge in all aspects of the disease. Another research done by Akin S & Abolfotouh MA [21,22] reported a substandard knowledge of nurses in regard to HIV transmission. Turkish students displayed poor knowledge with the associated exaggerated panic of contracting the infection [23-25]. Similarly, studies confirmed that Turkish undergraduate nursing students were short of knowledge on transmission and prevention aspects of HIV/AIDS [10,26,27].

Therefore, nursing program should encompass courses that also discover HIV/AIDS to broaden the knowledge of the students on the disease. Since education plays a foremost role in improving the knowledge of students, nurse educators should demonstrate unwavering commitment to train their students with all required and sufficient information about the disease and then to enable them provide standard-based nursing care for people Living with HIV/AIDS. Bosk & Frader [28] emphasized that understanding the perception and beliefs of healthcare workers has become a major area of interest for educational organizations and the quality of care delivered to HIV/AIDS patients.

## Significance of the study

The current study focuses on determining the knowledge level of nursing students on HIV/AIDS. Therefore, this research will estimate or evaluate the up-to-date knowledge of the students and will have great importance both nationally and globally [29-33]. Through this research, colleges and universities in the country will further realize the knowledge level achieved by their students on HIV/AIDS, and therefore will help them to maintain, strengthen or modify the curriculum. Furthermore, the results that will be presented in this study will deliver valuable figures and data for future research that will explore the various aspects of HIV/AIDS.

## Methodology

### Study Design

This descriptive cross-sectional study was designed to assess the HIV/AIDS knowledge level of undergraduate nursing students in two universities in Turkey.

### Study Setting and Characteristics

The study was conducted in 2018 at Erciyes University (ERU) and Nuh Naci Yazgan University (NNYU), Kayseri, Republic of Turkey. The population of the current study was all undergraduate nursing students who were admitted and attending their education at ERU and NNYU in the department of Nursing. The faculty of health sciences at Erciyes University involves department of nursing, nutrition, midwifery, language and speech therapy, and audiology. The education in nursing department is delivered in the form of modules with integrated education system. The department provides HIV/AIDS related sessions during model IV nursing and health disorders courses in third year. The health sciences fields at Nuh Naci Yazgan University (NNYU) involves department of nursing and health services, nutrition, physical therapy and rehabilitation. Education at NNYU department of nursing follows a classical educational system. The topic of HIV/AIDS is imparted for students in adult health course during the fall semester of second year.

### Data Collection

In this cross-sectional study, a total number of 1445 students comprised the population of the study. Of the entire population, 1158 students were receiving their education at ERU (Year I=212, Year II= 233, Year III= 354, Year IV=359) and the remain 287 students were from NNYU (Year I=54, Year II= 60, Year III= 91, Year IV=82). A total of 1000 students were consented to participate in the study and 808 of the total students agreed to complete the

questionnaire. Of these eight-hundred-and-eight subjects, 588 (72.2%) students were from ERU & 220 (27.3%) were from NNYU. Data was collected using informed consent form, sociodemographic form, HIV/AIDS related knowledge form. The sociodemographic and knowledge related questions was developed by the researcher via reviewing previous studies [15,17,19,20,29-33].

### Pilot Test

Before executing the actual data collection, a pretest was conducted on forty students to ensure the clarity, consistency and practicability of the questionnaire. On the basis of the pilot test findings, a few reforms were made in the socio-demographic section of the instrument prior its final application.

### Ethical Consideration

Voluntary participation was aptly explained, confidentiality was secured, and ethical permission was approved and issued by the Institutional Review Board with a reference number 2018-14, and by the Ethical Review Committee of nursing department of Erciyes and Nuh Naci Yazgan Universities. A written informed consent was obtained from the participating students before data collection. Thus, of the 1000 surveys distributed 80.8% (808) were returned

complete.

### Inclusion and Exclusion Criteria of Study

Undergraduate nursing students who were volunteer to participate in the study, were native Turkish speaker and/or international students who achieved C1 Turkish language proficiency were included in the study. Students who had no desire to participate and difficulty reading and understanding Turkish language were not included in the study.

### Statistical Analysis

Analysis was done using IBM SPSS version 22.0 statistical software. Descriptive statistics such as mean±standard deviation for continuous numerical variables and frequency (n) and percentage (%) for categorical variables were given. The normal distribution of numerical variables was evaluated with Shapiro Wilk normality test.

### Results

This portion of the study presents the socio-demographic characteristics, participants' knowledge about HIV/AIDS, and relationship of the socio-demographic characteristics of the students to their knowledge level towards HIV/AIDS.

### Knowledge of Nursing Students on HIV/AIDS

Knowledge related statements	Year 1 n(%)	Year 2 n(%)	Year 3 n(%)	Year 4 n(%)			P	$\chi^2$
<b>Causative Agent</b>								
Causative agent is virus	148 (92.5)	117 (95.9)	243 (97.6)	269 (97.1)	777	96.2	0.064	6.988
Causative agent is bacteria	155 (96.9)	120 (98.4)	242 (97.2)	275 (99.3)	792	98	0.188	4.579
It can be caused by stress	158 (98.8)	122 (100)	248 (99.6)	277(100)	805	99.6	0.158	3.599
The cause is unknown	156 (97.5)	119 (97.5)	244 (98.0)	266 (96.4)	785	97.2	0.727	1.29
<b>Diagnosis, Treatment and Nature</b>								
AIDs can be cured	133 (83.1)	106 (86.9)	233 (93.6)	258 (93.1)	730	90.3	<b>0.001</b>	16.697
There is no drug available for AIDS	75 (46.9)	56 (46.7)	92 (37.1)	127 (45.8)	350	43.3	0.112	5.99
Regular exercise prevents AIDS	153 (95.6)	122 (100)	246 (98.8)	277 (100)	798	98.8	<b>0.001</b>	13.711
Recently vaccine for AIDS is developed	136 (85.0)	108 (88.5)	232 (93.2)	244 (88.1)	720	89.1	0.061	7.362
AIDS can be prevented via preventative measures	56 (35.0)	58 (47.5)	111 (44.8)	129 (47.1)	354	43.8	0.072	6.992
AIDS is a hereditary disease	112 (70.9)	100 (82.6)	214 (86.6)	233 (84.7)	659	81.6	<b>0</b>	40.549
AIDS reduces the resistance ability of the body	98 (61.6)	68 (56.2)	177 (71.4)	177 (64.4)	520	64.3	<b>0.009</b>	16.984
AIDS is a serious disease	132 (83.0)	110 (90.2)	222 (89.2)	229 (83.3)	693	85.8	<b>0.024</b>	14.58

Some people are resistant to HIV/AIDS	42 (26.4)	61 (50.0)	168 (67.7)	190 (69.1)	461	57.1	0	93.973
People with AIDS die from multiple disease	64 (40.3)	73 (59.8)	130 (52.8)	130 (47.3)	397	49.1	0	66.481
Weight loss seen in late phases of the disease	56 (35.4)	58 (47.5)	153 (61.4)	136 (49.5)	403	49.9	0	43.505
HIV is confirmed with blood test	123 (77.8)	108 (88.5)	229 (92.0)	245 (89.1)	705	87.3	0	33.801
AIDS is the collection of several diseases	47 (29.6)	42 (34.7)	116 (46.6)	95 (34.5)	300	37.1	0	69.532
<b>High Risk Groups</b>								
Having multiple sexual partners	145 (90.6)	112 (91.8)	242 (97.2)	272 (98.2)	771	95.4	0	18.736
Drug addicts	15 (9.4)	36 (29.5)	107 (43.0)	61 (22.0)	219	27.1	0	61.164
Homosexuals	56 (35.0)	52 (42.6)	121 (48.6)	137 (49.5)	366	45.3	0.017	10.227
Health care providers	125 (78.1)	79 (64.8)	128 (51.4)	143 (51.6)	475	58.8	0	37.954
Inpatients	124 (77.5)	96 (78.7)	169 (67.9)	185 (66.8)	574	71	0.016	10.365
Adolescents	10 (6.3)	12 (9.8)	49 (19.8)	89 (32.4)	160	19.8	0	53.033
Married women	141 (88.1)	107 (87.7)	215 (86.3)	202 (72.9)	665	82.3	0	26.518

**Table 1:** Correct Responses on HIV/AIDS Knowledge by Educational Year of Students (n=808).

The difference of students' knowledge in accordance to their year of study is given in Table 1. In respect of the diagnosis, nature and treatment subdivision, 93.6% of the third year and 93.3% of the fourth year students revealed that AIDS is not curable, when contrasted with 83.1% of the first and 86.9% of the second year students ( $p=0.001$ ). An increased risk of infection from having a multiple sexual partners was reported by 98.2% of the fourth year students ( $p<0.001$ ). It is also indicated that more proportion of 4<sup>th</sup>

year than 1<sup>st</sup> year students respectively knew that drug addicts (22.0% vs 9.4%,  $p<0.001$ ), homosexuals (35.0% vs 49.5%,  $p=0.017$ ) and adolescents (6.3% vs 32.4%,  $p=0.001$ ) are among the high risk groups. However, more proportion of year one than year four students correctly knew that healthcare providers (78.1% vs 51.6%,  $p<0.001$ ) and married women (88.1% vs 72.9%,  $p<0.001$ ) are not among the high risk groups.

Knowledge related statements	Year 1 n(%)	Year 2 n(%)	Year 3 n(%)	Year 4 n(%)			P	$\chi^2$
<b>Statement related to HIV/AIDS transmission</b>								
From infected pregnant woman to her baby during delivery	74 (46.3)	78 (64.9)	218 (87.6)	229 (82.7)	599	74.1	0	110.403
Having sexual contact with an infected person	152 (95.0)	117 (95.9)	248 (99.6)	272 (98.2)	789	97.6	0	29.868
Vaginal and seminal fluids of an infected person	135 (84.4)	107 (87.7)	222 (89.2)	249 (89.9)	713	88.2	0.027	14.208
Homosexual men have high risk of contracting HIV	80 (50.0)	67 (54.9)	157 (63.0)	161 (58.1)	465	57.5	0	31.976
HIV infected blood transfusion	138 (86.8)	109 (89.3)	236 (94.8)	252 (91.0)	735	91	0	43.938
Sharing injection needles or the surgical operation devices of an infected person	105 (65.6)	95 (77.9)	226 (90.8)	204 (73.6)	630	78	0	67.33
Sharing needles for shooting drugs, piercings, or tattoos	119 (74.4)	97 (79.5)	225 (90.4)	224 (80.9)	665	82.3	0	36.852
<b>Statement related to HIV/AIDS prevention</b>								

Keeping away from using infected needle and knife	139 (86.9)	106 (86.9)	238 (95.6)	247 (89.2)	730	90.3	<b>0.018</b>	15.259
Avoiding untested blood transfusion	152 (95.0)	115 (94.3)	241 (96.8)	265 (95.7)	773	95.7	<b>0.049</b>	12.485
Avoiding sexual relationship with HIV/AIDS infected persons	154 (96.2)	113 (92.6)	242 (97.2)	273 (98.6)	782	96.8	<b>0.001</b>	23.076
Using condom decreases risk of HIV transmission	112 (70.0)	97 (79.5)	231 (92.8)	254 (91.7)	694	85.9	<b>0</b>	65.006
Avoiding sexual intercourse with commercial sex workers	153 (95.6)	115 (94.3)	240 (96.4)	271 (97.8)	779	96.4	<b>0.02</b>	15.021
Penile withdrawal protective during sexual intercourse	39 (24.4)	72 (59.0)	171 (68.7)	200 (72.2)	482	59.7	<b>0</b>	119.043
Sharing the same sharp materials like blade, knife, manicure create problem	131 (81.9)	110 (90.2)	222 (89.2)	255 (92.1)	718	88.8	<b>0</b>	32.928

p<0.05, p<0.001

**Table 2:** Correct Responses of Nursing Students on HIV/AIDS Mode of Transmission and Prevention by Their Year of Study (n=808).

The impact of educational year on the students' knowledge of HIV transmission and prevention is showed in Table 2. In this section, only 46.3% of first year students correctly knew that HIV is transmittable from mother to her child compared to 87.6% of those third year (p<0.001). Third year students showed better knowledge than the 1st year on the statement that says sharing injecting needles or surgical devices of seropositive person is one way of HIV transmission (p<0.001). A significant percentage of 3<sup>rd</sup> and 4<sup>th</sup> year students as compared with 1st year students (50%) knew that homosexuals are at increased risk of contracting

HIV (p<0.001).

In respect of HIV prevention, more proportion of senior students than junior students reported avoiding sexual relationship with HIV/AIDS infected individuals prevents HIV transmission (p=0.001), refraining from sexual intercourse with commercial sex workers avoids HIV infection (p=0.020), penile withdrawal during sexual intercourse is not a safe method of HIV prevention (p<0.001) and sharing the same sharp materials like blade, knife and manicure is unsafe exercise (p<0.001).

Statement related to non-transmission ways	True n (%)	False n (%)	Don't know n (%)
HIV is spread via salivary fluid of an infected person	241 (29.8)	434 (53.7)	133 (16.5)
HIV is spread via tears of an infected person	100 (12.4)	552 (68.3)	156 (19.3)
HIV is spread via sweat of an infected person	93 (11.5)	563 (69.7)	152 (18.8)
HIV is spread through kissing HIV/AIDS individuals	134 (16.6)	566 (70.0)	108 (13.4)
HIV is spread via touching an infected person, such as hugging and holding	41 (5.1)	678 (83.9)	89 (11.0)
Using an infected person's belongings such as clothes, comb and towel	206 (25.5)	493 (61.0)	109 (13.5)
Sitting adjacent in the same armchair or desk with HIV/AIDS a person	77 (9.5)	650 (80.5)	81 (10.0)
Donating blood	296 (36.6)	398 (49.3)	114 (14.1)
Mosquito bite	334 (41.3)	231 (28.6)	243 (30.1)
Handshaking with an infected person	98 (12.1)	603 (74.6)	107 (13.2)
Skin contact with an infected person	69 (8.5)	647 (80.1)	92 (11.4)
Living in the same place with an infected person	39 (4.8)	688 (85.2)	81 (10.0)
Exposure to an infected person who coughs or sneezing	147 (18.2)	532 (65.8)	129 (16.0)
Sharing public toilets and swimming pools with an infected person	243 (30.1)	389 (48.1)	176 (21.8)

**Table 3:** Students' responses on ways of non-transmission of HIV (n=808).

Table 3 reveals the misconceptions of nursing students on HIV transmissions. Almost half of the students fallaciously considered HIV transmission via salivary secretions. The majority of respondents accurately responded that HIV cannot be transmitted through tears, sweat, kissing and sitting side by side or nearby of an infected person. About 85% of the students identified that HIV is not contagious by living

together with HIV positive people. However, large proportion of students erroneously replied that HIV is transmittable through blood donation. Further misunderstandings in regard to the HIV transmission included HIV transmission through mosquito bite (71.4%) and sharing public services such as toilets and swimming pools (51.9%).

Knowledge items on HIV/AIDS on misconceptions	Year 1 n(%)	Year 2 n(%)	Year 3 n(%)	Year 4 n(%)	p	$\chi^2$
HIV is spread via salivary fluid of an infected person	73 (45.6)	54 (44.3)	136 (54.6)	171 (61.7)	<b>0.004</b>	22.598
HIV is spread via tears of an infected person	98 (61.3)	79 (64.8)	182 (73.1)	193 (69.7)	<b>0.029</b>	14.031
HIV is spread via sweat of an infected person	94 (58.8)	81 (66.4)	185 (74.3)	203 (73.3)	<b>0.002</b>	20.79
HIV is spread through kissing HIV/AIDS individuals	84 (52.5)	79 (64.8)	182 (73.1)	221 (79.8)	<b>0</b>	62.732
HIV is spread via touching an infected person, such as hugging, holding and shaking hands	108 (67.5)	100 (82.0)	219 (88.0)	251 (90.6)	<b>0</b>	56.254
Using an infected person's belongings such as clothes, comb and towel	69 (43.1)	81 (66.4)	152 (61.0)	191 (69.0)	<b>0</b>	41.605
Sitting adjacent in the same armchair or desk with a person with AIDS	107 (66.9)	100 (82.0)	209 (83.9)	234 (84.5)	<b>0</b>	45.942
Donating blood	51 (31.9)	53 (43.4)	122 (49.0)	172 (62.1)	<b>0</b>	54.312
Mosquito bite	33 (20.6)	36 (29.5)	66 (26.5)	96 (34.7)	0.071	11.637
Handshaking with an infected person	87 (54.4)	84 (68.9)	198 (79.5)	234 (84.5)	<b>0</b>	63.337
Skin contact with an infected person	99 (61.9)	94 (77.0)	207 (83.1)	247 (89.2)	<b>0</b>	52.349
Living in the same place with an infected person	120 (75.0)	100 (82.0)	219 (88.0)	249 (89.9)	<b>0</b>	30.933
Exposure to an infected person who coughs or sneezing	86 (53.8)	74 (60.7)	160 (64.3)	212 (76.5)	<b>0</b>	47.969
Sharing public toilets and swimming pools with an infected person	59 (36.9)	63 (52.1)	114 (45.8)	153 (55.2)	<b>0.001</b>	22.559

p<0.05, p<0.001

**Table 4:** Correct Responses on HIV/AIDS the Ways of Non-Transmission by Educational Year of the Students (n=808).

Comparison of students' responses on HIV/AIDS non-transmission ways in the accordance to their educational study is indicated in Table 4. Third and fourth year students presented significantly more correct responses than first and second year students on the following items: HIV is spread via salivary fluid of an infected person (p=0.007), tears of an infected person (p=0.029) and via sweat of an infected person (p=0.002).

## Discussion

HIV/AIDS is a well-known health threat in the recent era and it accounts for the significant number of deaths and disabilities particularly in the dynamic age groups [33]. In Turkey the incidence of registered seropositive individuals

has been increasing since the emergence of the disease in 1985 [7,8]. The contributing elements to HIV/AIDS epidemics in the nation could be multifactorial. Its tremendous growth in young population has central importance. Additionally, the strategic location of the country for international trade activities, travel and tourism activities that cause incessant mobilization of expatriates have placed the nation at greater risk for HIV epidemic. Another culprit behind the rising of HIV/AIDS may be the influx of immigrants from different countries that brought about the aggregation of commercial sex workers with associated levitation of unsafe sexual practices [4]. As the incidence of the infection is increasing in Turkey, nurses of the nation are expected to be aware of the disease and to be more supportive for patients with HIV/AIDS.

Scholars have cited the critical impact of adequate knowledge of health professionals on delivering effective and considerate care to patients living with HIV/AIDS [34]. Therefore, determining the knowledge of Turkish undergraduate nursing students on HIV/AIDS is found to be vital to fight against the disease. It was evident in this study that students had less understanding about the high risk groups or key population for HIV/AIDS infection. Such results are similar to the findings of Walusimbi & Okonsky [35]. These unfavorable findings on risk groups strongly indicate the incompetence of students to identify the target population who are at risk of contracting HIV infection and such findings give cause for alarm.

The cohort of the students in this study scored a decent knowledge on causative agent, nature and treatment subscales. An estimated 80% of the students quoted HIV/AIDS as acquired, severe and non-curable disease. Myriads of articles also mentioned the seriousness of HIV/AIDS in similar way [28,36]. In the current study, almost all students correctly underlined that AIDS is caused by virus. These results were slightly higher than the research findings of some other studies Huang J, et al. [28,37,38]. The higher results of this research might be attributed to the combination of education provided to the students at their institutions and high HIV advertisements in the social media. Nursing students in the current study presented an average knowledge on other aspects of nature and treatment of HIV/AIDS. However, previous studies indicated that great number of students believed the existence of vaccine for HIV/AIDS [21,28,39]. Students of the current research were cognizant about blood test confirmation of HIV and the nonexistence of HIV/AIDS vaccine. Consistent with those findings, literature indicated that a vast majority of nursing students were aware of the lifelong and viral nature of the disease [34,39-41].

Findings of this study showed knowledge deficiencies in regard to the pathophysiology of HIV/AIDS compared with the previous research [10,42]. The dearth of knowledge in this study could be stemmed from the fact that nursing program in both institutions are less likely to include in-depth lessons that cover the pathological aspects of the disease. Such findings should require a premier consideration because evidence-based and satisfactory knowledge levels are the prerequisites for nurses to execute their professional functions of caring patients with HIV/AIDS. As far as nurses play a forefront role in offering care for HIV/AIDS patients, it is imperative that they gain reasonable knowledge to ensure that safe care with minimum possible risk of contamination is provided. Increased number of studies have shown that nursing students score inadequate knowledge in regard to HIV transmission routes [28,40,43]. The present data indicates an overall reasonable knowledge level about the

modes of HIV transmissions. Unprotected sexual contact and transfusions with contaminated blood were mentioned among the primary ways of HIV transmission. Additionally, more than 80% of the students were knowledgeable about the HIV transmission via sharing needles or syringes, infected vaginal and seminal fluids which is consistent with the findings of Akın S, et al. [21,36,39,44,45] who have found a promising knowledge score on ways of HIV transmission. On the other hand, students were not aware that homosexuals are the high risk population for HIV infection consistent to finding by Walusimbi & Okonsky [35].

The most thought-provoking finding from this survey was the fact that the students harbored unexpected misconceptions. Almost half of the samples were concerned about infection due to salivary fluids, mosquito bite, sharing public toilets and swimming pool, and sharing properties such as clothes. Such misunderstandings were echoed in other descriptive cross-sectional studies Bektas HA & Kulakac O [10,22,46-48]. Unlike the present findings, studies conducted by Al Jabri AA & Al-Abri JH [41,46,49] found tolerable false impression where only 1.2% to 10.1% of students believed that HIV is transmittable via sharing public toilets and swimming pool, and sharing official utensils with an infected person.

Misconceptions may cause unreasonable panics and adversely limit the confidence of the professionals to deliver proper nursing interventions. Nurse students are the principal professionals who are on the brink of receiving the responsibilities of educating and counseling HIV/AIDS patients on HIV transmission. According to WHO reports, there are three known universal means of HIV transmission; through sexual intercourse, through exposure to blood and blood products, and mother to her fetus or child. Shortage of understanding the ways of transmission of the infection results in exaggerated panics of contagion among healthcare workers and even patient discrimination [43]. Literature described the positive association of improved knowledge of health professionals about HIV transmission and previous formal education on HIV/AIDS [50]. Strong evidence was released from the study conducted by Catherine E Earl [47] who confirmed the positive impact of formal education on students' capacity of understanding the disease. Additionally, one research discovered significant correlation of decent HIV/AIDS knowledge and positive attitudes of students towards patients with HIV/AIDS [51]. According to Corr, et al. [50], fear of being infected is worse if there is a knowledge scarcity in regard to causes and ways of transmission of the disease. Thus, panic of contagion while providing care for HIV/AIDS patients can be decreased by maximizing the knowledge of nurses on the transmission ways of the disease. Intensive and regular discussions on the topic of HIV/AIDS

would have positive influence on the knowledge level of the students. Therefore, in-depth education on the ways of transmission is required to enhance the confidence of the students. Likewise, an additional didactic training should be given in regard to the risk groups of HIV infection.

Knowledge in relation to HIV/AIDS prevention and precautions generally appeared quite good in this study. Students of the cohort pointed out the protective significance of keeping away from infected sharp tools, avoiding unconfirmed blood transfusion, avoiding sex with seropositive people and prostitutes. Conversely, several studies Abolfotouh MA, et al. [22,45,48,52] found reduced knowledge score of students in HIV/AIDS prevention. As also reported in similar studies Bektas HA & Kulakac O [10,36,43,49,53,54] the current sample exhibited good awareness about the protective role of condom. The intensive advertisements about preventative measures on social media and the fear of contagion could be the expected reasons for the decent knowledge on HIV prevention subdivision. Nursing students in this study appeared to be reasonably well-informed about HIV/AIDS prevention. However, that does not mean there are no areas where improvement is needed. For instance, about half of the students either did not know or did inaccurately consider that penile withdrawal method as a protective for HIV prevention. Previous studies have discussed on the critical functions of nurses in prevention of HIV transmission and promotion health [36]. Achieved findings in this study necessitate nurses to improve their knowledge level to execute their caring functions for patients living with HIV/AIDS. The role of nurse in prevention of HIV/AIDS transmission, offering care and support is huge therefore it is recommended that they should achieve a reasonable knowledge. Thus, the training program offered at the institutions should target at improving the confidence and capacity of students so that they can easily deal with HIV/AIDS infection. Educational training about HIV/AIDS in combination with case discussions is suggested to help students improve their knowledge on HIV/AIDS.

### Conclusion and Recommendation

In this study, some knowledge gaps towards HIV/AIDS were discovered. It was evident in this study that students had less understanding about the high risk groups or key population for HIV/AIDS infection, on causative agent, nature and treatment subscales, and in regard to the pathophysiology of HIV/AIDS compared with the previous research findings. However, they were cognizant about confirmation of HIV diagnosis through blood test and the nonexistence of HIV/AIDS vaccine and also indicate an overall reasonable knowledge level about the modes of HIV transmissions such as unprotected sexual contact,

transfusions with contaminated blood, sharing needles or syringes, infected vaginal and seminal fluids. But students missed that homosexuals are the high risk population for HIV infection. On the other hand, students showed misconceptions that HIV can be transmitted through salivary fluids, mosquito bite, sharing public toilets and swimming pool, and sharing properties such as clothes. The study also reveals a good knowledge of HIV/AIDS prevention and precautions like worth of keeping away from infected sharp tools, avoiding unconfirmed blood transfusion, avoiding sex with seropositive people and prostitutes.

As these students are among the major source of HIV/AIDS related information for the community, they need to obtain scientific-based training about the disease so as to boost their knowledge and awareness of the disease. It can be concluded that the upgrading of knowledge towards HIV/AIDS patients can be achieved by enriching the nursing curriculum with HIV-related courses. Hence, the study suggested additional courses to be added to the curriculum that cover all aspects of HIV/AIDS that embrace cause, risk factors, diagnosis, treatment, transmission and precautions. Nursing educators are also required to establish effective approaches that would be helpful for nursing students in alleviating their fear of infection during caring people with HIV/AIDS. This can be achieved by establishing interactive group discussions or providing students with up-to-date books and journals on HIV/AIDS. Additional comprehensive studies are recommended in the future to generate representative findings in the country and to determine the core elements that influence nursing students' HIV/AIDS knowledge level.

### Limitation of The Study

Few shortfalls should be taken into account when it comes to the limitation of the study. First, as the questionnaire deals with sexuality, students might be influenced by social desirability bias in that they might express some reservations while providing their beliefs or views regarding HIV/AIDS. Second, the results gathered from the present study were assembled only from two universities which may undermine the extent to which the findings can be representative to similar nursing students of higher educational institutions. Third, the self-report nature of the question form requires a great honesty of the participants' feedback and there was no objective scale to confirm the accuracy of some of the information delivered, hence the outcomes may elicit some degree of uncertainty.

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## References

- Binswanger HP (2000) Scaling up HIV/AIDS programs to national coverage. *Science* 288(5474): 2173-2176.
- Editors HC (2019) History of AIDS.
- WHO (2017) HIV/AIDS, World health organization.
- Şengöz G, Pehlivanoğlu F (2017) İnsan Bağışıklık Eksikliği Virüsü/Edinsel İmmün Yetmezlik Sendromu: Dünyada ve Türkiye’de Epidemiyolojik değişimler. *Medical Bulletin of Haseki/Haseki Tıp Bülteni* 55(4): 248-253.
- Babayigit MA, Bakir B (2004) HIV enfeksiyonu ve AIDS: Epidemiyoloji ve korunma. *TSK Koruyucu Hekimlik Bülteni* 3(11): 280-290.
- WHO (2011) Country statistical profile in “The work of WHO in the Eastern Mediterranean Region: Annual report of the Regional Director, World health organization.
- Sağlık TC, Bakanlığı BHD, Birimi ZH (2016) Türkiye’de Bildirilen HIV/AIDS Vakalarının Yıllara Göre Dağılımı 01 Ekim 1985 – 30 Haziran, pp: 2.
- (2016) Türkiye’de AIDS tehlikesi artıyor, World AIDS day.
- Weinhardt LS, Carey MP, Johnson BT, Bickham NL (1999) Effects of HIV counseling and testing on sexual risk behavior: a meta-analytic review of published research, 1985-1997. *Am J Public Health* 89(9): 1397-1405.
- Bektas HA, Kulakac O (2007) Knowledge and attitudes of nursing students toward patients living with HIV/AIDS (PLHIV): a Turkish perspective. *AIDS Care* 19(7): 888-894.
- (2018) A timeline of HIV and AIDS, HIV.gov.
- Curran VR, Mugford JG, Law RMT, MacDonald S (2005) Influence of an Interprofessional HIV/AIDS Education Program on Role Perception, Attitudes and Teamwork Skills of Undergraduate Health Sciences Students. *Education for Health* 18(1): 32-44.
- Kohi TW, Horrocks MJ (1994) The knowledge, attitudes and perceived support of Tanzanian nurses when caring for patients with AIDS. *Int J Nurs Stud* 31(1): 77-86.
- Susan W, Jennifer G (2006) Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome: A Survey of the Knowledge, Attitudes, and Beliefs of Texas Registered Nurses in the 21<sup>st</sup> Century. *Journal for Nurses in Professional Development* 22(5): 232-238.
- Jemmott LS, Jemmott JB 3rd, and Collins CM (1992) Predicting AIDS patient care intentions among nursing students. *Nurs Res* 41(3): 172-177.
- WHO (2002) Nursing role in HIV/AIDS care and prevention in South-East Asia region, No. SEA-NUR-437, Editor. 2002, World Health Organization Regional Office for South-East Asia.
- Mckelcey RS, Webb JA, Baldassar LV, Robinson SM, Riley G (1999) Sex knowledge and sexual attitudes among medical and nursing students. *Aust N Z J Psychiatry* 33(2): 260-266.
- Babaoğlu ÜT, Demir G, Biçer S (2018) Hemşirelik bölümü öğrencilerinin HIV/AIDS hakkındaki bilgi düzeyleri ve tutumlarının değerlendirilmesi. *Bozok Tıp Derg* 81: 18-24.
- Hatipoğlu ÇA, Çelik AK, Yıldız F, Kınıklı S, Demiröz AP (2005) Bir eğitim araştırma hastanesindeki sağlık personelinin HIV/AIDS konusundaki bilgi düzeyleri. *Türk HIV/AIDS Dergisi* 8(2): 56-60.
- Zencir MYN, Zencir G, Orhan N (1998) Pamukkale Üniversitesi Tıp Fakültesi Eğitim, Uygulama ve Araştırma Hastanesinde Çalışan Hemşire ve Hekimlerin AIDS Konusundaki Bilgi ve Tutumlarının Değerlendirilmesi. *HIV/AIDS Dergisi* 1(4): 159-164.
- Akın S, Mendi B, Mendi O, Durna Z (2013) Turkish nursing students’ knowledge of and attitudes towards patients with HIV/AIDS. *Journal of Clinical Nursing* 22(23-24): 3361-3371.
- Abolfotouh MA, Al Saleh SA, Mahfouz AA, Abolfotouh SM, Al Fozan HM (2013) Attitudes of Saudi nursing students on AIDS and predictors of willingness to provide care for patients in Central Saudi Arabia. *SAGE Open* 3(3): 1-11.
- İnci A (2004) Knowledge Level and Attitude of Health Care Workers About HIV/AIDS. *Journal of Clinical and Analytical Medicine* 5(5): 394-396.
- Horsman JM, Sheeran P (1995) Health care workers and HIV/AIDS: a critical review of the literature. *Soc Sci Med* 41(11): 1535-1567.
- Kaya M, Yağmur Y, Güneş G (2007) Sağlık Yüksek Okulu Öğrencilerinin HIV/AIDS’le İlgili Bilgi ve Tutumları. *TSK Koruyucu Hekimlik Bülteni* 6(3): 175-180.
- Çimen S, Bahar Z, Öztürk C, Bektaş M AIDS (2005) Tutum Ölçeğinin Geçerlik ve Güvenirlik Çalışması, ZKÜ. Zonguldak Sağlık Yüksekokulu Sağlık Eğitim ve Araştırma Dergisi. *Journal of Health Education Research* 1(1): 1-11.

27. Kurt AS, Dereli SY (2012) Sağlık Yüksekokulu Öğrencilerinin HIV/AIDS Hakkındaki Bilgi Düzeyleri ve Bilgi Kaynakları. *Hemşirelikte Eğitim ve Araştırma Dergisi* 9(3): 47-52.
28. Huang J, Bova C, Fennie KP, Rogers A, Williams AB (2005) Knowledge, attitudes, behaviors, and perceptions of risk related to HIV/AIDS among Chinese university students in Hunan, China. *AIDS Patient Care & STDs* 19(11): 769-777.
29. Röndahl G, Innala S, Carlsson M (2003) Nursing staff and nursing students' attitudes towards HIV-infected and homosexual HIV-infected patients in Sweden and the wish to refrain from nursing. *J Adv Nurs* 41(5): 454-461.
30. McCann TV, Sharley RJS (2001) Educational intervention with international nurses and changes in knowledge, attitudes and willingness to provide care to patients with HIV/AIDS. *Journal of Advanced Nursing* 27( 2): 267-273.
31. Pickles D, King L, Belan I (2009) Attitudes of nursing students towards caring for people with HIV/AIDS: thematic literature review. *J Adv Nurs* 65(11): 2262-2273.
32. Hatipoğlu ÇA, Bulut C, Çelik AK (2005) Bir eğitim hastanesindeki sağlık personelinin HIV/AIDS konusundaki bilgi düzeyleri. *Türk HIV/AIDS Dergisi* 26: 1788-1795.
33. Tavoosi A, Zaferani A, Enzevaei A, Tajik P, Ahmadinezhad Z (2004) Knowledge and attitude towards HIV/AIDS among Iranian students. *BMC Public Health* 4: 17.
34. Lohrmann C, Välimäki M, Suominen T, Muinonen U, Dassen T, et al. (2000) German nursing students' knowledge of and attitudes to HIV and AIDS: two decades after the first AIDS cases. *Journal of advanced nursing* 31(3): 696-703.
35. Walusimbi M, Okonsky JG (2004) Knowledge and attitude of nurses caring for patients with HIV/AIDS in Uganda. *Applied Nursing Research* 17(2): 92-99.
36. Peate I, Suominen T, Välimäki M, Lohrmann C, Muinonen U (2002) HIV/AIDS and its impact on student nurses. *Nurse Education Today* 22(6): 492-501.
37. Adebajo SB, Bamgbala AO, Oyediran MA (2003) Attitudes of Health Care Providers to Persons Living with HIV/AIDS in Lagos State, Nigeria. *African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive* 7(1): 103-112.
38. Taher E, Abdelhai R (2020) Nurses knowledge, perceptions, and attitudes towards HIV/AIDS: Effects of a health education intervention on two nursing groups in Cairo University, Egypt. *Journal of Public Health and Epidemiology* 3(4): 144-154.
39. Ayranci U (2005) AIDS knowledge and attitudes in a Turkish population: an epidemiological study. *BMC public health* 5(1): 95.
40. Opt SK, Donald A (2004) Loffredo, College students and HIV/AIDS: More insights on knowledge, testing, and sexual practices. *The Journal of Psychology* 138(5): 389-403.
41. Al-Jabri AA, Al-Abri JH (2003) Knowledge and attitudes of undergraduate medical and non-medical students in Sultan Qaboos University toward acquired immune deficiency syndrome. *Saudi medical journal* 24(3): 273-277.
42. Bazargan M, Kelly EM, Stein JA, Husaini BA, Bazargan SH (2000) Correlates of HIV risk-taking behaviors among African-American college students: the effect of HIV knowledge, motivation, and behavioral skills. *Journal of the National Medical Association* 92(8): 391-404.
43. Goel NK, Bansal R, Pathak R, Sharma HK, Aggarwal M (2010) Knowledge and awareness of nursing students about HIV/AIDS. *Journal of Health and Population: Perspectives and Issues* 33(1): 55-60.
44. Shaikh FD, Ross MW, Grimes RM (2007) Knowledge and Attitudes of Pakistani Medical Students Towards HIV-Positive and/or AIDS Patients. *Psychology, Health & Medicine* 12(1): 7-17.
45. Joshi DR, Khatri KP, Rosyara RB, Malla B (2007) Do Behavioral Patterns of University Students of Nepal Make Them Vulnerable to HIV/AIDS? . *Journal of Institute of Medicine* 29(3): 13-17.
46. Oğuzkaya MA, Çürük GN (2006) Sağlık okulu öğrencilerinin HIV/AIDS, Hepatit B ve C virusu konusundaki bilgi düzeylerinin değerlendirilmesi. *Erciyes Tıp Dergisi* 28(3): 125-133.
47. Inungu J, Mumford V, Younis M, Langford S (2009) HIV Knowledge, Attitudes and Practices among College Students in The United States. *J Health Hum Serv Adm* 32(3): 259-277.
48. Krasnik A, Fouchard R, Bayer T, Keiding N (1990) Health workers & AIDS: Knowledge, Attitudes and Experiences as Determinants of Anxiety. *Scand J Soc Med* 18(2): 103-113.
49. Ouzouni C, Nakasis K (2012) HIV/AIDS Knowledge, Attitudes and Behaviors of Student Nurses. *Health*

- Science Journal 6(1): 129-150.
50. Corr CA, Nabe C, Corr DM (2003) Death and dying, life and living ed. 4<sup>th</sup> Belmont, GA: Wadsworth/ Thomson Learning.
51. Delobelle P, Rawlinson JL, Ntuli S, Malatsi I, Decock R, et al. (2009) HIV/AIDS Knowledge, Attitudes, Practices and Perceptions of Rural Nurses in South Africa. Journal of Advanced Nursing. 65(5): 1061-1075.
52. Hassan ZM, Wahsheh MA (2011) Knowledge and Attitudes of Jordanian Nurses towards Patients with HIV/AIDS: Findings from a Nationwide Survey. Issues in Mental Health Nursing 32(12): 774-784.
53. Smit R (2005) HIV/AIDS and The Workplace: Perceptions of Nurses in A Public Hospital in South Africa. Journal of Advanced Nursing 51(1): 22-29.
54. Oppong Asante K, Oti Boadi M (2013) HIV/AIDS Knowledge Among Undergraduate University Students: Implications for Health Education, Programs in Ghana. African Health Sciences 13(2): 270-277.

