Knowledge Levels and Misconceptions about HIV/AIDS: What do University Students in Turkey Really Know?

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Abstract

This study examined the knowledge levels and misconceptions of HIV/AIDS among university students (N=1925) in Istanbul Turkey. Almost the entire sample reported hearing about HIV/AIDS; however, the sample had average to moderate levels of knowledge regarding HIV/AIDS. Findings indicate that less than 20% of the sample had misconceptions about HIV/AIDS where 16% believed AIDS was a punishment from God. Sex differences were examined for knowledge levels and misconceptions. Chi-square analyses suggest significant sex differences for HIV/AIDS knowledge levels and misconceptions. Throughout the literature, lack of education and misinformation has been linked with having low knowledge levels, negative attitudes, and existing misconceptions regarding HIV/AIDS. Findings from this study support existing literature. By incorporating sexual and reproductive health courses into the Turkish academic curriculums, beginning at junior high throughout college, it is anticipated that the existing lack of information may improve to better levels and that the misconceptions among university students will be reduced.

Keywords: HIV/AIDS, Turkey, knowledge, misconceptions, health education

Introduction

Since the 1980's HIV/AIDS has developed into a serious public health problem throughout the world and has become a major epidemic with no known cure. Despite the increase in the number of outlets to inform, educate, promote prevention, and increase public awareness about HIV/AIDS, today, there are still many who continue to become infected, battle with, and die from this disease. In 2009, it was estimated that 7,000 new cases of HIV/AIDS were diagnosed per day[1]. According to the 2010 UNAIDS Global Report, despite a 19% decrease in incidence rates, there are approximately 33.3 million people living with HIV/AIDS, 2.6 million new cases of HIV/AIDS, and 1.8 million deaths worldwide[1].

The first HIV/AIDS case in Turkey was diagnosed in 1985. According to Turkey's Ministry of Health[2] statistics, the number of HIV/AIDS cases reported in 2007 was 2,711 and as of 2010, this number has increased to a total of 4,177 HIV/AIDS cases where the primary routes of transmission have been determined to be heterosexual sex (75%), men having sex with men (12%), and IV drug use (7%). On the other hand, as per UNAIDS[3] data, in 2009 a total of 4,600 HIV/AIDS cases were reported for Turkey.

HIV/AIDS knowledge

HIV/AIDS knowledge can be defined under two categories: (1) general knowledge about the disease and (2) knowledge regarding transmission routes. With this in mind and despite the low prevalence rates in Turkey, we have some information on how much the Turkish population actually knows about this disease and its transmission routes. A number of studies have been conducted in Turkey that examines HIV/AIDS knowledge levels within various samples[4-14]. For example, a study conducted with 44 street children between the ages of 9 and 22 in Istanbul, Turkey and found that 56.8% of their sample did not have any knowledge about HIV/AIDS[6]. Another study conducted with 1048 participants between the ages of 11 and 83 from Eskisehir, Turkey a western Anatolian city, and found that this sample had "fairly good to excellent knowledge" regarding HIV/AIDS[5]. In a similar study conducted with 1427 university students and found that 51% percent indicated that they knew "very much" about HIV/AIDS and that 17% indicated that they knew "very little" about HIV/AIDS[14].

In another study conducted a study with 660 maritime ship workers (mariners) and found that the overall knowledge levels for HIV/AIDS were low[4]. One study conducted with 705 high school students found moderate levels of knowledge regarding HIV/AIDS[11]. One study conducted with 542 university students and found that although students had ample knowledge about HIV/AIDS; students studying in the natural sciences were more knowledgeable than students studying in the social sciences[12]. Another study conducted with children under protective services found that the participants overall HIV/AIDS knowledge levels were low[9]. In another study conducted with 128 surgeons and found that 67.2% had enough information to take adequate measures for prevention; however, none had received any formal HIV/AIDS training[10]. Similarly, another study surveyed 227 nursing students and found that 18.5% had high levels, 60.8% had moderate levels, and 20.7% had low levels of HIV/AIDS knowledge[7]. These findings, although varying, suggest that the HIV/AIDS knowledge levels in Turkey vary between samples and cannot be generalized.

Misconceptions regarding HIV/AIDS

Despite the efforts to reduce misconceptions regarding HIV/AIDS, it is evident from the literature that misconceptions continue to widely exist[4-6,8-12,14]. For example, one study found that 14% of their sample believed that HIV/AIDS was transmitted via social activities (embracing one another, kissing, standing in close proximity, and shaking hands) and that 22% believed that HIV/AIDS was transmitted by the air, rubbish, and having sexual relations with dogs[6]. Another study found that close to 23% of the sample indicated that HIV/AIDS was a punishment from God and 24% agreed that if a person was engaged in sports and well nourished, they could not be infected by HIV/AIDS[5]. Also, another study found that a majority of their sample believed that mosquitoes, flies and ants were sources of HIV/AIDS transmission. Also, more than half of their sample believed that having everyday contact with an HIV positive person would also spread HIV/AIDS[8]. In one study, a substantial number of participants, who were Turkish university students, indicated that HIV/AIDS could be contracted by sharing food utensils (46%), sharing a toilet seat of an infected person (37%), mosquito bite (56%), wearing the clothes of an infected person (51%), hugging an infected person (78%), kissing/holding an infected person (64%), swimming with an infected person (77%), and being exposed to an infected person who coughs or spits (59%). In addition, respondents indicated that married people did not get infected with HIV (31%) and that a person with AIDS would be totally cured if they took the prescribed medication (60%)[14]. From the literature, one can see that misconceptions about HIV/AIDS continue to exist.

Purpose of this Study

The purpose of this exploratory quantitative cross-sectional survey study is to examine the knowledge levels (general knowledge and transmission routes) regarding HIV/AIDS and examine the existing misconceptions pertaining to the disease among Turkish university students. Research questions generated for this study were (1) How much do Turkish university students know about HIV/AIDS in terms of general knowledge and of transmission routes and (2) Which misconceptions among Turkish university students exist regarding HIV/AIDS, and (3) Are there any differences between the sexes in levels of knowledge and misconceptions regarding HIV/AIDS?

Materials and Methods

Participants

This cross-sectional survey study was conducted at Fatih University, which is a conservative private university, located in Istanbul Turkey (N=1925; 860 men, 1065 women; *M* age = 21.39 yr., *SD*=2.11). With the exception of foreign students, the majority of the student population is primarily composed of native Turkish speakers. The teaching language medium of this university is mixed as some faculties teach in English and others teach in Turkish. Participants in this study were all Turkish. Foreign students were excluded from this study as the number of foreign participants was insufficient to match the Turkish sample.

Prior to distributing the questionnaires, faculty deans were contacted and the study was explained. After obtaining verbal consent to administer the surveys from faculty deans, additional permissions from course instructors were obtained to administer the surveys during class periods. As the surveys were in English, with the exception of the prep-school students, classes taught in English were specifically chosen for distributing the questionnaires. Participants completed the survey during various classes on a voluntary basis. The sample included prep-school students (n=165), freshman (n=387), sophomores (n=486), juniors (n=425) and seniors (462).

After participants completed an informed consent, they completed the measure used in this study. Respondents were not paid for their participation.

Questionnaire

The survey required participants to respond to a number of items regarding HIV/AIDS. The instrument used in this study was developed by Ayranci[5] which was based on the literature and the World Health Organization (WHO) AIDS program knowledge, attitudes, beliefs, and practices survey developed in 1988.

In the original instrument used by Ayranci[5], answer options were three scaled: "true, false, and I don't know". For this study the "I don't know" option was removed for the entire instrument. This option was eliminated because it was assumed that by having an alternative answer option of "I don't know", participants would refrain from giving a wrong answer and select "I don't know" as a way to avoid responding to the statement. Therefore, with this in mind, the option "I don't know" was considered to be equivalent to the statement being false. For this reason, this option was removed and the instrument was converted into a dichotomous measure.

The instrument used in this study consisted of three sections: (1) demographics, (2) HIV/AIDS knowledge, including general knowledge about and transmission routes of HIV/AIDS, and (3) misconceptions concerning HIV/AIDS in general.

The demographic section contained 8 questions regarding the participant's age, sex, academic year, major, whether or not they have heard of HIV/AIDS, whether or not they knew anyone with HIV/AIDS, whether or not they could define HIV/AIDS as a sexually transmitted disease with terminal consequences, and their source of information for HIV/AIDS. Section 2 contained 34 true/false statements regarding HIV/AIDS knowledge and HIV/AIDS transmission routes. The maximum obtainable score for this section was 34. Section 3 contained 6 true/false statements regarding misconceptions about HIV/AIDS and individuals with HIV/AIDS.

Alpha coefficients obtained from the Ayranci study[5] were reported to be 0.891, 0.734, and 0.603 for the knowledge, attitudes, and beliefs or misconceptions scales, respectively. For this study, because the instrument was converted into a dichotomous instrument, reliability statistics were calculated using the Kuder-Richardson 20 (KR20) formula. The KR20 for the overall scale was found to be 0.66 and the KR20 for the knowledge scale and misconception scales were found to be 0.68 and 0.71 respectively.

Data Analysis

Data for this study was collected during the Spring Semester (April – May) of 2011. Data analysis was conducted using SPSS v.15. In addition to the descriptive frequency analyses that were conducted for the demographic data and scale items, Chi-square (χ^2) analyses were also conducted to test all research questions to determine any existing sex differences regarding HIV/AIDS knowledge and misconceptions.

Results

Demographic Information

Almost the entire sample had heard about HIV/AIDS; men (95.3%) and women (95.4%). Fourteen percent of men and 7.2% of women reported that they personally knew a person who had received a diagnosis of HIV. Forty-two percent of men and 49.2% of women provided a correct definition of HIV/AIDS. Sources of information for men and women were reported as follows: visual media (63.4%, 66.1%), internet (61.4%, 44.3%), print media (46.4%, 45.1%), friends (40.4%, 25.6%), health care professional (24.6%, 16.6%), family (14.8%, 16.3%), and HIV/AIDS association (6.4%, 3.4%).

To examine the anticipated sex differences for the abovementioned demographic data, a Chi-square analysis was conducted (Table 1). Results from this analysis suggests that sex differences exist for knowing persons diagnosed with HIV/AIDS, correctly defining HIV/AIDS, obtaining information on HIV/AIDs from a health care worker, the internet, friends, and HIV/AIDS associations. Findings suggest that men are more likely to know individuals who have been diagnosed with HIV/AIDS, obtain information on HIV/AIDS from a healthcare worker, the internet, friends and HIV/AIDS associations compared to women. However, although almost half of the sample provided correct definitions for HIV/AIDS, more women provided a correct definition than men.

HIV/AIDS Knowledge

The mean for the scores obtained on the knowledge section for this sample was 23.83 (SD=3.78). This finding indicates that the sample had average to moderate levels of HIV/AIDS knowledge.

Frequency analysis for HIV/AIDS knowledge can be found in Table 2. With the exception of item 12, the sample appears to have some general knowledge regarding HIV/AIDS. Interestingly, 21% of the sample believed that HIV/AIDS was a hereditary disease (item 3), 38% believed that there was an active treatment for HIV/AIDS (item 4), 36% believed that there was a vaccine for HIV/AIDS (item 11), 38% did not know that the ELISA test was used to test for HIV/AIDS (item) and 71% believed that HIV/AIDS could be detected via urine analysis, x-ray, total blood count, and biochemical analyses (item 12). In terms of knowledge regarding HIV/AIDS transmission, the data suggests that the majority of the sample had sufficient knowledge regarding the various routes of transmission; however, the same cannot be said for items 13 (52.2%), 18 (46.0%), 20 (51.6%), 31 (49.9%), and 34 (50.9%).

With regards to sex differences in knowledge, Chi-square analyses were carried out for the HIV/AIDS knowledge items (Table 3). Men were more likely than women to find statements 3, 5, 6, and 10 to be true; however an interesting finding indicates that women were significantly more likely than men to find statement 9 (there is a vaccine for HIV/AIDS) to be true. In terms of HIV/AIDS transmission knowledge, the data indicates that sex differences also exist for various items. Women were more likely than men to find statements 1, 2, 3, 9, 17, 18, and 19 to be true. Also, men were more likely than women to find statements 5, 8, 20, and 22 to be true.

Misconceptions about HIV/AIDS

The majority of the sample found the statements in the misconception section to be false; however, misconceptions still existed for this sample. Nine percent believed that being passionately in love with someone would grant immunity to AIDS, 16% believed that HIV/AIDS was a punishment from God, 9% believed that HIV/AIDS did not affect the Turkish, 10% believed that they would not become infected with HIV/AIDS no matter what, 7% believed that even if married couples had extramarital sex with others they would not contract HIV/AIDS, and 8% believed that if they ate well and were active in sports they would not contract HIV/AIDS. Chi-square analysis indicates that sex differences existed regarding these misconceptions; men were more likely than women to have misconceptions about HIV/AIDS (Table 4).

Discussion

The aim of the present study was to explore and analyze the knowledge levels and existing misconceptions regarding HIV/AIDS among Turkish University students. Three research questions were examined for this study.

Research Question #1

Research question 1 examines how much Turkish university students know about HIV/AIDS in general and HIV/AIDS transmission routes. While the maximum obtainable score was 34 for the knowledge section, the mean scores obtained was 23.83 (SD=3.78). This suggests that this sample had average to moderate levels of HIV/AIDS knowledge. This finding is consistent with previous studies[7,10,11] which have reported their samples having average to moderate levels of HIV/AIDS knowledge levels.

One possible explanation for this level of knowledge can be examined within the participants' educational background and academic curriculum prior to attending university. In Turkey, sexual education classes or health education classes are not a part of the formal education system[8,9]. In addition, these courses are generally offered at institutions of higher education that focus primarily on the health sciences[7,12,13]. Based on this information and out of curiosity, the author conducted a Google search using the terms "sexual health courses" and "reproductive health courses" and found that 16 universities in Turkey, which currently has 140 universities (state and private), published on their websites that they offered this course, either as an elective course open to the entire university or as a major course under health-based programs, including master's programs, like nursing and midwifery. Only one university published on their website that they had a sexual health centre on campus and another university published that they had a sexual health & reproductive support hotline for children. There is still a great debate within the Ministry of Education as to whether or not these courses should be included in the academic curriculum; however, findings from the present study suggest that courses in sexuality at the college level are needed desperately.

Another explanation for this finding of having average to moderate levels of HIV/AIDS knowledge can be examined within the socio-cultural context that talking about "sex" and related issues continues to be a cultural taboo in Muslim countries[21]. Although rapidly changing with global development and Westernization process, talking about sex and sexuality continues to remain a social and cultural taboo amongst various sub-populations in Turkey[8,10,22]. Not being able to talk about an issue that is culturally deemed as "shameful" or "sinful" may also decrease the possibility of obtaining accurate information regarding HIV/AIDS from the proper information outlets[22].

Research Question #2

Research question 2 examines the misconceptions that exist among Turkish university students regarding HIV/AIDS. Findings suggest that misconceptions still exist, which is consistent with previous findings[4-6, 8-12, 14].

Among the misconceptions listed, seeing HIV/AIDS as a "punishment from God" had the highest percentage (16%). This finding was very close to Ayranci[5] where 20% of the sample agreed with this misconception. Of the other misconceptions, all were under or close to 10%. One explanation for the "HIV/AIDS is a punishment from God" misconception can be sought in cultural and religious roots where pre-marital sex, extramarital sex, and sexual activity without being married is not situated in religious and cultural framework of the Turkish and Muslim communities[21]. As a result, this behaviour is deemed "deviant" and "immoral" and therefore deserves punishment, which comes from God in the form of HIV/AIDS[5, 8, 11, 22].

Another explanation for these misconceptions can be linked to misinformation. Accessing incorrect information and not having sufficient information may lead to the development of misconceptions as well as stigma against and ostracism of individuals who have HIV/AIDS. An important source of misinformation has been shown to be the media in Turkey where wrongful representations and inaccurate information regarding HIV/AIDS have been portrayed over the year[8, 9]. As a result, the combination of wrongful representations and inaccurate information may have contributed to the creation of distorted perceptions regarding the disease[9]. Finally, the lack of sufficient educational material in academic curriculums in both schools and universities may have also contributed to the existing misconceptions regarding HIV/AIDS[8, 9].

Research Question #3

Research question 3 looks at existing sex differences in HIV/AIDS knowledge levels and misconceptions regarding HIV/AIDS. Findings suggest that sex differences exist (Table 1, Table 3, and Table 4). Although sex differences appear to exist for this particular sample, an important issue warrants attention: How much of these sex differences are influenced by gender roles, cultural norms, and religious values? This question should be addressed detail in future research. Taking into consideration that Turkey is a predominately Muslim country, many children and adolescents are raised with the notion that talking about sex is sinful, shameful, embarrassing, and taboo[8]. While these concepts are instilled in children, individuals that live outside of the family's normative framework are also seen to be equivalent to these concepts.

For example, individuals living with HIV/AIDS in Turkey face considerable stigma from society in general. With this in mind and the notion that knowledge levels of HIV/AIDS range between low and moderate in Turkey[4,6,7,9-11,14] it is highly probable that when people are aware that they are living in close proximity with individuals who have HIV/AIDS they might engage in the following behaviors: (1) gather support from neighbors/friends to make individual with HIV/AIDS leave the residence or neighborhood – after all, the neighbor has a disease that resulted of their free lifestyle and it was God's will/punishment[22] and will set a bad example for the children and possibly transmit the disease to anyone living in close proximity, (2) ostracize this individual because of the HIV/AIDS diagnosis[22] – the diagnosis was something that the person deserved because her behavior deviated from what the norms and values believed to be "proper", and (3) people will move to a different location to protect themselves from contracting the disease – as they are using the same water sources, breathe the same air, ride the same bus, and shop from the same markets[6].

Limitations

This study had several limitations. One limitation of this study was related to the language of the instrumentation. Although the medium of teaching is English at Fatih University, native Turkish speakers may not have had a clear and full understanding of the statements in the survey as English is their second language.

This may have contributed to the acceptable but low reliability scores; therefore, findings should be interpreted with caution. Another possible limitation of this study was the conversion of the original instrument from a 3-point Likert scale into a dichotomous measure. This too may have contributed to the low reliability scores. Finally, issues concerning generalization bring limits to this study. Despite the sample size being quite large it must be noted that this sample is from a single university with students who come from a religious and conservative background and therefore generalizations must also be made with caution.

Conclusions

This study examined the knowledge levels and misconceptions regarding HIV/AIDS among university students in Turkey. The study revealed average to moderate levels of knowledge concerning this disease. As sexual health and reproductive health courses are not widely offered to students in both high schools and universities, the findings from the study are not surprising as in the literature it has been noted that low knowledge levels contribute to negative attitudes and misconceptions. Sexual health and reproductive health courses should not be limited to only faculties of health sciences and medicine but rather be a mandatory course that be included in the general education curriculum in universities and high schools throughout Turkey.

Currently providing accurate information about HIV/AIDS and properly educating officials regarding the disease appears to be one of the most effective outlets to increasing awareness and correcting existing misconceptions. Another recommendation for reducing the lack of information and existing misconceptions is for the Ministry of Health to organize public campaigns informing the public on what HIV/AIDS is, how it is and is not transmitted, and how one can protect themselves from contracting HIV/AIDS on a regular basis. Creating public announcements during thematic months like December, where World AIDS Day is recognized, is not a sufficient measure in fighting the disease. Great responsibilities fall upon print and visual media outlets with regards to ethical broadcasting and publishing. As many people regularly read the news paper and watch television, these outlets should be used to correct existing misinformation and misconceptions.

Non-profit community and government organizations as well as AIDS organizations need to be much more pro-active in Turkey. More activities need to be organized to increase public awareness and knowledge about HIV/AIDS. In addition, these organizations need to go to schools and universities more frequently than they currently do if they are to contribute to improving the current knowledge levels and correcting existing misconceptions.

This study contributed to the HIV/AIDS issue in Turkey by providing comprehensive data and insight regarding the knowledge levels and existing misconceptions regarding HIV/AIDS. Findings from this study may be of important value for educators, university administrators, health professionals, teachers, counselors, and government officials in the Ministry of Education and the Ministry of Higher Education in Turkey.

Competing Interests

The author declares no financial or non-financial competing interests

Author's Information

Nalan Linda Fraim is a Health Psychologist and Assistant Professor of Psychology at Fatih University. Her areas of research include young breast cancer, breast self-examination, health education, HIV/AIDS prevention, health promotion, and cultural differences in health practices.

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Bektaş & Kulakaç

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Table 1 Chi Square Analysis for Sex Differences Regarding General Descriptive Data

Type of Activity	Males	Females	X^2	df	p	Effect Size
1. Know person with HIV/AIDS	13.9	7.2	23.29	1	.000**	.110
2. Correctly defined HIV/AIDS	42.0	49.2	9.28	1	.002*	.072
3. Obtained HIV/AIDS information from healthcare professional	24.6	16.6	18.80	1	.000**	.099
4. Obtained HIV/AIDS information from the internet	61.4	44.3	55.48	1	.000**	.170
5. Obtained HIV/AIDS information from friends	40.4	25.6	47.00	1	.000**	.157
6. Obtained HIV/AIDS information from HIV/AIDS foundation/association	6.4	3.4	9.54	1	.002*	.071

*p<.05, **p<.000

Table 2 Frequency Analysis of Respondent's HIV/AIDS General Knowledge and Transmission Knowledge by Sex

	True n (%)		Total True	False n (%)		Total False
	M	F	n (%)	M	F	n (%)
General Knowledge						
1. AIDS is caused by a virus.	757 (89.5)	966 (90.6)	1723 (90.1)√	89 (10.5)	100 (9.4)	189 (9.9)
2. AIDS is a contagious disease.	787 (93.0)	1002 (94.0)	1789 (93.6)√	59 (7.0)	64 (6.0)	123 (6.4)
3. AIDS is a hereditary disease.**	216 (25.5)	194 (18.2)	410 (21.4)	630 (74.5)	872 (81.8)	1502 (78.6)√
4. There is an active treatment for AIDS.	327 (38.7)	399 (37.4)	726 (38.0)	519 (61.3)	667 (62.6)	1186 (62.0)√
5. AIDS is mostly seen in developing or underdeveloped countries, mostly in countries least able to afford to care for infected people.**	495 (58.5)	521 (48.9)	1016 (53.1)√	351 (41.5)	545 (51.1)	(898) 46.6
6. AIDS is not serious; it's a simple disease like the common cold.**	74 (8.7)	51 (4.8)	125 (6.5)	772 (91.3)	1015 (95.2)	1787 (93.5)√
7. A person infected with HIV does not usually show any symptoms of the disease	356 (42.1)	425 (39.9)	781 (40.8)√	490 (57.9)	641 (60.1)	1131 (59.2)
8. Resistance to other diseases in an individual with AIDS is rather low.	632 (74.7)	777 (72.9)	1409 (73.5)√	214 (25.3)	289 (27.1)	503 (26.3)
9. There is a vaccine for AIDS.**	267 (31.6)	426 (40.0)	699 (36.2)	579 (68.4)	640 (60.0)	1219 (63.8)√
10. We can distinguish AIDS patients from others by their appearance. **	194 (22.9)	137 (12.9)	333 (17.3)	652 (77.1)	929 (87.1)	1581 (82.7)√
11. The ELISA test is used to check for the HIV virus in the blood.	542 (64.1)	641 (60.1)	1183 (61.9)√	304 (35.9)	425 (39.9)	729 (38.1)
12. Urine, X-ray, total blood count and biochemistry analyses are used to check for the HIV virus in the blood.	605 (71.5)	760 (71.3)	1365 (71.4)	241 (28.5)	306 (28.7)	547 (28.6)√
Transmission Knowledge						
13. HIV/AIDS can be transmitted by sharing public toilets and swimming pools with an infected person. **	378 (44.7)	620 (58.2)	998 (52.2)	468 (55.3)	446 (41.8)	914 (47.8)√
14. HIV/AIDS can be transmitted by using an infected person's belongings such as clothes, comb, underwear, and towel. *	324 (38.3)	480 (45.0)	804 (42.1)	522 (61.7)	586 (55.0)	1108 (57.9)√
15. HIV/AIDS can be transmitted by sharing a razor blade with an infected person. *	676 (79.9)	892 (83.7)	1568 (82.0)√	170 (20.1)	174 (16.3)	345 (18.0)
16. HIV/AIDS can be transmitted by touching an infected person, such as hugging, holding, and shaking hands	134 (15.8)	154 (14.4)	288 (15.1)	712 (84.2)	912 (85.6)	1624 (84.9)√
17. HIV/AIDS can be transmitted by sharing the food utensils of an infected person. *	343 (40.5)	385 (36.1)	728 (38.1)	503 (59.5)	681 (63.9)	1184 (61.9)√
18. HIV/AIDS can be transmitted by being exposed to an infected person who coughs or spits.	379 (44.8)	499 (46.8)	878 (45.9)	467 (55.2)	567 (53.2)	1034 (54.1)√
19. HIV/AIDS can be transmitted by having a tattoo done with the same devices after an infected person.	659 (77.9)	842 (79.0)	1501 (78.5)√	187 (22.1)	224 (21.0)	411 (21.5)
20. HIV/AIDS can be transmitted with a mosquito bite.*	457 (54.0)	527 (49.4)	984 (51.5)	389 (46.0)	539 (50.6)	928 (48.5)√
21. HIV/AIDS can be transmitted by sharing injection needles or surgical operation devices of an infected person. *	718 (84.9)	945 (88.6)	1663 (87.0)√	128 (15.1)	121 (11.4)	249 (13.0)
22. HIV/AIDS can be transmitted by having a tooth extracted with the same devices after an infected person.	660 (78.0)	804 (75.4)	1464 (76.6)√	186 (22.0)	262 (24.6)	448 (23.4)
23. A pregnant woman can transmit HIV/AIDS to her unborn baby.	585 (69.1)	772 (72.4)	1357 (71.0)√	261 (30.9)	294 (27.6)	555 (29.0)
24. HIV/AIDS can be by donating the organs and tissues of an infected person to another person.	615 (72.7)	753 (70.6)	1368 (71.5)√	231 (27.3)	313 (29.4)	544 (28.5)
25. HIV/AIDS can be transmitted by having vaginal sex with an infected person.	795 (94.0)	1011 (94.8)	1806 (94.5)√	51 (6.0)	55 (5.2)	106 (5.5)
26. HIV/AIDS can be transmitted by having oral sex with an infected person.	543 (64.2)	677 (63.5)	1220 (63.8)√	303 (35.8)	389 (36.5)	692 (36.2)

27. HIV/AIDS can be transmitted by having anal sex with an infected person.	641 (75.8)	843 (79.1)	1484 (77.6)√	205 (24.2)	223 (20.9)	428 (22.4)
28. HIV/AIDS can be transmitted by receiving blood from an infected person.	743 (87.8)	924 (86.7)	1667 (87.3)√	103 (12.2)	142 (13.3)	245 (12.8)
29. HIV/AIDS can be transmitted by the vaginal liquid of an infected person.*	668 (79.0)	888 (83.3)	1556 (81.4)√	178 (21.0)	178 (16.7)	356 (18.6)
30. HIV/AIDS can be transmitted by the sperm of an infected person.*	665 (78.6)	898 (84.2)	1563 (81.7)√	181 (21.4)	168 (15.8)	349 (18.3)
31. HIV/AIDS can be transmitted by the urine of an infected person.*	400 (47.3)	554 (52.0)	954 (49.9)	446 (52.7)	512 (48.0)	958 (50.1)√
32. HIV/AIDS can be transmitted by the tears of an infected person.**	191 (22.6)	148 (13.9)	339 (17.7)	655 (77.4)	918 (86.1)	1573 (82.3)√
33. HIV/AIDS can be transmitted by mucus or nasal fluid from an infected person.	251 (29.7)	297 (27.9)	548 (28.7)	595 (70.3)	769 (72.1)	1364 (71.3)√
34. A mother can transmit HIV/AIDS to her baby by her breast milk.*	444 (52.5)	495 (46.4)	939 (49.1)√	402 (47.5)	571 (53.6)	973 (50.9)

*p<.05; **p<.001; √ denotes correct response

Table 3 Chi Square Analysis for Sex Differences Regarding HIV/AIDS General and Transmission Knowledge

	Males	Females	X^2	df	p	Effect Size
General Knowledge						
1. HIV/AIDS is a hereditary disease	25.5	18.2	*15.06*	1	.000**	.089
2. HIV/AIDS is mostly seen in developing countries	58.5	48.9	*17.59*	1	.000**	.096
3. HIV/AIDS is not serious, it's a simple disease like the common cold	8.7	4.8	*12.12*	1	.001*	.080
4. There is a vaccine for HIV/AIDS	31.6	40.0	*14.41*	1	.000**	.087
5. We can distinguish HIV/AIDS patients from others by their appearance	22.9	13.9	*33.48*	1	.000**	.132
Transmission Knowledge						
6. HIV/AIDS can be transmitted by sharing public toilets and swimming pools	44.7	58.2	*34.34*	1	.000**	.134
7. HIV/AIDS can be transmitted by using an infected person's belongings such as clothing, comb, underwear, and towel	38.3	45.0	*8.77*	1	.003*	.068
8. HIV/AIDS can be transmitted by sharing a razor blade	79.9	83.7	*4.55*	1	.036*	.049
9. HIV/AIDS can be transmitted by sharing food utensils	40.5	36.1	*3.92*	1	.048*	.045
10. HIV/AIDS can be transmitted with a mosquito bite	54.0	49.4	*3.96*	1	.046*	.046
11. HIV/AIDS is transmitted by sharing injection needles	84.9	88.6	*5.95*	1	.015*	.056
12. HIV/AIDS is transmitted by vaginal fluids	79.0	83.3	*5.87*	1	.015*	.055
13. HIV/AIDS is transmitted by sperm	78.6	84.2	*10.04*	1	.002**	.072
14. HIV/AIDS is transmitted by urine	47.3	52.0	*4.15*	1	.042*	.047
15. HIV/AIDS is transmitted by tears	22.6	13.9	*24.44*	1	.000**	.113
16. A mother can transmit HIV/AIDS to her baby via breast milk	52.5	46.4	*6.90*	1	.009*	.060

*p<.05, **p<.000

Table 4 Chi Square Analysis for Sex Differences Regarding HIV/AIDS Misconceptions

	Males	Females	X^2	df	p	Effect Size
Misconceptions						
1. If you passionately in love with someone, you become immune to HIV/AIDS	11.3	6.8	*11.85*	1	.001*	.079
2. HIV/AIDS is a punishment from God	23.2	10.2	*58.93*	1	.000**	.176
3. HIV/AIDS does not affect the Turkish	14.5	5.0	*51.66*	1	.000**	.164
4. I will not become infected with HIV/AIDS no matter what	13.0	7.4	*16.56*	1	.000**	.093
5. Married couples do not contract HIV/AIDS even if they have sex with others	8.9	4.9	*12.09*	1	.001*	.080
6. You cannot become infected with HIV/AIDS if you are engaged in sports and eat well	10.3	5.8	*13.10*	1	.000**	.083

*p<.05, **p<.000