

Comparing the Knowledge about HIV and HPV Infections among the General Population of Iran

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Background: Governmental sexually transmitted disease (STD) educational programs are more focused on HIV/AIDS, and knowledge about other STDs, such as HPV, is low. To test this hypothesis and allow government authorities to modify the sexual health education policies and programs, we developed a survey to assess and compare the current level and sources of HPV and HIV information in the general population.

Materials and Methods: In this cross-sectional study, an online questionnaire containing 46 items was created and distributed using a web-based application. Respondents were asked to provide information about their knowledge of HIV/AIDS, HPV infection, and HPV vaccination.

Results: A total of 370 (36.56%) males and 642 (63.44%) females participated in this study. Regarding overall knowledge of HPV and HIV/AIDS, the awareness scores of HIV/AIDS were significantly higher compared to HPV scores (71.39 ± 23.66 vs 35.90 ± 23.65 , $P < .001$). Only 2.8% of participants had not heard about HIV, while 26.5% and 75.0% had never heard about HPV and HPV vaccination, respectively. Only 11.2% of participants were aware of the protective role of vaccination against cervical cancer. The most frequent source for HIV information was national radio and television, which do not have a substantial role in HPV.

Conclusion: Although HPV and HIV are both infections that can be transmitted sexually, the overall knowledge of the general public about HPV is substantially lacking compared to HIV. The findings of this study highlight the real need for the implementation of health education programs on STDs, particularly regarding HPV and HPV vaccination.

Keywords: HPV; HIV; Education; Knowledge

INTRODUCTION

Sexually transmitted diseases (STDs) such as Human immunodeficiency virus (HIV), which causes acquired immune deficiency syndrome (AIDS), and Human papillomavirus (HPV), which is the cause of genital warts, have become the world's most serious public health challenges in recent years (1).

AIDS is a chronic condition that is associated with medical and psychological morbidities. Despite its overall

mortality has dropped, it remains a top-10 cause of death in some populations (2).

HPV is the most common STD in the world and has a well-known role in preinvasive and invasive cervical squamous cell carcinoma (1). Although there is no virus-specific treatment for HPV or HIV, many efforts have been made to prevent these viruses. For instance, public education on STD-related transmission and prevention is an important factor in reducing the risk of infection (3).

Although the government has tried to increase STD awareness through public media, studies show that there are knowledge deficits on both HIV and HPV among the general population (4). As governmental STD educational programs are more focused on HIV/AIDs rather than HPV, it would be expected that there is significant knowledge deficits about HPV compared to HIV (4).

To test this hypothesis and allow government authorities to modify the sexual health education policies and programs, we developed a survey to assess the current level and sources of HPV and HIV information in the general population; then, we compared their knowledge about HPV with that of HIV/AIDS.

MATERIALS AND METHODS

The protocol of the study was approved by the research committee of the Skin Research Center and the Research Ethical Committee at the Shahid Beheshti University of Medical Sciences (IR.SBMU.SRC.REC.1398.017).

Study population

An online questionnaire containing 46 items was created using a web-based application (Porsline). The aim and objectives of the study and the voluntary nature of participation were described in the cover section. The web link to the online questionnaire was then distributed via various social media platforms (WhatsApp and Telegram). From March to June 2020, the subjects were recruited and were asked to answer and distribute the questionnaire using a virtual sequential chain-referral sampling method.

Informed consent was obtained from all study participants. A consent statement ("Would you like to take part in the study? ") was included at the beginning of the survey; the questionnaire was terminated automatically if participants answered no.

Study instrument

The authors developed the questionnaire based on previous STD studies and literature reviews. All items were assessed for relevance, clarity, simplicity, and ambiguity by health survey experts and modified based on their feedback for content validity. The questionnaire

reliability was tested using Cronbach's alpha and the test-retest method. A pilot study was conducted on 10 subjects, and the retest was given within 2 weeks. In the pilot sample, the internal consistency of each question in the questionnaire using Cronbach's alpha coefficient was 0.89, indicating reasonable internal consistency. The test-retest reliability of the developed questionnaire using Spearman's test showed that the correlation coefficients were significant ($r = 0.94$, $p < 0.001$) and, thus, interpreted as acceptable reliability. The data from the pilot study were removed from the final analysis.

The questionnaire included four sections: demographics, HPV knowledge, HIV knowledge, and source of information about HPV and HIV. Demographic variables included age, gender, marital status, educational level, and a question on whether they or their relatives have had genital warts or HIV.

The second section included 22 questions aimed to evaluate the participants' general knowledge and awareness about HPV and its vaccine. These questions were related to the clinical presentation, mode of transmission, and prevention of the virus, its correlation to cervical cancer, and the vaccine benefit, availability, and target population.

The third section included 18 questions intended to assess the participants' general knowledge and awareness of HIV. These questions were related to the clinical presentation, mode of transmission, and prevention of the virus.

Participants had the option to provide a written response or to select 'Yes,' 'No,' 'True,' 'False,' or 'I don't know' for each item. One point was assigned to a correct response, while no points were given for an incorrect/unknown answer. The total points were added for every participant, and a percentage was calculated: (amount of points/number of questions $\times$ 100). This percentage is the knowledge score. A higher percentage suggests better awareness.

To evaluate the level of HPV or HIV awareness, answers to all questions from those who responded that

they had not heard of HPV or HIV were considered as "I don't know".

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS, version 22. IBM Corp., USA). Categorical data were described as frequencies (percentages), and continuous data were reported as mean and standard deviation (SD). An independent samples t-test was applied to compare the means of continuous variables, and a chi-squared test was used for categorical variables. A statistically significant difference was considered if the p-value was less than 0.05.

RESULTS

Of the 3178 survey link views, 1195 forms were submitted (response rate: 37.60%). Those younger than 18 years old or medical students or medical graduates who participated in the pilot study were excluded (183 respondents). The final sample eligible for analysis consisted of 1012 participants, including 370 (36.56%) men and 642 (63.44%) women.

Demographic characteristics of the sample

The age of the respondents ranged between 18 and 70, with a mean $\pm$ SD of 35.67 ± 10.62 . Given the education of the study sample, it was observed that 13 (1.28%) of the sample had primary, 364 (35.97%) had secondary education, and 635 (62.75%) had an academic degree. The majority of participants (74.21%) had sexual experience. 191 (18.87%) and 99 (9.78%) participants reported that either they or their relatives were affected by genital warts and HIV/AIDs, respectively.

Knowledge of genital warts and HPV vaccination

As shown in Table 1, more than half of the participants (55.6% %) were aware that genital wart is sexually transmitted and is not restricted to females (60.4%). Also, 50.6% knew that condom reduces the risk of HPV transmission. Only 28.4% knew that condom does not guarantee 100 % prevention of genital warts. The majority (85.6%) did not know that HPV infected person may show no symptoms but transmit the disease to others. More than

half of the respondents (70.1%) wrongly thought that genital warts may be transmitted through public swimming pools or blood (87.0%). Overall, only 40.2% of the respondents knew that cervical cancer is related to HPV infection and the proportion of females with the correct answer was more than that of men (46.3% vs 29.7%, $P < 0.001$). Among respondents, only a small percentage (8.3%) know that antibiotics cannot treat genital warts.

Regarding the knowledge of the HPV vaccine, the participants' answers showed poor knowledge as presented in Table 1. Only 25.0% had heard of the vaccine, which was significantly higher among females than males (28.8% vs 18.4%, $P < 0.001$). Among 253 participants who had heard of the HPV vaccine, only 138 (54.5%) persons knew the age at which the HPV vaccine can be administered. 88.8% were unaware of the protective role of vaccination against cervical cancer. Only 10.3% and 9.0% of participants knew that "vaccine does not have a therapeutic role on genital warts" and "those who are vaccinated against HPV might still develop genital warts with subtypes not covered by the vaccine", respectively.

Knowledge of HIV/AIDS

The analysis of data showed that most participants had acceptable knowledge about HIV/AIDS (Table 2). Nearly all respondents understood that HIV is sexually transmitted (92.0%) and that condoms reduce the risk of transmission (73.7%). Most were also aware that HIV is transmitted by the sharing of a needle (95.8%), receiving blood from an infected donor (89.6%), and from pregnant mother to child (64.3%). The majority of respondents indicated that HIV could not be transmitted through a toilet seat (55.1%), public swimming pool (62.1%), hugging (79.9%), coughing and sneezing (72.9%), and sharing a drink with an infected person (63.3%). However, only 27.9% of respondents knew that AIDS is not transmitted by mosquito bites.

Most participants (77.0%) knew that HIV could be present without visible signs or symptoms for many years. 56.6% knew that there was no vaccine for AIDS prevention, and 66.8% indicated that AIDS is not curable at present.

Table 1. Knowledge of the general population toward genital warts, human papillomavirus (HPV), and HPV vaccination

Item	Correct answer	Yes	No	Do not know
General Knowledge				
1 Have you ever heard of genital warts?		744(73.5%)	268(26.5%)	
2 Do you know genital warts symptoms?	Yes	375(37.1%)	369(36.5%)	268(26.5%)
3 Genital wart is only seen in women	No	50(4.9%)	611(60.4%)	351(34.7%)
4 Is genital wart a sexually transmitted disease?	Yes	563(55.6%)	26(2.6%)	423(41.8%)
5 Can HPV infected person be asymptomatic?	Yes	228(22.5%)	140(13.8%)	644(63.6%)
6 Does HPV infection increase the risk of cervical cancer in women?	Yes	407(40.2%)	30(3.0%)	575(56.8%)
7 Can HPV infection be resolved spontaneously without any treatment?	Yes	78(7.7%)	389(38.4%)	545(53.9%)
8 Can HPV infection be treated by antibiotics?	No	84(8.3%)	239(23.6%)	689(68.1%)
9 Can using a condom during sexual intercourse decrease the risk of virus transmission?	Yes	512(50.6%)	55(5.4%)	445(44.0%)
10 Genital wart is a very rare disease	No	136(13.4%)	392(38.7%)	484(47.8%)
11 Can HPV infected person become symptomatic many years later?	Yes	299(29.5%)	36(3.6%)	677(66.9%)
12 Is HPV transmitted from a carrier to his/her partner only if the carrier shows symptoms?	No	275(27.2%)	146(14.4%)	591(58.4%)
13 Can HPV be transmitted by public swimming pool?	No	302(29.8%)	135(13.3%)	575(56.8%)
14 Can condoms provide 100% protection against HPV?	No	192(19.0%)	287(28.4%)	533(52.7%)
15 Can HPV be transmitted via needle stick and body fluid exposure?	No	132(13.0%)	279(27.6%)	601(59.4%)
Vaccine				
1 Have you ever heard of the HPV vaccine?		253(25.0%)	759(75%)	
2 Is the HPV vaccine available in IRAN?	Yes	179(17.7%)	17(1.7%)	816(80.6%)
3 What is the age range for the HPV vaccine?	9-26 years	138(13.6%)	34(3.4%)	840(83.0)
4 Who benefits from the HPV vaccine?	Male/female	177(17.5%)	32(3.2%)	803(79.3%)
5 Does the HPV vaccine have therapeutic effects on genital warts?	No	68(6.7%)	107(10.3%)	840(83.0%)
6 Can someone still get genital warts after being vaccinated?	Yes	91(9.0%)	65(6.4%)	856(84.6%)
7 Is the HPV vaccine capable of preventing the occurrence of cervical cancer?	Yes	114(11.3%)	38(3.8%)	860(85.0%)

Table 2. Knowledge of the general population about human immunodeficiency virus (HIV)

Item	Correct answer	yes	No	Don't Know
1 Have you ever heard of HIV/AIDS?		984(97.2)	28(2.8)	
2 Is HIV/AIDS a sexually transmitted disease?	Yes	931(92.0)	28(2.8)	53(5.2)
3 Can HIV be transmitted from mother to baby during pregnancy?	Yes	615(64.3)	134(13.2)	227(22.4)
4 Can a person get HIV by sharing an injection needle with someone who has HIV?	Yes	970(95.8)	2(0.2)	40(4.0)
5 Can a person get HIV from a toilet seat?	No	134(13.2)	558(55.1)	320(31.6)
6 Can HIV/AIDS be spread through hugging or shaking hands with an infected person?	No	71(7.0)	809(79.9)	132(13.0)
7 Can HIV be transmitted by mosquitoes?	No	330(32.6)	282(27.9)	400(39.5)
8 Can HIV be spread through a swimming pool?	No	102(10.1)	628(62.1)	282(27.9)
9 Can HIV be transmitted by blood transfusion from an infected blood donor?	Yes	907(89.6)	15(1.5)	90(8.9)
10 Can a person with HIV look and feel healthy?	Yes	779(77.0)	42(4.2)	191(18.9)
11 Can using condoms lower the risk of getting HIV?	Yes	746(73.7)	64(6.3)	202(20.0)
12 Can HIV/AIDS be cured with antibiotics?	No	80(7.9)	676(66.8)	256(25.3)
13 Is there a vaccine to prevent HIV infection?	No	99(9.8)	573(56.6)	340(33.6)
14 Do coughing and sneezing spread HIV?	No	115(11.4)	738(72.9)	159(15.7)
15 Can a person get HIV by sharing a glass of water with someone who has HIV?	No	178(17.6)	641(63.3)	193(19.1)
16 Can HIV-infected person be asymptomatic for many years?	Yes	700(69.2)	47(4.6)	265(26.2)
17 Can a person have HIV without knowing it?	Yes	774(76.5)	51(5.0)	187(18.5)
18 Does extramarital sex increase the risk of HIV transmission?	Yes	920(90.9)	7(0.7)	85(8.4)

Overall knowledge of HIV vs HPV

The overall knowledge score (mean $\pm$ SD) regarding HPV was 35.90 $\pm$ 23.65. Female participants had significantly higher scores than males (38.04 $\pm$ 24.28 vs. 32.20 $\pm$ 22.07, $P < 0.001$). Participants with higher education levels demonstrated significantly greater knowledge compared with those without academic education (40.44 $\pm$ 24.70 vs. 28.27 $\pm$ 19.55, $P < 0.001$). Additionally, participants who themselves or whose relatives had experienced HPV infection had significantly higher knowledge scores than those without prior exposure to HPV (41.96 $\pm$ 22.64 vs. 34.49 $\pm$ 23.67, $P < 0.001$).

The overall knowledge on HIV was 71.39 $\pm$ 23.66, and there was no significant difference ($P = 0.136$) between males (69.93 $\pm$ 24.47) and females (72.24 $\pm$ 23.15). The knowledge score was higher for participants with academic education than for participants without academic education (77.60 $\pm$ 19.91 vs. 60.94 $\pm$ 25.72, $P < 0.001$).

Regarding overall knowledge of HPV and HIV/AIDS, the awareness scores of HIV/AIDS were significantly higher, compared to HPV scores (71.39 $\pm$ 23.66 vs 35.90 $\pm$ 23.65, $P < 0.001$). Only 2.8% of participants have not heard of HIV, while 26.5% have never heard of HPV.

Source of information

As shown in Figure 1, the sources of obtaining information were diverse. Internet webpages were the main source of information for both HIV and HPV. The most frequent source for HIV information was national radio and television, which does not have a substantial role in HPV. In providing information about HPV, schools and universities have a trivial role to play.

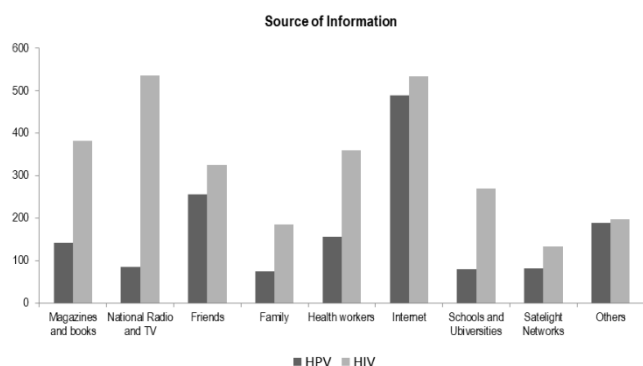


Figure 1. The source of obtaining information about HIV and HPV

DISCUSSION

Assessing public awareness is an important prerequisite in planning preventive and treatment strategies (4). To identify the current level and sources of HPV and HIV information, we assessed the current HPV and HIV knowledge in the general population.

This study demonstrates significant knowledge deficits about HPV compared to HIV. Overall results from our study demonstrated that the majority of participants had a moderate level of knowledge of HIV/AIDS. Knowledge about HIV has increased considerably during these years (5,6), which could be attributed to the educational program by the government.

Between 1996 and 2005, with the rising prevalence of HIV in Iran (5), the need for preventive education was profoundly recognized. Since then, educational programs on HIV/AIDS transmission and prevention have been started in schools, universities, and media to increase public awareness about HIV (5). Several studies have shown that mass media play a significant role in health promotion and disease prevention (7). In this study, we observed that national radio and television are the primary sources of HIV/AIDS information.

Despite HIV, unfortunately, knowledge and awareness about HPV have not increased in recent years (8). Numerous studies have reported that most people are unaware of genital warts, their methods of transmission and prevention, their vaccination, and their association with cervical cancer (8,9). A possible explanation may be related to the lack of educational programs in schools and universities on the genital wart, and inadequate activity of the media in educating people about HPV and its consequences.

Similar to previous reports, we also found higher levels of HPV knowledge among participants with higher levels of education and female gender (10). The same differences were also observed among participants in the knowledge of HPV vaccination. The possible explanation might be related to the topic, i.e., HPV. Due to the connection between HPV and cervical cancer, women are likely to

have heightened concerns about this STD, and it is expected that there would be increased media exposure targeted towards women.

Although nearly all participants in this study had heard of HIV, the more detailed questions revealed that there are many misconceptions. Overall, only half of the participants knew that there is no preventive vaccination for HIV/AIDS, and HIV cannot be spread through shared plates, glasses, seat toilets, and swimming pools. Only one-third of participants knew that mosquitoes cannot transmit HIV.

Overall, knowledge of HPV was worse. Only 14% knew that genital warts can be transmitted from an asymptomatic but infected person. Less than half of the participants knew the mode of transmission, ways of prevention, and treatment. Only 40% knew that cervical cancer is related to HPV infection. And only 25% of the participants have heard of vaccination. In Iran, the HPV vaccine is accessible but has not been introduced to the national routine vaccination program. Moreover, it is not covered by insurance companies. Despite the high prevalence of genital warts, there is no national program for HPV education and prevention for the public in our society. Furthermore, the role of mass media, schools, and universities was not found to be significant. Most participants were unaware of the benefits of vaccination, indicating a substantial need for public education initiatives.

Multiple HPV-related cancers can be reduced through HPV vaccination; therefore, increasing vaccination rates among youth of both sexes is a vital public health issue (11). There is evidence showing that providing adequate information on the benefits of vaccination to the general public increases the acceptance of HPV vaccination (12).

Limitations

Given that this survey was done using electronic questionnaires, the study targeted a population who had access to a smartphone and social media such as WhatsApp and Telegram. These populations have a better

socioeconomic status and are not representative of the real population. Because of some moral and legal considerations in our society, another limitation of our study is that the participants were not asked about their sexual behavior, the number of partners, and their sexual orientation. However, they were asked about the history of HIV or HPV infection in their relatives, and our results revealed that those with a positive answer to this question had better knowledge.

CONCLUSION

Although HPV and HIV are both infections that can be transmitted sexually, the overall knowledge of the general population about HPV is substantially lacking compared to HIV. The findings of this study highlight the real need for the implementation of health education programs as a priority in schools and universities for STD education, particularly HPV. For public education, mass media, especially TV, should take a more active role in addressing this concern. Eventually, all these interventions can help in effectively decreasing the incidence of HPV and HIV infections.

Conflict of interest

The authors declare that they have no conflicts of interest.

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