

Pre-Service Teachers' Knowledge of HIV/AIDS and Their 'Hidden' Role in Protecting Their Future Pupils' Well-Being through Health Education.

Eleni Michalopoulos PhD, RN

Laboratory Teaching Staff
University of Patras
Department of Nursing

Maria Frounta, PhD, RN

Laboratory Teaching Staff
University of Patras
Department of Educational Sciences and Social Work

Panagiotis Kiekkas, PhD, RN

Associate Professor
University of Patras
Department of Nursing

Vasiliki Dimopoulou, MS, RN

Head Nurse, Department of Hemodynamics
Ilias General Hospital,
Greece

Antigone Michalopoulos, PhD, RN

Laboratory Teaching Staff
University of Patras
Department of Nursing

Abstract

Health education plays a fundamental role in the protection of health. The implementation of health education within schools depends, to an extent, on the teachers' knowledge. The purpose of this study was to evaluate pre-service teachers' HIV/AIDS knowledge using the brief HIV-KQ-18 questionnaire. Greek university students from the Departments of Primary Education (53.8%) and Mechanical Engineering (46.2%) were included. The results indicate that 76,1% of the participants have a low and moderate HIV/AIDS knowledge level while 56,7% acquired HIV/AIDS knowledge from their school teacher. Students of the Department of Primary Education demonstrated a low knowledge level (77.1%). Based on these findings a portion of the sample, including future teachers in primary education, appears to have insufficient knowledge related to HIV/AIDS.

Keywords: pre-service teachers, health education, students' knowledge, child well-being, HIV/AIDS

1. Background

Initial education offered to pre-service teachers affects the health, safety and well-being of their pupils. Teachers are responsible in facilitating the healthy growth and development of children and youth. In order for this goal to be accomplished within the school setting there is a demand for education related to many topics including health education. Well-being can be defined in various ways and achieved when individuals have the appropriate psychological, social, and physical resources they need to cope with life's challenges. According to Dodge et al. (2012), well-being focuses on a state of balance that may be affected by life challenges. However, well-being of modern societies is achieved through individual risk management, when each person learns to manage situations presented throughout life (Bonner, 2018). In addition, well-being is not a static phenomenon, it evolves as the individual develops and is affected by various events and experiences, both present and future (Soutter et al. 2014). It is a multidimensional concept, affecting all aspects of life (Pinto et al. 2017; Shepherd et al., 2015).

Health has a central role on the well-being of an individual. According to the World Health Organization (WHO), good health was defined in 1986 as "a major resource for social, economic and personal development and an important dimension of quality of life" (WHO, 2018).

It is a holistic phenomenon, intertwined with daily, professional, family and community life (Svalastog et al. 2017). Health has changed from being a static to a dynamic state, a commodity that man strives to achieve and maintain (Frounta, 2014a). An essential tool for the protection of health and, therefore, an individual's well-being is health education. Health education encourages individuals to improve or maintain their health, prevent illness and reduce risky behaviors with the purpose of becoming healthy and productive adults. Health education focuses on the individual as a whole, including physical, mental, emotional, spiritual and social aspects (Frounta, 2014b). It contributes, individually as well as collectively, to the understanding of health and the control of one's life in the present for the future. According to WHO (2020), health education helps individuals and communities by combining learning experiences designed to improve health, provide knowledge or influence attitudes. This includes many parameters, such as spiritual, psychological or social activities that lead to knowledge concerning health problems and enhancing one's ability to make responsible decisions about his or her own well-being and the well-being of his or her family and society (Gouvra et al., 2005). Therefore, if individuals acquire health-related knowledge by developing skills that are necessary for their psychological, emotional, social and physical development, they enhance their well-being (WHO, 2016).

Adolescence is a time of great change, when behaviour and lifetime habits are often acquired. One of the aims of school education is to empower children to develop healthy behaviors during this challenging phase of their life. Thus, an environment based on communication and learning opportunities should be provided in order to facilitate these learning needs. However, since health education programs (HEPs) across the globe are not mandatory within the school setting, there is a potential gap within the school environment on providing this important lifelong support to students (Naidoo and Wills, 2016).

With regard to the sexually transmitted disease HIV/AIDS, the United Nations has set a goal to terminate the AIDS epidemic by 2030 (UNAIDS, 2019a). However, a concern arises of how this can be achieved, since according to the Fact Sheet – World AIDS Day 2019 presenting HIV data globally, the number of people living with HIV in 2000 were 24.9 million while in 2018 the number increased to 37.9 million (UNAIDS, 2019b). According to the National Public Health Organization (NPHO, 2018), diagnoses of HIV/AIDS infections in 2018 in Greece increased from 645 to 687 in 2017.

Although the risk of transmission, by people infected with the virus who are under treatment is reduced only if they are strict in following guidelines, nevertheless, the movement of population as well as the economic crisis, may have implications in terms of new diagnoses. Another important point to consider is that a person who has been infected with the HIV virus can transmit the virus for a very long period of time (5-10 years) without being aware of it, since the time between HIV infection and its manifestation to AIDS and thus, showing disease symptoms, varies (WHO, 2019).

1.1. Health education within schools

Teachers and schools can provide a holistic approach to their students' health needs through the fundamental framework of health and well-being (Shepherd et al. 2015). Health education aims to address physical, social and emotional dimensions of health (Chandrashekar et al. 2012). Sexual and reproductive health education, along with prevention of communicable diseases, have positive outcomes if they begin early in a child's life (Dounis, 2016; Doubova et al. 2017). The school is called upon to promote children's health and well-being in relation to these health issues, however this is not always achieved (WHO, 2016; Stewart-Brown, 2006). As suggested by Pinto et al. (2017), it is important for people to gain an understanding and control of their lives, in order to achieve well-being. The choice of strategies and their effectiveness in delivering health education within the school setting depends on teachers. Research shows that well-educated teachers, implement appropriate educational strategies in order to provide basic health information and skills safeguarding the well-being of their students (Frauenknecht, 2003; Parker, 2001; Frounta et al, 2019). However, studies have shown that the main motive of teachers who implement HEPs within schools is the fulfillment of their own personal limitations and needs rather than to address their students' knowledge needs (Jourdan 2011; Frounta et al, 2019).

Even today, after 30 years of implementation of HEPs, students' HIV/AIDS knowledge level does not appear to have increased and this is evident by the data on the HIV/AIDS epidemic by UNESCO (2019) that confirmed an increase in new diagnoses. The epidemic is not over and young people are still at risk, noting that new infections in adolescents and specifically, young women, are significantly higher than in men of the same age. Thus, numerous questions arise such as: do university students gain the appropriate health knowledge during their training as to enhance their well-being? Are pre-service teachers adequately trained to contribute to the well-being of their pupils and therefore the well-being of the individual overall?

2. Study Aim

Based on the above questions, the purpose of this study was to evaluate HIV/AIDS knowledge of Greek undergraduate university students, specifically of pre-service teachers. A portion of the sample was recruited from another department to allow for data comparison. Correlations were made regarding students' knowledge and demographics. The topic of HIV/AIDS was selected as a case study (Bryman, 2017).

2.1 Study design

A cross-sectional survey was conducted with the use of a convenience sample (Bryman, 2017). Included in the study were 184 undergraduate students from two university departments, the Department of Primary Education (pre-service teacher) (PE) and the Department of Mechanical Engineering (ME).

2.2 Data collection

Data were collected with the use of a questionnaire. The questionnaire consisted of three parts. First, demographic information was collected regarding gender, university department of study, religion, religiousness (devotion to their religion) and parents' educational level. The second part of the questionnaire included the brief HIV-Knowledge Questionnaire-18 (HIV-KQ-18) consisting of 18 statements, for which the participant was asked to choose among 'true', 'false' or 'don't know'. The items measure knowledge related to HIV transmission. A score is yielded overall, with a score of 18 indicating an excellent level of knowledge. The third and final part of the questionnaire included questions regarding the participants' source of HIV/AIDS knowledge. Based on the number of items students answered correctly, their knowledge levels were divided into three categories: low, moderate and high. Participants who answered 7 or less items correctly were considered to have a low level of knowledge, those who answered 8-12 items correctly were considered to have a moderate level of knowledge while those who answered 13-18 items correctly were considered to have a high level of knowledge.

2.3 Validity and reliability

Psychometric evaluation of the HIV-KQ-18 in terms of validity and reliability, have been reported by Carey and Schroder (2002), who recommend the use of the HIV-KQ-18 as a proven research tool for measuring HIV/AIDS knowledge. This questionnaire has been previously used in similar studies conducted by Pharr et al. (2017) and Talwar et al. (2015).

Language validity of the questionnaire was maintained, following a forward and back translation process. Initially, the HIV-KQ-18 questionnaire was translated from English to Greek by a bilingual nursing professor. A blind back-translation of the Greek questionnaire followed into English by another bilingual nursing professor, who had no prior knowledge of the questionnaire items. The final English version of the questionnaire was then compared to the original HIV-KQ-18 questionnaire by the researchers, to identify possible words or phrases that were problematic.

These issues were addressed and the Greek version of the questionnaire was completed (Sousa and Rojjanasrirat, 2010). In order to ensure that the questionnaire items were comprehensible and appropriate to the aims of the study, a pilot study was conducted (n=10), which led to a final revision (In, 2017).

2.4 Informed Consent and Ethical Considerations

Following the above procedure, the final Greek version of the questionnaire was administered to students at the end of their scheduled lectures. Students who had completed the third year of their university education, and had therefore fulfilled a large portion of their university experience, were invited to participate. The researchers informed the students of the study's purpose and asked them to voluntarily participate by completing the questionnaire, guaranteeing their anonymity and that all data would be used only for the purpose of this study. Students who provided verbal consent proceeded with questionnaire completion.

Following this procedure, the researchers withdrew from the lecture room to avoid participants social desirability bias. The researchers wanted to minimize the student's discomfort of answering sensitive questions, possibly relating to their own sexual behaviour (Krumpal, 2013). Upon completion, the questionnaires were collected by another member of staff that did not participate in the study.

2.5 Data analysis

Data analysis was conducted using the SPSS version 24.0. Descriptive statistics including mean and standard deviation was performed. Independent samples t-test was used to determine if there was a significant difference between the means of the two sample groups (Katsilis, 2006). The nonparametric statistical chi squared test was also used to further analyze the data. Statistical significance was set at $p < 0.05$.

3. Results

3.1 Demographic characteristics

Of the 184 participants, 110 (59.8%) were women and 74 (40.2%) were men, while 99 (53.8%) studied at the Department of PE and 85 (46.2%) at the Department of ME. The majority of the participants were Christians (84.2%, n=155) whereas only 14.7% (n=27) declared another religion and 2 participants refused to answer this question (1.1%). Although many declared a religion, when asked about their religiousness, 55.4% (102 participants) stated that they actively practiced their religious, where as 41.3% (76 participants) claimed that they did not. Six participants did not answer this question (3.3%). Lastly, regarding the educational level of the participants' parents, 57.1% (n=105) of the fathers and 58.2% (n=107) of the mothers had completed a university undergraduate or postgraduate degree (Bachelor/Postgraduate/PhD level). A slightly lower rate of participants' mothers had completed secondary education (31.0%, n=57) in comparison to the fathers' sample (33.2% (n=61). Students claimed that 10.3% (n=19) of their mothers and 9.8% (n=18) of their fathers had an elementary educational level.

3.2. HIV/AIDS Knowledge

High percentages of correct responses were observed for items, such as if coughing and sneezing (66.8%) or sharing a glass of water with someone who has HIV/AIDS can transmit the virus (63.6%), if the withdrawal method is used by a man during sexual intercourse before climaxing (86.4), if showering genitals after sexual intercourse (77.2%), if a woman has sex while menstruating (73.9%), if taking antibiotics protects a person from contracting HIV (71.2%); and if having sex with more than one partner can increase a person's chance of being infected (78.8%) (items:1, 2, 3, 5, 10, 13, and 14).

While items such as if a woman can contract HIV/AIDS through anal intercourse; if people infected with HIV quickly show signs of infection; if there is a vaccine that can protect against HIV; if a person is likely to contract HIV by kissing, from oral intercourse or by using the same toilet or pool with a person who has HIV and if using Vaseline or baby oil with condoms lowers the chances of getting HIV (items 4, 7, 8, 9, 16, 17 and 18) were answered correctly by almost half of the sample.

Low percentages of correct responses were observed for items, regarding pregnant women infected with HIV resulting in babies born with AIDS, their awareness of female or natural skin condoms and that taking an HIV test one week after having sex will provide an HIV diagnosis (items 6, 11, 12 and 15) (Table 1).

3.3. HIV/AIDS Knowledge Levels

Of the 184 participants, 50% appeared to have a moderate knowledge level, while 26.1% a low and 23.9% a high level of knowledge. The students' mean HIV/AIDS Knowledge was 9.92. The maximum HIV/AIDS Knowledge score achieved for this sample was 16.

3.4. HIV/AIDS Information Sources

The majority of the participants (75.8%, n=135) claimed that they were informed about HIV/AIDS from the internet while more than half (56.7%, n=101) were informed by their school teacher and almost half (49.4%, n=88) by their family. A small percentage of the participants mentioned that their source of HIV information was from newspapers/magazines 8.4% (n=15), radio programs 1.7% (n=3), and from relatives outside the immediate family circle 10.1% (n=18).

3.5. HIV/AIDS Knowledge level and Gender

Independent samples t-test was used to investigate HIV/AIDS knowledge between male and female participants. A statistically significant difference between the two groups regarding HIV/AIDS knowledge ($p < 0.001$) was found. The mean value of HIV/AIDS knowledge of male participants was 11.05 while for the female sample was 9.17. This result was also confirmed by the chi-squared test ($p = 0.006$) concerning the participants' HIV/AIDS knowledge level and gender. Specifically, male participants demonstrated a higher percentage of correct answers in contrast to female participants.

3.6. HIV/AIDS Knowledge Level and Participants' University Department of Study

A comparison of the participants' HIV/AIDS knowledge level to the university department of study was performed. A statistically significant difference was found, suggesting that the students from the Department of PE have a lower level of HIV/AIDS Knowledge, in relation to that of the students of the ME Department ($\chi^2 = 15.424$, $p < 0.001$) (Table 2). Students of the ME Department demonstrated a high knowledge level of 61.4% and a low knowledge level of 22.9% while the students of the PE Department demonstrated a high knowledge level of 38.6% and a low knowledge level of 77.1%. A similar level of moderate knowledge was demonstrated by participants from both departments (48.9% and 51.1%).

3.7. HIV/AIDS Knowledge and religion/ religiousness

A statistically significant difference between the two groups (Christians & another religion) regarding HIV/AIDS knowledge and their religion, was found (HIV/AIDS: $t(56.616) = -4.540, p < 0.001$).

The average HIV/AIDS knowledge of students belonging to another religion was 11.82 while for Christian students, was 9.57. In order to test the independence of the variables 'Religiousness' and 'HIV/AIDS knowledge level', chi squared test was performed, demonstrating a statistically significant result ($\chi^2 = 18,672, p < 0,001$). Thus, indicating that there is a difference in the HIV/AIDS knowledge level of participants who actively practice their religion to those who do not (Table 2).

3.8. HIV/AIDS Knowledge Level and HIV/AIDS Information sources

Regarding their source of information, 79.1% of the participants reported the internet while 60.5% claimed they gained information from their school teacher, 46.5% from their family and 25.6% from a friend. The majority of the students that demonstrated a moderate HIV/AIDS knowledge level reported that the internet was their source of information (77.8%), while 55.6% claimed they gained information from a school teacher, 52.2% from their family and 27.8% from a friend. Lastly, students that demonstrated a low HIV/AIDS knowledge level reported the internet (68.9%) as a source of information, while 55.6% a school teacher, 46.7% their family and 33.3% a friend.

4. Discussion

In Greece, after about 30 years of implementation of health education programs (HEPs), a positive outcome on the issue of HIV/AIDS is expected. However, this study shows a lack of HIV/AIDS knowledge. The maximum score achieved for this sample was 16 out of 18 while the average (mean) HIV/AIDS knowledge score was 9.92, just above the baseline of '9' (18 was considered excellent). In a similar study of 405 Malaysian University students conducted by Talwar & Rahman (2015), the HIV-KQ-18 scale was used and the highest score obtained was 14 out of 18, while the mean score was 7. A possible interpretation of this result is suggested in a recent article by Crocker et al. (2019). In this article, the authors state that issues related to sex education, which are desirable by Australian youth, are missing from school education. Also, Tung et al. (2008) assessed the knowledge, attitudes, sources of HIV/AIDS information, and behaviors related to HIV/AIDS among a highly educated group of college students in Taiwan, and claimed that the samples' level of knowledge with regard to transmission was poor and has not improved since 1993 (Tung et al, 2008).

With regard to the correct answers provided by the participants of the HIV-KQ-18 questionnaire, similar percentages were presented in a study by Pharr et al. (2017) involving adolescents in Nigeria.

Although the research by Pharr et al. (2017) was completed in a developing country, where deficiencies and misconceptions about HIV/AIDS knowledge were identified, the participants provided correct responses to questions related to HIV/AIDS transmission (water, female condom, toilet - swimming pool and how soon symptoms will appear after infection - with the exception of transmission through semen that is most commonly found in the present study).

Additionally, in relation to the three levels of knowledge (low, moderate, high), fifty percent of the sample was classified as having a moderate level of knowledge, while the other 50% was balanced between the other two levels. The analysis and correlation of the data between the Department of PE and the three levels of knowledge regarding HIV/AIDS (low, moderate, high), demonstrated that participants of the PE Department had a significantly larger percentage (77%) of 'low knowledge level' compared to students of the ME Department (22.9%). On the contrary, the 'high knowledge level' students from the ME Department (61.4%) had better percentage outcomes relating to the 'high knowledge level' students of the PE Department (38.6%). A 'high knowledge level' was obtained by 61.4% of the students from the ME Department while only 38.6% was achieved for the students of the PE Department. Additionally, a difference in knowledge is apparent in our sample, since their responses demonstrate that women appear to be less knowledgeable than men. The above findings are of particular interest concerning the Department of PE. HIV/AIDS Knowledge of the pre-service teachers within this sample, is beneficial for their personal lives and well-being but is further necessary for promoting health and wellbeing for future generations within their profession. Thus, if pre-service teachers are not trained properly, they are likely to teach only what they know from their personal experience and this knowledge may be wrong or superficial.

4.1. HIV/AIDS Information Sources

According to the results of this study, it appears that the internet is the main source of HIV/AIDS information, followed by a school teacher, a family member, and a friend. The internet seems to be the students' most dominant source of information, independent of their level of knowledge. Information provided by a school teacher was the samples' second most frequent response. Specifically, more than half of the students that participated in this study

claimed they were informed by a teacher (56,7%), a presumably valid source, while they were pupils. This finding is in agreement with the study by Bleakley et al (2009).

Bleakley et al. (2009) report that the most frequent sources of sexual information are friends (74.9%), teachers (62.2%), mothers (60.9%) and the media (57.0%). Contrary to Bleakley et al. (2009) findings, 75.8%, of students in our study, claimed that their main source of HIV/AIDS information was the internet.

This finding is also mentioned in the study by Tung et al. (2013), including students who attended universities in China and the United States of America (USA), which resulted in the majority of participants mentioning they were informed of HIV/AIDS online. Specifically, students who studied in the USA (90.2%) mentioned the internet as the first source of information, while students who studied in China (69,5%) reported the internet as their second choice. Chinese students mentioned as their first source of HIV/AIDS information sources such as newspapers, television and the radio. However, 40% of the participants reported other information sources, including teachers, friends and family members. Similarly, in a study conducted by Abiona et al. (2014), 63% of the student participants mentioned they were also informed about HIV/AIDS from the internet.

Although teachers constitute the second most frequent source of information in the present study, Sidiropoulou's (2018) study reported that teachers were the main source of HIV/AIDS information. Similarly, a study conducted in Italy regarding Italian adolescents' knowledge on sexually transmitted diseases concluded that parents and teachers were the main source of information, while only 9% of their sample considered sex education they received in school as good (Drago et al. 2016). A possible explanation for this finding has been suggested by the participants of a qualitative study involving novice teachers, who felt their training did not adequately prepare them to provide sexual and reproductive health knowledge to their students (Xiong, Warwick and Chalties, 2019).

A vicious circle of lack of knowledge, especially regarding the university pre-service students of the PE Department is evident. In other words, teachers with poor knowledge teach pupils, who later become pre-service teachers with limited knowledge. An institutional gap appears to emerge. Similarly, as mentioned by Xiong, Warwick and Chalties (2019) their participants felt their lack of training did not adequately prepare them to provide sexual and reproductive health knowledge to their pupils, perhaps creating an international institutional gap within the pre-service teacher curriculum. Educational institutions, schools or universities, currently do not seem capable of breaking this vicious circle. One could argue that sexual health curricula could be tailored to the interest of first year university students as they enter their university life, however, since young people are exposed to the possible danger at a young age, this information has to be offered within education, earlier in life and throughout their life span. Similarly, if a young person does not attend university that knowledge will never be provided.

In our study, the 'family' was the third source of information mentioned by almost half of the sample (49.4%). However, in similar studies, parents are the first source of information regarding young individuals' sexual education (Kreatsas, 2003, Bleakley et al. 2009), although they appear to inadequately answer their children's critical questions in recent studies (Abiona et al. 2014; Frounta, 2014a; Torbati, et al. 2019). Specifically, the sample's parental educational level was high, 57.1% of the fathers and 58.5% of the mothers had a higher educational level (Bachelor/Postgraduate/PhD level). Based on this profile and related research findings (Dounis, 2016), it would be expected that the participants of this study would have a high HIV/AIDS knowledge level.

4.2. Religion

In this sample, students' HIV/AIDS knowledge appears to be affected by religion. Those who claim to be religious had a lower HIV/AIDS knowledge level than those who claimed not to be. In a similar study including nursing students conducted in Greece, religious students demonstrated limited knowledge when compared to students with no religious belief (Ouzouni and Nakakis, 2012).

Similarly, in a qualitative study of Christians conducted by Usadolo (2019), their perceptions of HIV and the influence of their religious belief concluded, that just by being a faithful Christian they are protected from the HIV virus. They claimed to believe that HIV/AIDS is a divine punishment. A possible explanation of this study's findings is the fact that, based on their religious belief, Christians are forbidden to have premarital sexual relations, and perhaps considered themselves not being at risk of HIV due to abstinence and monogamy (Usadolo, 2019).

5. Conclusion

In conclusion, as mentioned by Crocker et al. (2019), HEPs are the main source for improving individuals' health and thus their well-being. Gaining knowledge on a wide range of health topics is a primary strategy both to increase and enhance health and well-being. However, the implementation and effectiveness of sexual education programs depends on the teachers, who are required to apply them, and specifically on their training and knowledge.

Lack of teachers' sufficient training, can be a major obstacle for the implementation of quality HEPs, thus highlighting the fact that teachers' effectiveness in health education depends on the quality of their professional training and education (Sarma and Oliveras, 2013). If teachers are not sufficiently trained, it is difficult for them to meet their future work requirements and specifically the effective implementation of health education in schools

(Xiong, Warwick and Chalies, 2019). According to Frauenknecht (2003), university programs should prepare future teachers for their involvement in health education by guiding them in order to develop the ability to assess, analyze and sufficiently use health information and services for the benefit of their students.

Additionally, in a study conducted by Fraim (2012) examining the knowledge levels and misconceptions regarding HIV/AIDS among university students in Turkey demonstrated that sexual health courses should be incorporated on a mandatory basis in all university curriculum. Teachers have a key role in preparing children, because the social skills and knowledge they will acquire at school are crucial in relation to the choices they will make later in life to maintain their well-being (Yuchi et al. 2015). Nevertheless, the results of this research study demonstrated that today's university students, a portion of which will be teachers in primary education, do not have sufficient knowledge on such an important health topic, as HIV/AIDS. Therefore, it would be overly optimistic to believe that in the future, as professional educators, they will be able to adequately support HEPs.

The school setting is called upon to provide appropriate knowledge, attitudes and beliefs as to establish or incorporate appropriate healthy behaviors as a person enters adulthood. By acquiring this knowledge at a young age, they are protected by the possible threat of contracting the HIV virus. As for the students of the PE Department, special courses need to be incorporated in their university curriculum as to offer, these future teachers, knowledge on how to implement HEPs within schools. Emphasis needs to be placed not only in terms of the knowledge itself, since it will be acquired within their school setting as pupils, but as to gain self-confidence and the ability to present that knowledge in a way as to safeguard the well-being of their pupils.

5.1. Study limitations and future research recommendations

Although this study demonstrated interesting results, however the sample did not include students from other pre-service teacher departments, thus the results of this study cannot be generalized. A future study could perhaps involve a larger sample of students across more disciplines within the university setting. Another approach to the topic could perhaps involve teachers in order to identify their knowledge level as to implement possible future improvements.

Table 1 Percentage of correct answers of HIV-KQ-18 Questionnaire.

ITEMS	Correct responses%
1. Coughing and sneezing DO NOT spread HIV/AIDS.	66,8%
2. A person can get HIV/AIDS by sharing a glass of water with someone who has HIV/AIDS.	63,6%
3. If the man uses the withdrawal method, during sexual intercourse, before he climaxes this prevents a woman from getting HIV/AIDS.	86,4%
4. A woman can get HIV/AIDS if she has anal intercourse with a man.	51,6%
5. Showering, or washing one's genitals, after sex keeps a person from getting HIV/AIDS.	77,2%
6. All pregnant women infected with HIV will have babies born with AIDS.	33,7%
7. People who have been infected with HIV quickly show serious signs of being infected.	45,1%
8. There is a vaccine that can stop adults from getting HIV.	52,2%
9. People are likely to get HIV by deep kissing if their partner has HIV.	56,5%
10. A woman cannot get HIV if she has sexual intercourse while menstruating.	73,9%
11. There is a female condom that can help decrease a woman's chance of getting HIV.	19,0%
12. A natural skin condom works better against HIV than does a latex condom.	35,3%
13. A person will NOT get HIV if he/she takes antibiotics.	71,2%
14. Having sex with more than one partner can increase a person's chance of being infected with HIV.	78,8%
15. Taking a test for HIV one week after having sex will tell if a person has HIV.	33,2%
16. A person can get HIV by using the same toilet seat or swimming pool with a person who has HIV.	48,4%
17. A person can get HIV from oral intercourse.	52,7%
18. Using Vaseline or baby oil with condoms lowers the chances of getting HIV.	47,3%

Table 2 Differences in HIV/AIDS knowledge level according to participants', gender, university department of study and religiousness.

HIV/AIDS Knowledge Level	Gender		p	χ^2
	Male (n=74)	Female (n=110)		
Low level	10 (20,8%)	38 (79.2%)	0.006	10,383
Moderate level	42 (45,7%)	50 (54.3%)		
High level	22 (50,0%)	22 (50%)		

HIV/AIDS Knowledge Level	Department of Study		p	χ^2
	PE Department (n=99)	ME Department (n=85)		
Low level	37 (77.1%)	11 (22.9%)	<0,001	15,424
Moderate level	45 (48.9%)	47(51.1%)		
High level	17 (38.6%)	27 (61.4%)		

HIV/AIDS Knowledge Level	Religiousness		p	χ^2
	Yes (n=102)	No (n=76)		
Low level	39 (83.0%)	8 (17.0%)	<0,001	18,672
Moderate level	46 (51.7%)	43 (48.3%)		
High level	17 (40.5%)	25 (59.2%)		

References

- Abiona, T., Balogun, J., Yohannes, E., Adefuye, A., Yakut, Y., Amosun, S., & Frantz, J. (2014). HIV/AIDS knowledge, perception of knowledge and sources of information among university students in USA. *Health Education Journal*, 73(6), 755–767. doi:10.1177/0017896914550943
- Bleakley, A., Hennessy, M., Fishbein, M., and Jordan, A. (2009). How Sources of Sexual Information Relate to Adolescents' Beliefs about Sex. *US National Library of Medicine National Institutes of Health*, 33(1), 37–48.
- Bonner, A. (2018). *Social Determinants of Health: An Interdisciplinary Approach to Social Inequality and Wellbeing*. Bristol: Policy Press.
- Bryman, A. (2017). *Social Research Methods*. Athens: Gutenberg
- Carey, P. M., and Schroder, E. E., K. (2002). Development and Psychometric Evaluation of the Brief HIV Knowledge Questionnaire (HIV-KQ-18). *AIDS Education and Prevention*, 14(2), 172–182. doi.org/10.1521/aeap.14.2.172.23902
- Chandrashekar, B. R., Suma, S., Kiran, K., & Manjunath, B. C. (2012). The use of school teachers to promote oral hygiene in some secondary school students at Hyderabad, Andhra Pradesh, India: A short term prospective pilot study. *Journal of family & community medicine*, 19(3), 184–189. doi:10.4103/2230-8229.102319
- Crocker, B.C.S., Pit, S.W., Hansen, V. John-Leader, F & Wright, M. (2019). A positive approach to adolescent sexual health promotion: a qualitative evaluation of key stakeholder perceptions of the Australian Positive Adolescent Sexual Health (PASH) Conference. *BMC Public Health* 19, 681. doi.org/10.1186/s12889-019-6993-9
- Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining well-being. *International Journal of Well-Being*, 2(3), 222-235. doi:10.5502/ijw.v2i3.4
- Dobova, S.V., Martinez-Vega I.P., Infante-Castañeda C., Pérez-Cuevas, R. (2017). Effects of an internet-based educational intervention to prevent high-risk sexual behavior in Mexican adolescents. *Health Education Research*, 32(6),487–498. doi.org/10.1093/her/cyx074
- Dounis, A. (2016). The affect of health and well-being on gender and social inequalities of young people. *Social Policy - Social Theory*. <http://socialpolicy.gr/2016/07/> Accessed 14 March 2019
- Drago, F., Ciccicarese, G., Zangrillo, F., Gasparini, G., Cogorno, L., Riva, S., Javor, S., Cozzani, E., Broccolo, F., Esposito, S., & Parodi, A. (2016). A Survey of Current Knowledge on Sexually Transmitted Diseases and Sexual Behaviour in Italian Adolescents. *International journal of environmental research and public health*, 13(4), 422. doi:10.3390/ijerph13040422
- Fraim, N.L. (2012) Knowledge levels and misconceptions about HIV/AIDS: What do university students in Turkey really know? *International Journal of Humanities and Social Science*. 2 (12): 50-58.
- Frauenknecht, M. (2003). The Need for Effective Professional Preparation of School-Based Health Educators. *ERIC Digest*. *ERIC Clearinghouse on Teaching and Teacher Education*. ED482701. <https://www.ericdigests.org/2004-4/health.htm>. Accessed 10 January 2020.
- Frounta, M., Michalopoulou, E., Michalopoulou, A., & Dimopoulou, V. (2019). Students and HIV/AIDS: Exploring the situation in Greek higher education (full text in Greek). *Academia*, 16-17, 62-86. doi.org/10.26220/aca.3172

- Frounta, M.(2014a) Innovative Health Education Programs in Secondary Education: Teachers and Sex Education for Adolescents (SEA).*National Archive of PhD Thesis. National Documentation Centre.* Ioannina Greece.
- Frounta, M. (2014b). Exploring the relationship between the concepts of health - health education and health promotion: contribution to the more effective development of health education programs in schools. *Scientific Yearbook of the Department of Primary Education*, University of Ioannina: Repository of UOI "Olympias",26<http://olympias.lib.uoi.gr/jspui/handle/123456789/5849?mode=more>
- Gouvra, M., Kyridis, A., Mavrikaki, Evag. (2005). *Health Education and School*. Athens: Dardanos.
- In J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology*, 70(6), 601–605. doi:10.4097/kjae.2017.70.6.601
- Jourdan, D. (2011). Health education in schools. The challenge of teacher training. *Collection: Santé en action*. Saint Denis: INPES ISBN: 978-2-9161-9231-4
- Katsilis, G.(2006). *Inferential statistics: Applied to the social sciences and education with emphasis on computer analysis*. (1st ed.) Athens: Gutenberg -Dardanos.
- Kreatsas, G. (2003). *Sexual Education and Gender Relations*. Athens: Greek Grammata.
- Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: a literature review. *Qual Quant* 47, 2025–2047. doi.org/10.1007/s11135-011-9640-9
- Naidoo, J., & Wills, J., (2016). *Foundations for health promotion* (4th ed.). Amsterdam: Elsevier.
- National Public Health Organization (NPHO)(Greece) (2018). <https://eody.gov.gr/disease/aids/>Accessed 10 January 2020
- Ouzouni, C., & Nakakis, K. (2012). HIV/AIDS knowledge, attitudes and behaviors of student nurses. *Health Science Journal*. 6 (1), 129-150.
- Parker, J.Terry. (2001). School-based sex education: A new millennium update. *ERIC Clearinghouse on Teaching and Teacher Education Washington*, 1-7<https://eric.ed.gov/?id=ED460130>
- Pharr, R., Victor, J., Mavegam, B.O., Olutola, A., Karick, H., & Ezeanolue, E. (2017). A Cross-Sectional Study of the Role of HIV/AIDS Knowledge in Risky Sexual Behaviors of Adolescents in Nigeria. *International Journal of High Risk Behaviors & Addiction*, 6(4), e63203. doi:10.5812/ijhrba.63203
- Pinto, S., Fumicelli, L., Mazzo, A., Caldeira, S., & Martins, J.C. (2017). Comfort, well-being and quality of life: Discussion of the differences and similarities among the concepts. *Porto Biomedical Journal*, 2 (1), 6–12.doi.org/10.1016/j.pbj.2016.11.003
- Sarma, H., & Oliveras, E. (2013). Implementing HIV/AIDS education: impact of teachers' training on HIV/AIDS education in Bangladesh. *Journal of health, population, and nutrition*, 31(1), 20–27. doi:10.3329/jhpn.v31i1.14745
- Shepherd, J., Pickett, K., Dewhirst, S., Byrne, J., Speller, V., Grace, M.,Almond, P., Roderick, P. (2015). Initial teacher training to promote health and well-being in schools – A systematic review of effectiveness, barriers and facilitators. *Health Education Journal*, 75(6), 721–735. doi.org/10.1177/0017896915614333
- Sidiropoulou, K.(2018).Adolescents' Knowledge and Attitudes toward Sexually Transmitted Diseases (STDs) and the use of a condom as a means of protection against STIs based on the theory of planned Behavior. Knowledge and Attitudes of Adolescent youth toward Sexually Transmitted Diseases (STDs) and the use of condoms as a means of STD protection, based on the theory of planned behavior. *Archive of PhD Thesis / Hellenic Open University*<https://apothesis.eap.gr/handle/repo/38877?mode=full>
- Sousa, V. D., & Rojjanasirat, W. (2010). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice*, 17(2), 268–274. DOI:10.1111/j.1365-2753.2010.01434.x
- Soutter, A.K., O'Steen B., & Gilmore A. (2013). The student well-being model: a conceptual framework for the development of student well-being indicators. *International Journal of Adolescence and Youth*, 19 (4), 496-520. DOI: 10.1080/02673843.2012.754362 doi.org/10.1080/02673843.2012.754362
- Stewart-Brown, S. (2006). What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach? *Copenhagen, WHO Regional Office for Europe's Health Evidence Network (HEN)*. <http://www.euro.who.int/document/e88185.pdf>Accessed 28 March 2019
- Svalastog, A. L., Donev, D., Jahren Kristoffersen, N., & Gajović, S. (2017). Concepts and definitions of health and health-related values in the knowledge landscapes of the digital society. *Croatian medical journal*, 58(6), 431–435. doi.org/10.3325/cmj.2017.58.431
- Talwar, P., & Rahman, M. F. (2015). Assessment of HIV knowledge among university students using the HIV-KQ-18 scale: A cross-sectional study. *South East Asia Journal of Public Health*, 5(1), 33-38. doi.org/10.3329/seajph.v5i1.24849
- Torbati, S., Ismaili, S.T. & Khosravi, N. (2019) A qualitative study of sexual education of teenagers and its underlying factors emphasizing on interaction with parents, case study. *International Journal of Humanities and Social Science*. 9 (12): 52-66.doi:10.30845/ijhss.v9n12p7

- Tung, WC., Cindy Davis, JH., Tung, WK. & Lin, YM. (2008). Knowledge, Attitudes, and Behaviors Related to HIV and AIDS among Female College Students in Taiwan. *Journal of Human Behavior in the Social Environment*, 17(3-4), 361-375. doi.org/10.1080/10911350802068102
- Tung, WC., Cook, DM., Lu, M., Yang, W. (2013). HIV knowledge and behavior among Chinese college students in China and the United States. *Western Journal of Nursing Research*, 35(9), 1171-83. doi.org/10.1177/0193945913486201
- UNAIDS. (2019a). UNAIDS DATA 2018: State of the epidemic https://www.unaids.org/sites/default/files/media_asset/unaid-data-2018_en.pdf Accessed 11 March 2019.
- UNAIDS.(2019b).FACT SHEET–WORLD AIDS DAY 2019. https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf Accessed 22 March 2019.
- United Nations Educational, Scientific and Cultural Organization (UNESCO). (2019).World AIDS Day.<https://en.unesco.org/commemorations/worldaidsday> Accessed 10 January 2020
- Usadolo, S. E. (2019). Christians' perceptions of HIV prevention in Benin City, Nigeria: Implications for HIV/AIDS communication. *Cogent Medicine*, 6(1). doi.org/10.1080/2331205X.2019.1658957
- World Health Organization (WHO). (2016). THEMATIC PAPER 2: Schools and pre-schools promoting health and well-being for all children and adolescents. Promoting Intersectoral and Interagency Action for Health and Well-being in the WHO European Region. *High-level Conference – France*. http://www.euro.who.int/__data/assets/pdf_file/0010/324658/Thematic-Paper-2-Education.pdf Accessed 28 July 2019
- World Health Organization (WHO). (2018). Health promotion: The Ottawa Charter for Health Promotion. <https://www.who.int/healthpromotion/conferences/previous/ottawa/en/> Accessed 25 July 2019
- World Health Organization (WHO). (2019). HIV/AIDS. Updated November 2017 <https://www.who.int/features/qa/71/en/> Accessed 20 April 2019
- World Health Organization(WHO). (2020). Health education https://www.who.int/topics/health_education/en/ Accessed 20 March 2020
- Xiong, Z., Warwick, I.,Chalies, S. (2019). Understanding novice teachers' perspectives on China's sexuality education a study based on the national pre-service teacher education programme. *Sex Education, Sexuality, Society and Learning*, 20 (3), 252-266. doi.org/10.1080/14681811.2019.1640113
- Yuchi,Zh., Jing, L., Endris, A. (2015). *Developing Support Systems for Rural Teachers' Continuing Professional Development*. India-NewDelhi: SAGE Publications.