

Original Article

Knowledge, Attitude, and Practice (KAP) Study of Egyptian physicians towards HIV infection: a multicentre study

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Abstract

Introduction: In Egypt, there is a paucity of new data regarding awareness of HIV/AIDS among physicians. This study aimed to assess the level of awareness, attitude, practice, and knowledge of a sample of Egyptian physicians regarding HIV regarding natural history, epidemiology, and virology, method of transmission, clinical manifestations, diagnosis, prevention, and management.

Methodology: Sixty-eight Egyptian physicians were enrolled in an observational analytic multicenter cross-sectional KAP study in Egyptian tertiary health care facilities covering different localities, including New Valley University, Assiut University, South Valley University, Helwan University, Alexandria University, Aswan University, and Al-Azhar University.

Results: The attitude of physicians towards the privacy of persons living with HIV, was the one with the highest percentage 85.3%. On the other hand, respondents think that only 25% of physicians do not stigmatize HIV patients. Moreover, only 25% of the study group do not stigmatize persons living with HIV. The highest proportion of favorable practice was 39.7% and the lowest was 17.6%. With regard to their knowledge about HIV, the lowest proportion of correct answers to a question was 4.4%, and the highest proportion was 92.6%. Most of the enrolled physicians were found to have a moderate knowledge score, 49/68 (72%). There was a significant difference between different specialties regarding knowledge scores.

Conclusions: There are some knowledge gaps among a sample of Egyptian physicians with regard to HIV/AIDS. In addition, Egyptian physicians may have a moderate degree of undesirable attitude and practice toward HIV/AIDS.

Key words: HIV; AIDS; physicians; knowledge; attitude; practice; Egypt.

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Introduction

The Middle East and North Africa (MENA) are among the top two areas in the world with the most rapid increase of Human Immunodeficiency Virus (HIV) cases. The risk of HIV and unanswered questions are a real problem, especially with the significant increase in the prevalence of HIV, diagnosis of new cases (individuals with HIV infection), and the high

rates of Acquired Immune Deficiency Syndrome (AIDS) related mortality [1].

In low- and middle-income nations like Egypt, there is still some misinformation about HIV/AIDS, particularly about its prevention and transmission. This misinformation can result in unfavorable behaviors toward those who are living with HIV/AIDS [2,3].

People living with HIV/AIDS may find it difficult to receive and maintain a range of healthcare services

due to stigma, which can have a detrimental effect on their quality of life. Moreover, even healthcare professionals themselves have connected HIV/AIDS-related stigma to shortcomings in implementing the crucial services relating to prevention, investigations, and management [4].

The majority of earlier research on HIV/AIDS awareness, whether done in Egypt or elsewhere, was restricted to participants who were not especially at high risk of infection, did not have a sufficient degree of medical knowledge, and were not directly connected to HIV/AIDS [2-6]. Undoubtedly, the knowledge of HIV/AIDS among physicians is expected to have a correlated impact and influence on the levels of information about HIV/AIDS awareness among the general population. In Egypt, there is a paucity of new data regarding awareness of HIV/AIDS among physicians. Furthermore, to the best of the authors' knowledge and the available evidence, no prior study examined the same HIV-related concerns among physicians as we did in this study. The aim of this study was to (i) determine the level of knowledge of a sample of Egyptian physicians about HIV infection, (ii) assess the practices of physicians toward HIV infection, and (iii) investigate the attitude of physicians toward an individual with HIV/AIDS.

Methodology

Ethics Statement

The study was conducted in accordance with the ethical guidelines of the 1975 Helsinki Declaration and was approved by the local ethics committee of the Faculty of Medicine, Assiut University (IRB.17300943). All participants provided informed consent before contributing to this study.

An observational analytic multicentre cross-sectional study was conducted in Egyptian tertiary health care facilities, including New Valley University, Assiut University, South Valley University, Helwan University, Alexandria University, Aswan University, and Al-Azhar University.

Inclusion criteria:

- Practicing physicians with the highest academic degree (MD, Medical Doctorate), with at least one year of post-degree experience, when answering the questionnaire.
- Included specialties: specialties dealing with HIV patients and specialties of high risk of acquiring HIV infection; infectious diseases, internal medicine with its subspecialties including gastroenterology, surgical specialties, neurology,

psychiatry and substance abuse specialists, and dermatology and andrology.

Sample Size Calculation

The study recruited 68 eligible Egyptian physicians in the studied areas fulfilling the inclusion criteria who agreed to participate after signing the consent form by total coverage sampling technique. They were categorized into 3 age groups: group 1; 35-40 years old, group 2; 40.1-45 years old, and group 3; above 45 years old.

Knowledge, attitudes, and practices (KAP) studies are handy tools before further educational intervention to assess whether individuals have enough awareness about a specific subject matter [7]. A self-administered semi-structured, well-designed questionnaire was used in evaluating their KAP towards HIV topics, including personal characteristics of the participant, their knowledge of basic virology, epidemiology, prevention, general treatment measures, psychiatric issues, pathogenesis, organ affection, and clinical manifestations. All questions, used in our questionnaire, were adopted from previous validated HIV questionnaires of the same nature [2-6,8-17].

Questionnaires were answered in front of data collectors to prevent any bias of information reviewing before answering the questionnaire and without names labeling them. Each questionnaire was only examined after collecting all data from the whole study group. Keeping the confidentiality of each questionnaire and its relation to study subjects was essential.

Before collecting final data, a pilot study was carried out on 10 participants to fulfill the following purposes: Testing the questionnaire form and its reliability and detecting any modifications, estimating the time needed to collect the data, and detecting the difficulties that may arise and how to deal with them.

Attitude and practice results were categorized as favorable and unfavorable according to what is supposed to be the ideal scenario (positive practice and positive attitude towards persons living with HIV).

Statistical analysis

Data were cleaned and verified, then entered using software SPSS version 25 for Windows. Firstly, the normality test was performed to verify that the results were normally distributed. Frequencies and descriptive statistics were carried out. A chi-square test was done. The probability of less than 0.05 is used as the cut-off point for all significant tests. The scoring system of knowledge degree was calculated as (High knowledge is a score above mean + 1SD), (Low knowledge is a

score below mean 1SD) and (middle knowledge from mean - 1SD to mean + 1SD).

Results

Sixty-eight physicians were enrolled in this study; 30 (44.1%) were male and 38 (55.9%) were female. In age group 1 there were 43 physicians (63.2%), in group 2 there were 18 physicians (26.5%), and in group 3 there were 7 physicians (10.3%). Most of the enrolled physicians belonged to the Internal Medicine specialty with its subspecialties (39.7%) and infectious diseases (27.9%). Regarding Surgery and its subspecialties, there were 6 physicians (8.8%). In addition, three physicians belonged to the dermatology and andrology specialty (4.4%). Thirteen physicians were enrolled belonging to the specialty of neurology, psychiatry, and substance abuse (19.1%).

Table 1 shows the proportion of favorable attitudes (defined as positive attitudes towards persons living with HIV) of the enrolled Egyptian physicians regarding different questions. The highest percentage of favorable attitudes to a question was 85.3% and the lowest was 25%.

As shown in Table 2, there was a significant difference ($p = 0.001$) among age groups regarding giving a favorable attitude to keeping students with HIV out of school. Most of (age group 1) and (age group 2) showed favorable attitudes; 38/43 (88.4%) and 14/18 (77.8%), respectively. Unlike the two younger age groups, most of age group 3, 5/7 (71.4%) gave unfavorable attitudes.

There was a significant difference ($p = 0.000$) among age groups in terms of providing a favorable attitude to moving out a family member living with HIV; 55/68 (80.9%). Most of (age group 1) and (age group 2) showed favorable attitudes; 39/43 (90.7%) and 14/18 (77.8%), respectively. Unlike the two younger age groups, most (age group 3) 5/7 (71.4%) gave unfavorable attitudes. This means that younger ages have better attitudes towards HIV patients than older ages.

There was a significant difference ($p = 0.033$) among age groups regarding giving a favorable attitude to working as a volunteer with AIDS patients. Most of (age group 2) and (age group 3) gave unfavorable attitudes; 14/18 (77.8%) and 6/7 (85.7%), respectively.

Table 1. Attitude of the study group.

Questions	Study group (n = 68); n (%)		
	Yes	No	Do not Know
We should keep HIV-positive students out of class	10 (14.7)	54 (79.4)*	4 (5.9)
You are willing to offer time to help persons living with HIV.	25 (36.8)*	36 (52.9)	7 (10.3)
You believe that if a member of your family gets HIV while living with you, he should leave the house.	7 (10.3)	55 (80.9)*	6 (8.8)
Would you feel at ease sharing a bench with someone who has HIV?	32 (47.1)*	32 (47.1)	4 (5.9)
Would you keep such information private if you knew that a member of your mosque or church was HIV positive?	58 (85.3)*	2 (2.9)	8 (11.8)
If a member of your mosque is HIV positive, in your opinion, he should be allowed to hold a leadership position like Imam or be eligible for certain privileges.	45 (66.2)*	17 (25)	6 (8.8)
Would you accept working in the same department with an HIV-positive doctor?	30 (44.1)*	27 (39.7)	11 (16.2)
Would you be willing to provide medical treatment for a sick HIV-positive relative in your home or neighbourhood?	32 (47.1)*	26 (38.2)	10 (14.7)
If someone in your family had HIV/AIDS, would you feel ashamed?	36 (52.9)	20 (29.4)*	12 (17.6)
Would you stay friends with your friend if they were HIV positive?	36 (52.9)*	22 (32.4)	10 (14.7)
Should an HIV-positive student who is your son's classmate be permitted to continue their studies in this school?	32 (47.1)*	25 (36.8)	11 (16.2)
Should a teacher who tests positive for HIV be permitted to continue teaching at your son's school?	28 (41.2)*	32 (47.1)	8 (11.8)
How much do medical professionals stigmatize HIV/AIDS patients?			
Not at all		17 (25)*	
Moderate		35 (51.5)	
Extremely		16 (23.5)	
Reasons why one would not want to work on HIV:			
fear		41 (60.3)	
poor patient behaviour		17 (25)	
lack of interest		10 (14.7)	
emotional reasons		10 (14.7)	
lack of training		30 (44.1)	
Motivating elements to work on HIV:			
training on HIV care		33 (48.5)	
counselling on HIV care		26 (38.2)	
good patient behaviour		19 (27.9)	
high income		28 (41.2)	
personal satisfaction		15 (22.1)	
reduced stigma		18 (26.5)	

*Favourable attitude.

Table 2. Relation between age groups and physicians’ attitudes that of significant difference between age groups.

Questions	Favourable attitude, n (%)			p value
	age group 1	age group 2	age group 3	
We should keep HIV-positive students out of class	38/43 (88.4)	14/18 (77.8)	2/7 (28.6)	0.001*
You are willing to offer time to help persons living with HIV.	20/43 (46.5)	4/18 (22.2)	1/7 (14.3)	0.033*
You believe that if a member of your family gets HIV while living with you, he should leave the house.	39/43 (90.7)	14/18 (77.8)	2/7 (28.6)	0.000*

*Significant p-value < 0.05.

On the other hand, regarding attitude, there was no significant difference between males and females among different specialties.

Table 3 shows the proportions of the favorable practice of the enrolled physicians regarding different questions. As shown in the table, the highest percentage of favorable practice was with regards to ‘not allowing testing laboratory to inform relatives of persons living with HIV’ (39.7%). The lowest proportion of favorable practice was regarding their ability to ‘counsel with persons living with HIV’ (17.6%) and ‘their ability to adjust their medications’ (20.6%). It was noticed also that only 25% (17) of enrolled physicians think that medical professionals do not stigmatize HIV/AIDS patients. Not only that, but also, it was also found that most enrolled physicians think that the main two reasons why one would not want to work on HIV are fear (60.3%) and lack of training (44.1%). In addition, most enrolled physicians think that the main motivating element to work on HIV is training on HIV care (48.5%), followed by the need for a pay rate increase or incentive for working with such complex cases (41.2%).

Regarding knowledge questions, as shown in Table 4, the lowest proportion of correct answers to a particular question was 4.4% and 13.2%, about the role of pulling out the penis before ejaculation in transmitting HIV and the prevalence of HIV among males and females respectively. As shown in Table 3, the highest proportion of answers about the role of tattoos and vaginal fluid in transmitting HIV were 92.6% and 91.2% respectively.

The knowledge score of the study group was calculated for each physician. The mean knowledge

score was 36.19 ± 7.97 . Maximum and minimum scores were 54 and 17 respectively. The knowledge level was categorized into three groups: high, moderate, and low (above 44, 28 - 44, and below 28 respectively).

As shown in Table 5, most of the enrolled physicians were found to be of moderate knowledge score, 49/68 (72%). Regarding knowledge score, we didn’t find any significant difference between male and female physicians and among different age groups. There was a significant difference between different specialties regarding knowledge scores; within each specialty, the highest percentage of high knowledge scores was among the infectious diseases specialty (31.6%) and the Internal medicine specialty (14.8%) (Table 5).

Discussion

In our study, 14.7% (10/68) of participants had a sufficient level of knowledge of HIV/AIDS. Whereas, those with poor knowledge comprised 13.2% (9/68) of the participants. Most of the Egyptian physicians enrolled in the study had an average knowledge score and represented 72% (49/68) of the total participants.

Lack of knowledge has also been reported in other countries, including Middle East countries (13-15). In their study, Khandwalla *et al.* 2000, found that general practitioners and specialists in Pakistan lacked awareness of sexually transmitted illnesses (STIs), including HIV/AIDS, and recommended increased training in counseling and management to prevent future spread [13]. In contrast, other research in developed countries found that general practitioners had a high level of awareness and knowledge [14].

Table 3. Practice of the study group.

Questions	Study group (n = 68), n (%)		
	Yes	No	Do not Know
How at ease are you changing an HIV patient's medication?	14 (20.6)*	21 (30.9)	33 (48.5)
Would you purchase vegetables from someone selling them if you knew they were HIV positive?	24 (35.3)*	37 (54.4)	7 (10.3)
Do you believe the testing facility will be required to inform all of the subject's partners if the test results are positive for HIV?	26 (38.2)	27 (39.7)*	15 (22.1)
How confident are you in your ability to offer HIV/AIDS patients counselling			
Not at all		21 (30.9)	
Moderate		35 (51.5)	
Extremely		12 (17.6)*	

*Favourable practice.

Table 4. Knowledge of the study group.

Knowledge Questions (n = 59)	Right answers by Study group n = 68 (%)	Right answer
Does pulling out the penis before a man cums, prevent a woman from contracting HIV when having sex?	3 (4.4)	Yes
Women are more likely than men to have HIV.	9 (13.2)	Yes
The majority of HIV/AIDS patients have friendly, social, and talkative personalities.	15 (22.1)	Yes
Saliva is a potential way to transfer HIV.	19 (27.9)	No
Breastfeeding can transmit HIV from a mother who has it.	21 (30.9)	Yes
ART-taking HIV patients who are virally suppressed do not spread the virus to their sexual partners.	23 (33.8)	Yes
People who contract HIV through sexual activity just pay the price.	27 (39.7)	No
Among non-enveloped viruses is HIV	27 (39.7)	Yes
An important place for HIV transmission is barbershops.	29 (42.6)	No
HIV nucleic acid may integrate into the DNA of the host cell and manifest as a provirus.	30 (44.1)	Yes
Reverse transcriptase (RT) is present in HIV	31 (45.6)	Yes
Tears are well known to transmit HIV.	32 (47.1)	No
After a positive HIV antibody test, there is no need for further confirmation with a western blot test.	32 (47.1)	No
Antiretroviral medications can cause neuropsychological adverse effects.	32 (47.1)	Yes
AIDS can result in Sensory polyneuropathy and Gillian Bare Syndrome.	33 (48.5)	Yes
One week after having intercourse, a person can find out if they have HIV by taking an HIV test.	38 (55.9)	No
Sweat has the potential to transfer HIV.	38 (55.9)	No
Sharing a room with an HIV-positive individual brings problems.	38 (55.9)	No
HIV is prevented by using condoms properly and consistently.	39 (57.4)	Yes
Urine is a potential way to transfer HIV.	39 (57.4)	No
HIV is only spread by individuals who conduct morally dubious lives.	40 (58.8)	No
The risk of HIV transmission can be decreased by avoiding sexual activity.	41 (60.3)	Yes
All HIV-positive women who become pregnant will give birth to children who have AIDS.	41 (60.3)	No
If a man or woman has oral sex with them—mouth on vagina—they can both contract HIV.	41 (60.3)	Yes
The most likely resembling illness for an acute HIV infection's symptoms is mononucleosis.	41 (60.3)	Yes
People with HIV who do not have AIDS live normal lives.	43 (63.2)	Yes
Using an AIDS medication Antiretroviral medication reduces a pregnant HIV-positive woman's risk of passing the virus to her unborn child.	43 (63.2)	Yes
Kissing from mouth to mouth might spread HIV.	43 (63.2)	No
If a woman has sex when she is in period, she could not contract HIV.	43 (63.2)	No
From the toilet seat in a public lavatory, HIV can spread.	43 (63.2)	No
Receiving services from an HIV-positive person will provide issues.	43 (63.2)	No
HIV core protein p24 detection aids in the diagnosis of the window phase.	43 (63.2)	Yes
Detecting HIV transfer during labour from an HIV-positive mother	44 (64.7)	Yes
By sharing a hot tub or pool with a person who has HIV, one can contract the disease.	45 (66.2)	No
HIV is spread via mosquito bites.	45 (66.2)	No
AIDS/HIV can lead to CNS lymphoma.	45 (66.2)	Yes
HIV can cause vascular myelopathy and progressive multifocal leukoencephalopathy.	46 (67.6)	Yes
Is it possible to limit the risk of HIV transmission by only having sex with one dependable, healthy partner?	48 (70.6)	Yes
HIV can be spread by utilizing infected personal items like clothing, a comb, and towels.	48 (70.6)	No
Touching an infected individual, such as shaking hands or giving a hug, might spread HIV.	48 (70.6)	No
Sharing a glass of water and using a person's contaminated eating utensils can spread HIV.	48 (70.6)	No
Working with HIV-positive people carries a risk of infection	49 (72.1)	No
Providing care and support for people living with HIV will have issues	49 (72.1)	No
Women who douche after sex would not contract HIV.	50 (73.5)	No
Coughing and sneezing both carry the risk of HIV transmission.	50 (73.5)	No
There is no known remedy for AIDS.	51 (75)	Yes
CD4+ T cells (T helper cells) are those who infected with HIV	51 (75)	Yes
AIDS sufferers are more likely to commit suicide	51 (75)	Yes
Sharing cigarettes increases the risk of contracting HIV.	52 (76.5)	No
After having intercourse, showering and washing genitalia and intimate areas can make a person avoid contracting HIV.	52 (76.5)	No
HIV is identified among RNA viruses	52 (76.5)	Yes
Sharing a toothbrush could transmit HIV.	54 (79.4)	Yes
A person may have protection against HIV/AIDS by receiving a vaccination.	58 (85.3)	No
Having an open wound makes HIV transmission possible from HIV infected person.	59 (86.8)	Yes
HIV-positive individuals can survive for years without developing AIDS or showing any symptoms	60 (88.2)	Yes
Semen is a way to spread HIV.	61 (89.7)	Yes
HIV can cause opportunistic infections of the CNS like Toxoplasmosis, Cryptococcal meningitis, and Cytomegalovirus	61 (89.7)	Yes
When someone gets a tattoo, they could contract HIV.	62 (91.2)	True
Vaginal fluid is among the ways that HIV can spread.	63 (92.6)	True

The knowledge score was related significantly to the specialty of the physicians enrolled in the study. This reflects the fact that physicians may not have enough knowledge and ability to give counseling to HIV patients and their relatives (Table 5).

We investigated knowledge of various specialties including basic virology, epidemiology, preventing and controlling infections, transmission of HIV infection, general treatment measures, psychiatric issues, pathogenesis, organ affected, and clinical manifestations. Correct answers to each question ranged from 4.4% to 92.6% (Table 3). The results of the knowledge questions of the participants demonstrated that awareness about HIV/AIDS needs different strategies to be improved and importantly including future educational campaigns to support behavior changes. The participants demonstrated an acceptable level of knowledge in some questions, such as the role of touch, toothbrush, tattoo, semen, and vaginal fluid in the transmission of HIV. However, misconceptions about other information were detected, such as the role of saliva, breastfeeding, pregnancy, barbershops, tears, and sweat in transmitting HIV infection (Table 3). Furthermore, it was found that enrolled Egyptian physicians still have inadequate knowledge about the basics of the virology of HIV and the psychosocial characteristics of persons living with HIV.

Regarding the attitude of the study group towards HIV/AIDS, favorable responses ranged from 25% to 85.3%. Unfortunately, the present study found that about 23.5% of physicians strongly stigmatize individuals living with HIV. On the other hand, only 25% do not stigmatize them at all. They had a favorable attitude regarding questions about keeping the confidentiality of HIV patients and keeping HIV patients away from the surrounding community. Despite that, there was an unacceptable proportion of

favorable attitudes in questions about helping HIV patients, working with them, and letting their children with them in the same classroom.

It was also observed that most enrolled physicians think that the main two reasons why they would not want to work in the HIV area are fear (60.3%) and lack of training (44.1%). We could overcome issues like ‘Fear and lack of training’ by developing a proper program of education that includes training courses around HIV for physicians to raise awareness and teach them the most important and practical ways of dealing with HIV and to minimize any misconceptions and/or points of confusion about HIV.

In addition, most enrolled physicians think that the main motivating element to work in the HIV area is training on HIV care (48.5%) and higher payment incentives (41.2%). These latter points seem to be reasonable. As it was mentioned before, training is very essential to motivate physicians to contribute more in this area of work. Also, their comment on the need for payment incentives could reflect their fear of exposing themselves to the risk of infection. Health Authorities may need to amend the existing policies and provide additional support to encourage physicians to work more in the field of HIV.

Regarding practice questions, favorable responses ranged from 17.6% to 39.7%. Our study found that 30.9% of the enrolled physicians were not confident in engaging and counseling HIV/AIDS patients. The proportion of favorable responses in all practice questions seems to be unsatisfactory, and this correlates with the results of attitude questions about lack of training. Physicians are still unaware enough about ways of infection, they still need more training in diagnosis, treatment, and prevention of HIV/AIDS and still need to know more about the importance of patient confidentiality. To our knowledge, there is a lack of

Table 5. Relation between grades of knowledge score versus age, gender, and specialty.

	Grades of knowledge score, n (%)			p
	Low knowledge score	Moderate knowledge score	High knowledge score	
Gender:				0.224
Male	2 (6.7)	22 (73.3)	6 (20)	
Female	7 (18.4)	27 (71.1)	4 (10.5)	
Age group (years):				0.424
35-40	7 (16.3)	29 (67.4)	7 (16.3)	
40.1-45	2 (11.1)	14 (77.8)	2 (11.1)	
Above 45	0	6 (85.7)	1 (14.3)	
Specialty:				0.019*
Infectious diseases	1 (5.3)	12 (63.2)	6 (31.6)	
Internal medicine and its subspecialties	7 (25.9)	16 (59.3)	4 (14.8)	
Surgical specialties	0	6 (100)	0	
Dermatology and Andrology	0	3 (100)	0	
Psychiatry and Neurology	1 (7.7)	12 (92.3)	0	
Total	9 (13.2)	49 (72)	10 (14.7)	

*Significant p value < 0.05.

research studies regarding similar questions conducted on similar study groups.

The results of our study are in line with the results of Vista *et al.* 2018 who reported a high rate of negative attitudes (61%) and bad practices (55.7%) of their enrolled dermatological physicians [16]. Also, Fido and Al Kazemi (2002) found that Kuwaiti family physicians expressed negative attitudes toward homosexuality and AIDS patients in general; with 83% of enrolled physicians do not prefer managing AIDS patients [16].

On the other hand, a study held in Barbados found that physicians had better attitudes towards individuals living with HIV but also showed inadequate knowledge about HIV/AIDS [17].

To our knowledge, the present study is the first to enroll Egyptian physicians of specialties that are closely related to the field of HIV/AIDS and of a higher degree of education (MD holders), working in different tertiary care hospitals belonging to seven different Egyptian universities. However, our results unexpectedly showed that Egyptian physicians lack knowledge about HIV/AIDS and have a discriminatory attitude towards persons living with HIV.

The main limitation of this study is the small sample size, and this refers to the characteristics of the enrolled group, physicians with MDs who were approved to be involved in the study. Additionally, there are other limitations like, no random selection being used, cross-sectional design snapshot of time, and social desirability bias for the attitude questions.

Conclusions

This study examined HIV/AIDS-related knowledge, attitudes, and practice among Egyptian physicians. Accordingly, the following conclusions are made:

- a. Since the present finding revealed that a few numbers of the physicians, 10 (14.7%) had high knowledge scores and 49 (72%) of the Egyptian physicians showed average knowledge scores, it is seemingly possible to conclude that there was some sort of knowledge gap among Egyptian physicians, and this was significantly related to their specialty. Not only that but also there is fear and lack of training. All these defects had an impact on their attitudes towards HIV/AIDS.
- b. The findings show a desirable attitude towards HIV/AIDS in more than 50% of the study group that was obtained only in 5 questions (38.5%). Moreover, only 17 (25%) of the study group do not stigmatize persons living with HIV.

- c. The findings showed that most Egyptian physicians do not want to work in HIV area because of some kind of fear and lack of training, 41 (60.3%) and 30 (44.1%), respectively. Similarly, it was found that most of the study group needed more training on HIV care and pay incentives as motivating elements to work in the HIV area, 33 (48.5%) and 28 (41.2%).
- d. Regarding practice questions, the number of Egyptian physicians enrolled in the present study who gave desirable answers to each question did not exceed 27 (39.7%) for any question asked.

Recommendations

A more robust and effective education program about HIV/AIDS for Egyptian physicians of different specialties, either dealing directly with HIV patients or who are at risk of acquiring infection, should be designed and implemented as that would alleviate the deficiencies and misconceptions observed in this study concerning knowledge about HIV/AIDS, undesirable attitudes they had towards HIV/AIDS and undesired practices so that it would improve health care practices among the Egyptian physicians towards HIV infection, change any negative attitudes of physicians and improve their practices.

Ethical approval and consent to participate

The study was conducted in accordance with the ethical guidelines of the 1975 Helsinki Declaration and was approved by the local ethics committee of the Faculty of Medicine, Assiut University (IRB.17300943). All participants provided informed consent before contributing to this study.

Authors' Contributions

Mohamed Farouk, Principal investigator, Questionnaire development, Collecting data, Editing; Helal F. Hetta, Questionnaire development, Study design, writing and reviewing; Mohamed Abdelghani, Collecting data; Reem Ezzat, Collecting data; Ehab F Moustafa, Collecting data; Sahar Hassany, Collecting data; Khaled Aboshaera, Questionnaire development, Collecting data; Lobna Abdelwahid, Collecting data; Mohamed Alboraie, Collecting data; Shamardan Bazeed, Collecting data; Nermeen Abdeen, Collecting data; Medhat A. Saleh, Questionnaire development, Study design, Medical statistics; Mohamed El-Kassas, Questionnaire development, Study design, Collecting data, Revision and supervision

References

1. UNAIDS (2023) Global HIV & AIDS statistics - Fact sheet. Available: <https://www.unaids.org/en/resources/fact-sheet>. Accessed: July 2024.

2. Bhowmik J, Biswas RK (2022) Knowledge about HIV/AIDS and Its transmission and misconception among women in Bangladesh. *Int J Health Policy Manag* 11: 2542-2551. doi: 10.34172/ijhpm.2022.6321.
3. Choudhary HA, Ali RA, Altaf S (2015) Knowledge, behaviour and attitudes regarding HIV/AIDS among undergraduate students in an Irish University. *Int J Surg Med* 1: 58-66. doi: 10.5455/ijsm.20150814034728.
4. Joint United Nations Programme on HIV/AIDS (2017) Confronting discrimination: Overcoming HIV-related stigma and discrimination in health-care settings and beyond. Available: <https://www.unaids.org/en/resources/documents/2017/confronting-discrimination>. Accessed: Sep 2019.
5. Feyissa GT, Abebe L, Girma E, Woldie M (2012) Stigma and discrimination against people living with HIV by healthcare providers, Southwest Ethiopia. *BMC Public Health* 12: 522. doi: 10.1186/1471-2458-12-522.
6. Shah S, Elgalip A, Al-Wahaibi A, Al-Fori M, Raju P, Al-Skaiti M, Al-Mashani HN, Duthade K, Omaar I, Muqeerullah M, Mitra N, Shah P, Amin M, Morkos E, Vaidya V, Al-Habsi Z, Al-Abaidani I, Al-Abri SS (2020) Knowledge, attitudes and practices related to HIV stigma and discrimination among healthcare workers in Oman. *Sultan Qaboos University Med J*: 29-36. doi: 10.18295/squmj.2020.20.01.005.
7. National AIDS Control Committee Central Technical Group (2020) The impact of HIV and AIDS in Cameroon through 2020. Available: www.healthpolicyinitiative.com/Publications/Documents/125_0_1_Cameroon_EN_Singles_Reduced_acc.pdf. Accessed: Apr 2015.
8. Fido A, Al Kazemi R (2002) Survey of HIV/AIDS knowledge and attitudes of Kuwaiti family physicians. *Fam Pract* 19: 682–684. doi: 10.1093/fampra/19.6.682
9. Gemson DH, Colombotos J, Elinson J, Fordyce J, Hynes M, Stoneburner R (1991) Acquired immunodeficiency syndrome prevention. Knowledge, attitudes, and practices of primary care physicians. *Arch Intern Med* 151: 1102–1108. doi: 10.1001/archinte.151.6.1102.
10. Kittleson MJ, Venglarcik JS (1991) Assessing primary care physicians' knowledge about HIV transmission. *J FAM Pract* 31: 661–663.
11. Quach L, Mayer K, McGarvey ST, Lurie MN, Do P (2005) Knowledge, attitudes, and practices among physicians on HIV/AIDS in Quang Ninh, Vietnam. *AIDS Patient Care STDS* 19: 335–346. doi: 10.1089/apc.2005.19.335.
12. Khandwalla HE, Luby S, Rahman S (2000) Knowledge, attitudes, and practices regarding sexually transmitted infections among general practitioners and medical specialists in Karachi, Pakistan. *Sex Transm Infect* 76: 383–385. doi: 10.1136/sti.76.5.383.
13. Ooi C, Dayan L, Yee L (2004) Knowledge of post exposure prophylaxis (PEP) for HIV among general practitioners in northern Sydney. *Sex Transm Infect* 80: 420. doi: 10.1136/sti.2004.009977.
14. Askarian M, Mirzaei K, Cookson B (2007) Knowledge, attitudes, and practice of Iranian dentists with regard to HIV-related disease. *Infect Control Hosp Epidemiol* 28: 83–87. doi: 10.1086/509851.
15. Moghimi M, Marashi SA, Kabir A, Taghipour HR, Faghihi-Kashani AH, Ghoddoosi I, Alavian SM (2009) Knowledge, attitude, and practice of Iranian surgeons about blood-borne diseases. *J Surg Res* 151: 80–84. doi: 10.1016/j.jss.2007.12.803.
16. Fido A, Al Kazemi R (2002) Survey of HIV/AIDS knowledge and attitudes of Kuwaiti family physicians. *Fam Pract* 19: 682–684. doi: 10.1093/fampra/19.6.682.
17. Massiah E, Roach TC, Jacobs C, St John AM, Inness V, Walcott J, Blackwood C (2004) Stigma, discrimination, and HIV/AIDS knowledge among physicians in Barbados. *Rev Panam Salud Publica/Pan Am J Public Health* 16: 395-401. doi: 10.1590/s1020-49892004001200005.

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