# Improving Knowledge and Attitudes of Health Care Providers Following Training on HIV/AIDS Related Issues: A Study in an Urban Turkish Area

## Sağlık Çalışanlarının HIV/AIDS ile İlgili Konularda Eğitildikten Sonra Artan Bilgi ve Tutumları: Türkiye'de Kentsel Alanda Yapılmış Bir Çalışma

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**ABSTRACT Objective:** The objective of the study was to assess HIV/AIDS related knowledge, attitudes and risk perception among health care providers in İzmir. **Material and Methods:** A pretest and posttest patterned intervention study was conducted in 2007 among health care providers participating in a training course on HIV/AIDS and universal precautions. The participants consisted of 158 health care professionals from 7 public hospitals and 2 public dental clinics. Information was collected regarding demographic details, HIV/AIDS related knowledge, attitudes and perceptions about patients at the beginning and the end of the course. Pre- and post-training dichotomous point scale scores were compared. **Results:** Of the participants, 72.6 % were females. Only 30.0 % of the respondents reported a scalpel or needle stick injury at least once last year. Some of the participants (40%) thought that it was necessary to take extra infection control precautions for patients with HIV. The average pre- and post-training mean knowledge scores were 9.32 ± 2.1 (3-13) and 12.76 ± 2.3 (5-17), respectively. The mean pre- and post-training beliefs scores were 12.37 ± 3.1 (3-19) and 15.57± 3.8 (6-22), respectively. There were significant differences in the pre-and post-training mean scores of the responses related to attitudes toward patients with AIDS. **Conclusion:** There was improvement in knowledge and negative attitudes on patients with AIDS at the end of the training. The results of this study suggested that the negative attitudes of health care providers towards individuals with AIDS due to the fear of transmission and inadequate knowledge could be improved with training.

**Key Words:** Acquired immunodeficiency syndrome; attitude; HIV; training; knowledge; health personnel

**ÖZET Amaç:** Çalışmanın amacı, İzmir'deki sağlık çalışanlarında HIV/AIDS ile ilgili bilgi, tutum ve risk algısını değerlendirmektir. **Gereç ve Yöntemler:** 2007 yılında HIV/AIDS ve genel önlemler ile ilgili bir eğitime katılan sağlık çalışanlarında ön test ve son test şeklinde girişimsel bir çalışma yapılmıştır. Katılımcılar 7 kamu hastanesi ve 2 kamu diş kliniğinde çalışan 158 sağlık çalışanından oluşmaktadır. Kursun başında ve sonunda, demografik detaylar, HIV/AIDS ile ilgili bilgi, tutum ve hastalara ilişkin algılar hakkında bilgi toplanması amacıyla anket uygulanmıştır. Katılımcıların bu dikotom puanlı (0 ve 1) anketten, eğitimden önce ve sonra aldıkları puanlar karşılaştırılmıştır. **Bulgular:** Katılımcıların %72,6'sı kadındır. Yanıt verenlerin %30'u geçen yıl en az bir kez bistüri veya iğne ile yaralanmaya maruz kaldığını bildirmiştir. Katılımcıların %40'ı HIV pozitif hastalar için ek enfeksiyon kontrol önlemleri almak gerektiğini düşünüyorlardı. AIDS/HIV ile ilgili ortalama bilgi puanı, kursun sonunda, başlangıca göre istatistiksel açıdan anlamlı bir şekilde daha yüksek saptanmıştır. Eğitimden önceki ortalama bilgi puanı 9,32 ± 2,1 (3-13) iken, eğitimden sonra 12,76 ± 2,3 (5-17) bulunmuştur. Katılımcıların hastalara karşı tutumlarla ilgili ortalama puanları ise eğitimden önce 12,37 ± 3,1 (3-19) ve eğitimden sonra 15,57 ± 3,8 (6-22) şeklinde hesaplanmıştır. **Sonuç:** Eğitimin sonunda HIV/AIDS ile yaşayan hastalarla ilgili bilgilerde ve olumsuz tutumlarda düzelme olmuştur. Sağlık çalışanlarının HIV/AIDS ile yaşayan kişilere karşı negatif tutum benimsemelerinin nedenleri olan hastalığın bulaşması korkusu ve bilgi yetersizliğinin, hizmet içi eğitimlerle düzeltilebileceği anlaşılmıştır.

**Anahtar Kelimeler:** Edinilmiş immünyetmezlik sendromu; tutum; HIV; eğitim; bilgi; sağlık personeli

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The World Medical Association (WMA) reported that many factors give rise to the spread of the disease, such as poverty, homelessness, illiteracy, stigma, discrimination, and gender-based inequality.[1] These social, economic, legal and human rights factors affect not only the public health dimension of HIV/ AIDS but also health care providers (HCPs) and patients, their decisions and relationships.[1] Duyan described that radical changes happened in psychological, social, economic, physical and sexual lives of people who live with HIV/ AIDS.[2] HIV/AIDS is not only a health problem but also a social problem.[2]

General hysteria and a lack of information about HIV lead to HIV- infected people being isolated from the society. Inadequate social and family support and poor information on HIV are important barriers in preventing the population including HCPs from being judgmental and mistreating the person and this, in turn, prevents treatment and facilitates the spread of the disease. Stigma related to HIV affects the decision of an individual with HIV risk to take an HIV test or take preventive measures to protect others from the disease. One of the most important factors in a patient receiving medical treatment is the knowledge, beliefs and behavior of HCPs. Although the risk of infection is very low, HCPs report that they are concerned and unwilling to treat HIV-infected patients.[3-9]

Although applying universal precautions is adequate to protect HCPs from HIV transmission through occupational exposure, AIDS can call out irrational emotions in HCPs.[3-9] Oni reported that HIV/AIDS was a social issue and that education may be a means to stop the spread of the disease.[10] HIV care requires an integrated team providing various services; thus, continuing education is required for all team members.[11] The WMA reported that the education of physicians in the relevant psychological, legal, cultural and social dimensions of HIV/AIDS was vital.[1] Local attitudes, beliefs and educational policies all play a role in shaping the attitudes of nursing and medical students toward people with HIV/AIDS.[12-14] Educators must be prepared to help students overcome prejudice and increase their capacity for empathy toward AIDS patients.[12-14] Their curricula should include social and behavioral aspects of HIV and AIDS. They should be given sympathetic messages regarding HIV-positive people.[12-14]

HIV/AIDS prevalence is low in Turkey. The present epidemiological stage of HIV in Turkey and the low level of injecting drug use compared to other countries, make it reasonable to assume that commercial sex work is the main driver of the epidemic. Commercial sex work is common, and condom use has been shown to be low.[15,16] It is also important to note that sex workers from Eastern Europe and the former Soviet Union come to Turkey on tourist visas and engage in sex workers.[17] According to the data of the Ministry of Health Primary Health Care General Directorate, HIV/AIDS incidence was 0.23 per 100.000 in 2000, and 0.46 per 100.000 in 2005 and HIV/AIDS incidence was 0.38 per 100.000 in males and 0.18 per 100.000 in females in 2003.[18] The disease was included in the notifiable diseases list of the Ministry of Health in 1987; while in 1987 screen testing started in all blood/tissue/organ donations, registered sex workers and before any major operations. In addition, injections and all other invasive medical devices had to be disposable.[16] In 1993, the health sector was educated on universal prevention measures regarding infectious diseases.[19] The National AIDS Commission (NAC) was established in 1996 in Turkey. NAC headed by the Ministry of Health, has a multi-sectoral mandate and involves governmental and non-governmental organizations, academics, professional associations dealing with HIV/AIDS and the United Nations (UN) agencies.[16]

Sexual education of children and adolescents within the family is very poor, and sometimes it is forbidden to talk about sexuality in traditional Turkish families. According to customs and moral values of the society, sexuality is a shame, and extramarital sexual relations are unacceptable.[17,18] Although traditional values and customs still have an important impact, young people in some parts of Turkey have greater sexual freedom than previous generations, and they are also at greater risk of sexually transmitted infections, including HIV.[17,20] Some studies examined levels of HIV knowledge

among adolescents, healthcare professionals, sex workers, marine workers and the general population in Turkey.[19,21,22] Misinformation and lack of knowledge was common in most studies. News about HIV/AIDS in the early years reinforced the perception that HIV/AIDS was a gay disease. As a result, some people believed that if a person is not gay, then there is no need to think about HIV/AIDS. Some people thought that when a person became ill due to HIV infection, it was his or her own fault.[2,19] As in most countries in the initial stage of the epidemic, stigmatization and discrimination are widespread in Turkey, making vulnerable groups hard to reach and targeted prevention difficult to implement.[15,20]

In the study of the Turkish Sociological Association, Turkish respondents complained of discrimination toward HIV/AIDS patients due to lack of knowledge about HIV and fear of transmission. HCPs had very limited contacts with HIV-positive people and hesitated to provide treatment when they encountered an HIV-positive patient.[20]

Furthermore, according to the study of the Turkish Sociological Association, health professionals in focus groups stated that the lack of protective tools and technologies-such as latex gloves, needle stick dispensaries, and post-exposure prophylaxis-also increased the reluctance among medical staff to treat HIV-positive patients.[20] They also noted the lack of support in case of an occupational accident.[20]

The aim of this study was to determine the knowledge level and the beliefs of HCPs toward HIV/AIDS after training on HIV/AIDS and to determine the problems met when treating infected patients and prevention practices in İzmir metropolitan hospitals.

## MATERIAL AND METHODS

A pre-test and post-test intervention study was conducted in İzmir in 2007. In order to collect data, both quantitative and qualitative methods were used.

İzmir is the second highest risk area because of the large number of reported HIV/AIDS cases; thus, training health care providers is important in İzmir.

### PARTICIPANTS

A convenience sampling of 158 HCPs working in seven public hospitals and two dental hospitals affiliated with the Ministry of Health participated in a training program on HIV/AIDS. All HCPs in those hospitals were invited for the training of trainers program. Participants were voluntary to attend the training program and the study and they were interested in being trainers for their colleagues in their hospitals. They were trained in a half-day trainers' training program. The following topics were described in the sessions of the training program; transmission of HIV/AIDS, ways of protection, universal infection control, responsibilities of the HCPs in resolving the social and other problems of the patients living with HIV, ways to cope with their own problems for HCPs, communications with patients with HIV and legal rights and responsibilities of HCPs. The aim of this training program was to train trainers among health care personnel on HIV/AIDS for all hospitals of the Ministry of Health in Izmir. The tutors were the authors, a lawyer and a psychiatrist.

### PROCEDURE

Quantitative data were obtained using an anonymous structured and self-administered questionnaire, before and after the training. Questionnaire items were developed from literature reviews and it involved questions assessing demographic characteristics, work life, practices related to protection from infections, and knowledge and beliefs on patients with HIV/AIDS. Before data collection, the questionnaire was pilot-tested with some HCPs in a university hospital.

The qualitative data were collected using confidential essay questions before they completed the questionnaire at the beginning of the program. In order to learn the problems of HCPs and anything they wished to share, three open ended questions were asked: **i**. What problems do you face while treating HIV infected patients?, **ii** Which areas do you think you need the most education and sup-

port?, **iii** Do you have any experiences you wish to share? In addition, we asked the participants to "list the major strengths and the main shortcomings of the training program" at the end of the program. The qualitative data were organized by the researchers. A code list for data was developed and one of the authors rated notes on each open-ended questions.

The study received ethical approval and permission from the Ministry of Health. Each potential participant was informed on the purpose of the study, and the fact that the study was completely voluntary and all data collected would remain confidential. Oral consent to participate in this study was obtained.

### STATISTICAL ANALYSIS

Data were assessed by SPSS 11.5 computer statistics program. General descriptive statistics were calculated. In addition, in order to measure the pre- and post-training level of knowledge/attitudes, the scores were compared using independent two-sample *t*-test. The average pre-training knowledge/attitudes score, and independent variation comparisons were made with ANOVA and post-hoc Scheffe. In knowledge and beliefs item analysis, frequency and averages were used. The statistical significance of the differences in percentages of each item and demographic data were tested with the chi-squared test. The level of significance was $p<0.05$.

The scale consisted of 36 items about knowledge, beliefs and stigma rated on a dichotomous point scale, with higher scores indicating good knowledge or good attitude. Each correct answer scored 1 point and each incorrect answer scored 0 point. The KR- 21 reliability coefficient was calculated as 0.80

## RESULTS

### PART I: DEMOGRAPHIC DATA

The demographic features of those who attended the program and completed the survey were shown in Table 1. Most participants were female, doctors and middle-aged. The areas of work of participants were surgical clinics in 35.1%; dental in 21.1%; consultants in 8.8%; infectious diseases clinics in 15.7% and internal medicine clinics in 22.8%.

**TABLE 1:** Sociodemographic characteristics of healthcare providers.

| Characteristics | n= 158 % |
|---|---|
| Gender | |
| Male | 27.4 |
| Female | 72.6 |
| Job | |
| Physician | 37.8 |
| Nurse-midwife | 33.4 |
| Dentist | 21.8 |
| Laboratory-Health Technician | 3.8 |
| Age Groups | |
| 20-34 | 26.8 |
| 35-44 | 46.4 |
| 45-54 | 22.9 |
| >55 | 3.9 |
| Needlestick Injury | |
| Yes | 29.7 |
| No | 70.3 |

### PART II: QUALITATIVE FINDINGS

In the qualitative part of the study, HCPs expressed that their major problem was the lack of protective materials especially double gloving. This made them anxious while dealing with HIV patients. Some of the statements of the HCPs were:

*"I think that extra precautions are needed, so I wear double gloves when providing noninvasive care for a suspected HIV positive person."* a nurse

*"The supplies of protectve materials are inadequate in the hospital; this makes health workers afraid of touching HIV positive patients."* a nurse

*"We think that a minor and a major operation are different, so if we prepare for a major operation, for example abdomen operation, we must be more careful.* "an anesthetist

They also stated that they did not receive the necessary support from the institutions after any possible work accidents. They expected more in-

formation about the legal issues HCPs may face. They also stated that in order to communicate with an HIV positive patient it was necessary to understand the psychology of the patient. HCPs also emphasized that as well as updated information, psychological support and support from the institution were also important. The participants stated that some patients in some hospitals were made to have an HIV test before medical procedures, especially surgical, without the patient's knowledge or approval.

Healthcare providers who were in charge of the management of antiretroviral treatment for HIV-positive patients were more prone to show empathy to the patients. They criticized their colleagues for their discriminative behaviors toward patients living with HIV/AIDS. In addition, they mentioned that they encountered some problems due to bureaucratic processes and accessing imported drugs.

Some HCPs thought that preventive measures for other infectious diseases would not be sufficient to protect themselves from HIV transmission. They were afraid of becoming infected. Their statements were:

*"I believe I have the right to refuse to treat AIDS patients."*a dentist

*"It is our responsibility to treat all patients."* a physician

*"I would not eat together with persons with HIV even if they are my parents."* a physician

*"I'm afraid of it although I know that it is not easy to become infected* "a nurse

*"We have no time to be careful and we always have infection risk due to accidental exposures"* a physician

The participants gave positive feedback about the training course. HCPs found the training informative and they appreciated especially the lawyer's and the psychiatrist's presentations.

*"I think that HIV infected persons need psychological support and we also need it to cope with the problems of patients."*

*"This training and discussion session was beneficial to me."*

*"I'm glad to be a trainer. I will be pleased to contribute to the education of my colleagues in our hospital."*

*"It is an opportunity for me to assess my own strengths and weaknesses on HIV/AIDS."*

*"All presentations were informative, but I'm interested in our legal and ethical responsibilities."*

## PART III: QUANTITATIVE FINDINGS

The results of the pre-training questionnaire survey were as follows. Of the HCPs, 29.7% had needle stick or sharp object injuries in the last year. Accident frequency per person ranged from 1 to 20 in the last year; 45.7% of the HCPs had an accident once, 25% twice and 7.5% three times, the remaining participants stated that they had had 4 or more accidents. Occupational accident rate was 36.2% in physicians, 32.4% in dentists, 32.4% in nurses and 61.5% in laboratory workers, which is the group that collects blood samples from patients. The injury rates were statistically significant according to occupation (p= 0.007), with higher rates among laboratory technicians. No significant difference was found regarding other demographic characteristics.

The preventive measures taken by health workers to protect themselves from infections were; vaccination in 15.8%, use of gloves in 100.0%, hand washing in 100.0%, sterilization-disinfection in 78.5%, and avoiding touching the patient in 3.9%. Each individual reported using more than one preventive measure; 39.7% of the HCPs thought that additional measures were required for infectious diseases. In addition, 10% of the participants stated that they double gloved.

Regarding the question on pre-test HIV counseling and its content, 69.9% did not answer and only 15.8% gave the correct answer. In the question regarding post-test counseling, 72.7% did not respond and only 12.6% gave the correct answer.

Of the individuals who participated in the training, 7.6% thought that HIV virus was the one

with the highest probability to be transmitted to HCPs.

The correct answers given to pre- and post-training knowledge items were listed in Table 2. The items best known by the participants were item 1, 2, and 3; with the highest score on the item stating that an HIV positive patient may look healthy. The rate of incorrect answers in the pre-training test on infection routes in items 4, 5 and 10 ranged from 3.9% to 15%. Regarding the responses to items 7, 11 and 12, HCPs seemed to think that the risk of HIV infection was higher with homosexual relations.

The average pre- and post-training mean knowledge scores were 9.32 ± 2.1 (3-13) and 12.76 ±2.3 (5-17) respectively. The scores increased in the post-training test as shown in Table 2. This showed that there was significant improvement in knowledge scores ($p< 0.001$) after the training. One-way ANOVA tests or t-test were run to explore possible differences in knowledge scores by each demographic variable. There was no correlation between the mean knowledge score and the age, sex or occupation. However, physicians had the highest knowledge on item 2 ($p= 0.001$), item 3 ($p= 0.03$) and item 13 ($p= 0.03$).

When asked how they felt while treating an AIDS or HIV positive patient; 6.6% stated that there was no difference from other patients while 29.3% felt pity, 6.6% felt anger, 24% felt fear and 58.7% felt worry about patients with HIV. Just one person stated that they felt revolted. Regarding concerns while providing healthcare for these patients, 64% were concerned about material/devices used to be contaminated, 53.3% worried about how to treat and give advice and 44% had a fear of infection. One person stated that there was no need to give medical care to an already terminal patient.

The HCPs had the following opinions about what could be done to protect the patient from discrimination; 82.3% recommended education for medical personnel, 25.3% favored medical politics and rules against discrimination, 25.3% thought there should be legal arrangements in the country and 12.7% thought special materials should be used with these patients.

Table 2 shows that, besides feeling anxious while treating HIV patients, some healthcare providers would even refuse to treat a patient. In addition, some HCPs stated that they would refuse a social relationship with the patient in items 22, 23, 23, 31, 36.

The mean pre- and post-training beliefs scores were 12.37 ± 3.1 (3-19) and 15.57 ± 3.8 (6-22), respectively. Table 2 shows the post-training increase in scores. One-way ANOVA tests or t-test were run to explore possible differences in attitude and beliefs scores by each demographic variable. No relationship was determined between the beliefs scores and the age, sex or occupation of the HCPs. However, nurses had significantly higher scores regarding item 15 and a more favorable attitude ($p< 0.001$). Most of the nurses declared that they would not inform the other patients in the same ward about the patient's HIV status. The majority of the dentist participants had negative attitudes toward patients with HIV according to their perception on item 24 ($p= 0.03$), item 27 ($p= 0.05$), item 35 ($p= 0.01$), and item 36 ($p= 0.005$).

There was a weak and significant correlation between knowledge levels and beliefs scores ($r= 0.290$, $p= 0.002$).

## DISCUSSION

This study took place during a training program including healthcare providers working in various health institutions affiliated to the Ministry of Health in İzmir. The open-ended questions in the questionnaire showed that the participants in the study group had serious concerns about the risk of being infected with HIV. A few of HCPs believed that the risk of transmission of HIV in the health care setting was the highest among blood borne diseases. The infection risk for healthcare workers after contact with HIV positive blood was reported to be 0.3%.[23] Although the risk of HIV infection through occupational exposure is very low and can be prevented, healthcare providers still have fears and worries about HIV/AIDS patients.[24-26] The fre-

**TABLE 2:** Pre- and post-training knowledge, correct responses and positive beliefs.

| | | Before | After |
|---|---|---|---|
| 1. | HIV positive people may look healthy | 94.2 | 96.8 |
| 2. | A person with a negative HIV test definitely does not have the virus | 86.2 | 91.5 |
| 3. | AIDS is the form of the HIV infection in later stages | 88.6 | 90.6 |
| 4. | HIV cannot be acquired while using public bathrooms or toilets | 79.1 | 96.1 |
| 5. | HIV cannot be acquired by washing an HIV positive person's clothes or dishes | 94.2 | 96.1 |
| 6. | The safest condoms are made from latex | 62.9 | 71.8 |
| 7. | Lesbians cannot be infected with HIV | 77.6 | 89.2 |
| 8. | AIDS has no definite treatment | 76.5 | 86.4 |
| 9. | There is a vaccine against HIV to protect the public | 89.9 | 95.3 |
| 10. | HIV can be transmitted through sneezing and coughing | 88.8 | 97.5 |
| 11. | In HIV infection, homosexual anal sex has a higher risk than heterosexual anal sex | 47.6 | 49.0 |
| 12. | In HIV infection, oral sex from a man to a woman has a higher risk than a woman to a man | 54.3 | 55.1 |
| 13. | Contact of oil based creams with a condom may damage the condom | 27.2 | 47.1 |
| 14. | Individuals with a risk for HIV should have regular HIV testing | 94.8 | 91.3 |
| 15. | Patients in a ward should be notified about the status of an HIV patient in the same ward | 39.7 | 56.9 |
| 16. | All healthcare providers working in a ward should be informed about the status of an HIV patient in the same ward | 10.5 | 23.4 |
| 17. | HIV positive patients should have a sign on their file/bed | 35.1 | 50.0 |
| 18. | When a healthcare worker is injured with a needle contamiated with the blood of a patient, consent of the patient should be asked for an HIV test. | 36.7 | 46.8 |
| 19. | Patients with AIDS should have their names made public so that the public can be protected | 82.0 | 89.5 |
| 20. | All patients that are to give birth should have an HIV test | 26.5 | 38.3 |
| 21. | All patients undergoing surgery should be tested for HIV | 24.3 | 31.7 |
| 22. | I would feel uncomfortable having an HIV positive coworker | 61.4 | 77.6 |
| 23. | I would feel uncomfortable sending my children to a school where there was an HIV positive student attending | 58.8 | 68.0 |
| 24. | I wouldn't feel uncomfortable eating a meal at an HIV positive person's house | 39.5 | 24.8 |
| 25. | A person who was sexually infected with HIV deserves it | 88.9 | 91.1 |
| 26. | I would help an HIV/AIDS patients to have a normal social life | 86.3 | 90.3 |
| 27. | As they are a risk group I would refuse to treat/care for homosexuals | 83.7 | 91.9 |
| 28. | As they are a risk group I would refuse to treat/care for intravenous drug addicts | 86.3 | 87.9 |
| 29. | Spouses/partners/ relatives of HIV-positive patients should be informed regardless of the patient's consent | 18.4 | 37.1 |
| 30. | I would not want to operate on an HIV positive patient | 65.3 | 73.9 |
| 31. | If a member of my family had AIDS, I would take care of him/her | 88.2 | 93.3 |
| 32. | HIV positive health workers should not treat patients | 56.0 | 71.7 |
| 33. | I would not want to attend the birth of an HIV positive mother | 64.2 | 73.9 |
| 34. | HIV positive patients do not need to take any precaution outside of normal infection precautions | 47.7 | 55.6 |
| 35. | A separate nurse should take care of HIV positive patients | 63.2 | 94.3 |
| 36. | I would not shop from or eat in the restaurant of an HIV positive trader | 50.7 | 59.2 |

quency of needlestick or sharp instrument injuries within the last year was about 30% in our study group. In another study carried out in our country, the rate of needlestick injuries among nurses was 76.2%.[27] In a study in Iran, 49.6% of healthcare workers had needlestick injuries within the last year;[25] whereas in Tel Aviv, 65.9% of the HCPs had needlestick injuries during their past professional experience.[28] In a study in Egypt, 35.6% of the health care personnel was exposed to at least one needlestick injury during the past three months.[29]

The universal precautions guidelines are the major way to protect healthcare workers against bloodborne diseases.[3,30] On the other hand, 39.7%

of the participants in our study group thought that it was necessary to use extra measures against HIV infection in addition to the preventive measures recommended for other infectious diseases. Besides, 10% of the HCPs stated that they used double gloves. As an additional precaution, it can be seen in the literature that the use of double gloves is common. It is emphasized that in emergency situations, HCPs need to be more careful.[5,8] According to a study,[31] double gloving provides a significant reduction in the quantity of blood transferred during a needlestick injury. Double gloving offers considerable protection against exposure to contaminants in the blood and body fluids of the patient and should be made routine, especially in developing countries where HIV, hepatitis B and C are widely prevalent.[32] In developing countries, it has been expressed that giving all patients who are to undergo surgical procedures a mandatory AIDS test will not effective. However, it is still not possible to determine HIV positivity during window period.[5] The HCPs in our study did not have adequate knowledge about HIV counseling before and after the training. An HIV positive individual should be informed about activities that carry a high risk of transmission.[33]

The HCPs also complained that the necessary devices and materials were inadequate to protect them from being infected. In Turkey, there is a legal regulation under the name of "management of infection control in health services" and notice regarding the bases and procedures to provide the safety and protection of HCPs.[2,19] But while there is a legal framework, it has not been organized well on a hospital level and it is understood that the lack of equipment is important. Many studies suggested that, shortages of materials and staff and heavy workload were important factors influencing the implementation of universal infection control.[3,5,18,34] Stone et al. reported that poor working conditions and high work load were important risk factors for nurses being injured with medical equipment such as needles by 50-200%.[35]

Some HCPs in our study were misinformed about HIV/ AIDS before they took part in the training program. Especially, misconceptions on the transmission of HIV/AIDS were noticeable such as transmission through sharing public toilets and bathrooms with an infected person; washing an infected person's belongings such as clothes or dishes and exposure to an infected person who coughs. These results are in accordance with those of other studies in the literature.[6,26,36-38]

HCPs in our study had negative opinions about treating these patients or even sharing the same social surroundings. According to the legal regulations in our country, hospitals and doctors cannot legally refuse to treat any patient including HIV positive patients. Various studies reported that infection fear,misinformation or lack of information of healthcare providers had negative consequences such as humiliating the patient and even refusing to give treatment.[34,37] In addition, HCPs were reoprted to be influenced by cultural norms.[34,37] The study results demonstrated that some of the HCPs believed that patients should know their HIV status and this information should be shared with other HCPs and patients. The results of our study were consistent with those of previous studies carried out in Turkey.[18,38,39] In these three studies, most HCPs also stated that they were not comfortable about taking adequate preventive measures, and that they were concerned about treating AIDS patients and believed that HIV positive patients should be isolated from other patients.[18,38,39]

In our study, no correlation was found between knowledge and some variables of the HCPs. In some studies, the level of knowledge was higher among men and young people.[40] There was a difference between occupational groups in terms of knowledge and attitude levels; physicians had higher scores of knowledge and attitude. The physicians in our study had higher scores on condom use, HIV diagnosis and clinical progression of AIDS compared to other occupations. In addition, findings from this study revealed that the dentists had more negative attitudes than other occupations. The aim of this training program was to update the knowledge of healthcare workers and the intervention was successful in increasing the level of knowledge and re-

sulted with a better attitude toward HIV/AIDS. Nyamathi et al. reported that intensive training workshops could increase knowledge, attitudes, and willingness of healthcare professionals to provide care for persons infected with HIV.[36]

The study limitations are that there may be a selecting bias as nonrandom sampling was used to collect the data and the study sample does not represent all healthcare poviders. Participants were voluntary, since they were enthusiastic about learning and improving their knowledge, so this may have led to change their beliefs. This study used a self-reported questionnaire, which may be subject to recall bias. However, despite these limitations, the study can give us clues about the knowledge and attitudes of HCPs on the subject.

Correct knowledge for the management of HIV patients is important. Training HCPs improves their knowledge and attitudes. Our study showed that the training program with a large participation rate improved the knowledge level and probable negative attitudes of HCPs. For an even better improvement, this training may be given to smaller groups and may be repeated. The biggest need for education seemed to be in approaching and counseling an HIV positive patient. In addition, lack of protective material needs to be addressed and hospitals should be more organized in infection prevention measures.

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