

Effect of an Interventional Program on Reducing HIV/AIDS-Related Stigma and Discrimination among Health Care Providers in Surgical Departments at Zagazig University Hospital

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Abstract

Background: HIV stigma and discrimination exist worldwide. It is present even in the healthcare sector. **Objective:** To assess the effect of an interventional program on reducing HIV stigma and discrimination among healthcare providers in surgical departments at Zagazig University Hospital. **Method:** An interventional study was conducted in two surgical departments at Zagazig University Hospital on 124 randomly selected healthcare providers over 14 months through three phases: assessment, implementation and evaluation, using a comprehensive questionnaire for measuring HIV stigma and discrimination and an observation sheet for discriminatory behavior. **Results:** After intervention, there was a significant reduction in percent of participants who were worried to contact HIV patients during all activities except drawing blood ($p=0.55$) and assisting in labor of HIV positive woman ($p=0.09$), those who used extra-infection control measures when caring for HIV patients ($p<0.001$) and those who were hesitant to work alongside HIV co-worker ($p=0.04$). There was a significant increase in percent of participants who agreed on presence of adequate health facility policies protecting them from HIV ($p<0.001$) and HIV-positive women's right to have babies ($p<0.001$). **Conclusion:** This interventional program was effective in reducing most of the healthcare providers' stigmatizing attitudes and discriminatory practices towards HIV patients.

Keywords: *Stigma, Discrimination, HIV/AIDS, interventional program, attitude.*

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Introduction

HIV-related stigma and discrimination exist worldwide. It is a critical issue and considered a major barrier to HIV prevention, care, and treatment services.¹ Stigma is defined as any prejudice and negative attitudes result in the reduction of a person or group.² Discrimination is described as the negative acts that result from stigma which could lead to a violation of rights to health, education, and employment.³ In the developing world, the stigma and discrimination is a social and cultural phenomenon.⁴ HIV-related stigma and discrimination are due to false beliefs and lack of

knowledge that leads to high levels of inappropriate fear of HIV/AIDS not only among the general population but also among health care providers.⁵ It is one of the obstacles to achieving a high-quality health care for patients with HIV/AIDS thus can reduce the health status of patients and result in negative effects. This has made it necessary for AIDS programs to focus greater efforts on HIV/AIDS stigma and discrimination reduction.⁶ The global evidence base for what is effective at reducing stigma and discrimination is little.⁷ Most programs

have reported success in reducing stigma and discrimination against people living with HIV (PLHIV) among healthcare workers. Their results also showed that improving the attitude of healthcare workers leads in its turn to improving the community attitude towards PLHIV as they are seen as role models by the public.⁸ The national HIV program in Egypt aims at changing the attitude towards PLHIV through continuous training of healthcare workers in fever hospitals may be partly responsible for the reduced HIV stigma and discrimination in these settings.⁹

This study aimed at reducing HIV/AIDS-related stigma and discrimination among health care providers through application of a multidimensional training program based on providing knowledge, building up infection control skills as well as reinforcing medical ethics and HIV patients' rights. The research question was whether this program will be effective in reducing HIV stigma and discrimination among healthcare providers or not. The study objectives were to measure HIV/AIDS-related stigma and discrimination among health care providers in surgical departments at Zagazig University Hospital and to assess the effect of an interventional program on reducing HIV/AIDS-related stigma and discrimination among them.

Method

Study design and setting: An interventional (pretest-posttest) study was conducted in Surgical Zagazig University Hospital, Egypt during the period from January 2016 to February 2017.

Sampling and sample size: The sample size was calculated using Open Epi I program to be 124 healthcare providers taking into consideration that the reduction in HIV related stigma from previous study was from 44% to 19% after intervention¹⁰, the confidence interval 95%, the power of test 80%, and

10% expected drop-outs. The sample subjects were selected by multi-stage random sampling technique as follows:

1st stage: two out of six surgical departments at Surgical Zagazig University Hospital were selected randomly. They were the general surgical and the obstetrics and gynecology departments.

2nd stage: simple random sample of the healthcare providers fulfilling the inclusion criteria and working in the chosen departments was selected.

Inclusion criteria included healthcare providers of both genders, employed for 6 months or more, currently working at the time of the study, who accepted to be directly observed by the researchers during their encounter with HIV patients, and were willing to fill the questionnaire and share in the training program.

Data collection tools: (1) *Comprehensive questionnaire for measuring HIV stigma and discrimination among health facility staff:* It is a brief, globally standardized questionnaire developed by the Health Policy Project which was funded by the U.S. Agency for International Development.¹¹ It covers multiple domains that measure enacted (experienced or manifested) stigma and three drivers of stigma within health facilities including worry about HIV transmission, attitudes towards PLHIV, and health facility environment, including policies.¹² It was modified by removing the questions and sub-items related to high prevalent setting as the study setting has low HIV prevalence. Also, the questions related to presence of policies protecting HIV patients from discrimination were removed as these policies are not available in the studied health facility. So, the number of questions became 21 instead of 25 questions. It was also translated into Arabic then validated through a back-translation technique and Pilot testing. It was used as a pre and post-test with a mix of self- and interviewer-administered

modes. Positive responses like worried and very worried or agreed and strongly agreed were summed up and compared before and after intervention. It is formed of closed ended questions that were divided into the following sections: Section 1: background information (7 questions): including age, sex, current job, length of employment, ever working in a health facility that specialized in HIV care and treatment, HIV patient caseload in the past 12 months and types of HIV related training received.

Section 2: infection control (2 questions): one question with four sub-items covering the degree of worry of contracting HIV while working with PLHIV; ranging from non-invasive (touching clothing) to invasive (drawing blood); one question with four sub-items covering extra infection precautions that healthcare providers take with PLHIV but not with other patients.

Section 3: health facility environment (3 questions): one question with three sub-items covering "the observed stigma" i.e. specific practices (e.g., providing poorer quality of care or talking badly about a PLHIV) that have been observed by the participants in their facility in the last 6 months; one question with three sub-items covering "the secondary stigma" i.e. stigma experienced because of caring for PLHIV (e.g., been avoided by friends or family); one question covering the degree of hesitancy to work alongside a co-worker living with HIV.

Section 4: health facility policies (1 question): one question with two sub-items covering presence of policies protecting health care providers from HIV infection.

Section 5: opinions about people living with HIV (5 questions): one question with five sub-items covering different attitudes towards PLHIV; one question about HIV-positive women's right to have babies; three questions focused on willingness to treat key populations who are at higher risk of HIV infection

including people who inject illegal drugs, homosexual men, and sex workers.

Stigma towards pregnant women living with HIV among facility staff who care for pregnant women (3 questions): one question covering worry of contracting HIV during assisting in labor of HIV-positive women; one question with five sub-items covering observed stigma; one question with five sub-items covering attitudes towards pregnant women living with HIV.

(2) *Direct observation sheet*: Through the researchers' direct observation, this sheet was used to record the studied health care providers' discriminatory practices against PLHIV who were admitted to the selected departments during the assessment and evaluation phases of the study. The number of PLHIV who were admitted during the assessment and evaluation phases was 18 and 14 patients respectively.

Phases of the study:

The study passed through three phases:

Phase 1: Pre-intervention (Assessment phase): It took six months. It included continuous surveillance of the selected departments for PLHIV admission. Once the researchers were informed with this admission, they made daily visits to the place of admission for the length of HIV patient stay. After explaining the purpose of the study and taking informed consent, the researchers directly observe the healthcare providers' acts of discrimination towards PLHIV then asked them to fill the questionnaires. The participants were directed if they had a problem during the completion of the questionnaires. Data was collected then analyzed and used to guide designing the intervention.

Phase 2: Intervention (Implementation of training program): It took two months. The objectives of the training program were to cover the gaps in the participants' HIV knowledge, infection control skills and to improve attitude and behavior towards PLHIV. The training

was conducted by the researchers through direct personal communication in participants' workplace. The participants were divided into small groups. All groups received four sessions (each session last for 90 minutes) according to the following training topics plan: 1st session: HIV/AIDS updates, epidemiology, risk groups, etiology, immunology, courses and manifestations, transmission and treatment. 2nd session: universal precaution, prevention and post-exposure prophylaxis. 3rd session: ethical issues, patient rights. 4th session: stigmatization model, and stigma reduction strategies using evidence-based approach.

Videos and powerpoint presentations were used to cover the content of the training program during the session. The training content of each session was disseminated to the participants in the form of colored brochures and handouts. Participatory methods such as games, role-play, exercises, and group discussions were used. At the end of each session, the participants were asked to summarize key learning points as a group. In addition, they were allowed 15 min to ask questions, either privately or in the group setting.

Phase 3: Post-intervention (Evaluation phase): It took 6 months started immediately after the last training session to reassess the studied health care providers' stigmatizing attitudes and acts of discrimination towards PLHIV by the same ways used in the assessment phase.

Statistical management

After data collection, data were coded, entered and analyzed using SPSS (Statistical Package for Social Science) version 19. Qualitative data were presented as frequencies and percent, Quantitative data were presented by mean and standard deviation. McNemar test and McNemar Bowker test were used for comparing descriptive data. P value (≤ 0.05) was considered significant difference and P value (≤ 0.01) was

considered the highly significant difference.

Ethical aspect and administrative approach:

The research protocol was approved by Ethics Committee of Faculty of Medicine, Zagazig University, Egypt and the reference number is ZU- IRB#:3799. Before carrying out the study, the necessary official permission was taken from the head of Zagazig University Hospitals and the head of the General Surgical and Obstetrics and Gynecology departments. An informed consent was obtained from the studied physicians and nurses. They were reassured about the confidentiality of any obtained information and that the results would be used for the purpose of research.

Results

Table 1 shows the mean age of participants was 32.7 ± 7.2 years old. The majority of them were females and nurses. The mean length of employment was 11.3 ± 7.9 years. All the participants had not ever worked in a health facility that specialized in HIV care and treatment. The number of HIV patients provided with care by the participants in the past 12 months ranged from 0-15 patients with the mean of 3.13 ± 2.6 patients. Most of the participants reported that they received training courses on infection control and universal precautions; while only 15.3% of them had received training courses on HIV related stigma and discrimination.

Table 2 compares HIV stigma and discrimination among health care providers related to infection control domain before and after the intervention. It shows a significant reduction in the percent of participants who were worried to contract HIV during all patient care activities except drawing blood ($p=0.55$) and those who used extra-infection control measures when providing care or services for a PLHIV after the intervention ($p<0.001$).

Table (1): Background information of the participants

Items	N=124
1. Age (years): <i>Range</i> <i>Mean ± SD</i>	22– 47 32.7 ± 7.2
2. Gender: N (%) • Male • Female	37 (29.8) 87 (70.2)
3. Current Job: N (%) • Nurses • Physicians	82 (66.1) 42 (33.9)
Department: N (%) • General surgical • Obstetrics and gynecology	77 (62.1) 47 (37.9)
4. Length of employment (years) <i>Range</i> <i>Mean ± SD</i>	1-27 11.3±7.9
5. Have you ever worked in a clinic/hospital/department that specialized in HIV care and treatment? N (%) No	124 (100.0)
6. Number of HIV patients you provide with care in the past 12months <i>Range</i> <i>Mean ± SD</i>	0-15 3.13±2.6
7. Previous training courses on: N (%) • HIV stigma and discrimination • Infection control and universal precaution • Patient’s informed consent, privacy and confidentiality	19 (15.3) 85 (68.5) 52 (41.9)

Table 3 compares HIV stigma and discrimination among health care providers related to health facility environment and policies before and after intervention. It shows a significant reduction in the percent of the participants who had observed their colleagues did discriminatory behaviors towards PLHIV in their facility in the last 6 months (p=0.00) and those who were hesitant to work alongside a co-worker living with HIV (p=0.04). There

was no significant reduction in the percent of the participants who were worried about being stigmatized by others because of caring of PLHIV. Regarding health facility policies, there was a significant increase in the percent of participants who reported that there are adequate supplies (p=0.03) and standardized protocols (p=0.00) in their health facility that reduce their risk of becoming infected with HIV.

Table 4 compares health care providers' opinions about PLHIV before and after intervention. It shows slightly significant reduction in the percent of participants who expressed stigmatizing opinions about PLHIV and who were unwilling to treat key populations (p=0.03). While it shows a significant increase in the percent of participants who agreed on HIV-positive women’s right to have babies (p<0.001).

Table 5 compares HIV stigma and discrimination among health care providers towards pregnant women living with HIV before and after intervention. It shows insignificant reduction in the percent of participants who were worried about assisting in labor of HIV positive woman (p=0.09), and those who agreed on testing the pregnant woman for HIV without her consent (p=0.6) and disclosing the status of HIV positive woman to others (p=0.39). While it shows a significant reduction in the percent of participants who observed other health care providers using additional infection-control procedures during labor of HIV positive woman (p=0.00) and those who agreed on obligation of HIV positive women on contraception or involuntary sterilization (p=0.00).

Table 6 shows the effect of intervention on the most frequent health care providers’ discriminatory practices towards patient living with HIV observed by the researchers. The percent of participants decreased significantly after the intervention in all these practices

Table (2): Health care providers' stigmatizing attitudes and discriminatory practices towards patient living with HIV in infection control domain before and after intervention

Items	Before intervention N=124 (%)	After intervention N=124 (%)	P value*
1. How worried would you be about getting HIV if you did the following?			
Took the temperature of a patient living with HIV	77 (62.1)	32 (25.8)	<0.001
Touched the clothing of a patient living with HIV	103 (83.0)	31 (25.0)	<0.001
Dressed the wounds of a patient living with HIV	103 (83.0)	86 (69.3)	0.02
Drew blood from a patient living with HIV	101 (81.5)	96 (77.4)	0.55
2. Do you typically use any of the following measures when providing care or services for a patient living with HIV?			
Avoid physical contact	103 (83.0)	31 (25.0)	<0.001
Wear double gloves	103 (83.0)	84 (67.7)	0.009
Wear gloves during all aspects of the patient's care	103 (83.0)	31 (25.0)	<0.001
Use any special measures that you do not use with other patients	106 (85.4)	84 (67.7)	0.003

*McNamar test was used

Table (3): Health care providers' stigmatizing attitudes and discriminatory practices towards patient living with HIV related to health facility environment and policies before and after intervention

Items	Before intervention N=124 (%)	After intervention N=124 (%)	P value
1. In previous 6 months how often you observed the following at your health facility?			
Healthcare workers unwilling to care for a PLHIV			
• Never	48 (38.7)	80 (64.5)	<0.001**
• Once, Twice	24 (19.3)	23 (18.5)	
• Several times	52 (42.0)	21 (17.0)	
Healthcare workers providing poorer quality of care to a PLHIV than to other patients			
• Never	24 (19.3)	61 (49.2)	<0.001**
• Once, Twice	24 (19.3)	21 (16.9)	
• Several times	76 (61.4)	42 (32.9)	
Healthcare workers talking badly about people living with or thought to be living with HIV			
• Never	95 (76.6)	101 (81.4)	0.8**
• Once, Twice	23 (18.5)	17 (13.7)	
• Several times	6 (4.9)	6 (4.9)	
2. How worried are you about?			
a. People talking badly about you because you care for patients living with HIV	42 (33.8)	28 (22.6)	0.06*
b. Been avoided by friends and family because you care for patients living with HIV	67 (54.0)	51 (41.1)	0.11*
c. Been avoided by colleagues because of your work caring for people living with HIV	38 (30.6)	25 (20.2)	0.09*
3. How hesitant are healthcare workers in this facility to work alongside a co-worker living with HIV regardless of their duties?			0.049*
	66 (53.2)	51 (41.1)	
4. Do you agree with the following statements?			
a. There are adequate supplies (e.g., gloves) in my health facility that reduce my risk of becoming infected with HIV	66 (53.2)	84 (67.7)	0.03*
b. There are standardized procedures/protocols in my health facility that reduce my risk of becoming infected with HIV	56 (45.2)	90 (72.6)	<0.001*

*McNamar test was used

** McNemar Bowker test was used

PLHIV: patient living with HIV

Table (4): Health care providers' opinions about people living with HIV before and after intervention

Items	Before intervention N=124 (%)	After intervention N=124 (%)	P value*
1. Do you agree with the following statements?			
a. Most people living with HIV do not care if they infect others	58 (46.7)	39 (31.4)	0.02
b. People living with HIV should feel ashamed of themselves	60 (48.3)	42 (33.9)	0.038
c. Most people living with HIV have had many sexual partners.	59 (47.5)	50 (40.3)	0.24
d. HIV is a punishment for bad behavior	36 (29.0)	30 (24.2)	0.4
e. People get infected with HIV because they engage in irresponsible behaviors	59 (47.5)	50 (40.3)	0.24
2. Do you agree with "Women living with HIV should be allowed to have babies if they wish"?	20 (16.1)	56 (45.2)	0.00
3. Do you agree with "If I had a choice, I would prefer not to provide services to people who inject illegal drugs"?	35 (28.2)	18 (14.5)	0.03
4. Do you agree with "If I had a choice, I would prefer not to provide services to men who have sex with men"?	102 (82.2)	85 (68.5)	0.03
5. Do you agree with "If I had a choice, I would prefer not to provide services to sex workers"?	82 (66.1)	74 (59.6)	0.039

*Mc Nemar test used

Table (5): Health care providers' stigmatizing attitudes and discriminatory practices towards pregnant women living with HIV before and after intervention

Items	Before intervention N=47 (%)	After intervention N=47(%)	P value
1. How worried are you about assisting in labor and delivery if the woman is living with HIV?	36 (76.6)	27 (57.4)	0.09*
2. In the past 6 months, how often have you observed other healthcare providers:			
a. Performing an HIV test on a pregnant woman without her informed consent?			
• Never	16 (34.1)	21 (44.7)	0.6**
• Once or twice	14 (29.8)	9 (19.1)	
• Several times	17 (36.1)	17 (36.2)	
b. Neglecting a woman living with HIV during labor and delivery because of her HIV status?			
• Never	40 (85.1)	41 (87.2)	1.000*
• Once or twice	7 (14.9)	6 (12.8)	
c. Using additional infection-control procedures (e.g., double gloves) with a pregnant woman living with HIV during labor and delivery because of her HIV status?			
• Never	12 (25.5)	34 (72.3)	0.005**
• Once or twice	23 (49.0)	9 (19.1)	
• Several times	12 (25.5)	4 (8.6)	
d. Disclosing the status of a pregnant woman living with HIV to others without her consent?			
• Never	11 (23.4)	9 (19.1)	0.39**
• Once or twice	9 (19.1)	14 (29.8)	
• Several times	27 (57.5)	24 (51.1)	
e. Making HIV treatment for a woman living with HIV conditional on her use of family planning methods?			
• Never	9 (19.1)	23 (48.9)	<0.001**
• Once or twice	9 (19.1)	8 (17.0)	
• Several times	29 (61.8)	16 (34.1)	
3. Do you agree			
a. If a pregnant woman is HIV positive, her family has a right to know	47 (100.0)	47(100.0)	1.00*
b. Pregnant women who refuse HIV testing are irresponsible.	24 (51.1)	18(38.3)	0.07*
c. Women living with HIV should not get pregnant if they already have children.	12 (25.5)	3(6.4)	0.004*
d. It can be appropriate to sterilize a woman living with HIV, even if this is not her choice.	24 (51.1)	3(6.4)	<0.001*

*Mc Nemar test used

** McNemar Bowker test was used

Table (6): The most frequent health care providers' discriminatory practices towards patient living with HIV observed by the researchers before and after intervention

Items	Before intervention N=124 (%)	After intervention N=124(%)	P value*
1. Refusal to provide care to PLHIV	55 (44.4)	32 (25.8)	<0.001
2. Providing HIV patient with less quality care compared to other patients	69 (55.6)	43 (34.6)	<0.001
3. Disclosure of a person's HIV status to hospital employees without authorization.	117 (94.4)	112 (89.5)	0.073
4. Patients being tested without consent	124 (100.0)	124 (100.0)	1.00
5. Use of unnecessary infection control precautions	96 (77.4)	16 (12.9)	<0.001
6. Asking for unnecessary isolation of PLHIV	103 (83.1)	8 (6.4)	<0.001

*Mc Nemar test used PLHIV: patient living with HIV

except disclosure of HIV status and testing HIV patients without their consent practices.

Discussion

There is insufficient evidence about the effectiveness of HIV educational intervention on reducing HIV stigma and discrimination in Egypt. This study explored the effect of a multidimensional training program on reducing HIV stigma and discrimination among the health care providers in the surgical departments at Zagazig University Hospital. The majority of participants reported less frequent contact with PLHIV which is an independent driver of stigma.¹³ Prior studies have indicated that more contact with HIV patients and higher HIV patient loads are related to less HIV stigma.¹⁴ Moreover, 15.3% of the participants only received prior courses on HIV stigma and discrimination. This could explain why the majority of them had high levels of stigmatizing attitudes and discriminatory practices, suggesting that a focused intervention targeting HIV stigma and discrimination was needed to address this problem.

Regarding the effect of intervention on HIV stigma and discrimination related to infection control domain, the study revealed that the majority of participants were worried to contract HIV when providing any type of care or services to PLHIV before the intervention. This might be explained by lack of knowledge about HIV transmission. Various studies demonstrated low general knowledge about HIV even among medical staffs in Egypt and in the surrounding regions.^{15,16}

The intervention appeared to have a greater effect on worry related to low-risk activities than those that involve a higher risk of exposure to infection such as drawing blood from PLHIV or assisting in labor of HIV positive woman. This might be related to the

reduction in transmission misconceptions after the intervention.

The study also revealed that the participants' worry to get HIV infection and HIV transmission misconceptions pushed them to use special unnecessary infection control measures when providing services to a PLHIV or ask for unnecessary isolation of PLHIV before intervention. This finding was recorded in prior studies.^{8,17} After the intervention, these practices much decreased ensuring the success of the intervention in improving the participants' infection control knowledge and skills.

Regarding HIV stigma and discrimination related to health facility environment and policies, most participants reported observed stigma, worry about secondary stigma and hesitancy to work alongside a co-worker living with HIV before the intervention. This is consistent with the findings of previous studies.^{8,17,18} After the intervention, there was a significant reduction in the observed stigma and hesitancy to work alongside a co-worker living with HIV while there was insignificant reduction in worry of being stigmatized by others because of caring of PLHIV (Secondary Stigma) as changing this attitude is challenging and needs a wider intervention covering the community as a whole not only the healthcare setting.

Regarding health facility policies that protect healthcare providers from HIV infection, about half of the participants only reported that there are adequate supplies and standardized procedures/protocols in their health facilities that reduce their risk of becoming infected with HIV before intervention. This could be attributed to inability to link between the standard precautions and care of PLHIV and believing that providing medical care for patients with HIV may require other stronger precautions which are lacking in their health facility. The intervention

succeeded in improving this attitude through three dimensions. The first one, it included infection control training with specific HIV-related exercises which helped the participants make the missing link between the standard infection control measures and HIV. Secondly, it explored hospital-based policies for post-exposure prophylaxis and for ensuring availability of personal protective equipment for all healthcare workers at all times. Lastly, it presented scientific evidences on the effectiveness of infection control measures and minimal risk of infection in the healthcare setting, such as the overall rate of nosocomial transmission of HIV after needle prick injuries from HIV seropositive patients estimated to be only 0.3%.¹⁹

Regarding opinions about PLHIV, It is common that health care workers blame PLHIV for the infection, assume that PLHIV has engaged in immoral sexual behaviors, and think that being HIV positive is shameful.²⁰ Changing these opinions which are value based and has a religious root in Muslim countries was challenging, so the intervention achieved a slight statistical improvement through stressing on medical ethics which highlighted that there are rules that regulate health care workers profession, regardless of their judgments. Also, it is common that health care workers do not prefer to provide key population at greater risk of HIV infection i.e. who inject illegal drugs, homosexual men and sex workers with medical services due to their immoral actions.²¹ The intervention slightly improved this stigmatizing attitude through focusing on the patients' right of treatment irrespective of their moral behavior.

Regarding the effect of intervention on HIV stigma and discrimination among health care providers towards pregnant women living with HIV, the study revealed attitudes reflecting violation of the patient's ethical rights of strict confidentiality and informed consent

because of her HIV status before and even after intervention which reinforced these patient's rights. This could be attributed to lack of policies that protect these rights in the studied health facility. Although the CDC has issued guidelines suggesting that informed consent is a barrier to HIV testing and should be eliminated,²² evidence indicates that having an informed consent is not a barrier to testing, and actually leads to increased positive outcomes, including greater access to care.²³

The study also revealed attitudes reflecting violation of the patient's reproductive rights i.e. the rights to choose the number and spacing of children without obligation to undergo contraception or sterilization because of her HIV status before intervention. This is consistent with a previous study conducted in Egypt.²⁴ These attitudes decreased significantly after the intervention which highlighted new updates in HIV treatment and approaches to the provision of Anti-Retroviral therapy to prevent maternal fetal transmission. The intervention also illustrated the role of health care providers in reproductive health service which is provision of full information on the risks and benefits of the various treatment regimens and let the patient to take her decision.

Regarding the effect of intervention on the discriminatory practices towards PLHIV that were observed by the researchers, these practices changed similarly to the participants self-reported practices after intervention ensuring on the success of intervention and accuracy of results.

Strengths of this study include; 1. Dealing with a culturally sensitive issue associated with lack of knowledge and skills to deal with it as the channels for distributing its related information remain rare in Egypt, even for healthcare workers. 2. Dependence on a globally tested standardized reliable tool for

measuring HIV related stigma to evaluate the success of the intervention. 3. This study not only relied on self-reported attitudes but also on researchers' observation to avoid memory bias. Finally, the intervention based on a multidimensional approach aiming to change three dimensions of knowledge, skill, and values and not only one of them.

Limitations of this study include lack of control group and conduction of the study in a single setting could interfere with generalizability of results.

Conclusion and Recommendations:

This interventional program was highly effective in reducing most of the healthcare providers' stigmatizing attitudes and discriminatory practices linked to lack of HIV knowledge and infection control skills while it was slightly or non effective in reducing the value based HIV stigma and discrimination. Developing and rigorously evaluating interventions targeting HIV stigma in multiple settings should continue to remain a priority in HIV prevention and treatment efforts. The intervention must be multidimensional addressing HIV knowledge, infection control skills, medical ethics and patient rights and involving the whole community to overcome the value based HIV stigma.

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