

Effect of Educational Intervention on Nurses' Knowledge, Practices and Attitudes regarding Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

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Abstract:

Background: Nurses who provide health care to people with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) must be equipped with sufficient knowledge of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome. **The study aimed** to evaluate the effect of educational intervention on nurses' knowledge, practice and attitudes regarding Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome. **Methods:** quasi-experimental design used and performed on convenient sample included 122 nurses working with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome patients at Zagazig outpatient clinics of Fever and Chest Hospital. Three tools were used. **Tool (I):** self-administered structured questionnaire consisting of two parts about demographic characteristics of nurses and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome knowledge, **Tool (II):** Observational Nurse's Practice Checklist and **Tool (III)** regarding human immunodeficiency virus/acquired immunodeficiency syndrome attitude scale. **Results,** total satisfactory knowledge increased from 15.60% in pre-sessions to 84.40% in post sessions after one month and was reduced to 69.70% after three months. Also, nurses' satisfactory practice increased from 10.33±4.1 in pre-sessions to 14.45±3.1 in post sessions and was reduced to 13.26±2.9 after three months. Additionally, their positive attitude increased from 26.20% in pre-sessions to 72.10% in post sessions and reduced to 68.90% after three months. **Conclusion:** increasing nurses' knowledge, positive attitudes and good practices towards patients living with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome. **Recommendations:** develop educational interventions for nurses' focus on preventive methods, symptoms and modes of Human Immunodeficiency Virus transmission.

Keywords: *Attitude, Educational, Effect, HIV/AIDS, Knowledge, Intervention, Nurses & Practice.*

Introduction:

According to **the Joint United Nations Program** on Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), since the beginning of the HIV epidemic, nearly 78 million people have been infected with HIV, with nearly 35 deaths. 1 million people due to AIDS-related diseases and an estimated 36.7 million people are living with HIV worldwide by the end of 2015 (The Joint United Nations Program on HIV/AIDS (UNAIDS), 2018). In 2017, the number of people newly infected with HIV and the number of people who died from AIDS-related illnesses were approximately 2.1 million and 1.1 million, respectively (**American Federation for AIDS Research, 2020**). There were one million people living with HIV / AIDS in sub-Saharan Africa, with women at the end of 2014 making up more than 50% of the number, including 2.3 million girls. The number of estimated new infections in Sub-Saharan Africa has reached 1.4 million, which represents 70% of new infections worldwide. AIDS-related deaths account for 790,000 people in Sub-Saharan Africa (**HIV Survey Report, 2015**).

The human immune virus is transmitted through semen, vaginal secretion, by using infected drug

needles, contaminated blood and mother to child transmission during pregnancy, birth and breast milk. The infection is not spread through casual contact (such as kissing, sports participation, and touching).The virus attaches to the CD4-molecule receptor and forces itself into the cell. Research shows that it is almost exclusively T-helper cells that have CD4-molecules on their surface, and, therefore, HIV attacks these particular cells. The T-helper cells are lymphocytes that coordinate the immune system in the body (**Kaplan, 2019**). By making copies of itself inside these cells, HIV manages to destroy the T-helper cells and gradually breaks down the immune system. When the levels of T-helper cells are low in the body, the immune system cannot function, which leads to the body being unable to fight normal infections. This state is called Acquired Immunodeficiency Syndrome (AIDS). Additionally, the medication used is called antiretroviral therapy (ART). ART was introduced in the mid-1990s; it is a lifelong treatment that must be taken on a daily basis. Prior to the introduction of ART, the transition from HIV to AIDS would take only a few years. A person diagnosed with HIV who receives treatment before the disease progresses to an advanced stage can now

live nearly as long as someone who is not infected with the virus. HIV treatment leads to a decreased number of people developing AIDS, and an increased number of people staying well (Avert, 2018).

The main goal of HIV and AIDS education in nursing training is to provide them with the correct information needed to provide effective and culturally appropriate care to their patients while at the same time protecting themselves from infection (Paraniala et al., 2014). In Turkey, a study among nurses revealed that most students still had misconceptions about HIV and their attitudes needed improvement (Akin et al., 2013). In South Africa, nursing students have demonstrated positive attitudes and a willingness to care for people with HIV but lack knowledge about HIV policies (Sehume et al., 2012). Health care workers (HCWs) and, especially nurses are at risk of contracting HIV / AIDS For example, when they do not follow standard precautions and during unsafe injections so, is important to update the nurse's knowledge regarding the nature of HIV / AIDS, and prevention and treatment are essential to providing better care (Lowe et al., 2014)

Community health nurses, as health care providers and community members, perform multiple functions in HIV programs, including referring community members for HIV testing, linking them with care, accompanying them to clinic appointments, providing psychosocial support, referral to other services and counseling (Thomson, et al., 2014).

Significance of the study:

In recent years, HIV/AIDS has become seen as a major health problem due to high morbidity and mortality rates and the high costs of treatment worldwide. It is estimated that about 37.9 million people were infected with HIV/AIDS as of the end of 2018 (UNAIDS, 2019). Egypt is classified as having a low HIV/AIDS epidemic with a prevalence rate of less than 0.1% (UNICEF, 2017), and the estimated number of people living with HIV / AIDS in Egypt until the end of 2016 is relatively low (11,000). However, reports indicate that Egypt has the fastest growing epidemic in the Middle East and North Africa (MENA) region with a 76% increase in the number of cases between 2010 and 2016 (NICEF, 2017 & WHO, 2018). More than 62% of people with HIV / AIDS receive antiretroviral therapy (Petersen et al., 2013). Nurses play an important role in prevention, care, and support for patients with HIV / AIDS. High levels of knowledge about HIV/AIDS improve nurses' self-protection, comfort level, and lead to more positive attitudes toward people living with HIV/AIDS, resulting in safe practices and thus controlling the disease's spread (Lowe et al., 2014).

The current study's aim is to evaluate the effect of an educational intervention on nurses' knowledge, practice, and attitudes toward HVI/AIDS in the Sharkia Governorate.

The aim of the study was accomplished through the following **specific objectives**:

- Assess nurses' knowledge, practice and attitudes before and after the nursing educational intervention on HIV/AIDS at Sharkia Governorate.
- Plan, implement and evaluate the effect of nursing educational sessions on the knowledge, practice, and attitudes of nurses regarding HIV/AIDS.

Study hypothesis

Implementation of educational interventions will improve nurses' knowledge, practice, and attitudes regarding HIV/AIDS.

Subjects and Methods

Study design: A quasi-experimental design, with pre-post assessment, was used.

Study setting: This study was conducted at the outpatient clinics of Zagazig Fever Hospital and Zagazig Chest Hospital, which are the only two hospitals that provide care for patients with HIV/AIDS in the Sharkia Governorate, the Fever Hospital, and the Chest Hospital. Zagazig Fever Hospital provides care for patients who are suffering from infectious diseases or communicable diseases like, dengue fever, Hepatitis A, B & C, influenza, salmonella, COVID-19, HIV/AIDS, typhoid, brucellosis, and other foodborne illnesses, etc. Furthermore, the monthly case count ranges from 18 to 21 people. Additionally, Zagazig Chest Hospital supplies to care for patients who are suffering from respiratory distress, AIDS with tuberculosis. The number of cases per month ranges between 8 and 10 people. The clinics are open seven days a week.

Subjects: A convenient sample of 122 nurses, 71, out of 141 nurses from Fever Hospital, and 51 out of 121 nurses from Chest Hospital. Participants who met the inclusion criteria, only nurses and nurses working in outpatient and emergency clinics are willing to participate in the study and to be present at the time of data collection.

Tools of data collection:

Three tools were used to collect the necessary data for achieving the study objectives. **Tool (I):** A self-administered structured questionnaire consisting of 47 open-ended and close-ended questions was used for data collection and developed by the researchers through reviewing related literature. It consists of two parts: **Part one:** Nurses' demographic characteristics, such as age, gender, marital status, residence, educational level, income, years of experience in a hospital, and sources of information. This data was collected to describe the sample and to compare the

demographic characteristics of the study results. **Part two:** HIV/AIDS knowledge questionnaire. This questionnaire has 39 items designed to assess the nurse's level of knowledge about HIV/AIDS. The researchers developed it based on related literature and were guided by **Kok et al. (2020)**. The HIV-KQ-39 consists of 39 questionnaires with closed-ended questions in the following sections: definition (9Q), window period, signs and symptoms of HIV/AIDS, transmission, diagnosis test, and complications, and finally HIV/AIDS prevention and treatment. **Questionnaire reliability** was verified by Cronbach's Alpha; It was 0.785.

Scoring system of Knowledge:

For knowledge items, a correct answer of 2 is scored and zero is incorrect. For each knowledge area, the item scores and their total were summarized and divided by the number of items, giving the average score for the portion. The total score for knowledge was (39) points. These scores were converted into percent scores. Knowledge was considered satisfactory if the percentage was 60% or more and unsatisfactory if it was less than 60%.

Tool (II): Observational Nurse's Practice Checklist developed by researchers and with guidance from Magdy et al. (2013). The checklist consists of 29 items divided into two broad categories: compliance with universal precautions (items 1-13) and safety measures (items 14-29). A higher score on the NPC indicates satisfying safe practice with HIV/AIDS patients and a lower score on the NPC indicates the poor application of safety measures to HIV/AIDS. Questionnaire reliability was verified by Cronbach's Alpha; It was 0.799.

Tool (III): HIV/AIDS Attitude Scale, which was adapted by **Bliwise et al. (1991)** to assess the attitude of nurses towards AIDs patients. It included 20 statements. This is composed of three components: blame for infection (1-6Q), fear of infection (7-16Q), and professional resistance (17-20Q). Nurses were evaluated to indicate the extent to which they agreed, not sure, or disagreed. The reliability of the questionnaire was checked by the Cronbach's Alpha test; it was 0.801.

Scoring system: Answers "Agree," "Not Sure," and "Not Agree" are scored respectively 3, 2, and 1. The items' scores are summarized and their total divided by the number of items, giving the average score, which is converted into percent scores. If the percentage is 60% or higher, it is a positive; if it is less than 60%, it is a negative.

Content validity:

The validity of data collection tools was tested by five experts from the Community Health Nursing, Faculty of Nursing, Zagazig University, Faculty of Nursing, Ain Shams, University, and Faculty of Medicine,

Zagazig University to assess clarity, relevance, application, comprehension, and understanding of the tools. All recommended modifications to the tools were done.

Methodology

Administrative and Ethical Considerations:

The approval of the local ethics committee was taken before starting the study. Before data collection, official permission was granted to conduct the study by submitting official letters from the College of Nursing to the responsible authorities of the selected hospitals to obtain their permission to collect the data. In addition, informed consent was obtained from the nurses who agreed to participate in the study and were assured of the confidentiality of the information provided. They were also informed of their right to withdraw from studies at any time and for any reason.

Pilot study:

A pilot study was applied before the beginning of data gathering on 13 (10%) of the participants included in the study sample for the non-presence of any modification. The purpose of the pilot study was to ensure the clarity of items and their comprehension of the applicability and relevance of the tools. In addition, to test wording questions, and estimate the time required for collection of the study sample.

Fieldwork:

Data collection took five months; from the beginning of August 2020 to the end of December 2020. During the five months, the researchers began collecting data on two days per week from 10 a.m. to 1 p.m. The intervention was implemented in 4 sessions at the previously mentioned settings. The duration of each session was 15-20 minutes. The researchers created an intervention module in the form of an educational illustrated booklet to meet the needs of the nurses assist them in following the educational sessions, and serve as a reference at the hospital. The study was completed through four phases: assessment, planning, implementation and evaluation.

Assessment phase:

This phase involved collecting pre-intervention data to assess the baseline. The researchers introduced themselves first and explained the purpose of the research briefly to the director of Zagazig Fever Hospital and Chest Hospital. All nurses working in outpatient and emergency clinics were met and their verbal consent to participate was obtained. Pre-test knowledge, practices and attitudes were disseminated, and then the same questionnaire was used after the sessions were implemented for the post-evaluation (post-test). The time it took to complete the study questionnaire ranged from 15 to 20 minutes.

Planning phase:

Based on the literature review, sample characteristics, and results obtained from the assessment phase, researchers designed the content of the intervention sessions. The learning booklet was prepared by researchers and its content was validated and then distributed to the nurses for use as a self-learning guide.

General objective: The general objective of the nurses' sessions was to upgrade their knowledge, practice, and positive attitudes about HIV/AIDS.

Specific objectives: By the end of the sessions, the nurses should be able to:

Identify the meaning of HIV/AIDS and its window period.

List the stages of signs and symptoms of HIV/AIDS.

Discuss the modes of transmission of HIV/AIDS.

Describe the diagnosis of HIV/AIDS.

Explain the prevention of HIV/AIDS and its treatment.

Apply the universal precautions and safety measures to prevent HIV/AIDS infection.

Implementation phase:

The intervention was performed in the form of sessions; It was performed in the outpatient room of the hospital. The educational training methods were lectures, group discussions and brainstorming. Sessions with videos, photos, and posters were supported by a laptop. To ensure the nurses understood the content, each session began with a summary of what was presented in the previous session, followed by the goals of the new session. The intervention was carried out in 4 sessions; the duration of each session was 15-20 minutes. The number of nurses in each session ranged from 5-7 nurses. The objectives of the sessions were as follows:

At the beginning of the **first session**, the details of the session, such as the purpose, importance, content, time, and place of the topic, are all explained to establish good communication. Researchers have provided basic knowledge related to HIV / AIDS as a meaning of HIV / AIDS. Today, HIV infection and acquired immunodeficiency syndrome (AIDS) are a group of conditions caused by HIV infection. HIV interferes with the body's ability to fight infections and diseases. The period following the window period refers to the time after infection and before seroconversion, during which markers of infection are still absent or too scarce to be detectable. Tests can not always detect HIV infection during the window period (**Lok, 2020**), and they clarify the symptom stages of acute HIV infection.

The objective of the **second session** was to explain ways of HIV transmission and non-transmission. The diagnosis of HIV can be followed by a blood or saliva

test and followed by complications such as tuberculosis infection, hepatitis B, hepatitis C virus, STDs, liver or kidney damage, etc.

In the **third session**, researchers explained HIV prevention, which includes the use of barrier methods, such as using condoms or dental dams during sexual activity, antiviral drugs, pre-exposure prophylaxis, post-exposure prophylaxis, and microbicides for sexually transmitted diseases, and syringes with low dead space, followed by discussion of the role of the nurse, and training of nurses about universal precautions and safety measures to prevent HIV/AIDS infection.

The **last session** included a global summarization and revision of the aim of the program and the termination of the module sessions. Observations were made for one hour each day in the laboratory office and at nursing stations according to a rotating schedule.

Evaluation phase:

Evaluation of the nursing educational intervention was first done immediately and then after three months of implementation of its sessions (follow up); through applying the same tools of the pretest.

Statistical Analysis:

Data and statistical analysis were entered using the Statistical Package for Social Sciences (SPSS) 20.0 version, which is a statistical software package. Data was presented using descriptive statistics in the form of frequencies and percentages of qualitative variables, means, standard deviations, and averages of quantitative variables. The Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. Spearman's rank correlation was used to assess the interrelationships between quantitative and ordered variables. To determine the independent predictor of the variable, multiple linear regression analysis was used and variance was analyzed for full regression models. Friedman's test is a non-parameterized test for finding differences in treatments across multiple attempts.

Results:**Table (1): Distribution of Studied Subjects According to Their Socio-demographic Data at Zagazig Fever and Chest Hospitals 2020 (n=122).**

Items	No	%
Age (in years)		
20 - < 40	77	63.1
40 - < 50	36	29.5
50 +	9	7.4
Mean±SD	33,3 ±7.99	
Gender		
Male	11	9
Female	111	91
Residence		
Urban	73	59.8
Rural	49	40.2
Marital Status		
Married	114	93.4
Divorce	3	2.5
Single	5	4.1
Educational Level		
Secondary school	31	25.4
Technical institute	51	41.8
University	36	29.5
post graduate	4	3.3
Income		
Not Sufficient	26	21.3
Sufficient	72	59.0
Saving	24	19.7
Years of experience		
2- <13 ١٣	74	60.7
13- <24	41	33.6
24 – 35	7	5.7
Mean± S.D	11,10±٧,٤	
Source information		
Friends	14	11.5
TV/Radio/ internet	70	57.4
Hospital	31	25.4
Curriculum	7	5.7
Number Of Cases, Handled (Suffered From AIDS)		
1 - <200	93	76.2
200- <400	16	13.1
400 Or More	13	10.7
Mean±S.D	145.8±170.7	

Table (2): The Differences of Knowledge of studied nurses about AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

Items	Pre		Post		Follow up		Friedman test	P- value
	Complete answer		Complete answer		Complete answer			
	No	(%)	No	(%)	No	(%)		
Definition	29	23.8	118	96.7	110	90.2	163.34	.000**
Window period	8	6.6	116	95.1	93	76.2	178.14	.000**
Diagnosis	54	44.3	92	75.4	78	63.9	32.27	.000**
Prevention strategy	31	25.4	106	86.9	87	71.3	111.24	.000**
Complication	63	51.6	115	94.3	115	94.3	84.500	.000**
Treatment	122	100	122	100	122	100	0	0

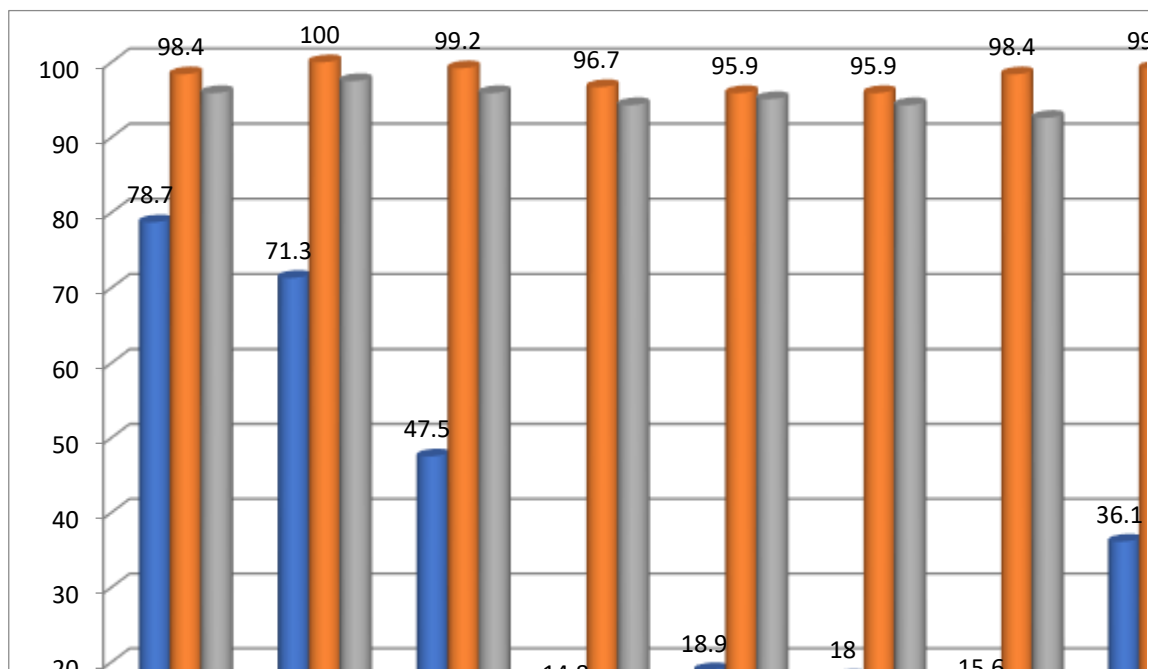


Figure (1): Knowledge of studied nurses regarding Signs and Symptoms of AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

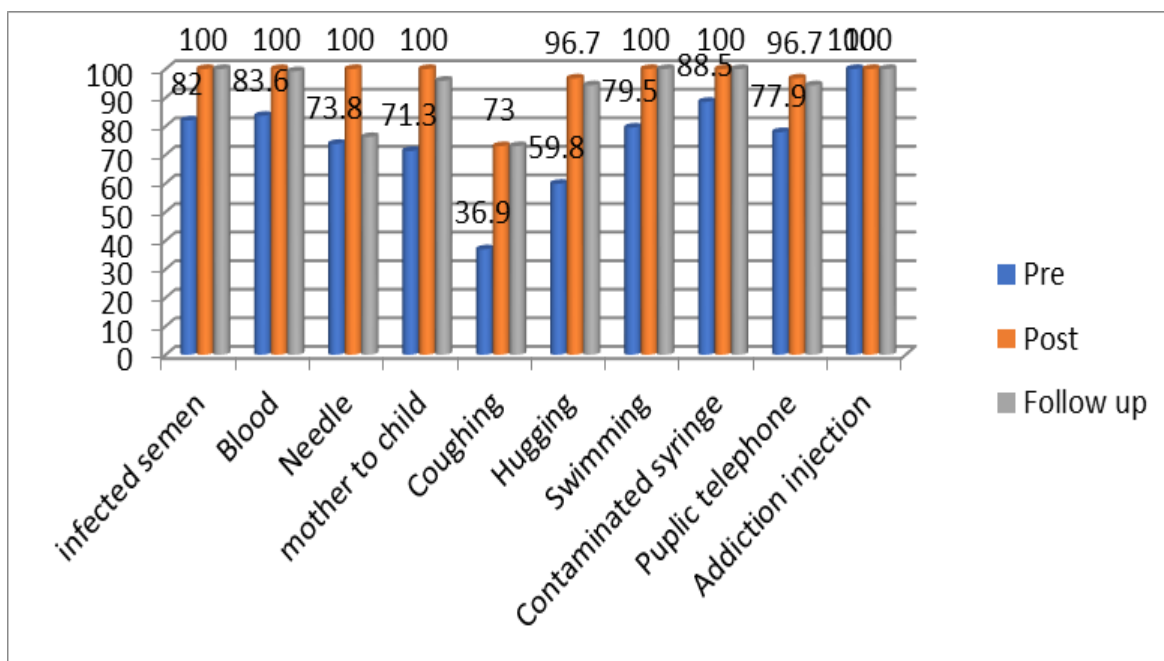


Figure (2): Knowledge of studied nurses regarding mode of transmission of AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

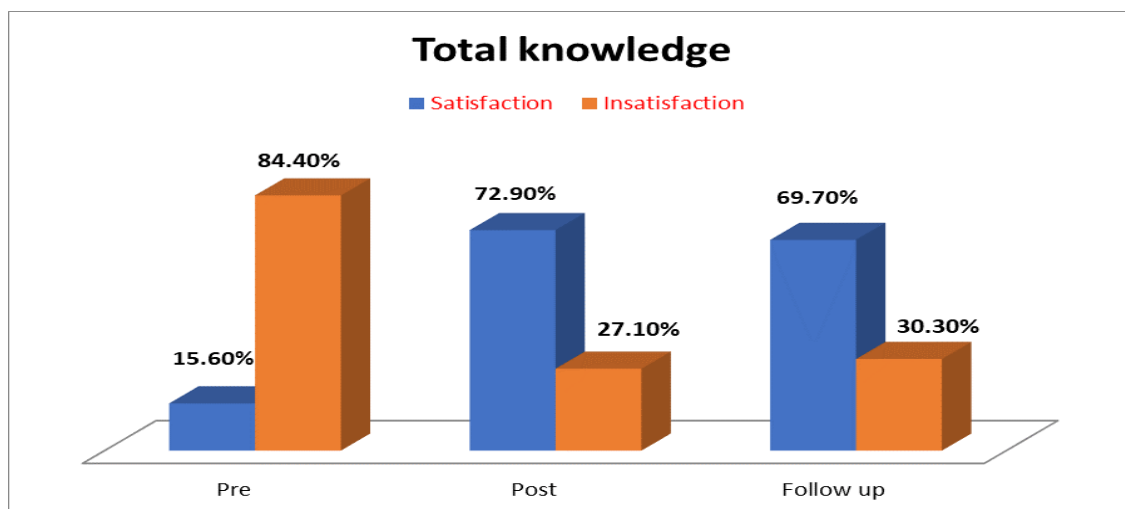


Figure (3): Total score of studied nurses' knowledge related to AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

Table (3): The Differences of Studied nurses' Practices related to AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

Items	Pre		Post		Follow up		Friedman test	P value
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory		
Total practice	40 32.8%	82 67.2%	105 86.1%	17 13.9%	100 82%	22 18%	36.974	.000**
Mean practice score	10.33±4.1		14.45±3.1		13.26±2.9			

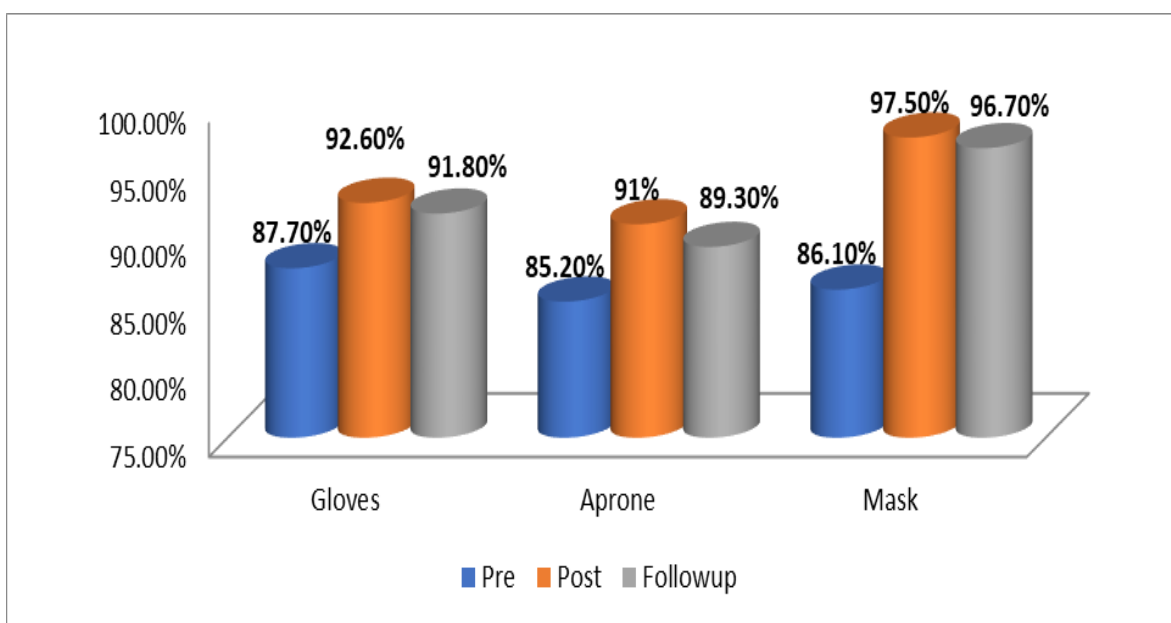


Figure (4): Distribution of studied nurses regarding uses of protective measures related to AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

Table (4) The Differences of Studied nurses' attitude related to AIDS on Pre, Post and Follow Up at Zagazig Fever and chest Hospitals, 2020 (n=122)

Items	Pre			Post			Follow up			Friedman test	P value
	Agree	Not sure	Disagree	Agree	Not sure	Disagree	Agree	Not sure	Disagree		
Blame for infection											
1. I think most people with AIDS just have to blame themselves.	27 22.1%	41 33.6%	54 44.3%	42 34.4%	20 16.4%	60 49.2%	34 27.9%	40 32.8%	48 39.3%	0.122	0.941
2. I think people who get AIDS through blood transfusions deserve treatment more than people who get AIDS through illegal sexual relations.	44 36.1%	32 26.2%	46 37.7%	27 22.1%	10 8.2%	85 69.7%	32 26.2%	15 12.3%	75 61.5%	60.04	.000**
3. I think I sympathize a little with people who get AIDS through illegal sexual relations.	44 36.1%	32 26.2%	46 37.7%	36 29.5%	24 19.7%	62 50.8%	37 30.3%	24 19.7%	61 50.0%	21.9	.000**
4. I think people who have multiple sexual partners deserve to get AIDS.	80 65.6%	28 23.0%	14 11.4%	55 45.1%	10 8.2%	57 46.7%	76 62.3%	12 9.8%	34 27.9%	55.36	.000**
5. I think women with HIV should not have children.	66 54.1%	11 9.0%	45 36.9%	47 38.5%	13 10.7%	62 50.8%	62 50.8%	10 8.2%	50 41.0%	10.17	.006**
6. I think will not maintain friendship if a friend become infected with HIV/AIDS.	57 46.7%	16 13.1%	49 40.2%	0 0.0%	0 0.0%	122 100.0%	0 0.0%	0 0.0%	122 100.0%	146	.000**
Fear of infection											
7. I think I am concerned about getting AIDS from social contact with someone (i.e. sharing food).	52 42.6%	12 9.8%	58 47.5%	28 23.0%	11 9.0%	83 68.0%	42 34.4%	10 8.2%	70 57.4%	28.54	.000**
8. I think I am worried about getting AIDS from one of your HIV patients.	78 63.9%	17 13.9%	27 22.1%	62 50.8%	16 13.1%	44 36.1%	65 53.3%	14 11.5%	43 35.2%	23.12	.000**
9. I think I would be concerned about your child having AIDS if his / her teacher had AIDS	74 60.7%	14 11.5%	34 27.9%	74 60.7%	14 11.5%	34 27.9%	66 54.1%	14 11.5%	42 34.4%	5.562	0.062
10. I think AIDS makes my job a high risk occupation	104 85.2%	2 1.6%	16 13.1%	80 65.6%	5 4.1%	37 30.3%	79 64.8%	2 1.6%	41 33.6%	44.89	.000**
Fear of infection (Cont)											
11. I guess I don't want my child to go to school with a child who has AIDS	82 67.2%	21 17.2%	19 15.6%	76 62.3%	6 4.9%	40 32.8%	71 58.2%	5 4.1%	46 37.70%	5.021	0.081
12. I believe that even by following strict infection control measures, I would potentially contract HIV, if I were to work with AIDS patients	110 90.2%	4 3.3%	8 6.6%	77 63.1%	2 1.6%	43 35.2%	67 54.9%	2 1.6%	53 43.40%	15.24	.000**
13. I think if you find out that your friend has AIDS, you will not maintain the friendship	45 36.9%	14 11.5%	63 51.6%	36 29.5%	17 13.9%	69 56.6%	67 54.9%	2 1.6%	53 43.40%	13.74	.001**
14. I think if you discover that a friend has AIDS, HIV should be isolated from the rest of society	51 41.8%	17 13.9%	54 44.3%	32 26.2%	17 13.9%	73 59.8%	36 29.5%	11 9.0%	75 61.50%	8.366	.015*
15. I believe that HIV-positive patients should not be placed in a room with other patients.	86 70.5%	3 2.5%	34 27.5%	84 68.9%	5 4.1%	33 27.0%	29 23.8%	13 10.7%	80 65.60%	82.41	.000**
16. I think young children should be taken out of the home if a parent has HIV.	34 27.9%	10 8.2%	78 63.9%	33 27.0%	9 7.4%	80 65.6%	62 50.8%	15 12.3%	45 36.90%	25.56	.000**

Items	Pre			Post			Follow up			Friedman test	P value
	Agree	Not sure	Disagree	Agree	Not sure	Disagree	Agree	Not sure	Disagree		
Professional resistance											
17. I think if I had a choice, I would rather not work with AIDS patients.	85 69.7%	7 5.7%	30 24.6%	5 4.1%	8 6.6%	109 89.3%	7 5.7%	6 5.0%	109 89.30%	162.43	.000**
18. I think I would consider changing my professional position if it becomes necessary to work with AIDS patients.	30 24.6%	19 15.6%	73 59.8%	35 28.7%	4 3.3%	83 68.0%	35 28.7%	4 3.3%	83 68%	3.406	0.182
19. I think it is better to train a few specialists who will be in charge of the treatment.	25 20.5%	4 3.3%	93 76.2%	8 6.6%	8 6.6%	106 86.9%	8 6.6%	8 6.6%	106 86.9%	19.76	.000**
20. I guess I don't want people who are more vulnerable to AIDS such as intravenous drug users and homosexuals.	83 68.0%	6 4.9%	33 27.1%	6 4.9%	7 5.7%	109 89.4%	8 6.5%	10 8.2%	104 85.3%	136.78	.000**

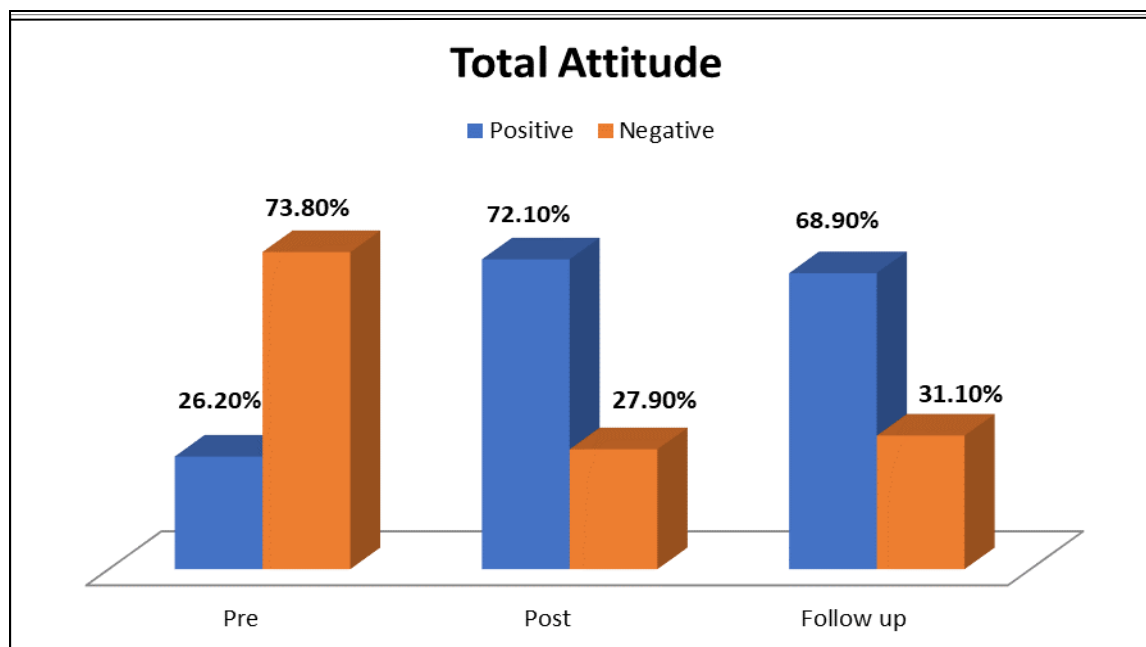


Figure (5): Total score of studied nurses' attitude related to AIDS on Pre, Post and Follow Up at Zagazig Fever and Chest Hospitals, 2020 (n=122)

Table (5): Correlations Matrix between Studied Variable at Post Intervention

Variables		Knowledge	Practice	Attitudes
Knowledge	r.		0.499	0.528
	p		.009**	.007**
Practice	r.	0.499		0.278
	p	.009**		.011*
Attitude	r.	0.528	0.278	
	p	.007**	.011*	

*Slight Significant at <0.05 - **High Significant at <0.01

Table (6): Best - Fitting Multiple Linear Regressions Model for Total Knowledge

Items	Unstandardized Coefficient		Standardized Coefficient	T- Test	P-Value
	B	Std. Error			
(Constant)	43.591	1.454		29.984	.000**
Educational level	0.235	0.209	0.189	5.017	.011*
Experience	0.318	0.311	0.246	7.894	.007**
Source of knowledge	0.201	0.187	0.199	6.102	.009**
Number of cases, handled suffered from AIDS	0.199	0.200	0.178	6.944	.008**

R square .038

Model ANOVA 12.410 p value .001**

Dependent variable: Knowledge score

Independent variables: Educational level, Experience, Source of knowledge, Number of cases, handled suffered from AIDS.

Table (7): Best Fitting Multiple Linear Regressions Model for Total Practices

Variables	Unstandardized Coefficient		Standardized Coefficient	T- Test	P Value
	B	Std. Error			
(Constant)	26.974	1.987		26.123	.000**
Educational level	.380	.352	.109	6.082	.009**
Experience	0.175	0.166	0.089	4.985	.013*
Number of cases, handled suffered from AIDS	0.208	0.176	0.154	3.968	.021*

R square .023

Model ANOVA 9.416 p value .004**

Dependent variable: practice score

Independent variables: Educational level, experience, number of cases, handled suffered from AIDS

Table (8): Best Fitting Multiple Linear Regressions Model for Total Attitude

Variables	Unstandardized Coefficient		Standardized Coefficient	T- Test	P Value
	B	Std. Error			
(Constant)	19.633	2.001		16.568	.000**
Educational level	.197	0.201	.157	4.135	.010*
Experience	0.163	0.186	0.142	3.996	.022*
Marital status	0.157	0.142	0.136	2.897	.035*

R square .031

Model ANOVA 6.412 p value .011*

Dependent variables: Attitude score

Independent variables: Educational level, experience, marital status

Table (1): The average age of the nurses in the study sample was 33.34 ± 7.99 , 91% of nurses were females, and 93.4% were married. Furthermore, 41.8% of the study sample had technical institute education. Additionally, 59.0% of them had sufficient income. Also, this table indicates that 59.8% of nurses reside in urban areas. In terms of job experience, we discovered that 60.7% of the study nurses had prior experience in a hospital ranging from two to thirteen years. Moreover, the primary source of information about HIV/AIDS was from TV/Radio 57.4%. Furthermore, 76.2% of the study sample treated cases, handled suffered from AIDS 1 - < 200 cases.

Table (2): Indicates that only (23.8%) of the study sample identified the meaning of HIV at preprogram compared to 96.7% in posttest and 90.2% at follow-up after three months. A considerable change was noticed between the studied sample at pre, and post-program implementation related to window period among males and females ($p = 0.001$). Additionally, all of them (100%) identified the treatment of HIV at all the intervention phases. However, only (25.4%) identified prevention methods that may be arisen from HIV diseases in pre-program intervention on post-it increased to 86.9%. Furthermore, the complication increased from 51.6% in pre-sessions to an equal percentage of 94.3% immediately after implementation of nursing intervention. As well as at follow-up all the differences observed were highly statistically significant ($p = 0.001$).

Figure (1): Clarifies that the highest sign mentioned by nurses at pre-intervention was fever 78.7% compared to 98.4% in post-intervention, followed by muscle ache 71.3% compared to 100% in post-intervention, and diarrhea 49.2% compared to 99.2% in post-intervention.

Figure (2): Illustrates that the most common mode of transmission mentioned by nurses are addiction injection 100% followed by contaminated syringe 88.5% compared to 100% in post-intervention, and infected semen 82% compared to 100% in post-intervention.

Figure (3): Illustrates that the total score of satisfactory knowledge of nurses increased from 15.60% in pre-sessions to 84.40% in immediately post sessions and reduced to 69.70% at follow-up after three months of intervention

Table (3): Clears that the total score of nurses' satisfactory practices increased from 32.80% in pre-sessions to 86.10% in post-session and reduced to 82.0% at follow-up after three months of intervention. Additionally, the mean satisfactory practice score increased from 10.33 ± 4.1 in pre-sessions to 14.45 ± 3.1 in post-session and reduced to 13.26 ± 2.9 after three months of intervention

Figure (4): Illustrates nurses' uses of protective measures as gloves was increased from 87.70% in pre-sessions to 92.60% in post sessions and reduced to 91.80% at follow-up after three months of intervention.

Table (4): Shows the attitude of studied subjects at pre, post and follow up related to AIDS. There are statistically significant differences of studied nurses' attitudes scores at pre, post and follow up related to AIDS except people with AIDS have only themselves to blame and would be worried about the child getting AIDS if his/her teacher had AIDS. There are statistically significant differences of studied nurses' attitudes' scores at pre, post and follow up related to AIDS except I would not want my child to go to school with a child with AIDS and changing my professional specialty/position if it became necessary to work with AIDS patients.

Figure (5): Illustrates that the total scores of nurses' positive attitude increased from 26.20% in pre-sessions to 72.10% in post sessions and then reduced to 68.90% at follow-up after three months of intervention.

Table (5): Reveals that HIV nurses' post-intervention knowledge scores had statistically significant positive correlations with their knowledge, practice and attitudes ($P < 0.001$).

Table (6): Indicates that the nurses' educational level, experience, source of knowledge, number of cases handled suffered from AIDS were the main statistically significant independent positive predictors of the nurses' knowledge score. 038 % of the change in this score as indicated by the r-square value.

Table (7): Shows that the nurses' educational level, experience, and number of cases, handled suffered from AIDS were the main statistically significant independent positive predictors of the nurses' practice score. The model explains .023% of the change in this score as indicated by the r-square value.

Table (8): Shows that the study educational level, experience, and marital status were the main statistically significant independent positive predictors of the nurses' attitude score. The model explains .031% of the change in this score as indicated by the r-square value.

Discussion:

The human immunodeficiency virus (HIV) has become one of the most serious public health challenges due to the high morbidity and mortality rates and the economic impacts. Knowledge and positive attitudes are important aspects of providing nursing care for people with HIV / AIDS. Outpatient nurses play critical roles in HIV / AIDS prevention and treatment, which continues to spread rapidly, it is

important to identify missing, incorrect or insufficient information as well as nursing situations about this disease in order to plan, implement and evaluate the effectiveness of treatment. (Avert, 2018).

In the current study, the demographic characteristics of the participants revealed that most of the participants were female, the mean age of the participants was 33.34 ± 7.99 years, and the age group that was most represented was 20 - <40 years. More than two fifths of the nurses were institute of nurses, and their mean work experience was $11.157.4 \pm 8.61$ years, with slightly more than two fifths having from 2- <13 years' experience in hospital as the highest frequency. Additionally, the mean number of cases handled suffered from AIDS was 145.8 ± 170.7 ranging from 1 - <200. These results were supported by the results of **Boakye & Mudzus (2019)**, in **Ghana**, which stated that the majority of the participants were female and their work experience ranged from 2 to 15 years, and most of them reported caring for patients with HIV and AIDS frequently. Likewise, with **Wei-ti chen et al. (2013)**, in Northeast China, it was found that the average age of their study participants was 37.42 ± 8.66 years; The mean years of working as a nurse were 16.63 ± 8.61 years, and only 2% of the participants were men. This finding was supported by **Ehsanul- Huq et al. (2019)**, in a study aiming to assess nurses' knowledge and attitude towards HIV-infected patients in **Barbados** which found that most of the nurses were female.

In the current study, the demographic characteristics of the participants revealed that most of the participants were female. The mean age of the participants was 33.34 ± 7.99 years, and the age group that was most represented was 20 - <40 years old. More than two-fifths of the nurses were institute nurses, and their average work experience was $11.157.4$, with slightly more than two-fifths having at least two years of hospital experience. Additionally, the mean number of cases handled suffered from AIDS was 145.8 ± 170.7 ranging from 1 - <200. These results were supported by the results of **Boakye & Mudzus (2019)**, in **Ghana**, which stated that the majority of the participants were female and their work experience ranged from 2 to 15 years, and most of them reported caring for patients with HIV and AIDS frequently. Likewise, in **Wei-ti chen et al. (2013)**, in Northeast China, it was found that the average age of their study participants was 37.42 ± 8.66 years; The mean years of working as a nurse were 16.63 ± 8.61 years, and only 2% of the participants were men. This finding was supported by **Ehsanul- Huq et al. (2019)**, in a study aiming to assess nurses' knowledge and attitudes towards HIV-

infected patients in **Barbados**, which found that most of the nurses were female.

The results of the current study revealed that the primary sources of information about HIV / AIDS were television / radio / Facebook/ internet, followed by hospitals in HIV / AIDS service training courses. This could be because the majority of the nurses in the study reported that HIV/AIDS isn't a topic of conversation in their families. This may be due to the fact that Egyptian culture is sexually conservative. These results are consistent with results of a study conducted in Greece, by **Ouzouni & Nakaki (2012)**, which found that the primary sources of information for participants were television (80.7%) and newspapers / magazines (64.6%). The results of this study are roughly in line with the results of the study conducted by **Hasan & Wahsha (2011)**, in **Jordan**, which stated that the main source of HIV / AIDS information obtained by Jordanian nurses was through the media (52.7%). However, these findings are inconsistent with those of research by **Kok et al. (2020)**, in Italy who stated that nurse' sources of information about HIV / AIDS are predominantly the nursing education curriculum (76.6%), followed by television (66.5%).

Regarding the overall knowledge score, the results of the present study showed that there is a statistically significant improvement in knowledge among the nurses under study after receiving the educational intervention in the immediate post and follow up periods. Moreover, satisfactory knowledge increased from less than a fifth in the previous sessions to less than three-quarters of the nurses in subsequent sessions and decreased slightly after three months. This result was consistent with those of **Marranzano et al. (2013)**, in **Italy**, who found that a higher level of knowledge was revealed in the post-intervention stage compared to the pre-intervention stage because they knew the meaning of AIDS (87%), the window period (62%) and that the infection could be transmitted by individuals. These people are infected even if they do not have AIDS symptoms (65%).

Moreover, the nurses were well-versed with how HIV infection was diagnosed (94%). In a similar vein, **Abul-Fotouh et al. (2013)** investigated Saudi nursing trends toward AIDS and predictions of readiness to provide care to patients in Saudi Arabia, and discovered that participants had a high level of knowledge after receiving the intervention. Likewise, **Aloteb et al. (2012)**, in **Kuwait**, who assessed the knowledge and attitudes of nurses regarding blood borne infection and reported that the nurses under study reported an acceptable level of knowledge regarding HIV infection. This study also agrees with the suggestions of **Ihsan ul-Haq et al. (2019)**, in

Barbados, who recently found that the general knowledge of the participants was good.

Regarding the mode of transmission in the current study, only a third of the nurses correctly answered questions related to HIV transmission by coughing, and more than three quarters correctly answered HIV transmission through swimming pools and the public phone. The insufficient knowledge demonstrated by the participants in this study may be attributed to the lack of training in HIV through workshops and seminars. This study result is in agreement with **Pal et al. (2016)** and **Uppala et al. (2017)** on the need for continuing professional training for nurses involved in patient management and care to enhance their knowledge and competence related to HIV. This finding is in the same context as the study conducted in **Greece**, by **Ouzouni and Nakaki (2012)**, who found that their study sample knowledge of HIV / AIDS was inaccurate and insufficient.

Additionally, half of the respondents believed that HIV can be transmitted by mosquitoes, a third through the toilet seat and a small percentage through swimming pools. In addition, more than half of the nurses believe they can protect themselves from AIDS by getting vaccinated against it. These results are in agreement with **Hasan & Wahsha (2011)** in **Jordan**, who found that a good level of knowledge among Jordanian nurses was recorded in the following subsections: manifestations, transmission, and prevention in prior intervention. This finding is supported by **Shivalli (2014)**, who evaluated the perception and preventive practices of nursing students and reported good knowledge of the modalities of HIV transmission among the nurses under study. Likewise, **Magdy et al. (2013)**, in Fever Hospital, Egypt, who discovered from their study that nurses working with HIV / AIDS patients possess a satisfactory level of knowledge about methods of transmission and non-transmission (78.5%).

The result of the current study shows that just less than three-quarters of the nurses under study have negative attitudes towards people living with HIV / AIDS. This finding may be related to the effect of public attitudes of society towards people with HIV / AIDS on the nurses under study. This finding is supported by **Hassan & Wahsha (2011)**, who assessed the knowledge and attitudes of the Jordanian nurses and reported a negative attitude exhibited by the nurses under study towards persons with HIV / AIDS. In addition, this finding is in agreement with **Rekab EslamiZadeh (2011)**, which assessed the knowledge and attitudes of nurses working with HIV / AIDS and reported a negative attitude towards HIV / AIDS patients expressed by the nurses under study. Meanwhile, the current study showed that there are

improvements between the pre-test and post-test intervention.

In terms of the contagion subscale, the nurses in this study agreed that AIDS makes their job a high risk occupation; slightly more than two-thirds agreed they would not want their child to go to school with a child with AIDS; and the vast majority agreed that it is likely that they will become infected with HIV even if strict infection control measures are followed. From the researchers' point of view, appropriate education is critical to improving nursing attitudes. This finding was in agreement with that of **Kok et al. (2020)** in Turkey, who reported that 63.1% of them agree that AIDS makes work a high-risk profession, 71.1% agree that they do not want their child to go to school with a child with AIDS, 72.3% agree that although even by following strict infection control measures, it is likely that they become infected with HIV. Several studies have reported that nurses generally have positive attitudes towards people living with HIV and AIDS (**Zarei et al., 2015 in Iran, Ishimaru et al., 2017 in Vietnam, & Ledda et al., 2017 in Italy**).

Furthermore, in terms of the occupational resistance subscale, the study results revealed that more than two-thirds of the nurses agree that, if given a choice, they would prefer not to work with AIDS patients, and just under a quarter would agree to change their specialty or professional career if possible. essential to work with AIDS patients, only a fifth of them agree that it is better to train a few specialists who will be in charge of treatment and less than a third of nurses do not agree to work with people at higher risk of AIDS such as IV drug users and homosexuals, as patients.

These findings were consistent with a study conducted in Turkey by **Kok et al. (2020)**, who found that 50.8% of people would prefer not to work with AIDS patients if given the option, and 28.9% would change specializations or professional jobs if it became necessary to work with AIDS patients. 43.1% believe it is better to train a few professionals who will be in charge of the treatment, while only 29.8% believe it is better to train many professionals.

These previous results contradict those of **Boaky & Mudzus (2019)** in **Ghana**, which found that the majority showed positive attitudes. The majority (58.4% $p < 0.00001$) strongly disagreed that people with HIV/AIDS only have themselves to blame. When respondents were asked whether they needed to be concerned about putting their family and friends at risk of contracting the disease when caring for someone with HIV / AIDS, most of them either strongly disagreed (30.7%) or just disagreed (43.3% $p = < 0.00001$). Several respondents strongly agreed (64.8% $p = < 0.0001$) or agreed (25.7% $p = < 0.0001$) that patients with HIV / AIDS have the right to the

same quality of care as any other patient. Half of them responded that they strongly agree (50.2% $p = <0.0001$) that all patients with HIV / AIDS deserve confidentiality, even if that puts others at risk of contracting the disease.

Additionally, the results of the present study are consistent with the findings of **Taher & Abdel-Hay (2011)**, in **Egypt**, which reported an avoidant attitude that was present in both students and postgraduate nurses before the intervention program, which changed to a lesser extent after the applied educational program. In addition, this finding is inconsistent with the results of a study by **Aloteb et al. (2012)**, in Kuwait, which showed that nurses showed a positive attitude towards people living with HIV.

The overall score of nurses' satisfactory practices in the current study, increased from only a third of the nurses in the previous sessions to an improvement in the majority in the immediately post sessions and was slightly reduced at the follow-up after three months. However, this finding disagrees with that of **Achappa et al. (2012)**, who reported a satisfactory level of practice among nurses working with HIV / AIDS. This finding contrasts with **Koc (2013)**, who discovered an unsatisfactory level of practice among nurses working with HIV / AIDS patients prior to the intervention. This discrepancy may be due to the difference in samples, as institutional policies have been applied to achieve a satisfactory level of practice. This result is consistent with that of **Boakye & Mudzus (2019)** in **Ghana**, and they found that their practice of safety measures was satisfactory and that most of the participants (212, 92.6% $p = < 0.00001$) reported wearing gloves the last time they took a blood sample. This is in agreement with the results of **Som et al. (2015)** in **India**, 92.6% wore gloves before screening patients. Increased compliance with this precaution is consistent with the **Beckers (2016)**, Africa Hospital Review, in which their report stated that the precautions with the highest compliance rate were wearing gloves (92%).

The multivariate analysis in this study showed that the educational level of the study, experience, the source of knowledge, the number of cases handled and who suffered from AIDS were the main independent positive indicators of statistical significance for the practice of nurses and the overall degree of knowledge. However, educational level, experience and marital status were the most important independent positive indicators of statistical significance for the nurses' position. These results are supported by **Marranzano et al. (2013)**, in **Sicily**, where they found that the level of knowledge is positively related to the level of education ($P = 0.016$). This result also agrees with the results of

Ehsanul-Huq et al. (2019), in an outcome study aimed at assessing nurses' 'knowledge and attitude towards HIV-infected patients in **Barbados**, who found, in logistic regression, that knowledge and attitude were used as dependent variables (outcome), while marital status, level, education and experience were used as explanatory variables. Related to HIV as an explanatory variable, the results are consistent with those of **Suominen et al. (2010)**, in **Finland**; they mentioned that the length of work experience is positively correlated with knowledge and attitudes. Knowledge and behavior are influenced by education, training and practical experience in dealing with patients with HIV.

Conclusion

The research hypothesis was justified as nurses with increased knowledge of HIV / AIDS and positive attitudes showed good practices towards people living with HIV and AIDS. In addition, in light of the results of the current study, it can be concluded that the study showed that the nursing sessions were effective in increasing the level of knowledge and practice of the nurses in addition to their positive attitudes towards HIV / AIDS. Moreover, the educational level of the study, experience, the source of knowledge, the number of cases dealt with, and those with AIDS were the main statistically significant independent positive predictors of the nurses' practice and knowledge scores.

Recommendations:

Based on the results of the present study, the following recommendations were suggested: The need for continuous in-service training for nurses on HIV and AIDS is a major factor contributing to enhancing knowledge, correcting misconceptions and positive attitudes, and improving compliance with global precautions and other preventive measures Practices. Information campaigns for patients and their families or caregivers should receive instruction on how to prevent disease transmission, including hand-washing techniques and methods for safely handling and disposing of items soiled with body fluids.

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