



E-ISSN: 2664-2301
P-ISSN: 2664-2298
IJOGN 2022; 4(1): 05-14
Received: 20-10-2021
Accepted: 05-12-2021

Hanan Abd El Monem Mohammed
Assistant lecturer of Women
Health and Obstetrics
Nursing- Faculty of Nursing -
Minia University, Egypt

Hoda Abd-Elazim Mohamed
Professor of Women Health
and Obstetrics Nursing-
Faculty of Nursing - Minia
University, Egypt

Hany Hassan Kamel
Professor of Obstetrics &
Gynecology- Faculty of
Medicine - Minia University,
Egypt

Corresponding Author:
Hanan Abd El Monem Mohammed
Assistant lecturer of Women
Health and Obstetrics
Nursing- Faculty of Nursing -
Minia University, Egypt

Effectiveness of implementing evidence-based guidelines on nurses' knowledge regarding caring of aborted women

Hanan Abd El Monem Mohammed, Hoda Abd-Elazim Mohamed and Hany Hassan Kamel

Abstract

Nurses and midwives are on the frontlines of the health care workforce, so they should have evidence knowledge to deliver the care and information in a therapeutic, nonbiased manner to the aborted woman.

Aim: This study aims to evaluate the effectiveness of implementing evidence-based guidelines on nurses' knowledge regarding caring for aborted women.

Subjects and Methods: Quasi-experimental research design (one group pre-test, post-test) was utilized to fulfill the aim of this study.

Setting: This study was conducted in obstetrics, labor, and gynecological departments at Minia university hospital for maternity and child.

Sample: convenient sample included 55 nurses.

Tool: A self-administered questionnaire was used.

Results: The study's main findings revealed that nearly three-quarters of the studied nurses (72.7%) had a poor level of total knowledge regarding abortion before implementing evidence guidelines. However, 89.1% and 74.6% of them had good knowledge in immediate and Post three months after evidence guidelines, respectively, with statistically significant differences between pre and post-implementation of evidence-based guidelines in which $p\text{-value} < 0.001$. In addition, there was a statistically significant relation between pre-test knowledge of nurses with their age and year of experience in which $P\text{-value} \leq 0.0009$ & 0.0003 respectively.

Conclusion: Implementing evidence-based guidelines effectively significantly improved nurses' knowledge of caring for aborted women.

Recommendation: The nursing curriculum should include updated evidence-based knowledge in abortion care and the distribution of brochures and pamphlets for nurses as guidance concerning abortion.

Keywords: Abortion care, nurses, knowledge, evidence-based abortion care

1. Introduction

According to WHO data, between 2015 and 2019, there were an estimated 73.3 million worldwide abortions. Every 1000 women between the ages of 15 and 45 who had an abortion, there were roughly 39 abortions performed. One in three of these abortions begins in unsafe conditions ^[1]. In developing countries, unsafe abortion is a problem that is often neglected. Abortion complications are a significant source of maternal death and morbidity unless the unsafe abortion is eradicated ^[2].

In developing countries, the abortion rate decreased significantly, but there was no meaningful difference in emerging regions. About 30 women die per 100,000 unsafe abortions in developed countries. It is estimated that 220 women die for every 100,000 unsafe abortions in underdeveloped countries, and 520 people die for every 100,000 in sub-Saharan Africa ^[3].

Providing safe, effective, and acceptable abortion care services is an important factor in women's reproductive well-being. In order for an abortion to have a negative impact on a women's health, it must be conducted correctly. As a result, women's access to appropriate health care is further restricted by a lack of resources, inadequately qualified health personnel, equipment, lack of knowledge, and general socioeconomic level. This might lead to poor quality knowledge and counseling if practitioners lack enough training and expertise to terminate pregnancy ^[4, 5].

World health organization (WHO) is working with partners to accelerate progress towards improved health and well-being of all women, so that WHO developed and later updated guidelines for providing safe abortions, which cover each component of comprehensive abortion care and assist health care providers to utilize the best data available to provide safe abortion care and prevent the millions of mortality and disabilities that result from unsafe abortion^[6]. Appropriate skills and knowledge are required for caring for aborted women so that nurses working in this specialist area should have continuous professional development to help them provide high-quality, evidence-based abortion care. Also, there is an essential need to encourage nurses to do more research into related topics and become more politically aware to expand the nursing practice, and more evidence related to abortion care becomes available and extends to nurses^[7].

2. Significance of the study

Poor quality of health care services leads to unsafe abortion. That is considered a neglected health problem that was contributing to 8-13 % of maternal death worldwide. Sustainable Development Goals (SDGs) aim to decrease the maternal mortality ratio from 216 to 70/100 000 live births by 2030 globally. So in order to achieve this goal, developing countries need to improve the health care system to reduce abortion-related maternal deaths. Nurses should provide all women with self-care practices to decrease and prevent abortions and reduce maternal morbidity and mortality related to abortion causes. Therefore, empowering nurses with evidence related to abortion care leads to positive abortion care practices; thus, this study aimed to improve the nurses' evidence-based knowledge regarding abortion care^[8,9].

3. Aim of the study: To

Evaluate effectiveness of implementing evidence-based guidelines on nurses' knowledge regarding caring of aborted women.

4. Research hypotheses

H1: Nurses who received evidence-based guidelines will have improvement of their knowledge regarding care of aborted women.

H2: There will be significant relation between pre-test knowledge of nurses with their selected socio-demographic characteristics.

5. Subjects and methods

5.1 Research Design

Quasi-experimental research design (one group pre-test, post-test) was utilized to fulfill the aim of this study.

5.2 Setting

This study was conducted in obstetrics, labor, and gynecological departments at Minia university hospital for maternity and child. This setting is considered one of the important medical and specialized hospitals in North Upper Egypt, and it provides free health services for women and children during life stages.

5.3 Sample

All nurses (55 nurses) who work in obstetrics (16 nurses), labor (23nurses), and gynecological (16 nurses) departments

at Minia university hospital for maternity and child at the time of data collection were included in the study. Exclusion criteria: Nurses who are in long vocation at the time of data collection (as child care leave, a vocation without pay).

5.4 Tool of Data Collection

After a comprehensive review of the literature and previous studies, the researcher created data gathering tools. After that, five obstetrical and gynecological specialists in nursing and medical personnel review the data gathering tool.

A self-administered Questionnaire: It was used to assess and collect data related to three main parts:

Part (1): Socio-demographic characteristics of nurses such as age, educational level, years of experience, previous attendance of training courses, and source of their knowledge.

Part (2): General knowledge about evidence-based practice in nursing (pre and post-test) consists of 4 items the meaning of evidence-based practice, process & steps of evidence-based in nursing, and barriers of evidence-based in nursing.

The form of multiple choices questions; the first section asked about general knowledge about abortion as the definition of abortion, causes, contributing factors, dangerous signs of abortion, types of abortion, diagnostic test, therapeutic management, post-abortion care, complications, home and follow up precautions and preventive measures of abortion; the second section asked specific knowledge about each type of abortion manifestation and management of it. **Scoring System:** The nurse's answers related to knowledge were scored and calculated. Each correct answer was given one score, and the wrong answer or don't know was given zero. Total knowledge scores were converted into a percent score and classified as (poor knowledge scored < 60%, average knowledge 60%- < 85%, and good knowledge scored ≥85%.

5.5 Supportive material

Following a comprehensive study of the relevant literature, the investigator created a handout (booklet) to provide additional support material. As a result, it was written in an easy-to-understand Arabic language and had several pictures to help nurses learn about abortion and its treatment.

5.6 Validity and Reliability

An expert of Obstetrics and Gynecological staff and nursing professor panel of five assessed the questionnaire for clarity, relevancy, comprehensiveness, comprehension, application, and ease in order to prove its validity. It was determined that Cronbach's alpha test, which measures how stable an algorithm's internal consistency is, yielded a value of 0.875.

5.7 Pilot Study

A pilot study involving 10% of the overall study population was conducted (6 nurses). It was done to test the tool's applicability and clarity, examine the feasibility of fieldwork and identify any potential impediments that could confront the researcher and impede data collecting. On the basis of the results of the pilot research, adjustments were made, such as the addition of certain questions to tools (added three questions regarding nurses' knowledge of abortion) to improve their substance or make them simpler

and easier. The pilot sample was included in the final study sample.

5.8 Data Collection Procedure

The current study was achieved through three phases: assessment phase (pre-test), implementation (conducting evidence-based guidelines), follow-up, and evaluation phase (post-test).

5.8.1 Assessment phase (pre-test)

After official permission was obtained from the ethical research committee of the faculty of Nursing, participants' nurses were recruited from Minia university hospital for maternity and child. At the beginning of the interview, the researchers greeted each nurse explained the purpose, duration, and activities of the study; they were informed that participation in this study was voluntary and They had the right to withdraw at any time and taken oral approval of nurses to share in the study.

After obtaining the acceptance from nurses to participate in the current study, the researcher provided an overview and clarification about the assessment tool questions; then the self-administered questionnaire was distributed to each nurse to assess data related to socio-demographic data, general knowledge about evidence-based nursing practices, and specific knowledge about abortion, the time is taken to fill the questionnaire ranged from 15 to 20 minutes. The researcher visited data collection sites two days per/week at two shifts, morning and evening.

5.8.2 Implementation phase (conducting evidence-based guidelines)

Evidence-based guidelines were designed by the researcher in the Arabic language. It was also supplemented with information based on the review of relevant literature (nursing textbooks, journals, and internet resources) about abortion and the care of an aborted woman.

The evidence-based guideline was applied on two sessions for knowledge (each session lasted from 40-60 minutes), two sessions per day to cover all theoretical evidence-based guidelines, and was implemented according to work conditions.

In this phase, the nurse was divided into small groups; each sup group consisted of (3-5 nurses). The first session provides orientation on the guide and its aim, the definition of abortion, types, causes, and risk factors, in the second session discuss: diagnostic tests, components of post-abortion care, complications of abortion, preventive measures, and care of aborted woman were through used face to face method to achieved the proposed goal and allow the nurses to ask, discussion and reach a high level of understanding; the discussion was emphasized on improving nurses' knowledge and 15 minute was assigned at the end of the discussion for the question and obtains the feedback to ensure that the nurses got maximum benefits.

Different teaching methods and learning aids for knowledge

were used as lecture, group discussion using PPT on a laptop, hand out and pictures to easily understand, and an Arabic booklet with pictures was given to each participant. Motivation and reinforcement were by praising and recognition to encourage the nurses to participate in the program.

5.8.3 Evaluation phase

The investigator was conducted three times of evaluation

First time of evaluation (pre-test) done before implementation of the guideline to assess nurses' knowledge regarding abortion. The second time of evaluation (immediate post-test) is done immediately after implementation of the guideline. The third time of evaluation (post-test) was done after three months of the guideline.

The effect of evidence-based guidelines was done by comparing the pre-test and post-test that was conducted immediately and after three months of intervention to assess their knowledge regarding caring for aborted women. The data was collected for six months, from March 2020 to August 2020.

5.9 Administrative design

Before the conduction of the pilot study and the actual study, official permission and consent was obtained from the dean of the Faculty of Nursing, as well as the Director of Minia university hospital for maternity and newborns. The research proposal was approved from the ethical committee in the faculty of nursing.

5.10 Ethical consideration

Official permission to carry out the study obtained from the nurses that are willing to participate in the study, after explaining the importance, aim, nature, and purpose of the study, oral consent obtained from all nurses, all participants have the right to refuse to participate and or withdraw from the study without any rational any time, privacy was considered during the collection of data, no health hazards were present. Participants were assured that all their data were highly confidential; anonymity was also assured through assigning a number for each nurse instead of names to protect their privacy.

5.11 Statistical analysis

The collected data were tabulated, computerized, analyzed, and summarized using descriptive statistical tests to test research questions using SPSS (IBM, 25). The significance level was accepted at $P < 0.05$ and was considered highly significant when P-value was less than or equal to 0.01.

6. Results

This study aimed to evaluate effectiveness of implementing Evidence-Based Guidelines on nurses' knowledge regarding caring of aborted women.

Table 1: Percentage distribution of socio-demographic characteristics among the studied nurses (n= 55).

Socio-demographic characteristics	No.	%
Age/ years		
Less than 25	33	60.0
25 – < 35	20	36.4
35 - < 45	2	3.6
Mean ± SD	25.9 ± 4.5	

Educational level		
Diploma nursing	10	18.2
Nursing institute	45	81.8
Years of experience/ year		
Less than 5	33	60.0
5 - < 10	12	21.8
10 - < 15	6	10.9
More than 15	4	7.3
Mean \pm SD	6.1 \pm 4.5	
Attendance of training courses about the care of abortion		
Yes	7	12.7
No	48	87.3

Table (1): Shows that 60.0% of the studied nurses their age less than 25 years, 81.8% of them had nursing institute certification, 60.0% of them their years of experience less

than five years, and 87.3% of them hadn't any training about the care of abortion.

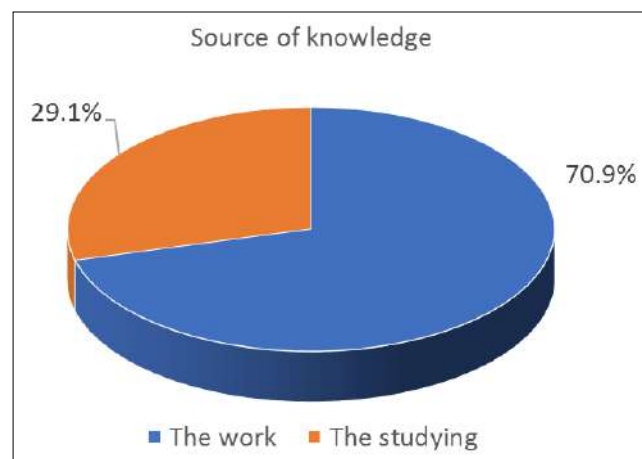


Fig 1: Distribution of the studied nurses regarding their source of knowledge about the care of aborted women (n= 55).

Figure (1): Demonstrates that 70.9% of them their source of knowledge was from the work experience, and 29.1% of them were from their studying.

Table 2: Distribution of the study sample regarding their general knowledge about evidence-based practice (n=55)

Items	Pre		Immediately		Post 3 months		X^2	$P - \text{value}$
	No.	%	No.	%	No.	%		
Meaning of evidence-based practice								
Don't know	28	50.9	0	.0	0	.0	118.592	.0001**
Poor	27	49.1	7	12.7	10	18.2		
Average	0	.0	5	9.1	20	36.4		
Good	0	.0	43	78.2	25	45.5		
Process of evidence-based practice in nursing								
Don't know	26	47.3	0	.0	0	.0	72.877	.0001**
Poor	16	29.1	5	9.1	10	18.2		
Good	13	23.6	50	90.1	45	81.8		
Steps of evidence-based in nursing								
Don't know	29	52.7	0	.0	0	.0	89.510	.0001**
Poor	16	29.1	7	12.7	8	14.5		
Good	10	18.2	48	87.3	47	85.5		
Barriers of evidence-based in nursing								
Don't know	23	41.8	0	.0	0	.0	88.275	.0001**
Poor	21	38.2	5	9.1	8	14.6		
Average	0	.0	1	1.8	4	7.3		
Good	11	20.0	49	89.1	43	78.2		

**= highly statistical significance differences at .01

Table (2): presents that regarding nurses general knowledge about evidence-based practice, the current study showed that there were statistically significant differences between

pre-test and post-test three months of evidence guideline application P-value < 0.001

Table 3. a: Distribution of the study sample regarding their general knowledge about abortion (n=55)

Items	Pre		Immediately		Post 3 months		X ²	P – value
	No.	%	No.	%	No.	%		
Definition of abortion								
Don't know	8	14.5	0	.0	0	.0	48.548	.0001**
Poor	20	36.4	0	.0	3	5.5		
Average	0	.0	2	3.6	21	38.2		
Good	27	49.1	53	96.4	31	56.4		
Types of abortion								
Don't known	52	94.5	13	23.6	14	25.5	72.033	.0001**
Good	3	5.5	42	76.4	41	74.5		
Causes of abortion								
Don't know	6	10.9	0	.0	0	.0	54.649	.0001**
Poor	46	83.6	10	18.2	24	43.6		
Good	3	5.5	45	81.8	31	56.4		
Contributing factors of abortion								
Don't know	15	27.3	0	.0	0	.0	93.053	.0001**
Poor	38	69.1	9	16.4	19	34.5		
Good	2	3.6	46	83.6	36	65.5		
Dangers signs of abortion								
Don't know	26	47.3	7	12.7	13	23.6	17.061	.0001**
Good	29	52.7	48	87.3	42	76.4		

**Highly statistical significance differences

Table (3.a): Shows that 49.1%, 5.5%, 5.5%, 3.6%, & 52.7% of the studied nurses had good knowledge regarding the definition of abortion, types of abortion, causes of abortion, contributing factors of abortion and danger signs of abortion in pre guidelines application, this percentage was increased

to 96.4%, 76.4%, 81.8%, 83.6% and 87.3% immediately after the application of the guideline while post 3 months decreased to 56.4%, 74.5%, 56.4%, 65.5% and 76.4% respectively with highly statistically significant differences which P-value < 0.001

Table 3. b: Distribution of the study sample regarding their general knowledge about abortion (n=55)

Items	Pre		Immediately		Post 3 months		X ²	P – value
	No.	%	No.	%	No.	%		
Diagnostic test of abortion								
Don't know	21	38.2	0	.0	0	.0	87.880	.0001**
Poor	33	60.0	3	5.5	8	14.5		
Average	0	.0	18	32.7	16	29.1		
Good	1	1.8	34	61.8	31	56.4		
Immediately hospital Post-abortion care								
Don't know	11	20.0	0	.0	0	.0	43.907	.0001**
Poor	15	27.3	0	.0	11	20.0		
Good	29	52.7	55	100.0	44	80.0		
Home and follow up precautions								
Don't know	9	16.4	0	.0	0	.0	45.441	.0001**
Poor	44	80.0	1	1.8	0	.0		
Average	0	.0	27	49.1	35	63.7		
Good	2	3.6	28	50.9	19	34.5		
Complications of abortion								
Don't know	16	29.1	0	.0	1	1.8	91.711	.0001**
Poor	38	69.1	12	21.8	18	32.7		
Average	0	.0	10	18.2	18	32.7		
Good	1	1.8	33	60.0	18	32.7		
Preventive Measures of abortion								
Don't know	9	16.4	0	.0	0	.0	60.966	.0001**
Poor	24	43.6	0	.0	3	5.5		
Average	0	.0	0	.0	16	29.0		
Good	22	40.0	55	100.0	36	65.5		

**Highly statistical significance differences

Table (3. b): Reveals that there were statistically significant differences between pre-test and post-test regarding their general knowledge about the diagnostic test of abortion,

immediately hospital post-abortion care, home and follow up precautions, Complications of abortion, and Preventive Measures of abortion (P-value < 0.001 respectively)

Table 3. c: General knowledge about abortion among studied nurses pre, immediately, and post three months of evidence-based guideline application (n=55)

	Evidence-based guideline						Test of significance	
	Pre-Guideline		Immediately-Guideline		Post-Guideline		X ²	P – value
	No.	%	No.	%	No.	%		
Time of first menstruation following abortion								
Don't know	34	61.8	0	.0	6	10.9	65.208	.0001**
Good	21	38.2	55	100.0	49	89.1		
Time of first intercourse following abortion								
Don't know	52	94.5	0	.0	8	14.5	123.200	.0001**
Good	3	5.5	55	100.0	47	85.5		
Waiting time for second pregnancy after abortion								
Don't know	50	90.9	1	1.8	1	1.8	134.842	.0001**
Good	5	9.1	54	98.2	54	98.3		

**Highly statistical significance differences

Table (3. c): Reveals that there were statistically significant differences between pre-test and post-test regarding their general knowledge about the time of first menstruation

following abortion, time of first intercourse following abortion, and waiting for the time for second pregnancy after abortion (P-value < 0.001 respectively)

Table 4: Distribution of the study sample regarding their total knowledge about different abortion types (n=55)

Types of abortion	Pre						Immediately						Post 3 months						Test of significance	
	Poor		Average		Good		Poor		Average		Good		Poor		Average		Good		χ^2	P-value
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Threatened abortion	27	49.0	3	5.5	25	45.5	4	7.3	1	1.8	50	90.9	7	12.7	4	7.3	44	80.0	35.022	0.0001**
Inevitable abortion	28	50.9	0	.0	27	49.1	1	1.8	0	.0	54	98.2	10	18.2	0	.0	45	81.8	38.077	0.0001**
Incomplete Abortion	40	72.7	10	18.2	5	9.1	1	1.8	1	1.8	53	96.4	3	5.5	8	14.5	44	80.0	111.119	0.0001**
Complete abortion	44	80.0	0	.0	11	20.0	8	14.5	0	.0	47	85.5	9	16.4	0	.0	46	83.6	65.594	0.0001**
Missed abortion	34	61.8	10	18.2	11	20.0	1	1.8	2	3.6	52	94.6	2	3.6	8	14.6	45	81.8	89.057	.0001**
Recurrent spontaneous abortion	30	54.5	20	36.4	5	9.1	1	1.8	6	10.9	48	87.3	5	9.1	3	5.5	47	85.5	96.339	0.0001**
Induced abortion	37	67.3	8	14.5	10	18.2	1	1.8	3	5.5	51	92.7	3	5.5	5	9.0	47	85.5	90.667	0.0001**

Table (4): It shows the distribution of the study sample regarding their knowledge about nursing care of different abortion types. It reveals highly statistically significant

differences between pre-test and post-test three months of evidence-based guideline application (P-value < 0.001 respectively).

Table 5: Distribution of the study sample regarding their total knowledge level pre, immediately, and post three months of evidence-based guideline application (n=55).

Total knowledge level	Pre		Immediately		Post 3 months		χ^2	P – value
	No.	%	No.	%	No.	%		
Poor	40	72.7	2	3.6	6	10.9	91.740	0.0001**
Average	10	18.2	4	7.3	8	14.5		
Good	5	9.1	49	89.1	41	74.6		

Table (5): Shows that nearly three-quarters of the studied nurses (72.7%) had poor total knowledge regarding abortion before evidence guidelines application. And the majority of them (89.1%, 74.6%) had good knowledge in immediate

and Post three months after evidence guidelines, respectively, with highly statistically significant differences which P-value < 0.001.

Table 6: Relation between socio-demographic characteristics of the studied nurses and their total knowledge pre- evidence-based guideline application (n=55)

Socio-demographic characteristics	Total knowledge level						Test of significance	
	Poor (n= 40)		Average (n= 10)		Good (n= 5)		χ^2	$P - \text{value}$
	No.	%	No.	%	No.	%		
Age/ years								
Less than 25	30	75.0	2	20.0	1	20.0	18.623	0.0009**
25 – < 35	10	25.0	8	80.0	2	40.0		
35 - < 45	0	.0	0	.0	2	40.0		
Educational level								
Diploma nursing	7	17.5	2	20.0	1	20.0	0.046	0.978
Nursing institute	33	82.5	8	80.0	4	80.0		
Years of experience/ year								
Less than 5	31	77.5	2	20.0	0	.0	25.323	0.0003**
5 - < 10	8	20.0	3	30.0	1	20.0		
10 - < 15	1	2.5	4	40.0	1	20.0		

More than 15	0	.0	1	10.0	3	60.0		
--------------	---	----	---	------	---	------	--	--

** Highly statistically significant differences

Table (6): Shows a statistically significant relationship between the total knowledge levels of studied nurses' pre-evidence-based guideline application and their age and years of experience in which $P\text{-value} \leq 0.0009$ & 0.0003 respectively.

7. Discussion

Throughout the data analysis, the finding of the current study indicated that less than two-thirds of the studied nurses their age less than 25 years, the most of them had nursing institute certification, slightly less than two-thirds of them their years of experience less than five years, and the majority of them hadn't any training about the care of abortion. This result agrees with Mahmoud^[10] who studied knowledge of nurses about abortion in the women's hospital and obstetrics in the holy city of Karbala and General AL – Hindia Hospital and reported that nearly half of the age group to the study sample were within (20-24 year), three fourth of them have a nursing high school, the majority of them has (1-3) year of experience, and the major of the study sample wasn't share in training courses.

This result is in the same line with El Sharkawy *et al.*,^[11] who studied "application of iowa model evidence-based practice on maternity nurses regarding postpartum hemorrhage" and reported that most of the studied sample had no previous training courses. But the same author disagrees with the current study, reporting that more than half of the studied sample had a diploma in nursing. But this result comes inconsistent with Arafat, Mahdy, & El-Kashif^[12] who studied "The Effect of Evidence-Based Guidelines on Nurses, Performance in Respect to Nosocomial Infection at Medical-Surgical and Obstetrician Departments" and reported that more than half of the studied sample their age in between 31:40 years, more than half had less than ten years of experience and more than half of them had previous training. But the same author agrees with the current study is reporting that more than half had nursing institute certification. Moreover, this result differs with Paulose *et al.*^[13] who studied "A Study to Assess The knowledge of Nurses on Evidence-Based Practice in Selected Setting" and reported that most of the studied nurses 86% under the age group of 20-29 and, more than half 54% of nurses have completed BSc Nursing, slightly less than half 49% of them are having more than one year experience but less than ten years. In addition, this result comes inconsistent with Al-Busaidi *et al.*^[14] who studied " Nurses' knowledge, attitudes, and implementation of evidence-based practice in Oman: A multi-institutional, cross-sectional study" and reported that the mean age was 32.4 ± 4.7 years, the most of them hold a diploma in nursing (73.5%) with a mean clinical experience of 10.9 ± 4.2 years.

Concerning the source of knowledge about the care of aborted women, the present study demonstrated that more than two-thirds of their source of knowledge was from their work experience. This finding may be related to the fact that work experience helps nurses gain more knowledge through practices. This result comes in accordance with Subasinghe *et al.*^[15] who studied " Primary care providers' knowledge, attitudes, and practices of medical abortion: a systematic review" and reported that most of the studied sample get their knowledge from their work experience. But the current

study differs with Assefa^[4], who studied " knowledge, attitude and practice of health providers towards safe abortion provision in Addis Ababa health centers" and reported that the majority of nurses improve their knowledge and skills through attendance of educational training.

Regarding nurses general knowledge about evidence-based practice, the current study showed statistically significant differences between pre-test and post-test for the meaning of evidence-based practice, the process of evidence-based practice in nursing, steps of evidence-based in nursing, and barriers of evidence-based in nursing $P\text{-value} < 0.001$. This result was confirmed by Mohammed & Said,^[16] who studied "Evaluation the Effect of Evidence-Based Guidelines for Maternity Nurses to Cope with Aborted Women" and reported that there was a highly statistically significant difference pre/ post guideline regarding studied nurses' knowledge about evidence-based in nursing, with the highest mean score regarding their knowledge about the meaning of evidence-based knowledge and barriers of evidence-based in nursing. Moreover, this result comes in line with Al Qadire^[17], who studied "Undergraduate student nurses' knowledge of evidence-based practice: A short online survey" and reported that the mean total knowledge regarding evidence-based practices was low. But this result comes inconsistent with Paulose *et al.*,^[13] who studied "A Study to Assess The knowledge of Nurses on Evidence-Based Practice in Selected Setting" and reported that slightly more than half of the nurses, 50.3% have average knowledge on evidence-based practices, more than two-thirds of nurses 42.9% have good knowledge on evidence-based practices and 6.8% nurses have poor knowledge on evidence-based practices.

Regarding nurses general knowledge about abortion, the present study showed that slightly less than half of the studied nurses had good knowledge regarding the definition of abortion, types of abortion, causes of abortion, contributing factors of abortion, and danger signs of abortion in pre guidelines application and increased to the majority of them immediately and post three months after the application of the guideline with highly statistically significant differences which $P\text{-value} < 0.001$. This result differs with Assefa,^[4] who studied " knowledge, attitude and practice (KAP) of health providers towards safe abortion provision in Addis Ababa health centers" and reported that the majority of the studied sample had good knowledge regarding definition, causes, types and risk factors of abortion. Also, the current study comes inconsistently with Mahmood,^[10] who studied "Knowledge of nurses about abortion in the women's hospital and obstetrics in the holy city of Karbala and General AL – Hindia Hospital" and reported that most of the studied sample had average knowledge regarding abortion. The reason for this discrepancy might be due to differences in study participants and differences in access to health information in different setting.

In addition, the present study revealed statistically significant differences between pre-test and post-test for a diagnostic test of abortion, immediately hospital post-abortion care, home and follow-up precautions, Complications of abortion, and Preventive Measures of

abortion (P-value < 0.001 respectively). This result may be due to the effective application of the guidelines. This result was confirmed by Farag, Nour, & El Masri, ^[18], who studied "Post-traumatic stress disorders for Patients Undergoing Abortion and Nursing Implications" and reported that the percent knowledge scores at the pre-test before the program implementation were low. However, statistically significant improvements in nurses' knowledge about abortion were noticed at the post-test ($p < 0.001$).

Regarding nurses' knowledge about the time of first menstruation following abortion, the current study illustrated that more than one-third of the studied nurses had good knowledge regarding the time of first menstruation following abortion increased to be the majority of them immediately and post guideline application. This result may be that the guidelines were clear, and most nurses understand it. This result comes in line with Alvargonzález, ^[19], who studied "Knowledge and attitudes about abortion among undergraduate students" and reported the majority of the studied sample had good knowledge regarding post-abortion care. But this result comes inconsistently with Ansari *et al.*, ^[20], who studied "Assessing post-abortion care in health facilities in Afghanistan: a cross-sectional study" and reported that the study participant needs training regarding post-abortion care.

The current study illustrated that the minority of the studied nurses had good knowledge regarding the first intercourse following abortion increased to be all of them immediately after application of guideline then decreased to the most of them post guideline application. This result may be related to the effective application guidelines that increase the nurse's knowledge. This result is in line with Hassan, ^[21], who studied "Nurses' Knowledge and Practice Regarding Post-Miscarriage Care in Omdurman Maternity Hospital, Khartoum State, Sudan" and reported that most of the studied nurses had poor knowledge regarding the first intercourse Post-Miscarriage. Moreover, This result comes in agree with Tran *et al.*, ^[22], who studied "Strengthening healthcare providers' capacity for safe abortion and post-abortion care services in humanitarian settings: lessons learned from the clinical outreach refresher training model (S-CORT) in Uganda, Nigeria, and the Democratic Republic of Congo" and reported that the knowledge of the health care provider had improved after the workshop.

Regarding the knowledge about waiting time for second pregnancy after abortion, the present study illustrated that the minority of the studied nurses had good knowledge regarding the waiting time for second pregnancy after abortion increased to the majority of them immediately after application of guideline then decreased to be the most of them post guideline application. This result may be because the investigator used effective learning methods to achieve the study aims. This result comes in line with Kamar, Chhugani, & James, ^[23], who studied "A Study to Assess the Awareness regarding Legislation of Abortion among Doctors, Staff Nurses, Pharmacists and Women in Selected Areas of New Delhi" reported that the majority of nurses not aware regarding the time of pregnancy after abortion. But this result differs with Mainey *et al.* ^[24], who studied "The role of nurses and midwives in the provision of abortion care: A scoping review" and stated that the studied nurses had poor knowledge and practices and needed further training.

Regarding the knowledge about nursing care of different abortion types, the current study found statistically significant differences between pre-test and post-test three months of evidence-based guidelines application (P-value < 0.001 respectively). This result comes in line with Mohammed & Said, ^[16], who studied "Evaluation the Effect of Evidence-Based Guidelines for Maternity Nurses to Cope with Aborted Women" and reported that there was a highly statistically significant difference regarding studied nurses' knowledge about evidence-based practice in nursing and abortion pre & post guidelines. This result was supported by Black *et al.* ^[25], who reported statistically significant improvement in research knowledge and ability. Participants and administrators identified the benefits of the training program, including the impact on evidence-based practices. Regarding nurses' total knowledge level pre, immediately, and post three months of evidence-based guideline application, the present study showed that nearly three-quarters of the studied nurses had poor total knowledge regarding abortion before evidence guidelines. And the majority of them had good knowledge in immediate and Post three months after evidence guidelines, respectively, with highly statistically significant differences which P-value < 0.001. This result comes in accordance with Baig *et al.* ^[26], who studied Knowledge, Attitude, and Practices of Mid-Level Providers regarding Post Abortion Care in Sindh, Pakistan and reported that the studied nurses had limited knowledge regarding abortion and highlighted the need for providing comprehensive training and workshop to nurses regarding abortion. This result comes in line with El Sharkawy *et al.*, ^[11], who studied "application of IOWA model evidence-based practice on maternity nurses regarding postpartum hemorrhage" and reported that good knowledge regarding evidence-based practice was 4.3% pre-program compared by 81.4% post-program while regarding good postpartum knowledge equal 17.1% was increased to reach 71.4% post-program, and regarding total knowledge was 11.4% pre-program compared by 80.0% post-program and also showed highly statistically significant differences between nurses knowledge pre and post implementing evidence guidelines application.

Regarding the relation between socio-demographic characteristics of the studied nurses and their total knowledge pre- evidence-based guideline application, the present study showed that there was a statistically significant relation between total knowledge levels of studied nurses' pre- evidence-based guideline application and their age and years of experience in which P-value ≤ 0.0009 & 0.0003 respectively. This may be due to the more years of experience the nurses can get knowledge. This result comes in line with Mainah, Keraka, & Otieno, ^[27], who reported that there were statistically significant differences between the studied nurses' knowledge and their socio-demographic data.

Also, this result comes in line with Mahmood *et al.* ^[10], who reported that there was a significant relationship between nurses' knowledge toward abortion and years of experience at ($P < 0.05$).

8. Conclusion

The current study findings concluded that implementing evidence-based guidelines effectively significantly improved nurses' knowledge of caring for aborted women.

9. Recommendations

The nursing curriculum should include updated evidence-based knowledge in abortion care, distribution of brochures and pamphlets for nurses as guidance concerning abortion and its management, and developing discharge instructions provided for all aborted women at discharge containing tips regarding danger signs, time of fertility, healthy habits and follow up.

10. Limitation

The nurses were redistributed due to the corona virus, and five nurses were withdrawn to the isolation unit, which led to a change in the research sample (from 60 - 55 nurses).

11. Acknowledgment

Special thanks to all nurses for their willing participation and cooperation.

12. References

- World health organization (WHO). Preventing unsafe abortion. 2020. <https://www.who.int/news-room/fact-sheets/detail/preventing-unsafe-abortion>.
- Ouedraogo L, Nkurunziza T, Muriithi A, Asmani C, Elamin H, Zan S, *et al.* Research Priorities for Preventing Unsafe Abortions in the WHO Africa Region. *Advances in Reproductive Sciences*. 2021;9:24-32. DOI: 10.4236/arsci.2021.91003.
- Bearak J, Popinchalk A, Ganatra B, Moller A-B, Tunçalp Ö, Beavin C, *et al.* Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990–2019. *Lancet Glob Health*. 2020 Sep;8(9):e1152-e1161. DOI: 10.1016/S2214-109X(20)30315-6.
- Assefa EM. Knowledge, attitude, and practice (KAP) of health providers towards safe abortion provision in Addis Ababa health centers. *Assefa BMC Women's Health*. 2019;19:138. <https://doi.org/10.1186/s12905-019-0835-x>.
- Bamniya A, Verma S. The study of knowledge, attitude, and practice about abortion and technology at the tertiary center in the region of Mewar, Rajasthan, India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology BamniyaA et al. Int J Reprod Contracept Obstet Gynecol*. 2018 Aug;7(8):3320-3324. www.ijrcog.org.
- World health organization (WHO) Medical management of abortion Medical management of abortion, 2018. ISBN 978-92-4-155040-6
- Royal College of Nursing (RCN). Termination of Pregnancy, 20 Cavendish Square, London, W1G 0RN. Royal College of Nursing, 2020.
- Gebremedhin M, Semahegn A, Usmael T, Tesfaye G. Unsafe abortion and associated factors among reproductive-aged women in Sub-Saharan Africa: a protocol for a systematic review and meta-analysis. *Systematic Reviews*. 2018;130:7. Article number: <https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-018-0775-9>
- WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division. Maternal mortality: Levels and trends 2000 to 2017. Geneva, 2019. (<https://www.who.int/reproductivehealth/publications/maternal-mortality-2000-2017/en/>, accessed 17 October 2019).
- Mahmood F. Knowledge of nurses about abortion in the women's hospital and obstetrics in the holy city of Karbala and General AL-India Hospital. *International Journal of ChemTech Research CODEN(USA): IJCRGG ISSN: 0974-4290, SSN(Online):2455-9555*, 2017;10(7):650-657.
- El Sharkawy AT, Said Ar, Abd El Hady RM. Application of iowa model evidence-based practice on maternity nurses regarding postpartum hemorrhage. *Journal of Critical Reviews*. 2020;7(5).
- Arafat MA, Mahdy AY, El-Kashif MM. The Effect of Evidence-Based Guidelines on Nurses' Performance in Respect to Nosocomial Infection at Medical-Surgical and Obstetric Departments. *American Journal of Nursing*. 2018;6(6):507-514.
- Paulose B, Carvalho LS, Mathew B, Mani S, D'souza DG, Bhattacharya C, *et al.* A Study to Assess The knowledge of Nurses on Evidence-Based Practice in Selected Setting. *International Journal of Nursing Education and Research*. 2016;4(3):307-310.
- Al-Busaidi IS, Al Suleimani SZ, Dupo JU, Al Sulaimi NK, Nair VG. Nurses' knowledge, attitudes, and implementation of evidence-based practice in Oman: A multi-institutional, cross-sectional study. *Oman medical journal*. 2019;34(6):521.
- Subasinghe AK, Deb S, Mazza D. Primary care providers' knowledge, attitudes and practices of medical abortion: a systematic review. *BMJ sexual & reproductive health*. 2021;47(1):9-16.
- Mohammed NA, Said AR. Evaluation the Effect of Evidence-Based Guidelines for Maternity Nurses to Cope with Aborted Women, 2018.
- Al Qadire M. Undergraduate student nurses' knowledge of evidence-based practice: A short online survey. *Nurse education today*. 2019;72:1-5.
- Farag DS, Nour SA, El Masri YM. Post-traumatic stress disorders for Patients Undergoing Abortion and Nursing Implications. *Zagazig Nursing Journal*. 2012;8(2):126-139.
- Alvargonzález D. Knowledge and attitudes about abortion among undergraduate students. *Psicothema*, 2017;29(4):520-526.
- Ansari N, Zainullah P, Kim YM, Tappis H, Kols A, Currie S, *et al.* Assessing post-abortion care in health facilities in Afghanistan: a cross-sectional study. *BMC pregnancy and childbirth*. 2015;15(1):1-9.
- Hassan AAH. Nurses' Knowledge and Practice Regarding Post-Miscarriage Care in Omdurman Maternity Hospital, Khartoum State, Sudan. University of Gezira, 2016.
- Tran NT, Greer A, Dah T, Malilo B, Kakule B, Morisho TF, *et al.* Strengthening healthcare providers' capacity for safe abortion and post-abortion care services in humanitarian settings: lessons learned from the clinical outreach refresher training model (S-CORT) in Uganda, Nigeria, and the Democratic Republic of Congo. *Conflict and Health*. 2021;15(1):1-12.
- Kamar R, Chhugani M, James MM. A Study to Assess the Awareness regarding Legislation of Abortion among Doctors, Staff Nurses, Pharmacists and Women in Selected Areas of New Delhi. *Int. J Nurs. Midwives*. Res. 2018;5(2).
- Mainey L, O'Mullan C, Reid-Searl K, Taylor A, Baird K. The role of nurses and midwives in the provision of abortion care: A scoping review. *Journal of Clinical*

- Nursing. 2020;29(9-10):1513-1526.
25. Black AT, Balneaves LG, Garossino C, Puyat JH, Qian H. Promoting evidence-based practice through a research training program for point-of-care clinicians. *The Journal of nursing administration*. 2015;45(1):14.
 26. Baig M, Jan R, Lakhani A, Ali SA, Mubeen K, Ali SS, *et al*. Knowledge, Attitude, and Practices of Mid-Level Providers regarding Post Abortion Care in Sindh, Pakistan. *Journal of Asian Midwives (JAM)*. 2017;4(1):21-34.
 27. Mainah J, Keraka M, Otieno GO. Nurses knowledge towards post-abortion care in tier three health facilities in nairobi county-Kenya. *Journal of Health, Medicine and Nursing*. 2019;4(5):35-50.