

## Effect of Applying a Modified Standard of Antenatal Care on Quality of Nursing Practices And Women's Satisfaction

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**Abstract:** This study aimed to evaluate the effect of applying a modified standard of antenatal care on the quality of nursing practices and women's satisfaction.

**Design:** A quasi experimental research design was used.

**Setting:** This study was conducted at antenatal clinics at the obstetrics and gynecology center in Mansoura University Hospital, Egypt.

**Subjects:** The study subjects included all nurses working at the antenatal clinic (20 nurses) and a purposive sample consisted of 180 pregnant women selected according to the inclusion criteria.

**Tools:** Four tools were utilized for data collection (Administered Questionnaire Sheet, Structured Interviewing Schedule, Nursing Practices Observational Checklist and Women's Satisfaction Questionnaire).

**Results:** There was an improvement in the total score of nurses' practices regarding antenatal care and activities post intervention in comparison to before, whereas 99.4% and 84.4% had good total practical score immediately and 3 months post intervention respectively. There was an improvement in the total score of women's satisfaction regarding nursing practices post intervention, whereas 90% of women were strongly agreed with the services. Additionally, there was statistically significant positive correlation between the total nurses' practices score and the total women satisfaction score ( $r = 0.77, p < 0.001$ ).

**Conclusion:** There was an improvement in the quality of nurses' practices regarding antenatal care as well as women's satisfaction regarding nursing practices and antenatal care services post intervention.

**Recommendations:** Periodic training courses and workshops regarding applying updated antenatal care standards should be designed and conducted for the maternity nurses.

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### I. Introduction

Antenatal care standard is an important element of maternity care standards which, beside those for intrapartum along with postnatal care. It is a concise list of measures that identifies expected care, which should be provided for woman during pregnancy (ACOG, 2015).

Utilization of written explicit antenatal standard provides a baseline for improving quality of nursing practices through giving directions and guidelines and promoting the ability of the nurse to involve efficiently in woman care to achieve positive pregnancy outcomes (Baffour, 2015). Standards of care may help to maintain documentation of care, illustrate areas of accountability, identify the degree of negligence, and obviously state different levels of nursing care (Sangha et al., 2015). It is accepted that the standards are useful to assure that the proper health care settings and professionals are in right place and deliver high-quality care (HG.ORG, 2017). Standards represent a rule by which quality of care can be assessed (Current Nursing, 2010). Quality of antenatal nursing practices is a tool to achieve successful performance of antenatal care based on the nursing process. It is defined as the degree to which maternity nurse provides health care services that are consistent with up-to-date knowledge and are free from defects so as to satisfy women's needs (Khushbu et al., 2015).

High quality antenatal nursing practices depend on competent nurses in a well-functioning health setting of good referral system and adequate supplies. So nurses should advocate the overall benefit to the woman and the importance of implementing the quality standards in the health care (Ahmed et al., 2014).

The antenatal nursing practices involve advocacy for the pregnant woman rights on behalf of nursing practice in organizational and management structures within nursing (Abd El-Hamed et al., 2012). Improving quality of antenatal nursing practices is the key to ensuring high-quality care. That will be achieved through a process that considers the institutional context, describes desired practices, identifies the causes of the gap

between desired and actual performance and selects interventions to close this gap (Ezz El-din et al., 2015).

Women's satisfaction is one of the principal qualitative determinants of the efficient service utilization and other elements of care that need to be improved. To achieve it, there must be a balance between expectations and the provision of care (Abd El-Hamed et al., 2012). In recent years, assessing levels of women's satisfaction is a useful tool for determining women's views on health services provided and the extent to which their needs are met (Kassie et al., 2015). Pregnant woman is more likely to be satisfied with care if nurse recognizes and meets her needs and expectations (Al-Ateeq and Al-Rusaies, 2015). Women satisfaction is an important indicator that responds to health status changes. During the antenatal period, the pregnant woman has provided excellent opportunities to reach the quality of care for early diagnosis and management of life threatening conditions as well as health education programs (Javed and Ali, 2016).

The maternity nurse has great responsibilities in caring for the pregnant woman which include; relevant assessment, planning, implementation and evaluation of the care provided. She also provides optimal and individualized care for the women according to their needs (Ezz El-din et al. 2015). Several studies showed that woman's satisfaction affects subsequent service utilization and considered it to be a predictor of woman's treatment compliance. If woman perceived the health center to provide good antenatal care, she will attend it again and recommend the health care services to others; thereby increasing continuity and utilization of the service (Nnebue et al., 2014). If a woman's need doesn't satisfy, the woman will lose the confidence of the health center (Doace et al., 2013).

### **Significance of the study**

According to the Ministry Of Health and Population (MOHP) statistics in Egypt, maternal mortality ratio was 52/100000/ year women die in 2013 due to complications of pregnancy and childbirth (MOHP, 2015). Quality of antenatal care in Egypt is poor and this is the one of the most important causes of maternal mortality (Abbas, 2014). There isn't a sufficient number of facilities and supplies, and a delay in providing emergency obstetric care exists. This became a barrier to access to the services due to women's negative perceptions regarding its quality (Mahiti et al., 2015).

Whereas the nurse has a great role in antenatal care; quality of nursing practices should be improved through continuous training and clinical skills development regarding utilization of antenatal care standard which in turn improves pregnancy outcome and increases women's satisfaction. Within this context, this study broadly aims to improve quality of nursing practices and women's satisfaction at antenatal clinics.

### **Aim of the study**

This study aimed to evaluate the effect of applying a modified antenatal care standard on the quality of nursing practices and women's satisfaction through:

- Applying an educational program based on modified standard of antenatal care.
- Determination of the effect of antenatal care standard education on the nurses' practices and women's satisfaction.

### **Study hypotheses**

1. Maternity nurses who follow the modified antenatal care standard will exhibit good quality of nursing practices than those who don't.
2. Pregnant women who receive the antenatal care according to the modified antenatal care standard will experience higher satisfaction level than those who don't.

## **II. Subjects And Method**

### **Study design**

A quasi experimental research design was used.

### **Study setting**

This study was conducted at antenatal clinics at the obstetrics and gynecology center in Mansoura University Hospital.

### **Study sample**

The study included two samples:

A. All the accessible nurses who are working at antenatal clinic at the obstetrics and gynecology center in Mansoura University Hospital (20 nurses).

B. A purposive sample included 180 pregnant women who were attending the antenatal clinic at the obstetrics and gynecology center in Mansoura University Hospital. They were selected according to the following criteria:

- Attend antenatal clinic regularly.
- Age more than 18 and less than 35 years.

## **Tools of Data Collection**

**Four tools were used for data collection:**

**Tool I: Administered Questionnaire Sheet.** It was prepared by the researchers and used to assess the general characteristics of the nurses such as age, level of education and previous training programs.... etc.

**Tool II: Structured Interviewing Schedule.** It was prepared by the researchers and used to assess the general characteristics of women such as age, level of education and residence.... etc.

**Tool III: Nursing Practices Observational Checklist.** It was used to evaluate the quality of antenatal nursing practices. It consisted of 16 items which have its sub items related to nurses' practices at the antenatal clinic. Each item was recorded as either done or not done. It was prepared based on the modified standard of antenatal care. This standard was prepared by the researcher using the national, Arab and international standards (**MOHP, 2005; BCPHP, 2010; WHO, 2011; HAAD, 2012; NICE, 2014; RANZCOG, 2014**). The modified standard of antenatal care included 40 items utilized to improve the quality of nursing practices at the antenatal clinic.

The items covered the antenatal nursing practices such as maternity booking and registration (treat the woman with kindness, respect and dignity, give the woman the opportunity to make informed decisions and maintain the woman privacy and confidentiality), good communication skills (encourage the woman to ask questions and respond positively), antenatal assessment (assist in taking history, clinical examination and laboratory investigations), identification of complications (detection of fetal conditions and pregnancy complications such as gestational diabetes and preeclampsia), establishment of referral path for risky women, providing health education (about antenatal visits, nutrition, rest & sleep, exercise and alarming signs), documentation (keep accurate records of observations made, care given, pain relief and any other form of medications administered to the woman) and following the infection control measures (as hand washing, decontamination, disinfection, sterilization,.....etc). Scoring system for the second part of the second tool: score (2) for correctly done, score (1) for incorrectly done and score (0) for not done. The total score of nurses' practice in antenatal clinic = 32 and it was classified into good, fair and poor as follows: poor < 50% (score up to 15), fair 50 - < 75% (score 16 - 23) and good 75% - 100% (score 24 - 32).

**Tool IV: Women's Satisfaction Questionnaire.** It was adopted by (**Ejigu et al., 2013**) and used to assess the women's satisfaction regarding ANC services by using a 5 point Likert scale. It consisted of 12 items with a scoring system as follows; score (5) for strongly agree, score (4) for agree, score (3) for uncertain, score (2) for disagree and score (1) for strongly disagree. The total score of women' satisfaction regarding ANC services = 60 which were classified into strongly disagree (unsatisfied), uncertain and strongly agree (satisfied) as follows: strongly disagree < 50% (score up to 29), uncertain 50% - < 75% (score 30 - 44) and strongly agree 75% - 100% (score 45 - 60).

## **Supportive Materials**

Videos and Arabic booklets were prepared by the researcher as supportive materials. The booklet contained theoretical information regarding antenatal care (e.g. definition and components of antenatal care, positive signs of pregnancy, topics of health education and definition of quality of antenatal nursing practices.... etc.) as well as nursing practices at the antenatal clinic based on the modified antenatal care standard (e.g. maternity booking and registration, antenatal assessment, identification of complications, referral path and application of infection control measures.... etc.).

## **Preparatory phase**

After reviewing the local and international relevant literature, the modified antenatal care standard and the tools for this study were prepared by the researchers. The standard was translated into Arabic language. This phase lasted three weeks (the 1<sup>st</sup> three weeks of July 2016).

## **Development of study tools content validity**

The tools used in the study were checked for its content validity by a jury of 3 experts in the field. Recommended modifications and reconstruction of tools were done.

## **Reliability**

Reliability of the study tools was calculated by Cronbach's  $\alpha$  test. It was 0.65 for nursing practices observational checklist while for women's satisfaction questionnaire; the internal reliability was 0.85 which found highly reliable.

## **Pilot study**

A pilot study was carried out at antenatal clinics at the obstetrics and gynecology center at Mansoura University Hospital on 10% of the total study samples (20 women and 2 nurses) to ascertain the clarity, relevance and applicability of the study tools as well as to estimate the time needed to answer them.

#### **Ethical considerations**

1. An official permission was obtained from the director of obstetrics and gynecology center in Mansoura University Hospital to conduct the study.
2. The purpose of the study was explained to the study subjects, their oral consent to participate in the study was obtained and the confidentiality of data was assured.
3. The study subjects were informed that they can withdraw from participation at any time, no hazards will come to them and the findings will be used only for the purpose of this study.

#### **Field work**

This study was carried out in the period from August 2016 to Feb 2017. Data were collected from the antenatal clinic at the obstetrics and gynecology center in Mansoura city after obtaining the written approval from the director to conduct the study. The researchers introduced themselves to the nurses and the women, explained the aim of the study and obtained their written consent to participate in the study after assuring the confidentiality of data. The researchers attended the previously mentioned setting four days per week from 9 a.m. to 1 p.m. until the calculated sample size of pregnant women according to the inclusion criteria was obtained. The researchers were meeting the nurses on Thursday which there was no reception for women and the nurses don't have duties. The work was conducted through four phases (assessment, planning, implementation and evaluation).

#### **Assessment phase:**

1. The researchers interviewed each woman individually for about 15 - 20 minutes to collect data regarding their general characteristics by using a Structured Interviewing Schedule as well as to measure their satisfaction regarding services provided at antenatal clinic by using Women's Satisfaction Questionnaire. During the interview, the researchers interviewed each woman about each item of the questionnaire and recorded her answer.
2. The researchers also distributed the questionnaires among the nurses to collect data regarding their general characteristics and previous training programs on antenatal care by using Administered Questionnaire Sheet and recollected them after answering.
3. Then, each nurse was observed while providing the care for the pregnant women (each nurse was observed directly on nine women) to assess their practices regarding quality of antenatal care by using Nursing Practices Observational Checklist.

#### **Planning phase:**

The contents of the teaching sessions to improve nurses' practices regarding antenatal care and provide comprehensive health care for women were designed by the researcher according to gap and needs which were obtained from the pre-intervention assessment. Videos and Arabic booklets were prepared by the researcher as educational media. The booklets were distributed among the nurses at the first session as a guide for the nurses.

#### **Implementation phase:**

1. Ten teaching sessions (six theoretical and four practical) on quality of antenatal care, were presented by the researcher for the nurses at the nursing room based on the modified standard of antenatal care. The nurses were divided into three groups. Conducting the sessions took four weeks as follows: three sessions in the 1st week (two theoretical about the definition and components of antenatal care and one practical about taking comprehensive history), two sessions in the 2nd week (one theoretical about positive signs of pregnancy and one practical concerning general physical examination).
2. The 3rd week included three sessions (two theoretical about weight gain during pregnancy, antenatal schedule and calculation of EDD and one practical regarding nursing role during local abdominal examination) and two sessions in the 4th week (one theoretical about the quality of antenatal nursing practices and one practical about infection control measures).
3. Each session lasted almost an hour separated by ten minute period of rest. Lectures, group discussion and demonstration were used as teaching methods.

**Evaluation phase:**

1. The researchers reassessed nurses' practices regarding antenatal care and quality of antenatal nursing practices immediately and three months after intervention by using the same pre-intervention tools.
2. The researchers also reassessed women's satisfaction regarding the services provided at antenatal clinic three months after the intervention.

**III. Statistical Analysis**

The collected data were organized, coded, transferred into specially designed formats and then statistically analyzed using SPSS program version 20. The data were properly tabulated and presented. Statistical descriptive measures as number, percentage, mean and SD for quantitative data were used. Appropriate statistical tests were used as: T test, Paired T test, Wilcoxon test, Pearson correlation test and Cronbach's  $\alpha$ . The difference in this study was considered statistically significant and highly statistically significant at p value  $\leq 0.05$  and  $< 0.001$  respectively.

**Results**

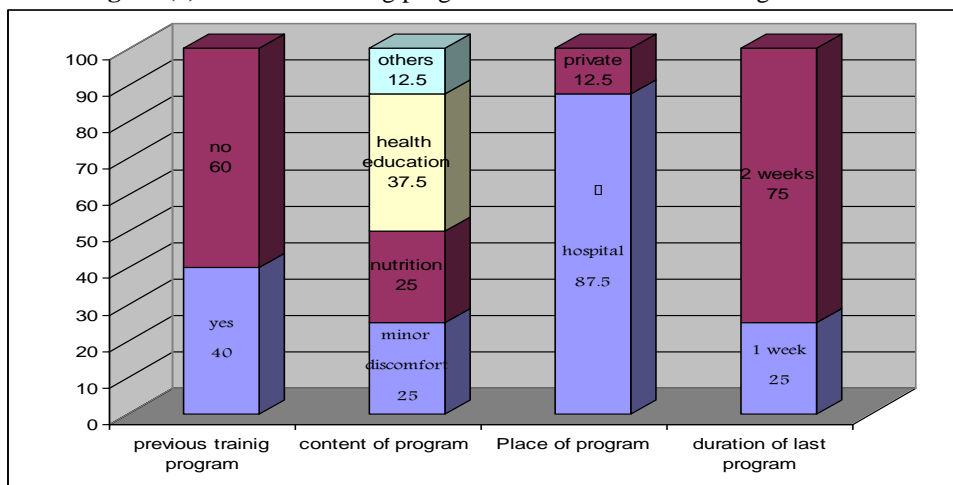
**Part (I): General characteristics of the study sample.**

**Table (1):** General characteristics of the maternity nurses.

General characteristics	NO.=20	%
<b>Age (yrs.)</b>		
● 25 - 30	4	20.0
● More than 30	16	80.0
<b>Mean±SD</b>	<b>35.95±6.02</b>	
<b>Level of education</b>		
● Secondary school nursing	13	65.0
● Technical institute of nursing	7	35.0
<b>Residence</b>		
● Rural	14	70.0
● Urban	6	30.0
<b>Years of experience</b>		
● Less than 5	1	5.0
● 5-10	3	15.0
● More than 10	16	80.0

**Table (1)** shows that 80% of nurses aged more than 30 years, with mean±SD 35.95±6.02 and 65% of them had a diploma of secondary school nursing. Concerning residence, the results reveal that 70% of them were from rural areas. It was observed that 80% had more than ten years of experience in antenatal care.

**Figure (1):** Previous training programs on antenatal care among the nurses.



**Figure (1)** represents that 60% of nurses did not receive any previous training programs on ANC. Out of those who had received programs, 37.5% of them had taken a program about health education during pregnancy. It also shows that 87.5% of nurses reported that these programs were conducted at the hospital.

**Table (2):** General characteristics of the pregnant women.

General characteristics	NO.=180	%
<b>Age (yrs.)</b>		
● 18 – 24	43	23.9
● 25 – 29	121	67.2
● 30 – 35	16	8.9
<b>Mean±SD</b>	<b>26.00±3.43</b>	
<b>Level of education</b>		
● Basic and less	13	7.2
● Secondary	147	81.7
● University	20	11.1
<b>Occupation</b>		
● Work	34	18.9
● Don't work	146	81.1
<b>Residence</b>		
● Rural	142	78.9
● Urban	38	21.1

**Table (2)** illustrates that 67.2% of women were in the age range 25 to 29 years with mean±SD 26.00±3.43 and 81.7% of them had a secondary level of education. It also shows that 81.1% were don't work and 78.9% were from rural origin.

**Part II: Quality of antenatal nursing practices.**

**Table (3):** Performance of antenatal care practices pre and post intervention (No.=20).

Items	Mean practical score (Mean±SD)			Paired t test	
	Pre	Immediately after	3 months later	P value	
				P1	P2
Assistance in taking the history	0.05±0.21	0.86±0.34	0.76±0.42	28.2 <b>0.001**</b>	28.2 <b>&lt;0.001**</b>
Measuring weight & height	0.01±0.19	0.91±0.29	0.86±0.35	41.4 <b>0.001**</b>	33.3 <b>&lt;0.001**</b>
Measuring blood pressure & temperature	0.11±0.31	0.88±0.32	0.84±0.36	24.6 <b>0.001**</b>	22.1 <b>&lt;0.001**</b>
Assistance in general examination	0.02±0.12	0.90±0.30	0.83±0.38	40.0 <b>0.001**</b>	29.0 <b>&lt;0.001**</b>
Assistance in abdominal examination & ultrasound	0.05±0.90	0.98±0.11	0.94±0.24	26.2 <b>0.001**</b>	52.0 <b>&lt;0.001**</b>
Examining face & extremities for edema	0.21±0.31	0.80±0.40	0.56±0.50	26.7 <b>0.001**</b>	15.1 <b>&lt;0.001**</b>
Testing urine for glucose & protein	0.24±0.43	0.77±0.42	0.67±0.47	24.3 <b>0.001**</b>	19.5 <b>&lt;0.001**</b>
Identification of pregnancy related complications	0.52±0.21	0.9±0.38	0.85±0.36	40.1 <b>0.001**</b>	31.8 <b>&lt;0.001**</b>

(\*) P is statistically significant if  $\leq 0.05$     (\*\*) P is highly statistically significant if  $< 0.001$

**P1 = difference between pre & immediately after**

**P2 = difference between pre & post 3 months**

**Table (3)** indicates that the performance of antenatal care practices was highly significantly improved post intervention in comparison to before (p value  $< 0.001$ ).

**Table (4):** Nurse’s practices regarding registration and nursing activities pre and post intervention (n=20).

Items	Mean practical score (Mean±SD)			Paired t test	
	Pre	Immediately after	3 months later	P value	
				P1	P2
Booking & registration	1.00	1.00	1.00	-	-
Good communication skills	0.09±0.29	0.95±0.22	0.91±0.28	29.9 <0.001**	27.2 <0.001**
Preparation for each procedure	0.06±0.22	0.93±0.24	0.86±0.34	36.6 <0.001**	27.7 <0.001**
Maintaining woman privacy & confidentiality	0.96±0.19	0.99±0.74	0.98±0.13	12.4 <b>0.014*</b>	12.01 <b>0.04*</b>
Establishing way of referral	0.62±0.22	0.91±0.29	0.87±0.33	41.4 <0.001**	34.9 <0.001**
Providing health education	0.76±0.12	0.95±0.22	0.87±0.34	58.3 <0.001**	34.1 <0.001**
Documentation	0.94±0.22	1.0±0	0.97±0.18	13.2 <b>0.001**</b>	11.0 <0.001**

(\* ) P is statistically significant if  $\leq 0.05$       (\*\*) P is highly statistically significant if  $< 0.001$   
**P1 = difference between pre & immediately after      P2 = difference between pre & post 3 months**

**Table (4)** indicates that there was highly statistically significant improvement in nurses’ practices regarding registration and nursing activities pre and post intervention except for booking & registration.

**Table (5):** Nurse’s practices regarding following infection control measures pre and post intervention (No.=20).

Items	Mean practical score (Mean±SD)			Paired t test	
	Pre	Immediately after	3 months later	P value	
				P1	P2
Hand washing	0.75±0.44	0.95±0.22	0.90±0.31	12.17 0.42	11.8 0.08
Decontamination	0.60±0.50	0.90±0.31	0.80±0.41	12.8 <b>0.01*</b>	12.17 <b>0.042*</b>
Disinfection	0.85±0.36	1.00	1.00	11.8 <b>0.083*</b>	11.8 <b>0.083*</b>
Sterilization	0.75±0.44	0.95±0.22	0.90±0.31	12.17 0.42	11.8 0.08
Waste disposal	0.80±0.41	0.90±0.31	0.85±0.37	11.4 0.163	0.56 0.577
Safe handling of sharps	0.80±0.41	1.00	0.90±0.31	12.2 <b>0.042*</b>	11.0 0.33
Using personal protective equipment	0.30±0.47	0.85±0.37	0.70±0.47	14.8 <b>0.001**</b>	13.5 <b>0.002*</b>

(\* ) P is statistically significant if  $\leq 0.05$       (\*\*) P is highly statistically significant if  $< 0.001$   
**P1 = difference between pre & immediately after      P2 = difference between pre & post 3 months**

**Table (5)** describes that there was statistically significant improvement in nurses’ practices regarding infection control measures pre and post intervention except for hand washing, sterilization and waste disposal.

**Figure (2):** Total nurses’ practical score regarding antenatal nursing care and activities pre and post intervention

(No.=20).

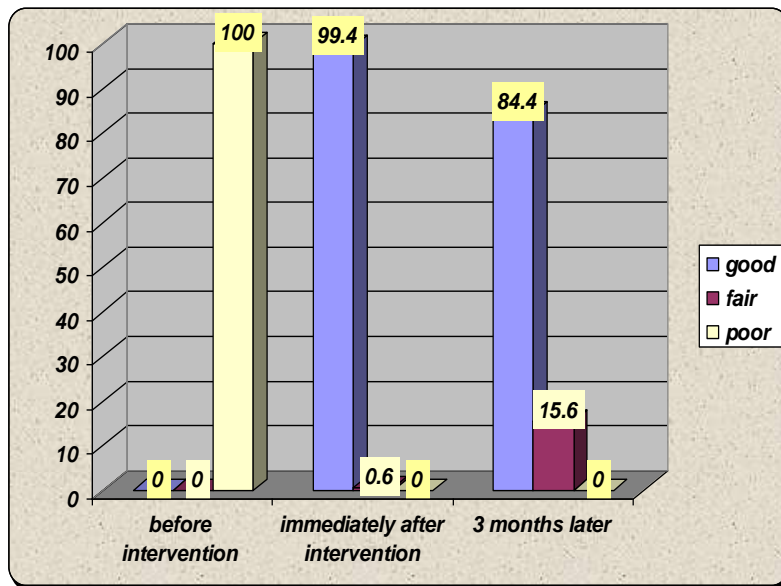


Figure (2) shows that there was an improvement in the total score of nurses’ practices regarding antenatal care and activities post intervention in comparison to pre intervention, whereas 99.4% and 84.4% of them had good total practices score immediately and 3 months post intervention respectively.

Table (6): Women satisfaction regarding nursing practices and antenatal care services pre and post intervention (No.=180).

Items		Level of satisfaction, N and %					Significance test P value
		Strongly Disagree	Dis-Agree	Un-Certain	Agree	Strongly Agree	
The greeting was good and in a friendly way	Pre	125 69.4	31 17.2	10 5.6	9 5.0	5 2.8	T= 24.8 <0.001**
	Post	13 7.2	6 3.3	2 1.1	22 12.2	137 76.1	
The nurse was easy to understand	Pre	7 3.9	12 6.7	0	30 16.7	131 72.8	T=14.2 <0.001**
	Post	0	2 1.1	0	31 17.2	147 81.7	
Privacy during consultation was maintained	Pre	99 55.0	64 35.6	0	11 6.1	6 3.3	T=16.2 <0.001**
	Post	11 6.1	21 11.7	0	56 31.1	92 51.1	
Receiving full information about antenatal care	Pre	180 100	0	0	0	0	T=11.3 <0.001**
	Post	25 13.9	0	0	57 31.7	98 54.4	
Nurse answer your questions	Pre	152 84.4	25 13.9	0	3 1.7	0	T=34.2 <0.001**
	Post	13 7.2	3 1.7	0	92 51.1	72 40.0	
Nurse explain test results	Pre	155 86.1	9 5.0	4 2.2	0	12 6.7	Z=0.6 <0.001**
	Post	60 33.3	5 2.8	1 0.6	0	114 63.3	
Recommend your relatives & others to attend this facility	Pre	91 50.6	13 7.2	58 32.2	0	18 10.0	T=13.9 <0.001**
	Post	11 6.1	1 0.6	9 5.0	36 20.0	123 68.3	
Satisfaction with all the services	Pre	107 59.4	26 14.4	12 6.7	11.7	21 7.8	Z=0.5 <0.001**
	Post	9 5.0	4 2.2	6 3.3	21 11.7	140 77.8	

**Paired T or wilcoxon test**

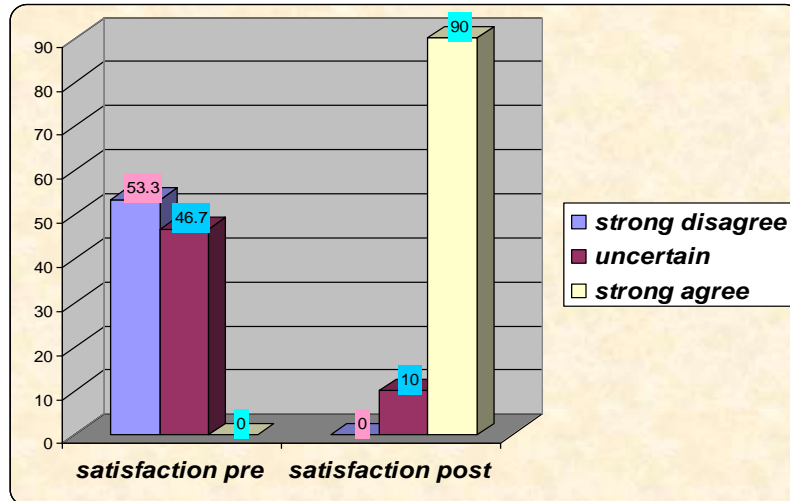
(\*) P is statistically significant if  $\leq 0.05$  (\*\*) P is highly statistically significant if  $< 0.001$

Table (6) clarifies that the women were strongly agreed regarding the understanding of nurses, satisfied with all the services, good greeting and nurse’s explanation of test results which reported by 81.7%,



77.8%, 76.1% and 63.3% of them respectively. It also shows that there was a highly statistically significant difference regarding the woman's level of satisfaction regarding nursing practices and antenatal care services before and after the intervention (p value < 0.001).

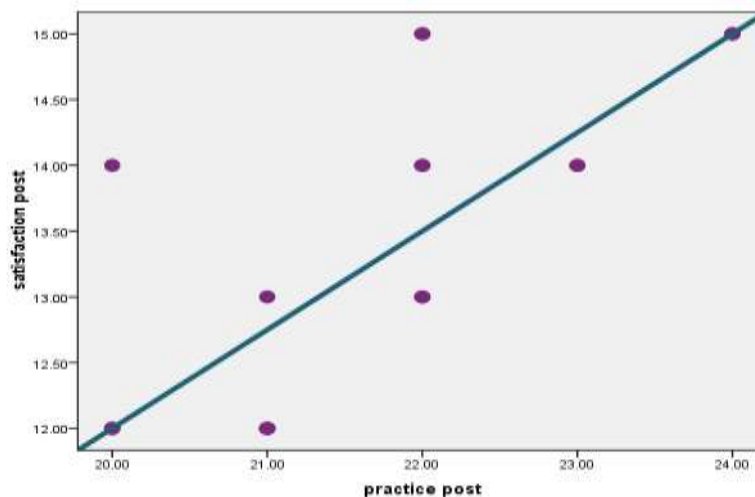
**Figure (3):** Total women satisfaction score regarding nursing practices and antenatal care services pre and post intervention (No.=180).



**Figure (3)** shows that there was an improvement in the total score of women's satisfaction regarding nursing practices and ANC services post intervention in comparison to before intervention, whereas 90% of women were strongly agreed with services post intervention.

**Part (III): Represent the correlation between total practical score of the nurses and a total satisfaction score of the women post intervention.**

**Figure (4):** Correlation between total practical score of the nurses and total satisfaction score of the women.



**Figure (4)** shows that there was statistically significant positive correlation between the total practices score of nurses and the total satisfaction score of women post intervention (r =0.77, at p <0.001).

#### IV. Discussion

This study aimed to evaluate the effect of applying a modified antenatal care standard on quality of nursing practices and women's satisfaction. The present study findings showed that there was a statistically significant improvement in nurses' practices and increase in women's satisfaction post intervention in comparison to before. So, the study hypotheses were accepted. The study revealed that more than half of nurses did not receive any previous training programs on antenatal care. This may be due to the work overload and the high attendance rate of women, which make nurses busy and have many duties to be performed. Hence, nurses'

need for attending teaching programs regarding antenatal care is suggested. This finding was in agreement with the study conducted in Qena city by **Ezz El-din et al. (2015)** to identify the impact of applying a performance model on antenatal nurses' care in family health centers who reported that, more than half of nurses didn't attend any previous training program related to antenatal care. Also, **Mersal and Ismail, (2012)** in a study carried out in North Cairo to improve health education skills and knowledge for nurses at MCH centers mentioned that three quarters of nurses did not attend training programs.

These results were in disagreement with **Das et al. (2016)** who conducted a descriptive study in India to assess nursing students' knowledge and attitudes regarding antenatal examination and reported that the majority of them have already attended classes related to antenatal care. The present study revealed that all nurses had poor total score of practices regarding antenatal care and activities before the intervention. This result may be due to the nurses don't follow antenatal care standard of practice. This can be attributed that continuous educational training programs for nurses are needed to improve their performance and achieve the professional expectations. This finding was in agreement with **Ezz El-din et al. (2015)** who mentioned that the majority of nurses had poor performance score regarding antenatal care pre-program. In this respect, **Abou El-Enein, (2011)** reported in the study that most pregnant women received poor antenatal care. On the other hand, **Radhika and Kasthuri, (2016)** conducted a study to assess health workers' knowledge and practices in relation to reproductive health services in India and found that the majority of them had good practices.

The present study further showed that there was an improvement in the total score of nurses' practices post intervention in comparison to before. This finding may be related to the positive effect of the intervention on the quality of nursing practices which was an opportunity for nurses to learn and develop their practical skills. The effectiveness of the intervention may be due to use of diverse teaching materials such as videos and Arabic booklet. This booklet was used as a guide or resource to refresh nurses' skills towards standards of antenatal care.

Moreover, the intervention was designed in such a way where nurses were divided into three small groups. As a result, a challenging and appropriate way for engaging them in their own learning was created. Furthermore, cost-effective intervention in a physical environment with adequate and comfort seating is of great importance to deliver effective teaching. **Hassan and Ahmed, (2013)** in their study in Benha to evaluate the effect of care model on quality of nursing performance at antenatal unit supported these findings and reported that there was significant difference regarding nursing practices before and after the intervention regarding registration, nursing activities and procedures at antenatal clinic. Recently, **Ezz El-din et al. (2015)** stated the same results.

In relation to infection control measures, there was statistically significant improvement in nurses' practices pre and post intervention except for hand washing, sterilization and waste disposal. The exception of hand washing was expected because it is the first step of infection control precautions when dealing with any patient, including pregnant women and after any contact with body fluids or other secretions. Likewise, waste disposal exceptions may be due to nurses' awareness of wastes related risks on health. This finding came with the finding of **Hassan and Ahmed, (2013)** who reported that there were significant differences regarding most items of infection control precautions at the antenatal unit before and after the intervention.

The study also indicated that there was an improvement in the total score of women satisfaction regarding nursing practices and antenatal care services post intervention in comparison to before. The study results found that the women were strongly agreed regarding the understanding of nurses, good greeting and satisfaction with all the services. Accordingly, this makes the highest percentage of women satisfied with all the services along with minimal cost for registration and medications which is reasonable for them in comparison to the private clinics. Parallel with this finding, **Hassan and Ahmed, (2013)** study showed that most pregnant women were satisfied with the care provided after the intervention. Even more study of **Ahmed, (2012)** conducted in Kalyubia governorate, about quality improvement of health care in maternal and child health care centers, which revealed that there was a highly statistically significant difference before and after the program regarding women' satisfaction about nursing performance at the MCH. This finding was in disagreement with **Blank et al. (2015)** who conducted an intervention study in Africa to evaluate quality of antenatal and childbirth care in rural health facilities and reported that post-intervention satisfaction scores did not show any difference to pre-intervention scores.

By the end of this study, it was found that there was a statistically significant correlation between the total nurses' practice scores and the total women satisfaction score. This finding may be related to the positive effect of the teaching sessions on quality of nursing practices which in turn increase women' satisfaction. Undoubtedly, well-trained nurses can comfort women, and consequently increase their satisfaction. Not only that, but greeting women with a smile, truly listening to what they say and providing them with the needed information were other successful strategies for increasing women satisfaction scores.

These findings were coinciding with the study of **Abd Alsemia and Abd Elshahed, (2017)** about the

effect of an educational program on quality of nursing care of patients with thalassemia at Ain Shams University Hospital. They reported that the satisfaction regarding the quality of nursing care was improved in the majority of patients after implementing the educational program. Also **Ndambuki, (2013)** stressed in his study conducted in Kenya to evaluate the level of patients' satisfaction and perception of quality of nursing services that, the quality of care can be improved through continuous nursing education and training. Similarly, **Javed and Ali, (2016)** were in agreement with these results in their study conducted in Pakistan about the effectiveness of continuous nursing education on the nurse's knowledge and patient satisfaction at tertiary care hospital, reported that the nurses' knowledge improved and the patient satisfaction ratio increased after implementing the intervention.

## V. Conclusion

The first hypothesis was accepted where the quality of antenatal nurses' practices has improved. The second hypothesis was also accepted because the women's satisfaction regarding nursing practices and ANC services has increased. Additionally, there was statistically significant positive correlation between the total women satisfaction score and the total nurses' practices score post intervention. The study concluded that applying a modified antenatal care standard was effective to improve the quality of nurses' practices and increase the women's satisfaction.

## Recommendations

**Based on the results of this study, the following were recommended:**

1. Periodic training courses and workshops regarding applying updated antenatal care standards should be designed and conducted for the maternity nurses.
2. Simple handouts as booklets and brochures about standardized nursing care at antenatal clinic should be developed and distributed among the nurses.
3. Women satisfaction regarding antenatal care services should be continuously evaluated.

**Further researches are proposed to:**

1. Investigate the clinical problems and obstacles facing the nurses in the provision of high quality ANC in different obstetric settings.
2. Raise women's awareness regarding the importance of antenatal care and follow up visits.
3. Evaluate the effectiveness of training programs on nurses' knowledge and practices in other obstetrical health care settings especially high risk and labor units.

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## Conflicts Of Interests

The authors declare that there is no conflict of interests regarding this study.

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