Original Article

Educational Guidelines To Overcome Obstacles Facing Pregnant Women Regarding The Performance Of Antenatal Exercises

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Abstract

Background: Antenatal exercises aim at improving the physical and psychological well-being of pregnant women for labor and preventing pregnancy-induced pathologies by various physical means. **Aim:** The current study aimed to evaluate the effect of educational guidelines to overcome obstacles facing pregnant women regarding the performance of antenatal exercises. **Research Design:** A Quasi-experimental. **Setting:** The study was conducted at antenatal clinic at Al-Hussien Hospital- Al-Azhar University**,** Cairo, Egypt. **Sample:** (140) pregnant women repeating in antenatal clinic**. Tools:** Interviewing questionnaire sheet, Knowledge assessment sheet, Obstacles assessment sheet, Reported Practice assessment sheet, Satisfaction assessment sheet. **Result:** More than one-third (38.6%) of the studied pregnant women aged from 26 to 30 years old with mean ±SD= 24.81 ± 4.54. Less than two thirds (62.9%) were from rural areas. Two thirds (66.4%) of the studied pregnant women were housewives. Post educational guidelines there was a positive correlation between the total reported practices and the obstacles that facing the pregnant women regarding performance of antenatal exercises one month after educational guidelines. **Conclusion:** the current study concluded that, most of the studied pregnant women had an effective increase in practicing antenatal exercises after applying the educational guidelines about antenatal exercises. **Recommendation:** Developing an educational program, booklets, and guidelines for pregnant women in antenatal clinics about antenatal exercises.

Keywords: Educational Guidelines, Obstacles, Antenatal Exercises.

INTRODUCTION

Pregnancy is the term used to describe the period that a fetus develops inside a woman's womb or uterus. Pregnancy usually lasts about 40 weeks, or just over 9 months, as measured from the last menstrual period to delivery. Health care providers refer to three segments of pregnancy, called trimesters. During pregnancy, the pregnant women undergoes significant anatomical and physiological changes in order to nurture and accommodate the developing fetus **(1).**

Antenatal period is a period from conception to birth. Antenatal exercise is a subcategory of planned, structured, repetitive and purposeful physical activity. The World Health Organization **(2)** recommends 30 minutes of exercise most days of the week during pregnancy same for the general population unless there are contraindications. During pregnancy, the hormone relaxin tends to support and justify a state of lying down and relaxing. Several studies have shown that antenatal exercises are beneficial. Exercise is documented as the first line of treatment for most diseases **(3).** Regular antenatal exercises have many well-established benefits for pregnant women with uncomplicated pregnancy. Benefits include physical benefits for maternal fitness and the prevention of excessive weight gain, as well as psychological benefits related to body image, perceived health status and reduced symptoms of depression. Benefits of regular antenatal exercises also include the prevention and management of maternal-fetal diseases such as gestational diabetes and pre-eclampsia **(4).**

Obstacles limiting participation in antenatal exercises during pregnancy are multidimensional. The most common and frequently reported obstacles regarding the performance of antenatal exercise during pregnancy according to the published scientific literature are lack of strength or fatigue, lack of time, lack of motivation, lack of social support, and concern

about the safety of physical activity for the fetus and the mother **(5).** In addition, cultural beliefs, lack of financial resources to register and pay for gym exercise, responsibilities of children, work and family are also listed as limiting factors for practicing antenatal exercises during pregnancy. Environmentally, limited access to facilities and resources, and bad weather are obstacles to practice antenatal exercises **(6).**

Maternity nurses can play a major role in providing anticipatory guidance and teaching because of the frequent, regular contact with antenatal mothers. Nursing guidelines and counselling sessions about practicing antenatal exercises for pregnant women will enrich pregnant women with knowledge about the importance of antenatal exercises for the mother and the fetus and will encourage pregnant women to practice antenatal exercises **(7).** The nurse should instruct the pregnant women that if pregnant women are new to exercise, pregnant women should start out slowly and gradually increase the activity. Pregnant women should begin with as little as 5 minutes a day. Then pregnant women can add 5 minutes each week until pregnant women can stay active for 30 minutes a day. Also, if pregnant women were very active before pregnancy, pregnant women can keep doing the same exercises with the ob-gyn's approval. But if pregnant women start to lose weight, pregnant women may need to increase the number of calories that pregnant women eat **(8).**

Significance of study:

Worldwide, and in the limited studies in South Africa, antenatal exercises practice reportedly remains low, despite their benefits for the mother's health and the fetus, and even beyond childbirth. Existing literature indicates limiting factors– social, economic, and cultural ones affecting women's decisions to initiate, participate and continue exercise during pregnancy. In addition, the physiological and anatomical changes during pregnancy could constitute obstacles to antenatal exercises **(5).** Most maternal deaths occur during the intrapartum and postpartum period are from direct preventable or treatable causes such as gestational diabetes, eclampsia and that complications. Unfortunately, Egypt maternal mortality rate for (2017- 2022) was 37.00 this means that about 960 women die each year in Egypt as a result of pregnancy complications **(9).** Severe maternal morbidity affects more than 60,000 women annually in the United States (Centers for disease control and prevention, 2021). Also, Egypt ' Sustainable Development Goals (SDGs) include reduce the global maternal mortality ratio to less than 70 per 100,000 live births, by 2030. In addition, reduce neonatal mortality to at least as low as 12 per 1,000 live births **(10).** Studies have reported that antenatal care that includes exercise programs has an impact on the major preventable causes of fetal morbidity, infant mortality, and morbidity among pregnant women **(11).** Therefore, the researcher conducted the study to determine the effect of educational guidelines to overcome obstacles facing pregnant women regarding the performance of antenatal exercises.

AIM OF THE STUDY

This study aimed to evaluate the effect of educational guidelines to overcome obstacles facing pregnant women regarding the performance of antenatal exercises.

Research Hypothesis:

Educational Guidelines expected to have a positive effect on the obstacles that facing pregnant women regarding the performance of antenatal exercises.

SUBJECT AND METHOD

Research Design: A Quasi-experimental design on one group (pre-test, post-test and follow up) was used to achieve the aim of the current study.

Setting: This study was conducted at antenatal clinic at Al-Hussein University Hospital which is affiliated to Al-Azhar University Hospitals-Egypt.

Sample: A purposive sample composed of 140 pregnant women repeating in antenatal care clinic, in the previously mentioned setting were included in the study.

Tools for data collection:

Data collected by using three tools:

1- 1st Tool : Interviewing questionnaire sheet.

It was developed by the researcher after reviewing the national and international relevant literature and adapted from **(12).** The Structured Interview Schedule filled by the researcher. It was written in simple Arabic language to suit pregnant

women level of understanding. It aimed to assess the pregnant women knowledge regarding antenatal exercises. It consisted of five parts:

Part I: Socio-demographic characteristics of studied pregnant women including: (Name, Age, Education level, Residence, Occupation status, Type of family).

Part II: Anthropometric measurements of studied pregnant women including: (Height, Weight and Body mass index, this tool administered two times (pre and one month after educational guidelines).

Part III: Obstetrical history of studied pregnant women including: (Gestational age, Number of pregnancy, Number of abortions, Number of labor, Type of delivery, History of previous delivery problems).

Part IV: Knowledge assessment questionnaire of studied pregnant women: including seven closed ended questions in form of multiple choice question (MCQ) in Arabic language used to assess woman's knowledge about antenatal exercises. This part was assessed three times (pre, immediate post and one month after educational guidelines). It was developed by the researcher after reviewing the international relevant literature and adapted from **(13).**

Scoring system:

A Scoring system was followed to assess woman's knowledge about antenatal exercises. The questionnaire contained of (7) questions and included on (75) items: 6 items for assessing source of information about antenatal exercises, 3 items for assessing the definition of antenatal exercises, 10 items for assessing types of antenatal exercises, 16 items for assessing the benefits of antenatal exercises for the mother, 5 items for assessing benefits of antenatal exercises for the fetus, 15 items for assessing contraindication of antenatal exercises for the mother, 5 items for assessing contraindication of antenatal exercises for the fetus, 8 items for assessing precautions and 8 item for assessing warning signs. The total scores of questionnaire were (75) grades, the complete correct answer was scored as (2) point, the incomplete correct answer was scored as (1) point, the incorrect answer was scored as (0) point. The scores were summed and converted into a percentage score.

Total percentage for pregnant women knowledge:
- Good knowledge: if the total score was ≥ 65%.
- Fair knowledge: if the total score ranged from 50 to 65 %.
- Poor knowledge: if the total score was ≤ 50 %.

Part V: Obstacles assessment of studied pregnant women: including (26) questions in Arabic language used to assess the Obstacles facing pregnant women regarding the performance of antenatal exercises: 17 items for assessing the personal obstacles, 5 items for family and social obstacles, 2 items for financial obstacles and finally 2 items for obstacles related to the house of pregnant women. This part was assessed two times (pre and one month after educational guidelines). It was developed by the researcher after reviewing the international relevant literature and adapted from **(14).**

2nd Tool : Practice assessment sheet self-reported by the pregnant women including (7) questions in Arabic language used to assess self-reported practice of antenatal exercises (pre and one month after educational guidelines). It was developed by the researcher after reviewing the international relevant literature and adapted from **(15).**

Scoring system:

A Scoring system was followed to assess woman's practice of antenatal exercises. The questionnaire contained of (7) questions about self-reported practice such as Pregnant women's practice exercises in general, practicing antenatal exercise in the current pregnancy or not, how many times do the pregnant women practicing antenatal exercise per week, Preferred position for practicing antenatal exercises. The total scores of questionnaire were (7) grades, the good practice of antenatal exercises more than 3 times a week was scored as (2) point, the fair practice of antenatal exercises less than 3 times a week was scored as (1) point, the poor practice of antenatal exercises was scored as (0) point for not performing antenatal exercises at all, these scores were summed and were converted into a percent score as the following:

- Good practicing: if the total score was ≥ 65%.
- Fair practicing: if the total score ranged from 50 to 65 %.
- Poor practicing: if the total score was ≤ 50 %.

Tool (3): Satisfaction assessment sheet :

Consist of (10) items in Arabic language used to assess the level of pregnant women satisfaction regarding information provided about antenatal exercises (this tool administered at one month after educational guidelines). It was developed by the researcher after reviewing the international relevant literature and adapted from **(16).**

Scoring system:

Every statement was given a score ; satisfied was scored (2), some extent was scored (1), and unsatisfied was scored (0). The score was calculated by summing up and converted into a percentage score as follows: If Responses of (50%) or more indicate that pregnant women are satisfied with information about antenatal exercises provided by the researcher. If Responses less than (50%) indicate unsatisfied pregnant women of the information about antenatal exercises provided by the researcher.

Supportive material: Educational guidelines booklet include information about antenatal exercises and how to overcome obstacles facing pregnant women regarding performance of antenatal exercises. The booklet was designed by the researcher based on current national and international related literatures using books, articles and scientific magazines. The booklet was written in simple Arabic language to suit the culture of pregnant women.

Validity:

The data collection tools were reviewed by a panel of three professors experienced in maternal and newborn health nursing department, one professor at Helwan University, one professor at Cairo University and one professor at MTI University (Modern University for Technology and Information).

Reliability:

The Cronbach's Alpha test through SPSS computer package was used to assess the reliability of the first tool "interviewing questionnaire sheet " which was 0.76 and the second tool's reliability was 0.87.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the scientific research ethics committee in the Faculty of Nursing, Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time and confidentiality of the information where it wasn't accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

Pilot study:

Pilot study was carried out on 10% (14 pregnant women) of the total study sample to evaluate the applicability, efficiency, clarity of tools, assessment of feasibility of field work, beside to detect any possible obstacles that might face the researcher and interfere with data collection. Necessary modifications were done based on the pilot study findings such as (omission of some questions from tool) in order to strengthen their contents or for more simplicity and clarity. The pilot sample was excluded from the main study sample.

Field work:

- This study was carried out in Al-Hussein hospital. The process of data collection was carried out over the period of four months from the beginning of July 2022 to the end of October 2022. The researcher had to extend the data collection period for another month to give pregnant women opportunity to practice antenatal exercises before collecting follow-up data.

- The researcher attended at antenatal clinic in Al-Hussein hospital three days per week from 9.00 am to 2.00 pm to collect data till the sample size reached the pre-determined number. The time taken by researcher to complete the data in the questionnaire sheet was 15-20 minutes for collecting the data before implementing the educational guidelines. After collecting the data in questionnaire sheet from each pregnant woman before implementing educational guidelines, the researcher gave a booklet to each pregnant woman and started to demonstrate the booklet items to pregnant women.

- After finishing the demonstration of the booklet items to pregnant women, the researcher started to collect the immediate post data after implementing the educational guidelines**.** In the third month of data collection, the researcher collected follow-up data from the first group, one month after implementing the educational guidelines and used tool (III) to assess pregnant women satisfaction regarding information provided about antenatal exercises. Also, in the fourth month of data

collection, the researcher collected follow-up data and used tool (III) to assess pregnant women satisfaction regarding information provided about antenatal exercises from the second group.

Statistical Design:

The data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 25. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using independent T-test for comparison between two means and Chi-square test (X2) for comparison between more than two means. Qualitative data were presented in the form of frequency distribution tables, number and percentage (%). The correlation between obstacles and reported practices regarding antenatal exercises was evaluated using Pearson's correlation (r). P value < 0.05 was considered significant.

RESULTS

Table (1) showed that, more than one-third (38.6%) of the studied pregnant women aged from 26 to 30 years old with mean ±SD= 24.81 ± 4.54. Also, less than half (46.4%) of the studied pregnant women had secondary education and slightly less than two thirds (62.9%) were from rural areas. Regarding occupation of the pregnant women, two thirds (66.4%) of the studied pregnant women were housewives. Moreover (61.7%) working 8 hours regularly and more than two-thirds (72.9%) had some extent enough income. As well as, nearly two-thirds (64.3%) of the studied pregnant women live in extended family.

Table (2) showed the Mean ± SD of the studied pregnant women weight was 79.51 ± 5.17 before educational guidelines and 79.76 ± 5.17 one month after educational guidelines. While, it was 161.86 ± 2.39 for height before and on month after educational guidelines. Regarding Body Mass Index, the majority (80.0% & 83.6%) of the studied pregnant women were normal, respectively. While, the lowest percentage were overweight (7.41%) before and one month after educational guidelines, respectively.

Table (3) revealed that, less than half (47.9%) of the studied pregnant women their age of menarche started between 11 - 12 years with mean 11.42 and SD 0.57. In addition, more than half (55.7%) of the studied pregnant women were primigravida and nullipara. Moreover, more than two thirds (67.7%) of the studied pregnant women had previous cesarean section deliveries. Furthermore, about (4.8%) of the studied pregnant women had one abortion. As well as, (91.9%) of the studied pregnant women had no stillbirth and about (4.8%) of the studied pregnant women had one stillbirth and less than two thirds (64.9%) of the pregnant women had two or more living children. Also, the majority (91%) of the studied pregnant women's gestational age ranged from (14:26) week.

Figure (1) illustrated that, two-thirds 93 (66.4%) of the pregnant women had heard about antenatal exercises from family and friends and less than two-thirds 92 (65.7%) from social media while, 26 (18.6%) of them reported as having read it from books and one- third 47(33.6) of them did not know.

Table (4) reveled that, more than four-fifth (96.4%) of the studied pregnant women answered correct about definition of antenatal exercises immediate post the educational guidelines as well as, the percentage decreased to (91%) one month after educational guidelines. Moreover, more than one third (49%) of the studied pregnant women did not know the definition before the educational guidelines. The studied pregnant women were aware that walking (96.4%), relaxation and breathing exercise (59.3%), yoga (36.4%), pelvic floor exercises (27.9%) are types of antenatal exercise during pregnancy. These percentages improved to (100% & 86% & 79% and 66%), respectively immediate post educational guidelines and (98% & 81% & 76% and 63%), respectively one month after educational guidelines.

Table (5) showed that, nearly two third of the studied pregnant women agreed that antenatal exercises during pregnancy would prevent excessive weight gain (67.9%), improve circulation (60.7%), reduce risk of back pain during pregnancy (59.3%). Also, more than half of the studied pregnant women agreed that antenatal exercises during pregnancy would strengthens pelvic floor muscle during pregnancy (56.4%), reduce morning sickness and help to sleep and reduce insomnia, anxiety and stress (56.4%), more rapid post-natal recovery (49.3%), before educational guidelines. These percentages improved to (80.7% & 90.7% & 74.3% & 83.6% and 82.9%), respectively immediate post educational guidelines and (71.4% & 84.3% & 69.3% & 80.0% & 77.9% and 80.0%) respectively one month after educational guidelines.

Table (6) represented that, more than half of the studied pregnant women agreed that antenatal exercises during pregnancy would stimulates the normal delivery of the fetus (67.9%), increases fetal blood flow (60.7%) and stimulates fetal movement during pregnancy (56.4%) before educational guidelines. These percentages improved to (80.7% & 90.7%

83.6%), respectively immediate post educational guidelines and (77.9% & 84.3% and 71.4%), respectively one month after educational guidelines.

Table (7) showed that, most of the studied pregnant women answered that vaginal bleeding during pregnancy (87.1%) is considered the most contraindications to exercise for the mother during pregnancy before educational guidelines. Also, less than two-third of the studied pregnant women answered that back pain during pregnancy (62.9%) is considered contraindications to exercise for the mother during pregnancy before educational guidelines. Moreover, one-third of studied pregnant women said that diabetes during pregnancy (35.0%), abdominal pain during pregnancy (34.3%), difficulty in breathing during pregnancy (30.7%), also gestational hypertension and uterine contractions during pregnancy (30.0%) were mostly considered the most contraindications to exercise for the mother during pregnancy before educational guidelines. These percentages improved to (97.1% & 90.7% & 72.9% & 72.9% & 62.9% and 85.7%) respectively immediate post educational guidelines and (75.7% & 77.9% & 60.0% & 60.0% & 56.4% and 74.3%), respectively one month after educational guidelines.

Table (8) showed that, more than one-third of the studied pregnant women answered that decreased fetal movement during pregnancy (36.4%) is considered the most contraindications to exercise for the fetus during pregnancy before educational guidelines. Also, multiple pregnancy (11%) and poor intrauterine fetal growth during pregnancy (6.4%) were mostly considered the most contraindications to exercise for the fetus during pregnancy before educational guidelines. These percentages improved to (63.6% & 69% and 60.0%), respectively immediate post educational guidelines and (54.3% & 28% and 37.1%), respectively one month after educational guidelines.

Table (9) showed that, more than four-fifth of the studied pregnant women answered that drinking plenty of water before during and after exercising (82.9%), and more than two third answered that avoidance of supine lying more than 5 minutes (75.7%) is considered the most precautions of antenatal exercises during pregnancy before educational guidelines. Also, more than one-third of the studied pregnant women answered that the place to perform the exercises should be wide, well-ventilated, well-lit far from any source of risk (37.9%), avoidance of holding the breath (34.3%) and less than one third answered that avoidance of changing positions quickly (28.6%), were mostly considered the most precautions of antenatal exercises during pregnancy before educational guidelines. These percentages improved to (85.7% & 77.9% & 53.6% & 92.9% and 72.9%), respectively immediate post educational guidelines and (94.3% & 85.0% & 63.6% & 90.0% and 60.0%), respectively one month after educational guidelines.

Table (10) showed that, more than four-fifth of the studied pregnant women answered that warning signs to stop antenatal exercises and consult doctor when vaginal bleeding (85.7%), amniotic fluid leakage (84.3%). Also, more than two third of studied pregnant women were aware that painful uterine contractions (70.0%) is consider warning sign to stop antenatal exercises. Moreover, less than one-third (24.3%) of the studied pregnant women answered that warning signs to stop antenatal exercises is excessively shortness of breath and abdominal pain (10.0%) before educational guidelines. These percentages improved to (92.9% & 95.7% & 90.0% & 90.0% and 92.9%), respectively immediate post educational guidelines and (97.1% & 88.6% & 90.0% & 77.1% and 82.9%), respectively one month after educational guidelines.

Figure (2) illustrated that, more than four-fifth (84.3%) of the studied pregnant women had poor knowledge level before educational guidelines while, immediate post educational guidelines the studied pregnant women had good knowledge level (85.7%). Furthermore, (78.1%) of the studied pregnant women had good knowledge level after one month of educational guidelines.

Table (11) reveled that, more than four fifth of the studied pregnant women answered that, personal obstacles that prevent pregnant women from practicing antenatal exercises, the pregnant woman being afraid of abortion (83.6%), more than two third of pregnant woman afraid of being exposed to premature birth (70.0%) and that is the most implicated personal obstacles for not practicing antenatal exercises before educational guidelines. Moreover, less than two-thirds of the studied pregnant women answered that lack of time to exercise (61%), pregnant woman has more household responsibilities (60%), pregnant woman has more work responsibilities (57%), pregnant woman afraid of injuries and fractures (56%), pregnant women do not like to exercise in general (52%) and lack of interest in performing antenatal exercises in cold or hot weather (46%) were the most implicated personal obstacles for not practicing antenatal exercises before educational guidelines. These personal obstacles decreased one month after educational guidelines.

Continue table (11) showed that, nearly four- fifth of the studied pregnant women reported that family/social obstacles that prevent pregnant women from practicing antenatal exercises are lack of family support (80.7%), lack of support from the spouse (71.4%) before educational guidelines. Also, nearly two-thirds of the studied pregnant women reported that family/social obstacles that prevent pregnant women from practicing antenatal exercises are lack of advice from

specialists (67.9%) and lack of motivation and energy (52.1%) before educational guidelines. While, these family/social and financial obstacles decreased one month after educational guidelines.

Table (12) reveled that, less than one- fifth (15.0%) of the studied pregnant women reported that they practice antenatal exercises once per week before educational guidelines while, these reported practices improved to more than two third of studied pregnant women (68.6%) for once per week. The percentages of pregnant women that practice antenatal exercises per week had improved after educational guidelines (12.1%) for two: three times per week and (7.1%) for more than three times per week. In addition, about (20.0%) of the studied pregnant women reported that they practice antenatal exercises during the current pregnancy for less than 30 min. before educational guidelines while, their practices improved to (51.4%) less than 30 min., and (34.3%) for around 30 min. while, (7.1%) for more than 30 min. one month after educational guidelines. Regarding the preferable time to practice antenatal exercises, the studied pregnant women reported that about (11.4%) of the studied pregnant women practice antenatal exercises in the afternoon before educational guidelines while, these practices improved to be (53.6%) one month after educational guidelines. Moreover, the studied pregnant women reported that about (12.1%) of them practice antenatal exercises in lying position before educational guidelines and these practice improved to (67.1%) one month after educational guidelines.

Figure (3) illustrated that, more than half (59.4%, n=19) of the studied pregnant women had poor practice level before educational guidelines while, (34.4%, n=11) of the studied pregnant women had fair practice level before educational guidelines. Furthermore, (6.3%, n=2) of the studied pregnant women had good practice level before educational guidelines. On the other hand, about (8.1%, n=7) of the studied pregnant women had poor practice level one month after educational guidelines while, (67.7%, n=66) of the studied pregnant women had fair practice level one month after educational guidelines. Furthermore, (15.1%, n=13) of the studied pregnant women had good practice level one month after educational guidelines.

Table (13) showed that, most of the studied pregnant women (98.6%) were satisfied regarding information provided about obstacles facing pregnant women regarding the performance of antenatal exercises. Also, most of studied pregnant women (97.9 %) were satisfied about information related to the importance of antenatal exercises. Moreover, (97.1%) of studied pregnant women became fully- aware by information about antenatal exercises. Furthermore, (96.4%) were satisfied about information related to practice and application of some types of antenatal exercises. And finally, (95.7% & 93.6 % & 90.7%) were satisfied about information related to contraindications, precautions and warning signs of antenatal exercises.

Figure (4) illustrated that, most of the studied pregnant women (95.9%) were satisfied about the information provided in the booklet related to importance, benefits, types, contraindications, precautions, warning signs and the obstacles of antenatal exercises and were keen on sharing the booklet to others.

Table (14): portrays that there is statistically significant relation between the obstacles and total reported practices of antenatal exercises pre and one month after educational guidelines at P-value (0.000**). The results revealed that there is a strong relation between studied variables after one-month of educational guidelines. There is a positive correlation between the total reported practices and the obstacles that facing the pregnant women regarding antenatal exercises one month after educational guidelines (p = 0.000

Table (1): Distribution of the studied pregnant women regarding demographic characteristics (n=140).

Demographic Characteristics	No. (n=140)	%
Age/years		
<20-25 years	29	20.7%
26 - 30 years	**54**	**38.6%**
31 - 35 years	42	30.0%
36 - 40 years	15	10.7%
Mean ± SD	**24.81 ± 4.54**	
Level of education		
Cannot read and write	4	2.9%
Basic education	25	17.9%
Secondary education	**65**	**46.4%**
Institute	34	24.3%
University	12	8.6%
Residence		

Urban	52	37.1%
Rural	**88**	**62.9%**
Occupation status		
Working	47	33.6%
House wives	**93**	**66.4%**
Working Hours /day: (n=47)		
8 hours	**29**	**61.7%**
12 hours	18	38.3%
Family income/ month:		
Enough	8	5.7%
Some extent enough	**102**	**72.9%**
Not enough	30	21.4%
Type of family:		
Extended family	**90**	**64.3%**
Nuclear family	**50**	35.7%

Table (2): Distribution of the studied pregnant women regarding anthropometric measurements (n=140).

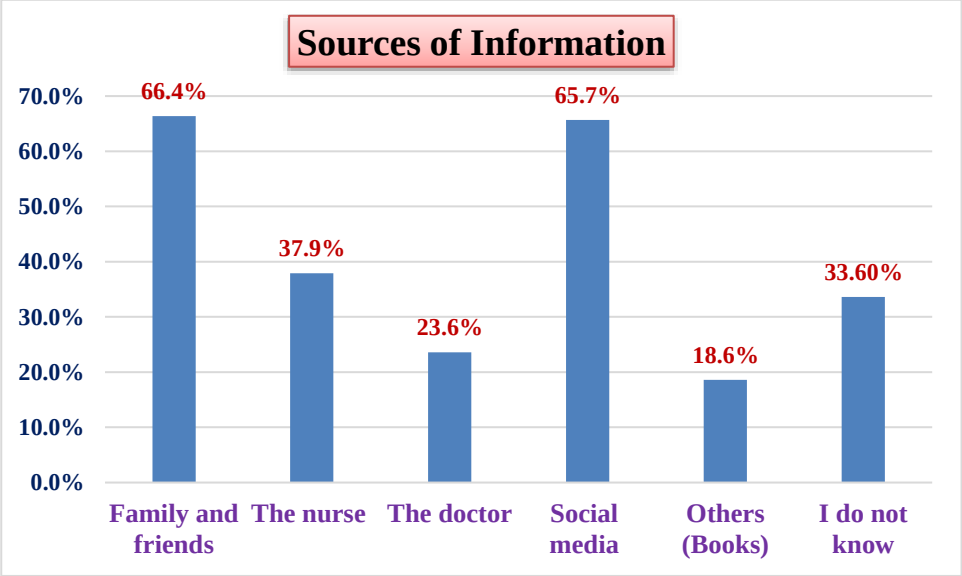
Anthropometric Measurements	**Before Educational Guidelines**		**One Month after Educational Guidelines**	
	No. (n=140)	**%**	**No. (n=140)**	**%**
Weight				
Mean ± SD	**79.51 ± 5.17**		**79.76 ± 5.17**	
Height				
Mean ± SD	**161.86 ± 2.39**		**161.86 ± 2.39**	
Body Mass Index (≥ 20 yrs.)				
Mild Thinness (17-18.5)	18	12.9%	13	9.3%
Normal (18.5-25)	**112**	**80.0%**	**117**	**83.6%**
Overweight (25-30)	**10**	**7.1%**	**10**	**7.1%**

Table (3): Distribution of the studied pregnant women regarding obstetrics history (n=140).

Obstetrics history	**No.**	**%**
Age of menarche / years		
< 11	42	30.0%
11 – 12	**67**	**47.9%**
13 – 14	25	17.9%
> 14	6	4.3%
Mean ± SD	**11.42 ± 0.57**	
Gravidity		
Primigravida	**78**	**55.7%**
Multigravida	62	44.3%
Parity		
Primipara	**78**	**55.7%**
Multipara	62	44.3%
Previous Mode of delivery (n= 62)		
Normal delivery	20	32.3%
Cesarean section	**42**	**67.7%**
Number of abortions (n= 62)		
No abortion	57	91.9%
Once	**3**	**4.8%**
More than once	2	1.4%

Stillbirth (n= 62)		
No stillbirth	**57**	**91.9%**
Once	**3**	**4.8%**
Twice	2	3.2%
No. of living children (n= 57)		
One	20	35.1%
Two or more	**37**	**64.9%**
Gestational age (Weeks)		
14 : 26 week	**127**	**91%**
27 : 40 week	13	9%

Figure (1): Distribution of the studied pregnant women regarding source of information pre educational guidelines (n=140).



*** Denotes multiple answers**

Table (4): Distribution of the studied pregnant women regarding knowledge of antenatal exercises pre, immediate post and one month after educational guidelines (n=140).

Variables	Before Educational Guidelines		Immediate post Educational Guidelines		One Month after Educational Guidelines		Chi square test	
	Frequency	%	Frequency	%	Frequency	%	X2	p-value
Definition of antenatal exercises:								
Correct	40	29%	**135**	**96.4%**	**127**	**90.7%**	76.354	<0.001**
Incorrect	32	23%	3	2.1%	9	6.4%		
I don't know	**68**	**49%**	2	1.4%	4	2.9%		
Types of antenatal exercises : (n = 140)*								
Walking	**135**	**96.4%**	**140**	**100%**	**137**	**98%**	17.357	<0.001**
Pelvic floor exercises (Kegel exercise)	**39**	**27.9%**	**93**	**66%**	**88**	**63%**	32.748	<0.001**
Relaxation and	**83**	**59.3%**	**120**	**86%**	**113**	**81%**	43.782	<0.001**

breathing exercise								
Back and abdominal exercise	**26**	**18.6%**	81	58%	79	56%	45.782	<0.001**
Yoga	**51**	**36.4%**	**111**	**79%**	**106**	**76%**	31.748	<0.001**
Pilates	16	11.4%	39	28%	34	24%	49.775	<0.001**
Squat exercise	36	20.0%	75	54%	69	49%	33.782	<0.001**
Swimming	13	9.3%	13	9.3%	13	9%	14.929	<0.001**
I do not know	5	3.6%	3	2.1%	5	3.6%	37.412	<0.001**

More than one answer is possible

Table (5): Distribution of the studied pregnant women regarding knowledge of benefits of antenatal exercises for the mother pre, immediate post and one month after educational guidelines (n=140)

Benefits of Antenatal Exercises	**Before Educational Guidelines**		**Immediate post Educational Guidelines**		**One Month after Educational Guidelines**		**Chi square test**	
	No	**%**	**No**	**%**	**No**	**%**	**X2**	**p-value**
Benefits of antenatal exercises for the mother #								
Reduces risk of back pain during pregnancy	**83**	**59.3%**	**104**	**74.3%**	**97**	**69.3%**	15.465	<0.001**
Prevent excessive weight gain	**95**	**67.9%**	**113**	**80.7%**	**100**	**71.4%**	12.357	<0.001**
Strengthens pelvic floor muscle during pregnancy	**79**	**56.4%**	**117**	**83.6%**	**109**	**77.9%**	30.748	<0.001**
Maintain abdominal muscle tone	27	19.3%	79	56.4%	65	46.4%	38.238	<0.001**
Improve spinal function	9	6.4%	84	60.0%	52	37.1%	89.354	<0.001**
Reduces the risk of gestational diabetes mellitus	51	36.4%	89	63.6%	76	54.3%	43.782	<0.001**
Reduce the risk of high blood pressure during pregnancy	43	30.7%	107	76.4%	85	60.7%	89.354	<0.001**
Increases energy and stamina during pregnancy	20	14.3%	89	63.6%	79	56.4%	36.782	<0.001**
Reduces risk of swelling of extremities during pregnancy	24	17.1%	86	61.4%	62	44.3%	45.238	<0.001**
Decrease muscle spasm	40	28.6%	98	70.0%	76	54.3%	43.782	<0.001**
More rapid post-natal recovery	**69**	**49.3%**	**116**	**82.9%**	**112**	**80.0%**	26.412	<0.001**
Improve circulation	**85**	**60.7%**	**127**	**90.7%**	**118**	**84.3%**	37.412	<0.001**
Reduce morning sickness	**79**	**56.4%**	**117**	**83.6%**	**109**	**77.9%**	30.748	<0.001**
Help to sleep and reduce insomnia, anxiety and stress	**79**	**56.4%**	**117**	**83.6%**	**109**	**77.9%**	30.748	<0.001**
Reduces the risk of postpartum depression.	51	36.4%	105	75.0%	96	68.6%	47.775	<0.001**
I do not know	45	32.1%	22	15.7%	13	9.3%	42.412	<0.001**

More than one answers are possible

(**) P value highly statistically significant if < 0.001

Table (6): Distribution of the studied pregnant women regarding knowledge of benefits of antenatal exercises for the fetus pre, immediate post and one month after educational guidelines (n=140)

Benefits of Antenatal Exercises	Before Educational Guidelines		Immediate post Educational Guidelines		One Month after Educational Guidelines		Chi square test	
	No	%	No	%	No	%	X2	p-value
Benefits of antenatal exercises for the fetus #								
Stimulates fetal movement during pregnancy	**79**	**56.4%**	**117**	**83.6%**	**109**	**77.9%**	30.748	<0.001**
Stimulates the normal delivery of the fetus	**95**	**67.9%**	**113**	**80.7%**	**100**	**71.4%**	12.357	<0.001**
Increases fetal blood flow	**85**	**60.7%**	**127**	**90.7%**	**118**	**84.3%**	37.412	<0.001**
Reduces the health problems of the fetus	43	30.7%	107	76.4%	85	60.7%	89.354	<0.001**
I do not know	45	32.1%	16	11.4%	25	17.9%	30.412	<0.001**

More than one answers are possible, (**) P value highly statistically significant if < 0.001

Table (7): Distribution of the studied pregnant women regarding knowledge of contraindications of antenatal exercises for the mothers pre, immediate post and one month after educational guidelines (n=140)

Contraindications of Antenatal Exercises	Before educational guidelines		Immediate post Educational Guidelines		One month after educational guidelines		Chi square test	
	No	%	No	%	No	%	X2	p-value
Contraindications of antenatal exercises for the mothers #								
Difficulty in breathing during pregnancy	43	**30.7%**	88	**62.9%**	79	**56.4%**	43.301	<0.001**
Abdominal pain during pregnancy	48	**34.3%**	102	**72.9%**	84	**60.0%**	37.798	<0.001**
Back pain during pregnancy (spine problems)	**88**	**62.9%**	127	**90.7%**	109	**77.9%**	76.368	<0.001**
Diabetes during pregnancy	**49**	**35.0%**	102	**72.9%**	84	**60.0%**	37.798	<0.001**
Gestational hypertension	43	**30.7%**	88	**62.9%**	79	**56.4%**	43.301	<0.001**
Uterine contractions during pregnancy	42	**30.0%**	120	**85.7%**	104	**74.3%**	46.684	<0.001**
Vaginal bleeding during pregnancy	**122**	**87.1%**	136	**97.1%**	106	**75.7%**	13.929	<0.001**
Premature labor during pregnancy	24	17.1%	101	72.1%	85	60.7%	65.412	<0.001**
Headache during pregnancy	28	20.0%	126	90.0%	70	50.0%	23.412	<0.001**
Dizziness during pregnancy	27	19.3%	113	80.7%	94	67.1%	36.458	<0.001**
Anemia during pregnancy	21	15.0%	106	75.7%	100	71.4%	59.741	<0.001**
Placenta Previa	8	5.7%	124	88.6%	120	85.7%	47.329	<0.001**
Incompetent cervix	26	18.6%	108	77.1%	78	55.7%	52.957	<0.001**
Recurrent pregnancy loss	27	19.3%	71	50.7%	61	43.6%	41.711	<0.001**
I do not know	18	12.9%	11	7.9%	17	12.1%	29.455	<0.001**

More than one answers are possible, (**) P value highly statistically significant if < 0.001

Table (8): Distribution of the studied pregnant women regarding knowledge of contraindications of antenatal exercises for the fetus pre, immediate post and one month after educational guidelines (n=140)

Contraindications of Antenatal Exercises	Before educational guidelines	Immediate post Educational Guidelines	One month after educational guidelines	Chi square test

	No	%	No	%	No	%	X2	p-value
Contraindications of antenatal exercises for the fetus #								
Decreased fetal movement during pregnancy	**51**	**36.4%**	**89**	**63.6%**	**76**	**54.3%**	43.782	<0.001**
Poor intrauterine fetal growth during pregnancy	**9**	**6.4%**	**84**	**60.0%**	**52**	**37.1%**	89.354	<0.001**
Multiple pregnancy	**16**	**11%**	**96**	**69%**	**39**	**28%**	59.741	<0.001**
Breech presentation at third trimester	2	1.4%	16	11.4%	9	6.4%	8.276	0.010
I do not know	89	35.0%	77	55.0%	43	30.7%	23.745	<0.001**

Table (9): Distribution of the studied pregnant women regarding knowledge of precautions of antenatal exercises pre, immediate post and one month after educational guidelines (n=140)

Precautions of Antenatal Exercises	Before Educational Guidelines		Immediate post Educational Guidelines		One Month after Educational Guidelines		Chi square test	
	No	%	No	%	No	%	X2	p-value
Precautions for antenatal exercises during pregnancy #								
Avoidance of supine lying more than 5 minutes	**106**	**75.7%**	**109**	**77.9%**	**119**	**85.0%**	9.462	0.010
Avoidance of holding the breath	**48**	**34.3%**	**130**	**92.9%**	**126**	**90.0%**	76.368	<0.001**
Avoidance of changing positions quickly	**40**	**28.6%**	**102**	**72.9%**	**84**	**60.0%**	29.236	<0.001**
Drinking plenty of water (before, during and after Exercising)	**116**	**82.9%**	**120**	**85.7%**	**132**	**94.3%**	8.276	0.010
Following proper warm-up and cool-down process	28	20.0%	70	50.0%	40	28.6%	23.412	<0.001**
Ensure bladder emptying before exercising	27	19.3%	71	50.7%	61	43.6%	41.711	<0.001**
The place to perform the exercises should be (wide - well-ventilated - well-lit - far from any source of risk)	**53**	**37.9%**	**75**	**53.6%**	**89**	**63.6%**	36.236	<0.001**
I do not know	24	17.1%	13	9.3%	20	14.3%	15.952	<0.001**

More than one answers are possible, (**) P value highly statistically significant if < 0.001

Table (10): Distribution of the studied pregnant women regarding knowledge of warning signs to stop antenatal exercises pre, immediate post and one month after educational guidelines (n=140)

Warning Signs to Stop Antenatal Exercises	Before Educational Guidelines		Immediate post Educational Guidelines		One Month after Educational Guidelines		Chi square test	
	No	%	No	%	No	%	X2	p-value
Warning signs to stop exercise and consult doctor #								
Excessively shortness of breath	34	**24.3%**	126	**90.0%**	108	**77.1%**	73.533	<0.001**
Vaginal bleeding	120	**85.7%**	130	**92.9%**	136	**97.1%**	6.272	0.043
Abdominal pain	14	**10.0%**	130	**92.9%**	116	**82.9%**	121.43	<0.001**
Increased or decreased fetal movement	9	6.4%	84	60.0%	52	37.1%	89.354	<0.001**
Painful uterine contractions	98	**70.0%**	126	**90.0%**	126	**90.0%**	13.440	<0.001**
Amniotic fluid leakage	118	**84.3%**	134	**95.7%**	124	**88.6%**	4.976	0.083
I do not know	20	14.3%	11	7.9%	9	6.4%	15.952	<0.001**

More than one answers are possible

(**) P value highly statistically significant if < 0.001

Figure (2): Distribution of the studied pregnant women's total knowledge regarding antenatal exercises pre, immediate post and one month after educational guidelines (n=140).

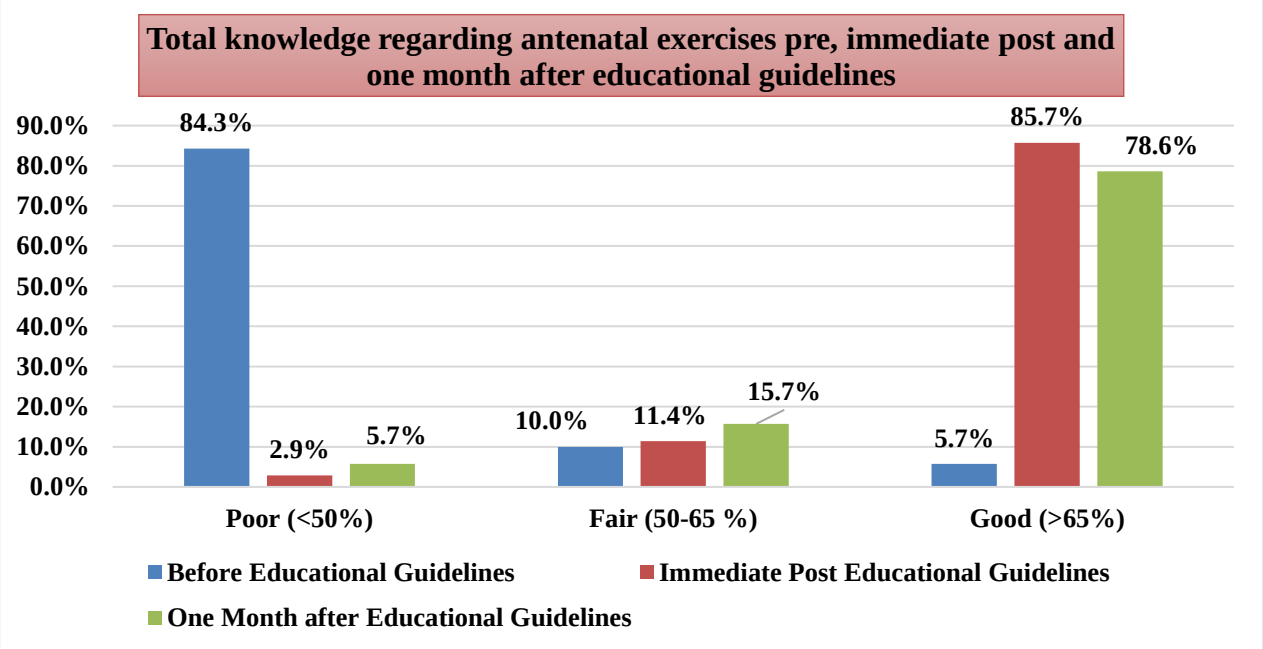


Table (11): Distribution of the studied pregnant women regarding knowledge of the personal obstacles to practice antenatal exercises pre and one month after educational guidelines (n=140)

Personal Obstacles	Before Educational Guidelines		One Month after Educational Guidelines	
	No. (n=140)	(%)	No. (n=140)	(%)
Personal Obstacles:				
A pregnant woman afraid of injuries and fractures.	**78**	**56%**	**5**	**3.6%**
A pregnant woman afraid of abortion.	**117**	**83.6%**	2	1.4%
A pregnant woman afraid of being exposed to premature birth.	**98**	**70.0%**	1	0.7%
A pregnant woman afraid of experiencing nausea due to exercise.	39	27.9%	13	9.3%
A pregnant woman has other children.	33	24%	6	4.3%
A pregnant woman has more household responsibilities.	**84**	**60%**	**15**	**10.7%**
A pregnant woman has more work responsibilities.	**80**	**57%**	**12**	**8.6%**
A pregnant woman does not think that antenatal exercises will give a sense of energy and vitality.	49	35%	5	3.6%
A pregnant woman feel tired while doing antenatal exercises.	42	30.0%	18	12.9%
A pregnant women feel tired all day.	51	36.4%	7	5.0%
A pregnant women do not like to exercise in general.	**73**	**52%**	**11**	**7.9%**
A pregnant woman has a physical barrier to exercise such as a 'bump or tummy'.	62	44%	27	19.3%
A pregnant woman does not believe that antenatal exercise fits the social and cultural norms of a pregnant woman.	28	20.0%	2	1.4%
Lack of time to exercise.	**85**	**61%**	**23**	**16.4%**
Lack of information about antenatal exercises.	55	39%	3	2.1%
Lack of information about the safety of antenatal exercises.	51	36%	3	2.1%
Lack of interest in performing antenatal exercises in cold or hot weather.	**65**	**46%**	**7**	**5.0%**

Multiple response possible

Continue table (11): Distribution of the studied pregnant women regarding knowledge of the family/social and financial obstacles to practice antenatal exercises pre and one month after educational guidelines (n=140)

Family/Social and Financial Obstacles	Before Educational Guidelines		One Month after Educational Guidelines	
	No. (n=140)	(%)	No. (n=140)	(%)
Family/Social Obstacles:				
Lack of support from the spouse	**100**	**71.4%**	**93**	**66.4%**
Lack of family support	**113**	**80.7%**	**86**	**61.4%**
Lack of support from friends and others	42	30.0%	4	2.9%
Lack of advice from specialists	**95**	**67.9%**	11	7.9%
Lack of motivation and energy	**73**	**52.1%**	8	5.7%
Financial Obstacles:				
A pregnant woman do not has a gym membership	**137**	**97.9%**	**16**	**11.4%**
A pregnant woman do not has equipment for antenatal exercises	**132**	**94.3%**	**11**	**7.9%**
Obstacles related to the house of a pregnant woman:				
A pregnant woman has no place to do antenatal exercises.	**90**	**64.3%**	**18**	**12.9%**
The place is not suitable in terms of (ventilation - lighting - space - privacy).	**32**	**22.9%**	**9**	**6.4%**

Multiple response possible

Table (12): Distribution of the studied pregnant women regarding reported practices about antenatal exercises pre and one month after educational guidelines (n=140)

Practice Items	Before Educational Guidelines		One Month after Educational Guidelines		Chi square test	
	No	%	No	%	X2	p-value
Pregnant women's practice exercises in general:						
Yes,	32	22.9%	32	22.9%	6.272	0.043
No,	108	77.1%	108	77.1%		
Pregnant women's practice of antenatal exercises in the current pregnancy:						
Yes,	28	20.0%	123	87.9%	53.4	<0.001**
No,	112	80.0%	17	12.1%		
The number of times a pregnant women practice antenatal exercises per week:						
Once per week	**21**	**15.0%**	**96**	**68.6%**	47.4	<0.001**
2-3 times week	5	3.6%	**17**	**12.1%**		
>3 times per week	2	1.4%	**10**	**7.1%**		
The period that a pregnant women practice antenatal exercises in the current pregnancy per day:						
<30 min	**25**	**20.0%**	**72**	**51.4%**	56.9	<0.001**
Around 30 min	2	1.4%	**48**	**34.3%**		
> 30 min	1	0.7%	**3**	**2.1%**		
Practicing antenatal exercises:						
Regular practice	7	5.0%	111	**79.3%**	41.7	<0.001**
Irregular practice	21	**15.0%**	12	8.6%		
Preferred position for practicing antenatal exercises:#						
Standing	**4**	**2.9%**	**9**	**6.4%**	53.1	<0.001**
Sitting	**7**	**5.0%**	**17**	**12.1%**		
Lying	**16**	**11.4%**	**94**	**67.1%**		
Kneeling	**1**	**0.7%**	**3**	**2.1%**		
Feel better after practicing antenatal exercises:						
Yes,	9	**6.4%**	110	78.6%	29.7	<0.001**
No,	19	**13.6%**	13	9.3%		

More than one answers are possible

(**) P value highly statistically significant if < 0.001

Figure (3): Comparison of the studied pregnant women's total reported practices regarding antenatal exercises pre and one month after educational guidelines (n=140)

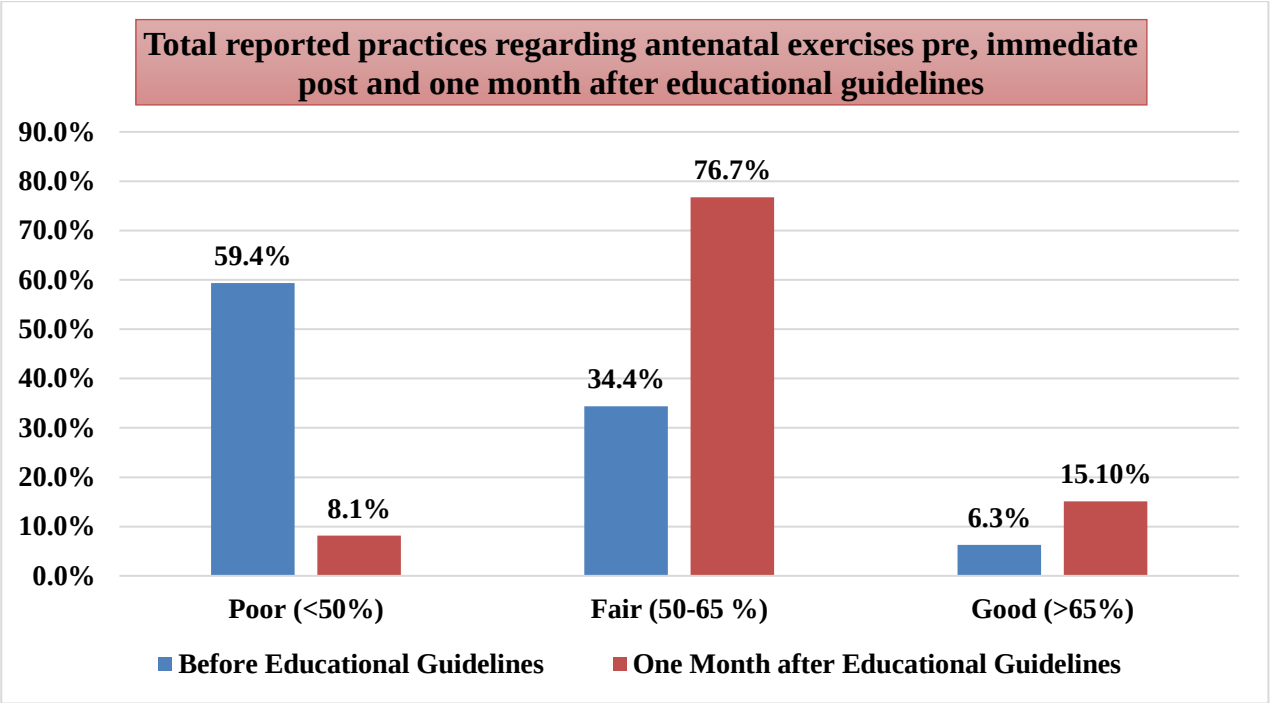


Table (13): Distribution of the studied pregnant women satisfaction regarding information provided in the booklet about antenatal exercises (n=140).

Items	Pregnant women (n=140)					
	Satisfied		Some extent		Un-satisfied	
	N	%	N	%	N	%
Information provided about importance of antenatal exercises.	137	**97.9%**	1	0.7%	2	1.4%
Information provided about types of antenatal exercises.	135	**96.4%**	4	2.9%	1	0.7%
Information provided about the benefits of antenatal exercises.	133	**95.0%**	4	2.9%	3	2.1%
Information provided about practice and application of some types of antenatal exercises.	135	**96.4%**	3	2.1%	2	1.4%
Information provided about contraindications of antenatal exercises.	134	**95.7%**	3	2.1%	3	2.1%
Information provided about precautions of antenatal exercises.	131	**93.6%**	5	3.6%	4	2.9%
Information provided about warning signs of antenatal exercises.	127	**90.7%**	8	5.7%	5	3.6%
Information provided about obstacles facing pregnant women regarding the performance of antenatal exercises.	138	**98.6%**	1	0.7%	1	0.7%
Pregnant women became fully- aware by information about antenatal exercises.	136	**97.1%**	3	2.1%	1	0.7%
Recommend to share the booklet to others.	138	**98.6%**	1	0.7%	1	0.7%

Figure (4): Distribution of the studied pregnant women total satisfaction (n=140).

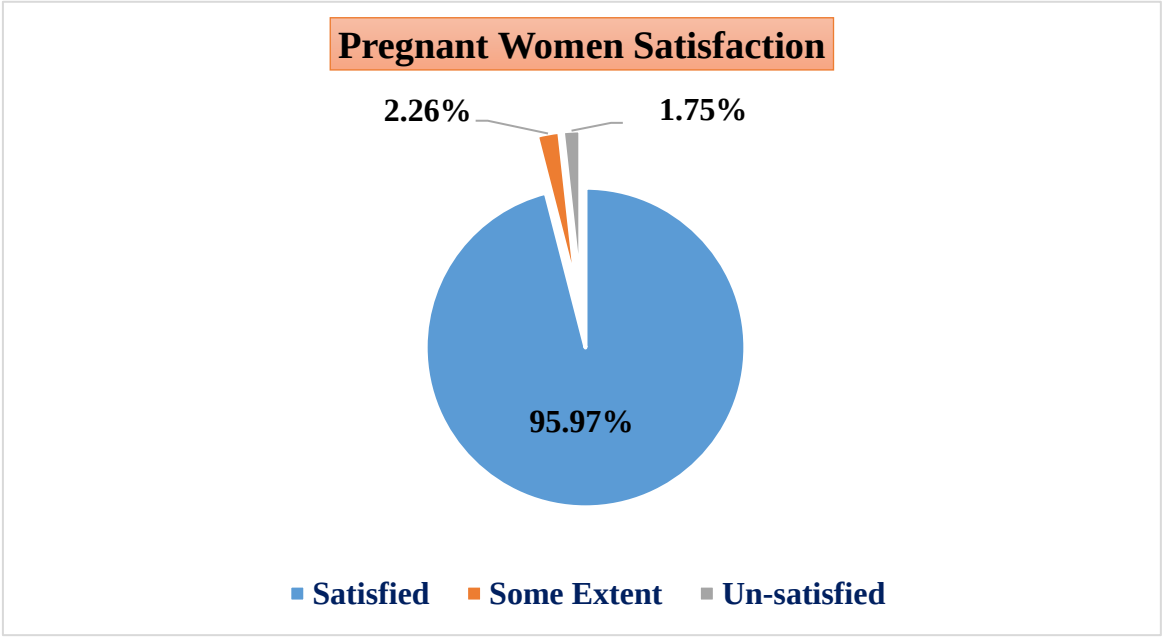


Table (14): Correlations between obstacles and reported practices regarding antenatal exercises pre and one month after educational guidelines (n=140)

Variables	Correlations between obstacles and reported practices of antenatal exercises pre and one month after educational guidelines			
	Pre Educational Guidelines		One Month After Educational Guidelines	
	R	P	R	P
Total reported practices	0.318	0.04*	0.579	0.000**
Obstacles	0.214	0.047	0.485	0.000**

(*) Significant (P<0.05) & (**) Statistically significant at p<0.01 & r = Pearson correlation

DISCUSSION

The current study aimed to evaluate the effect of educational guidelines to overcome obstacles facing pregnant women regarding the performance of antenatal exercises. Antenatal exercises are a part of the public health promotion and prevention program in most countries. Safe maternity with improved neonatal outcomes is predicated on proper antenatal health care services. Antenatal exercises provide many health benefits to pregnant women and the fetuses **(17).**

Antenatal Exercises is bodily activity that maintains pregnant women physical fitness, overall health and wellness. There are many type of exercise during pregnancy important and can help with some common discomforts of pregnancy and even help prepare body for labor and delivery **(18).** Walking, back and abdominal exercise, relaxation and breathing exercise, yoga and squat exercise are all excellent forms of exercise during pregnancy. However, the pregnant women should consult health care provider before begin exercising during pregnancy **(19).**

According to the pregnant women's demographic characteristics, in relation to age categories of the studied pregnant women, the current study showed that, more than one-third of studied pregnant women aged between 26-30 years with mean 24.81 ± 4.54. This result come in the line with **(20)** who studied "pregnant women's knowledge, attitudes, and associated factors toward physical exercise during pregnancy among those attending antenatal care at Bahir Dar city, Northwest Ethiopia" and reported that the mean age of the studied sample were 26-30 years. This result differ-with **(21)** who studied " Antenatal Education: An Assessment of Pregnant Women Knowledge and Preferences in Saudi Arabia " and mentioned that the mean age for the sample was 21-25 years.

Regarding pregnant women level of education, the current study showed that, less than half (46.4%) of studied pregnant women had secondary education. This result was supported by **(22)** who studied "Assessment of knowledge, attitude and practice towards ante natal exercise among pregnant women attending antenatal care at Health centers of Mekelle, Tigray Region, Ethiopia" and mentioned that less than half of studied sample had a secondary school education. This result was contrary to a study conducted by **(23)** who reported that one-third of the respondents attended secondary education. From the researcher's point of view, this may be due to that the most of people in rural area not interested in women education.

As regards to total knowledge of antenatal exercises, the findings of the current study showed that, more than three-quarters of the pregnant women had good knowledge after one moth of educational guidelines compared to only (5.7%) of them before educational guidelines with highly statistically significant difference. This study come in line with **(24)** who studied "Effect of Educational Program on Women's Awareness and their health status regarding antenatal Exercises" in Minia University and reported that, the majority of studied sample had good awareness regarding antenatal exercises after educational program with highly statistically significant difference.

From the researcher point of view, this improvement in the pregnant women's knowledge could be attributed to the active participation and good communication with the researcher who helped pregnant women to acquire knowledge. Also, the well-designed colored booklet that made in a simple Arabic language helped the participants in acquiring knowledge regarding antenatal exercises. To the best of the knowledge, this is the first study to assess pregnant women's knowledge regarding antenatal exercises before, immediate post and one month after educational guidelines.

Concerning to reported practice of antenatal exercises, the current study reported that, one fifth of the studied pregnant women was practice antenatal exercises in the current pregnancy before educational guidelines, this percentage had improved to more than four fifth of studied pregnant women after educational guidelines. This findings come in the line with **(25)** who studied "Barriers to physical activity during pregnancy among Saudi population on the Western region" and reported that, more than two third of studied sample were not exercising during pregnancy.

Moreover, less than one- fifth of the studied pregnant women reported that they practice antenatal exercises once per week before educational guidelines while, this percentage improved to more than two third of studied pregnant women for once per week. The percentages of pregnant women that practice antenatal exercises per week for 2-3 times and more than three times had improved after educational guidelines. In addition, about one fifth of the studied pregnant women reported that they practice antenatal exercises during the current pregnancy for less than 30 min per day before educational. This percentage had improved to more than half of studied pregnant women after educational guidelines.

This findings come in accordance with **(26)** who studied " Knowledge, Attitude, and Practice of Pregnant Women in Jazan, Saudi Arabia Concerning Pelvic Floor Muscle Exercises" and reported that the majority of studied sample were not performing any exercises during pregnancy . Also, more than two third of studied sample were perform antenatal exercises occasionally and less than one- fifth of studied sample were performing antenatal exercises rularly.

Finally, the findings of the present study achieved the study hypotheses and revealed that one month after implementing the educational guidelines, the pregnant women exhibited improvement in the knowledge and practice regarding antenatal exercises as well as a positive effect to overcome the obstacles that facing them regarding the performance of antenatal exercises.

CONCLUSION

Based on the study findings, it concluded that:

- This study is meaningful as the first educational guidelines to overcome obstacles facing pregnant women regarding the performance of antenatal exercises in Egypt. Most of the studied pregnant women had an effective increase in practicing antenatal exercises after applying the educational guidelines about antenatal exercises. So, the results of the current study achieved the research hypothesis.

RECOMMENDAATIONS

Based on the results of this study, the following recommendations are suggested:

- Conducting awareness sessions on antenatal exercises importance and effect of antenatal exercises practicing on the pregnant women to improve pregnancy outcomes.
- Developing a training program, booklets, and guidelines for nurses in antenatal clinics about antenatal exercises and the importance of educating pregnant women about antenatal exercises.

Further studies:

- Further studies are needed to document the role of antenatal exercises in improving pregnancy outcomes.
- Establishing of antenatal exercises strategy for all pregnant women in antenatal care protocol.
- Applying this study on different health care setting and sectors in Egypt and on a larger sample in order to generalize the result and improve the power of finding.

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Author contribution: Authors contributed equally in the study.

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