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RESEARCH ARTICLE

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Knowledge, Attitude and Performance of Physical Exercise among Pregnant Women Attending the Antenatal Clinic at Federal Medical Centre Asaba, Nigeria

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ABSTRACT

Background: There is currently an increased global interest amongst researchers on the safety and effects of physical exercise for pregnant women. Both national and international committees for its overall health benefits promote regular exercise. The American Congress of Obstetricians and Gynecologists, recommends that pregnant women can exercise moderately for 30 mins on most days of the week. This study aimed to assess the knowledge, attitude, and practice of pregnant women to antenatal exercises at Federal Medical Centre Asaba, Nigeria, 2022.

Methodology: A hospital-based cross-sectional study was conducted among 200 pregnant women. A systematic random sampling technique was used to select the study participants. Data were obtained on demographic and maternal characteristics, knowledge, attitude, and practice of pregnant women to antenatal exercises through a structured questionnaire. The data was subsequently analyzed using statistical package of social science version 20 (SPSS 20). Frequency and percentage were used to summarize the data and chi statistical test was used to test significant association at a p-value of <0.05.

Results: A total of 200 pregnant women were recruited for this study. It was found that 53%, 44% and 10% had adequate knowledge, a positive attitude, and good practice respectively of antenatal exercises. Prevention of back pain (93%), ability to cope with delivery (87%) and excess weight gain (90%) were perceived as benefits, while difficulty in breathing (55.7%), abdominal pain (52.6%), severe back pain (29.9%) and headache (52.6%) were considered as contraindications to antenatal exercises. Walking (74%), relaxation (30%), and breathing exercise (25%) were the most practiced antenatal exercises, while pelvic floor (8%) and abdominal strengthening exercises (9%) were poorly practiced. There was a significant association between age group, BMI, trimester, number of children, level of education and the participants' knowledge, attitude, and practice towards antenatal exercises (P<0.05). There was a significant association between the level of knowledge and attitude (P<0.05) but an insignificant association with their practice level to antenatal exercises (P>0.05).

Conclusion: This study shows that pregnant women demonstrated a good knowledge and positive attitude but had poor practice level towards antenatal exercises. Regular exercise programs should be incorporated by physiotherapists and healthcare professionals into antenatal classes that is safe for both mother and neonate.

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Introduction

The World Health Organization stated that insufficient physical exercise is primarily accountable for nearly 3.2 million deaths each year and as such is one of the prominent risk factors for death throughout the world [1]. Physical activity during pregnancy is one of the health promotions that has been shown to reduce chronic metabolic diseases significantly. Physical exercise has therefore, become an important constituent of antenatal care services. Antenatal exercises (ANEx) are very beneficial in maintaining physical fitness in women who adopt recommended physical exercises. These exercises comprise of

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core strengthening/stability, breathing exercises, pelvic floor exercises, aerobics, back care and postural educations [2]. According to Abedzadeh (2011), healthy pregnant women can exercise during their pregnancy or continue their pre-pregnancy exercise routine. Exercise during pregnancy promote physical fitness, reduce risk of excessive weight gain, reduce risk of pre-eclampsia and pre-term birth, reduces low back pain and improves sleep. It further reduces the risk of gestational diabetes mellitus (GDM) in obese pregnant women, improves maternal mental health and quality of life [2,3]. It has also been to be an essential component in the management of glycemic control in women with GDM. Research has shown that exercise during pregnancy helps reduce complications that may arise from delivery.

Physical inactivity has been identified as being a major lifestyle shift that is responsible for the onset of various disease conditions and the increased prevalence of chronic diseases [4]. Numerous research studies have shown a positive association between physical exercise and overall health and an inverse correlation with the incidence of chronic diseases, morbidity and mortality rates [5]. Low physical exercise performance in pregnancy is frequently associated with negative health implications on both mother and child leading to poor neonatal outcomes. Nonetheless, physical inactivity is escalating globally in all age groups and has been associated with increased disease risk. The advent of technological advancements over the last century has been attributed to be the major factor responsible for the reduction in physical activity. This has resulted in an increasingly sedentary lifestyle due to the adjustment in the way and method of performance or type of job, or by adoption of new leisure habits that are increasingly sedentary. According to Knight (2012), the sedentary death syndrome is one of the major risk factors for numerous diseases and premature deaths globally. Epidemiologic evidence has shown that physical inactivity is directly correlated with the development of chronic disease and is associated with several forms of cancer, diabetes, hypertension, pulmonary and cardiovascular diseases, obesity and all-cause mortality. Physical activity levels have been reported to reduce markedly during pregnancy [6]. Physical inactivity in pregnancy has been associated with an elevated risk of gestational diabetes mellitus and excessive weight gain [7]. These health conditions further increase the incidence of pregnancy complications, which put both the mother and baby at risk for type 2 diabetes, glucose intolerance and obesity later in life [8].

American College of Obstetricians and Gynecologists [9] recommends that healthy pregnant women should engage in at least 150minutes per week of moderate-intensity physical exercise, this recommendation extends to post-natal period. Empirical studies have shown that a major percent (60% to 80%) of pregnant women do not meet the recommended physical activity prescription [3]. Studies has also shown that there is inadequate information about antenatal exercises to pregnant women in some part of the world. Despite the growing public health concerns with regard to physical exercise in pregnancy, there is paucity of data on women's knowledge, attitudes and practice of physical exercise during pregnancy in Nigeria. This study aimed to evaluate the knowledge, attitudes and performance of physical exercise and its association with the socio-demographic and maternal characteristics among pregnant women attending the Antenatal clinic at Federal Medical Centre Asaba, Nigeria.

Methodology

Two hundred pregnant women attending antenatal clinic were consecutively recruited into this study. The sample size in this study was calculated using Rao-soft online sample size calculator (http://www.raosoft.com/samplesize.html), with margin of error is 5%, and the confidence level has been placed at 95%. Systematic sampling technique was used to recruit participants attending antenatal clinic at Federal medical Centre, Asaba, and Delta State, Nigeria. Inclusion criteria included participants attending antenatal clinic at Federal medical Centre Asaba during all trimester and gave informed consent. Exclusion criteria included participants with any physical deficiency and obstetrics complications that could have impact on the reliability of information.

Instrument

A validated height metre calibrated from 0cm to 200cm was used to measure the height of the pregnant women. A bathroom scale was used to measure the weights of the pregnant women in kilograms (Model: Conair TH100S Dial analogue-precision bathroom scale). A structured questionnaire; knowledge, attitude and practice questionnaire (KAP) was used for this study. The questionnaire was adapted from previous studies. This questionnaire sought information on socio-demographic, maternal obstetrics, their knowledge concerning ANEx, need for ANEx during pregnancy, attitude and practice towards ANEx.

Procedure

Ethical approval was sought and obtained from the Research and Ethics Committee of the Federal Medical Centre Asaba, Nigeria (FMC/ASB/A81 VOL. XII/265). The participants were adequately informed about the study, and that their participation in the study was voluntary. Written informed consent of the respondent was obtained. The questionnaires were self-administered to respondents and measurement gotten between 8am to 11am. The duration of completion of the questionnaires ranged between 10 and 15 minutes. Height was measure using a validated height scale with the pregnant women standing barefoot, with the heels, the back and occiput touching the height metre. Weight was measured with a bathroom weighing scale. The socio-demographic variables (Religion, occupation, educational qualifications, income) and maternal-obstetric characteristics (Family setting, parity, mode of delivery, place of delivery previous antenatal care start time, present antenatal care duration) was obtained with the KAP questionnaire. The questionnaire obtained information on knowledge, attitude and practice towards ANEx, which was collected after being adequately filled. Scores were assigned to each item based on its status in our society (Nigeria).

Statistical Analyses

The Statistical Package for Social Sciences version 20 (SPSS 20) was used in the data analysis. The data were statistically

analyzed using the descriptive statistics of frequency and percentage was used to summarize data. Inferential statistics of the chi-square test was used to test associations between knowledge and attitude of women toward antenatal exercises and the respondent's characteristics. The level of significance set at $p<0.05$.

Results

Two hundred participants were recruited and consented to participate in the study. The age of participants ranged from <18 to 50+ years. The results shows that majority of the participants (88%) are in the socio-economic middle and had secondary education (84%). Majority were Christians (98%), currently employed (72%) and were currently married (98%). Sixty percent (60%) reported this wasn't their first pregnancy and reported they were not medically advised to minimize physical activity or rest during pregnancy (74%). Details of participants' sociodemographic and maternal obstetrics characteristics investigated are presented in Table 1,2.

Table 1: Socio-Demographic Characteristics of Respondents.

	Frequency	Percentage
Socio-economic status		
High	18	9.0
Middle	176	88.0
Low	6	3.0
Level of education		
No formal	8	4.0
Primary	4	2.0
Secondary	20	10.0
Tertiary	168	84.0
Religion		
Christian	196	98.0
Muslim	4	2.0
Others	0	0.0
Origin		
Urban	130	65.0
Rural	70	35.0
Marital status		
Currently married	196	98.0
Separated	0	0.0
Divorced	4	2.0
Widowed	0	0.0
Employment		
Yes	144	72.0
No	56	28.0
work		
Self-employed	78	52.7
Private	28	18.9
Governmental	42	28.4
family		
Extended family	36	18.0
Nuclear Family	164	82.0

Table 2: Maternal Obstetric Characteristics of Respondents.

	Frequency	Percentage
Trimester		
1st	38	19.0
2nd	86	43.0
3rd	76	32.0
minimize physical activity/rest during pregnancy		
Yes	52	26.0
No	148	74.0
BMI classification		
Normal	74	37.0
Overweight	84	42.0
Obese	42	21.0
First pregnancy		
Yes	80	40.0
No	120	60.0
Number of children		
0	76	38.0
1	30	15.0
2	44	22.0
3	44	22.0
4	6	3.0
mode of previous delivery		
Labor	68	54.8
Caesarean Section	56	45.2
Place of delivery		
Hospital	126	95.5
Traditional	6	4.5
Home	0	0.0
Others	0	0.0

Knowledge (Benefits, Precautions and Contraindications) of Antenatal Exercises

The findings showed that 53 percent of pregnant women in this study had a good knowledge about antenatal exercises. Majority (77%) had good knowledge about benefits, 43 percent had good knowledge about precautions, while few (12%) had good of knowledge about contraindications of ANEx. Most of the respondent reported they have been advised to do ante-natal exercise (78%) and walking as an exercise (83%) (Table 2). Majority of the respondents have knowledge about ante-natal exercise (89%), breathing exercise (72%), back exercise (68%), abdominal exercise (58%), and aerobics (67%) as a type of antenatal exercise (Table 3). Furthermore, few reported to have knowledge cycling (61%) and pelvic floor strengthening exercises (24%). Table 5 & 6 shows the knowledge on benefits, precautions and contraindications to ANEx.

Table 3: Physical Exercises among Respondents.

	Yes	No
Have you been advised to perform walking as an exercise?	166 (83.0)	34 (17.0)
Have you been advised to perform ankle-toe movement?	76 (38.0)	124 (62.0)
Have you been advised to do ante-natal exercise?	156 (78.0)	44 (22.0)
Are you practicing exercise during Pregnancy?	178 (89.0)	22 (11.0)
Have you ever been engaged in physical activity before Pregnancy?	174 (87.0)	26 (13.0)
Have you ever smoked?	12 (6.0)	188 (94.0)
If yes, do you smoke during Pregnancy?	4 (2.0)	196 (98.0)
Do you drink alcohol during Pregnancy?	8 (4.0)	192 (96.0)

Table 4: Knowledge about Exercise.

	Frequency	Percentage
Have you ever heard about ante-natal exercise?	178 (89.0)	22 (11.0)
Have you ever heard about breathing exercise?	144 (72.0)	56 (28.0)
Have you ever heard about back exercise?	136 (68.0)	64 (32.0)
Have you ever heard about abdominal exercise?	116 (58.0)	84 (42.0)
Have you ever heard about ankle-toe exercise?	82 (41.0)	118 (59.0)
Have you ever heard about aerobics?	134 (67.0)	66 (33.0)

Have you ever heard about yoga?	160 (80.0)	40 (20.0)
Have you ever heard about cycling?	122 (61.0)	78 (39.0)
Have you ever heard about pelvic floor strengthening exercises?	48 (24.0)	152 (76.0)

Table 5: Knowledge – Benefits of exercise in pregnancy.

	Frequency	Percentage
Does exercise reduce risk of back pain during pregnancy?	186 (93.0)	14 (7.0)
Does prevents excessive weight gain in pregnancy?	180 (90.0)	20 (10.0)
Does strengthens pelvic floor muscle in Pregnancy?	92 (46.0)	86 (43.0)
Does reduces the risk of Gestational diabetes mellitus?	124 (62.0)	76 (38.0)
Does increases energy and stamina during Pregnancy?	156 (78.0)	44 (22.0)
Does give better ability to cope with delivery?	174 (87.0)	26 (13.0)
Does help rapid post-natal recovery after delivery?	156 (78.0)	44 (22.0)

Table 6: Knowledge of Precaution.

	Frequency	Percentage
You should drink plenty of water before & during exercise	178 (89.0)	22 (11.0)
You should exercise outside when it is humid	114 (57.0)	86 (43.0)
You should take proper precaution standing or lying during exercise	122 (61.0)	78 (39.0)
Knowledge – Contraindication	**Frequency**	**Percentage**
Chest pain during Pregnancy	70 (36.1)	124 (62.0)
Difficulty in breathing during Pregnancy	108 (55.7)	86 (43.0)
Abdominal pain during Pregnancy	102 (52.6)	92 (46.0)
Severe back pain during Pregnancy	58 (29.9)	136 (68.0)
Diabetes during Pregnancy	32 (16.5)	162 (81.0)
HTN during Pregnancy	24 (12.4)	170 (85.0)
Uterine contractions during Pregnancy	36 (18.6)	158 (79.0)
Vaginal bleeding during Pregnancy	52 (26.8)	142 (71.0)
Premature labor during Pregnancy	70 (36.1)	124 (62.0)
Headache during Pregnancy	102 (52.6)	92 (46.0)
Dizziness during Pregnancy	94 (48.5)	100 (50.0)
Decreased fetal movement during Pregnancy	40 (20.6)	154 (77.0)
Anemia during Pregnancy	28 (14.4)	166 (83.0)

Majority reported exercise reduce risk of back pain during pregnancy (93%), prevents excessive weight gain in pregnancy (90%) and increases energy and stamina during pregnancy (78%). It was reported by respondents that the precautions during exercise was drinking plenty water before and during exercise (89%) and one should exercise outside when it is humid (57%). Chest pain (36%), difficulty in breathing (55.7%), abdominal pain (52.6%), severe back pain (29.9%), headache (52.6%) during pregnancy were mostly considered as contraindications to exercise during pregnancy.

Attitude of Pregnant Women to Antenatal Exercises

It was reported by 93percent that doing exercise during pregnancy is essential, 91 percent report exercise during pregnancy reduces complications, majority (89%) & (93%) reported exercise helps recovery after delivery and prescribed antenatal exercises are safe both mother and child respectively. Most of the respondents (78%) reported they felt energetic doing exercise, 73 percent personally like doing exercise while 70percent have enough time to do exercise daily Table 7.

Table 7: Attitude.

	Frequency	Percentage
Do you think, doing Exercise during pregnancy is essential	186 (93.0)	14 (7.0)
Doing exercise during pregnancy reduces complications	182 (91.0)	18 (9.0)
Do you think exercise will help your recovery after delivery	178 (89.0)	22 (11.0)
Do you feel that prescribed Antenatal exercises are safe for you and baby?	186 (93.0)	14 (7.0)
Do you think that exercising during pregnancy does not fit your culture	44 (22.0)	156 (78.0)
Do you think any pregnant mother can perform exercises without the advices and recommendations from healthcare professionals?	62 (31.0)	138 (69.0)
Do you think during pregnancy the priority should be improvement of nutrition and the rest and not physical exercises?	100 (50.0)	100 (50.0)
Do you think performing day to day household activities gives adequate physical exercises to pregnant women and they do not have to perform recommended antenatal exercises?	92 (46.0)	108 (54.0)
Do you think you will feel energetic, doing exercise?	156 (78.0)	44 (22.0)
Do you personally like doing exercise?	146 (73.0)	54 (27.0)
Do you have enough time to do exercise daily?	140 (70.0)	60 (30.0)
Do you have sufficient information on exercise during Pregnancy?	128 (64.0)	72 (36.0)
Do you get enough family support for doing exercise?	140 (70.0)	60 (30.0)

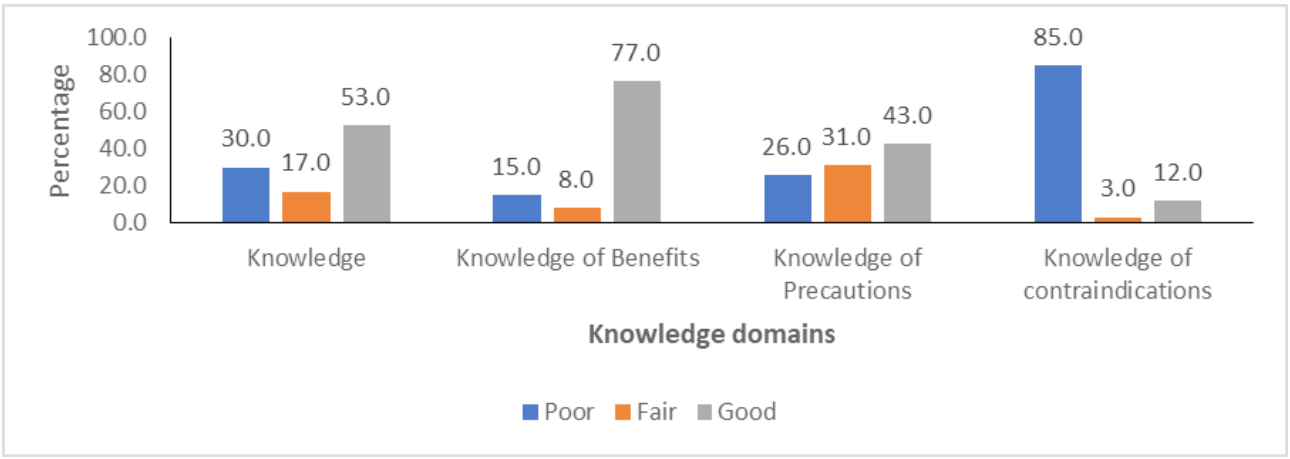

Figure 1: Bar Chart Showing Overall Level of Knowledge.

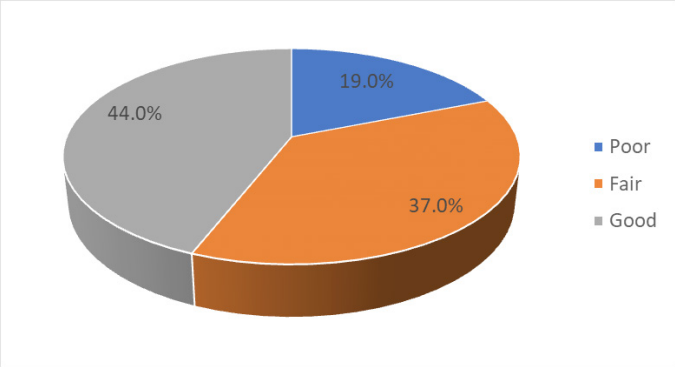

Figure 2: Level of attitude (** Poor = Negative ** Good = Positive).

Pie chart showing the level of attitude towards exercise as reported by the pregnant. It shows that 44.0% have good level of attitude, 37.0% have fair attitude, while 19.0% have poor level of attitude towards exercise in pregnancy.

Practice of Pregnant Women to Antenatal Exercises

This study shows majority (74%) practiced walking during pregnancy, almost half (49%) of respondent practiced ankle-toe exercises poorly, 9percent practiced abdominal strengthening exercises, a few (8%) poorly pelvic strengthening exercises, 52percent practiced breathing exercises well (Table 8). The level of Practice of exercise during pregnancy is shown in Figure 3.

Table 8: Practice of Exercise in Pregnancy.

	Frequency	Percentage
Walking		
Poor	14	7.0
Good	38	19.0
Excellent	148	74.0
Ankle, toe exercises		
Poor	98	49.0
Good	70	35.0
Excellent	32	16.0
Abdominal strengthening exercises		
Poor	124	62.0
Good	58	29.0
Excellent	18	9.0
Pelvic floor strengthening exercises		
Poor	116	58.0
Good	68	34.0
Excellent	16	8.0
Breathing exercises		
Poor	46	23.0
Good	104	52.0
Excellent	50	25.0
Relaxation exercises		
Poor	42	21.0
Good	98	49.0
Excellent	60	30.0

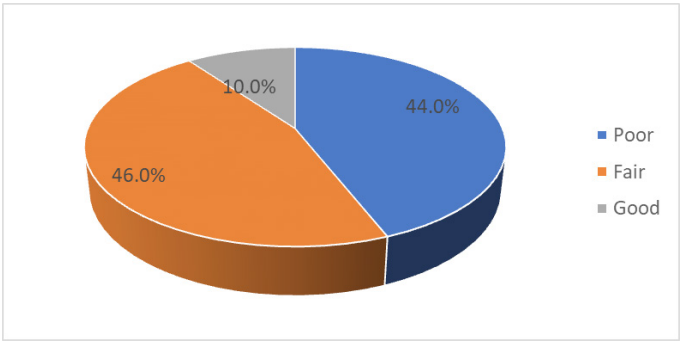

Figure 3: Level of Practice of Exercise during Pregnancy.

Pie chart showing 44.0% have poor practice level, 46.0% have fair practice level, while 10.0% have good level of practice of exercise during pregnancy.

Association between Demographic Characteristics with Each of Knowledge, Attitude and Practice

There was significant association between knowledge to antenatal exercises and age group (P = 0.013), BMI (P = 0.001), trimester (P = 0.000), level of education (P = 0.000), marital status (P = 0.009), employment (P = 0.016), number of children (P = 0.003) and mode of delivery (P < 0.001) (Table 9). This study shows that age group (P = 0.000), BMI (P = 0.000), trimester (P = 0.001), level of education (P = 0.000), socioeconomic status (P = 0.008), religion (P = 0.000) marital status (P = 0.031) and number of children (P = 0.001) significantly influence attitude towards exercise in pregnancy (Table 10). There was a significant association between the level of practice and age group (P = 0.000), BMI (P = 0.001), trimester (P = 0.000), level of education (P = 0.007), socioeconomic status (P = 0.002), employment (P = 0.023), number of children (P = 0.001) and mode of delivery (P< 0.001) (Table 3).

Association between Level of Knowledge and Attitude/ Practice

Furthermore, this study revealed there was a significant association between the level of knowledge and level of attitude (P= 0.000) and no significant association with the level of practice (P = 0.619) (Table 4).

Discussion

This study assessed knowledge attitude, and practice of Nigerian pregnant women towards antenatal exercises. This study included 200 participants attending ANC at Federal medical Centre, Nigeria. Majority of the participants in the study were within the age range of <18 – 50 years and belong to middle socio-economic class with adequate level of education. Almost all the respondents were married, Christians, from urban areas, and currently employed. Zhang and Savitz [10], found that subjects' characteristics such as age, level of education and experience in infant and maternal issues significantly influence knowledge, attitude, and practice of mothers towards ANEx [11-13]. Findings in some recent studies showed that knowledge, attitude, and practice of ANEx was significantly higher among pregnant women with a higher level of education and paid employment [13,14].

Table 9: Association between Demographic Characteristics and Level of Knowledge.

	Knowledge				
	Poor	**Fair**	**Good**	χ^2	**p**
Age group (Years)					
<25	12 (46.2)	4 (15.4)	10 (38.5)	19.421	0.013*
25 – 29	18 (27.3)	12 (18.2)	36 (54.5)		
30 – 34	12 (28.6)	4 (9.5)	26 (61.9)		
35 – 39	8 (19.0)	14 (33.3)	20 (47.6)		
40+	10 (41.7)	0 (0.0)	14 (58.3)		
BMI					
Normal	34 (45.9)	14 (18.9)	26 (35.1)	17.740	0.001*
Overweight	18 (21.4)	12 (14.3)	54 (64.3)		
Obese	8 (19.0)	8 (19.0)	26 (61.9)		
Trimesters					
1st	12 (31.6)	8 (21.1)	18 (47.4)	24.552	0.000*
2nd	38 (44.2)	16 (18.6)	32 (37.2)		
3rd	10 (13.2)	10 (13.2)	56 (73.7)		
Socio-economic status					
High	6 (33.3)	2 (11.1)	10 (55.6)	7.495	0.112
Middle	50 (28.4)	30 (17.0)	96 (54.5)		
Low	4 (66.7)	2 (33.3)	0 (0.0)		
Level of education					
No formal	0 (0.0)	0 (0.0)	8 (100.0)	25.863	0.000*
Primary	4 (100.0)	0 (0.0)	0 (0.0)		
Secondary	10 (50.0)	6 (30.0)	4 (20.0)		
Tertiary	46 (27.4)	28 (16.7)	94 (56.0)		
Religion					
Christian	60 (30.6)	34 (17.3)	102 (52.0)	3.620	0.164
Muslim	0 (0.0)	0 (0.0)	4 (100.0)		
Marital status					
Currently married	56 (28.6)	34 (17.3)	106 (54.1)	9.524	0.009*
Divorced	4 (100.0)	0 (0.0)	0 (0.0)		
Employment					
Yes	46 (31.9)	30 (20.8)	68 (47.2)	8.333	0.016*
No	14 (25.0)	4 (7.1)	38 (67.9)		
Number of children					
0	20 (26.3)	8 (10.5)	48 (63.2)	23.358	0.003
1	8 (26.7)	8 (26.7)	14 (46.7)		
2	14 (31.8)	6 (13.6)	24 (54.5)		
3	12 (27.3)	12 (27.3)	20 (45.5)		
4	6 (100.0)	0 (0.0)	0 (0.0)		
What was the mode of delivery?					
Labor	30 (44.1)	4 (5.9)	34 (50.0)	23.242	<0.001
Caesarean Section	10 (17.9)	22 (39.3)	24 (42.9)		

Table 10: Association between Demographic Characteristics and Level of Attitude.

	Attitude				
	Poor	**Fair**	**Good**	χ^2	**p**
Age group (Years)					
<25	12 (46.2)	10 (38.5)	4 (15.4)	33.107	0.000*
25 – 29	10 (15.2)	16 (24.2)	40 (60.6)		
30 – 34	6 (14.3)	24 (57.1)	12 (28.6)		
35 – 39	4 (9.5)	16 (38.1)	22 (52.4)		
40+	6 (25.0)	8 (33.3)	10 (41.7)		
BMI					
Normal	26 (35.1)	22 (29.7)	26 (35.1)	21.243	0.000*
Overweight	6 (7.1)	34 (40.5)	44 (52.4)		
Obese	6 (14.3)	18 (42.9)	18 (42.9)		
Trimesters					
1st	0 (0.0)	14 (36.8)	24 (63.2)	18.377	0.001*
2nd	26 (30.2)	30 (34.9)	30 (34.9)		

3rd	12 (15.8)	30 (39.5)	34 (44.7)		
Socio-economic status					
High	0 (0.0)	8 (44.4)	10 (55.6)	13.834	0.008*
Middle	34 (19.3)	66 (37.5)	76 (43.2)		
Low	4 (66.7)	0 (0.0)	2 (33.3)		
Level of education					
No formal	0 (0.0)	0 (0.0)	8 (100.0)	30.280	0.000*
Primary	0 (0.0)	4 (100.0)	0 (0.0)		
Secondary	10 (50.0)	4 (20.0)	6 (30.0)		
Tertiary	28 (16.7)	66 (39.3)	74 (44.0)		
religion					
Christian	34 (17.3)	74 (37.8)	88 (44.9)	17.401	0.000*
Muslim	4 (100.0)	0 (0.0)	0 (0.0)		
marital status					
Currently married	38 (19.4)	70 (35.7)	88 (44.9)	6.950	0.031*
Divorced	0 (0.0)	4 (100.0)	0 (0.0)		
employed					
Yes	30 (20.8)	54 (37.5)	60 (41.7)	1.581	0.454
No	8 (14.3)	20 (35.7)	28 (50.0)		
Number of children					
0	16 (21.1)	34 (44.7)	26 (34.2)	63.469	<0.001
1	12 (40.0)	8 (26.7)	10 (33.3)		
2	0 (0.0)	10 (22.7)	34 (77.3)		
3	4 (9.1)	22 (50.0)	18 (40.9)		
4	6 (100.0)	0 (0.0)	0 (0.0)		
What was the mode of delivery?					
Labor	10 (14.7)	22 (32.4)	36 (52.9)	1.043	0.594
Caesarean Section	12 (21.4)	18 (32.1)	26 (46.4)		

*****Shows significance at P < 0.05*

Table 11: Association between Demographic Characteristics and Level of Practice.

	Practice				
	Poor	**Fair**	**Good**	χ^2	**p**
Age group (Years)					
<25	18 (69.2)	8 (30.8)	0 (0.0)	55.070	0.000*
25 – 29	26 (39.4)	36 (54.5)	4 (6.1)		
30 – 34	12 (28.6)	14 (33.3)	16 (38.1)		
35 – 39	22 (52.4)	20 (47.6)	0 (0.0)		
40+	10 (41.7)	14 (58.3)	0 (0.0)		
BMI					
Normal	30 (40.5)	44 (59.5)	0 (0.0)	26.509	0.000*
Overweight	44 (52.4)	24 (28.6)	16 (19.0)		
Obese	14 (33.3)	24 (57.1)	4 (9.5)		
Trimesters					
1st	10 (26.3)	26 (68.4)	2 (5.3)	21.820	0.000*
2nd	50 (58.1)	32 (37.2)	4 (4.7)		
3rd	28 (36.8)	34 (44.7)	14 (18.4)		
socio-economic status					
High	4 (22.2)	14 (77.8)	0 (0.0)	16.610	0.002*
Middle	84 (47.7)	72 (40.9)	20 (11.4)		
Low	0 (0.0)	6 (100.0)	0 (0.0)		
level of education					
No formal	0 (0.0)	8 (100.0)	0 (0.0)	17.841	0.007*
Primary	0 (0.0)	4 (100.0)	0 (0.0)		
Secondary	10 (50.0)	10 (50.0)	0 (0.0)		
Tertiary	78 (46.4)	70 (41.7)	20 (11.9)		
religion					
Christian	84 (42.9)	92 (46.9)	20 (10.2)	5.195	0.074
Muslim	4 (100.0)	0 (0.0)	0 (0.0)		
marital status					

Currently married	84 (42.9)	92 (46.9)	20 (10.2)	5.195	0.074
Divorced	4 (100.0)	0 (0.0)	0 (0.0)		
employment					
Yes	70 (48.6)	64 (44.4)	10 (6.9)	7.557	0.023*
No	18 (32.1)	28 (50.0)	10 (17.9)		
Number of children					
0	34 (44.7)	34 (44.7)	8 (10.5)	27.827	0.001
1	14 (46.7)	14 (46.7)	2 (6.7)		
2	26 (59.1)	12 (27.3)	6 (13.6)		
3	8 (18.2)	32 (72.7)	4 (9.1)		
4	6 (100.0)	0 (0.0)	0 (0.0)		
What was the mode of delivery?					
Labor	14 (20.6)	48 (70.6)	6 (8.8)	36.597	0.001
Caesarean Section	40 (71.4)	10 (17.9)	6 (10.7)		

*****Shows significance at P < 0.05*

Table 12: Association between Level of Knowledge and Attitude/ Practice.

	Attitude			
	Negative	**Positive**	χ^2	**p**
Level of Knowledge				
Poor	44 (73.3)	16 (26.7)	10.451	0.001
Good	68 (48.6)	72 (51.4)		
	Practice			
	Poor	**Good**	χ^2	**p**
Level of Knowledge				
Poor	28 (46.7)	32 (53.3)	0.247	0.619
Good	60 (42.9)	80 (57.1)		

This study showed that 53percent of pregnant women had a good knowledge about antenatal exercises (77 percent had good knowledge about benefits, 43 percent had good knowledge about precautions, while 10percent had good of knowledge about contraindications of ANEx). In contrary, a study conducted in Tehran, it was determined that only 12.3 percent of women had high level of knowledge [15]. Another study, reported that 53 percent of women had a poor level of knowledge, 45 percent had moderate knowledge, and 2 percent had a good level of knowledge about exercise during pregnancy and postpartum [16]. Factors such as; age, BMI, trimester, level of education, marital status and current employment were statistically related to the level of knowledge of ANEx in this study.

Majority of pregnant women in this study had knowledge of some ANEx like; walking, aerobics, breathing exercise, back exercises, and abdominal exercise. However, only a few had knowledge about pelvic floor (Kegel), cycling and ankle-toe exercise as examples of ANEx. This is in-line with a study done in Ethiopia [17]. However, the ranking of exercises during pregnancy is in order as; Kegel, swimming, walking, bicycling, aerobics, and dance, according to American Pregnancy Association [18]. Surprisingly, most of the women in this study were unaware of the much importance of pelvic floor exercise (Kegel exercise) in pregnancy. The knowledge level of the pregnant women about ANEx in this study is higher than studies in Brazil and India [11,19]. The unavailability and unaffordability of bicycle ergometer for personal use and riding conventional bicycles on most Nigerian bad roads as there are no dedicated bikeways may be attributed to pregnant women low level of practice of Cycling as an ANEx; as stated in a recent study in Nigeria [3].

Regarding the benefits of ANEx on pregnancy, most of the pregnant women were fully aware of the necessity of these exercises during pregnancy. A majority of the pregnant women believed that ANEx reduces the risk of back pain during pregnancy, prevents excessive weight gain during pregnancy, strengthens pelvic floor muscle in Pregnancy, and promotes better ability to cope with delivery and rapid post-natal recovery after delivery. These findings are similar to previous studies [20-22]. It is in-line with a study report in Ethiopia by Janakiraman, 2020. Almost half of the respondents had a good level of knowledge about the precautions of ANEx during pregnancy, and the study reported poor level of knowledge about the contraindications of ANEx. The women in this study also believed that abdominal pain, chest pain, back pain, headache, difficulty breathing during pregnancy are contraindications for ANEx. According to ACOG recommendation, in the absence of underlying complications, back pain during pregnancy is at best a relative contraindication and should not rule out pregnant women from engagement in exercise [23]. The study showed that the attitude of these pregnant women was significantly associated with their knowledge level, where those that had a good knowledge had a positive attitude towards the ANEx.

In this study, 19% of the pregnant women demonstrated poor attitude towards ANEx in pregnancy. Although, majority seem to have considerably favorable (good and fair) attitude towards ANEx in pregnancy. This finding is in tandem with recent studies that have reported a positive attitude toward exercise during pregnancy [13,24]. Improved knowledge of safety of exercise for both the mother and fetus during pregnancy in most cases has been linked to the willingness to initiate or continue antenatal exercises [24]. A current study in Nigeria, reported

that attitude towards exercise in pregnancy was influenced mostly by tiredness, lack of feeling to exercise, and insufficient information on exercise [3]. However, the result of this study revealed that the age, BMI, months of gestation (trimester), socioeconomic status, level of education, religion and marital status; all significantly influence attitude towards antenatal exercises in pregnancy, exclusive of employment status.

This study found that about 10% of the pregnant women practiced exercise during pregnancy. This is lower to the findings from two studies reporting about level of physical activity during pregnancy [25,3]. However, it is much lower than the practice of exercise reported in Canada (29%), Nigeria (84.7%), and Brazil (29%) in a similar population [11,14,26]. This difference might be due to the knowledge level, awareness level, educational level, socio-economic differences, and more importantly the limitation in the utility of care including lack of health care counseling concerning ante-natal exercises. Furthermore, the most reported exercise practiced by the respondents in this study was walking, breathing, and relaxation exercises. This finding is similar to a study in Ethiopia, which showed that the most reported exercise practiced by the respondents was walking, breathing, and relaxation exercises [17]. Similar studies in Australia, Canada, and Brazil showed that the most frequent reported barriers to practice exercise were; risk to fetus, lack of time, and inadequate information or training [27,28]. This study shows no significant association between the level of knowledge and their practice towards ANEx among pregnant women.

Limitation of the Study

Since it is a cross-sectional study, it did not address the cause-and-effect relationship of the factors and the outcome variables. Besides, as the study was done in the hospital setting, the knowledge, attitude and practice of women who didn't attend ANC were not assessed.

Conclusion

The present study indicated that the level of knowledge and attitude toward ANEx during pregnancy was relatively high and practice was low. The findings from this study suggested that pregnant women's knowledge was good, the practice of antenatal exercise is comparably low to global standards and their attitude seems somewhat favorable. However, most of the pregnant women have a good knowledge of ANEx but relatively few pregnant women practiced ANEx. Empowering women through sustainable ergonomics training and physical exercise programs during pregnancy conducted by physiotherapists and antenatal healthcare professionals that is safe for both the mother and baby. Furthermore, counseling pregnant mothers during ANC should be emphasized to scale up a mother's knowledge, attitude and practice toward exercise during pregnancy.

Recommendation

Education and ergonomics training should be conducted by physiotherapists and healthcare professionals on proper antenatal exercises that is safe for both the mother and baby. Advocacy and enlightenment campaigns should also be focused on awareness of the importance of pelvic floor exercise (Kegel exercise) in pregnancy and contraindications of ANEx.

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