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KNOWLEDGE, PRACTICE AND PATTERNS OF ANTENATAL EXERCISE AMONG PREGNANT WOMEN: A COMPARATIVE STUDY OF URBAN AND RURAL DWELLERS IN ENUGU, NIGERIA

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ABSTRACT

Regular antenatal exercise is recommended for its maternal and foetal health benefits. Unfortunately, there is a dearth of literature on the antenatal exercise practices of pregnant women in Enugu State, relative to their geographical locations. This study compared the knowledge, practice and pattern of antenatal exercise among pregnant women in urban and rural areas of Enugu State, Nigeria. Three hundred consenting pregnant women (Urban- 194; Rural- 106) with a mean age of 27.6±6.1 years, conveniently recruited from four urban and four rural hospitals participated in this study. A structured questionnaire was used to collect information on their socio-demographic and obstetrics characteristics, knowledge, practice and pattern of antenatal exercise. Data were analyzed with descriptive statistics and inferential statistics of Mann-Whitney U test and Pearson's Chi-square. Majority of the women (urban-97.4%, rural-90.6%) had knowledge of antenatal exercises with preponderance in the urban women ($p=0.009$). Urban women significantly ($p<0.001$) showed higher (90.7%) practice of antenatal exercises. compared to rural women (72.6%). Lack of interest was the commonest factor limiting antenatal exercise practice by majority of the women. Most women practiced aerobics exercises (urban-49.4%, rural-67.5%). Urban-dwelling pregnant women showed more positive knowledge and practice of ANE, compared to the rural dwellers.

Keywords: Antenatal exercise, knowledge, practice, urban vs rural areas.

INTRODUCTION

Pregnancy is recognised as a unique time for behaviour modification and no longer considered a condition for confinement (ACOG, 2002). Regular antenatal exercise is highly recommended for its overall health benefits on the mother and the fetus (Suyindra*et al*., 2015; Katz, 1999). It is recognized as a safe practice, indicated for healthy pregnant women as long as the intensity, duration, frequency of the exercises are tailored to the requirement of each woman (Mbada *et al*., 2015). American College of Obstetrics and Gynecologist (ACOG, 2002) prescribed regular moderate exercise of about 30 minutes duration for pregnant women on most days of the week (ACOG, 2002). Recommended antenatal exercise include aerobics exercises, pelvic floor exercises, swimming, stretching exercise, muscle strengthening exercise, abdominal exercise, cycling, back care exercise, relaxation exercise and breathing exercise ([ACOG, 2002; Mbada *et al.*, 2014).

Exercise has become an important aspect of antenatal (Wadsworth, 2007) and postnatal (Ojukwu*et al.*, 2017). Several health benefits have been associated with regular exercise in pregnancy, some of which include maintenance and improvement of physical fitness and cardiovascular endurance (Wolfe and Davies, 2003), prevention of gestational weight gain and glucose intolerance (Chasen-Taber, 2012;

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Mottala and Ruchat, 2011) improved psychological adjustment to changes in pregnancy, facilitation of labour by conditioning of the involved muscles (Mbada *et al*., 2015; Wolfe and Davies, 2003). In addition, antenatal exercises have been shown to reduce the common problems associated with pregnancy (Wadsworth, 2007; Mbada *et al*, 2014). Despite the known benefits of antenatal and postnatal exercises, previous studies (Mbada *et al.*, 2014; Morkved *et al*., 2003; Pivarnik *et al*., 2006; Evenson *et al.*, 2009) have shown that most pregnant women are less active during pregnancy and several barriers, including, ignorance, race, income, occupation, religion, age, number of pregnancy, number of births, educational level, culture and ethnicity (Mbada *et al*., 2014; Paisley *et al*., 2003; Wang and Apgar, 1998; Ribeiro and Milanez, 2011) have been identified.

In Africa, there are still some conservative views and myths that exercises are delicate and unsafe for pregnant women. Women are also afraid to participate in physical exercise owing to fear that it will negatively impact on their health (Blum *et al*., 2004; Shelby, 2006). However, maternal education and campaigns on the promotion of exercises during pregnancy and postpartum periods are becoming essential aspects of antenatal and postnatal care in Nigeria although anecdotal observations have shown preponderance of such education and campaign programmes in urban cities as as health professionals commonly have preferences for practicing in developing or developed settings (Ojukwu *et al*., 2017).

The impact of antenatal exercise education will be ineffective if all strata of the population are not involved. This implies that the aim of antenatal exercise education on improving maternal health-related quality of life in Nigeria can best be achieved by ensuring a wide geographical coverage of such campaigns. In effect, need arises to evaluate maternal antenatal exercise practices in rural and urban settings in order to determine areas deficient of appropriate antenatal exercise campaigns. Such information will be useful for more effective implementation of health interventions towards improving maternal quality of life during pregnancy. Therefore the aim of this study was to compare knowledge, practice and pattern of antenatal exercise among pregnant women in urban and rural areas of Enugu state.

MATERIALS AND METHODS

Study Population: Three hundred (300) pregnant women, comprising of one hundred and ninety four (194) urban dwellers and one hundred and six (106) rural dwellers, who were conveniently selected from the ante-natal clinics of five rural and four urban-based hospitals in Enugu, south-eastern Nigeria, participated in this cross-sectional study.

Exclusion Criteria: Pregnant *women with medical conditions requiring bed rest or confinement, as directed by their physicians were excluded from the study*. Respondents who were not literate in either English or Igbo were also excluded from the study. Igbo is the local language of Enugu, Nigeria, where the study was conducted.

Ethical Consideration: Ethical approval was obtained from the University Of Nigeria Health Research Ethics Committee and a written permission was obtained from the Federal Ministry of Health, Enugu State. Furthermore, all the respondents gave written informed consent prior to participation in the study.

Data Collection: The instrument for data collection was structured Knowledge, Attitude and Practice (KAP) questionnaire adapted from previous studies (Walsh et al., 2011; Mbada et al. 2015).. For the purpose of this study, the questionnaire was modified from its previous version, excluding specific questions on postnatal exercises. The modified version sought information on socio-demographic, maternal and obstetric characteristics as well as practice of antenatal exercises. This version was translated to Igbo Language. In a pilot study, the Igbo version of the questionnaire was tested for reliability,

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using a test-retest method. Thirteen (13) copies of the questionnaire were initially administered to 13 pregnant women and were re-administered after 7 days. The test-retest reliability yielded a correlation coefficient of r = 0.890 (p = 0.001).

Data Analysis: Data collected were analyzed using the Statistical Package for Social Science (SPSS) version 20. Descriptive statistics of mean, standard deviation, frequency and percentage were used to summarize data while inferential statistics of Mann-Whitney U test was used to determine the difference between variables. Chi-square was used to determine the association between the variables.

RESULTS

Table 1 shows the socio-demographic and maternal characteristics of the participants. Majority of the women were between the ages of 25-39 (63.7%), multigravidas (61%), businesswomen (28.3%) and first degree holders (51.7%). A good number of the women were urban dwellers (64.7%) and started antenatal care within 4-6 months (51.3%).

Knowledge of antenatal exercises by the participants is presented on table 2. Majority of the participants, 97.4% of urban dwellers and 90.6% of rural dwellers reported positive knowledge of antenatal exercises with a significant difference of (p=0.009). 62.4% of the urban dwellers and 55.7% of the rural dwellers identified relaxation and breathing exercises as the recommended antenatal exercises. However, the total knowledge score revealed a poor knowledge of antenatal exercises (75.3% and 77.4%) by both urban and rural dwellers respectively. Majority of women from both groups (urban=66.1% and rural=66.7%) reported antenatal clinics as their source of information of antenatal exercises.

Table 3 reveals the practice of antenatal exercises among pregnant women. 90.7% and 72.6% of urban and rural dwellers respectively reported practice of antenatal exercises with a significant difference (p<0.001). Majority of the urban women (85.2%) identified coping with labour as the reason for antenatal exercise while majority of the rural women (85.7%) reported reduction of back pain as the reason. A greater percentage of women in both groups revealed lack of interest (urban=61.1%, rural= 82.8%), lack of strength (urban= 61.1%, rural=75.9%) and insufficient information (urban=72.2%, rural=72.4%) as the reasons for not engaging in antenatal exercise.

Table 4 reveals the patterns of antenatal exercise practices among the participants. 49.4% and 67.5% of urban and rural women respectively reported aerobics as the type of antenatal exercise they engaged in. Majority of women in both groups (urban=75%, rural=74%) revealed a low frequency of antenatal exercise participation i.e 1-4 days which is below WHO recommendation. Nurses were identified to be the most common prescriptors of antenatal exercises to majority of both urban (34.7%) and rural (39%) dwellers.

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Table 1: Socio-demographic characteristics of subjects

Variable	Frequency (n=300)	Percentage
Age		
Below 17	8	2.7
18-24	89	29.7
25-39	191	63.7
40 & above	12	4.0
Gravidity		
Primigravida	117	39.0
Multigravida	183	61.0
Occupation		
Home maker	28	9.3
Trader	41	13.7
Business	85	28.3
Civil servant	75	25.0
Students	70	23.3
Others	1	3
Educational Qualification		
None	3	1.0
Primary education	18	6.0
Secondary education	106	35.3
First degree	155	51.7
Post-graduate degree	18	6.0
Place of residence		
Urban	194	64.7
Rural	106	35.3
Commencement of ante-natal care (Month)		
<1	9	3
1-3	87	29
4-6	154	51.3
7-9	50	16.7

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Table 2: Knowledge of antenatal exercises among the participants

Variables	Urban (n=194) n (%)	Rural (n=106) n (%)	P value
Knowledge of antenatal exercises			
Yes	189 (97.4)	96 (90.6)	0.009*
No	5 (2.6)	10 (9.4)	
Knowledge of recommended exercises			
Aerobics	97 (50.0)	57 (53.8)	
Pelvic floor exercises	76 (39.2)	27 (25.5)	
Swimming	44 (22.7)	18 (17.0)	
Stretching exercises	77 (39.7)	41 (38.7)	
Muscle Strengthening exercises	71 (36.6)	40 (37.7)	
Abdominal exercises	24 (12.4)	13 (12.3)	
Cycling	32 (16.5)	20 (18.9)	
Back care exercises	81 (41.8)	49 (46.2)	
Relaxation and breathing exercises	121 (62.4)	59 (55.7)	
Total knowledge score			
Poor	146 (75.3)	82 (77.4)	0.756
Average	24 (12.4)	14 (13.2)	
Good	24 (12.4)	10 (9.4)	
Sources of information	n = 189^{+}	n = 96^{+}	
Antenatal clinic	125 (66.1)	64 (66.7)	
Television	14 (7.4)	5 (5.2)	
Book and magazines	14 (7.4)	4 (4.2)	
Friends	15 (7.9)	10 (10.4)	
Family members	12 (6.3)	7 (7.3)	
Health professional	45 (23.8)	37 (38.5)	
Work place	8 (4.2)	4 (4.2)	
Internet	14 (7.4)	2 (2.1)	
Religious group	7 (3.7)	4 (4.2)	

Key: * represents significance at P<0.05; $^{+}$ respondents aware of antenatal exercises

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Table 3: Practice of antenatal exercise among pregnant women

Variable	urban n(%)	rural n(%)	P-value
Practice of antenatal exercise			
Yes	176(90.7)	77(72.6)	0.000*
No	18(9.3)	29(27.4)	
Total	194 (100)	106 (106)	
Reasons for exercising	n = 176^{+}	n = 77^{+}	
Reduction of back pain	122(69.3)	66(85.7)	
Pelvic muscle strengthening	121(68.8)	53(68.8)	
Prevention of excessive weight	115(65.3)	58(75.3)	
Reduced varicose vein formation	73(41.5)	33(42.9)	
Reduced risk of urinary incontinence	73(41.5)	34(44.2)	
Reduced risk of swelling	90(51.1)	42(54.5)	
Prevention of hypertension	93(52.8)	44(57.1)	
Cope with labour	150(85.2)	64(83.1)	
Improved posture	107(60.8)	48(62.3)	
Maintenance cardiovascular fitness	91(51.7)	42(54.5)	
Rapid postnatal recovery	84(47.7)	39(50.6)	
To reduce fetal birth weight	48(27.3)	30(39.0)	
Have healthy baby	106(60.2)	54(70.1)	
Weight loss	77(43.8)	38(49.4)	
Improved sex life	53(30.1)	33(43.0)	
Satisfy my doctor	41(23.3)	21(27.3)	
Reduction of blood pressure	61(34.7)	29(37.7)	
Reduce fatigue	71(40.3)	33(42.9)	
Avoidance of Caesarean Section	74(42.0)	33(42.9)	
Reasons for not exercising	n = 18^{-}	n =29^{-}	
Lack of strength	11(61.1)	22(75.9)	
Lack of interest	11(61.1)	24(82.8)	
Busy schedule	9(50.0)	21(72.4)	
Childcare activities	2(11.1)	16(55.2)	
Insufficient information	13(72.2)	21(72.4)	
Unsafe for the fetus	2(11.1)	17(58.6)	
Fear of miscarriage	2(11.1)	14(48.3)	
Fear of labor inducement	3(16.7)	16(55.2)	
Not fun	7(38.9)	7(24.1)	
Refusal by husband and family	1(5.6)	1(3.4)	
No access to fitness centers	6(33.3)	6(20.7)	
Against doctors advice	1(5.6)	1(3.4)	

Key: * represents significance at P<0.05; $^{+}$ respondents who practiced antenatal exercises; $^{-}$ respondents who did not practice antenatal exercises

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Table 4: Patterns of antenatal exercise practices among the participants

Variable	urban (n=176) n(%)	rural (n=77) n(%)
Types of exercise		
Aerobics	87(49.4)	52(67.5)
Abdominals	8(4.5)	2(2.6)
Pelvic floor	44(25)	20(26.0)
Back care	49(27.8)	27(35.0)
Swimming	12(6.8)	5(6.5)
Cycling	10(5.7)	3(3.9)
Stretching	54(30.7)	25(32.5)
Relaxation/breathing	76(43.2)	6(7.8)
Muscle strengthening	30(17.0)	9(11.7)
Other (unspecified)	0	0
Frequency (days)		
1-4 (Below WHO recommendation)	132 (75.0)	57 (74.0)
≥ 5 (WHO recommendation)	44 (25.0)	20 (26.0)
Prescriptor		
Doctor	25(14.2)	21(27.3)
Nurse	61(34.7)	30(39.0)
Physiotherapist	27(15.3)	3(3.9)
Spouse	6(3.4)	2(2.6)
Self	57(32.4)	23(29.9)
Others (unspecified)	18(10.2)	27(35.1)

DISCUSSIONS

This study compared the knowledge, practice and pattern of antenatal exercise among pregnant women in urban and rural areas of Enugu, Nigeria. Interestingly, the results revealed that a good number of pregnant women in the urban and rural areas were well informed on the concept of antenatal exercise ANE. This is consistent with the findings of Ribeiro and Milanez (2011) which reported that almost 2/3rd (65.6%) of the pregnant women in their study were sufficiently aware of antenatal exercises with majority being in favour of it. In a Nigerian-based study, Mbada *et al*. (2014) also reported that majority of the women in western Nigeria had good knowledge of antenatal exercise and showed positive attitude towards it. This high maternal awareness level of ANE is suggestive of maternal education in the healthcare facilities attended by these mothers. Most antenatal clinics in Nigeria are increasingly involving maternal education on ANE as a major component of the antenatal clinic services. (Ojukwu *et al*., 2017).

However, knowledge levels of ANE were significantly different between the two groups of women in this study, with urban women showing higher knowledge levels than the rural women. This finding is concurrent with a previous study (Ojukwu*et al*., 2017) which showed that urban women had better knowledge of post-natal exercises, as compared to rural women in Enugu Nigeria. These differences in the knowledge of ANE may be attributed to the high level of education and exposure

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to modern and recent trends of healthy lifestyle among women in the urban areas.Another possible reason may be the deficiency of health professionals in the rural areas. It is common for medical professionals to have preferences for working in the urban-based health institutions where working conditions are more favourable. Deficiency of healthcare givers in the rural areas has a resultant effect of only few qualified medical personnel attending to a large number of women in the rural clinics, creating insufficient time for adequate maternal education. Despite the high awareness level of ANE among pregnant women in the present study, the demonstrated poor knowledge of the benefits of ANE with preponderance among the rural dwellers. This is in tandem with the findings of Ojukwu *et al*. (2017) which also revealed poor knowledge of the benefits of post natal exercises among nursing mothers in Enugu, Nigeria.

From the present study, it was revealed that majority of the participants practiced ANE although urban women showed higher practices than the rural women. This finding is in line with previous studies (Mbada *et al*., 2015; Ojukwu *et al*., 2017) which reported high rates of postnatal and antenatal exercise practices among Nigerian women, respectively. These high practices of exercises in the childbearing years are indicative of ongoing maternal health promotion and education activities. Majority of women in the present study reported coping with labour and reduction of back pain as the commonest reasons for participating in ANE. Several studies had reported high prevalence of low back pain among pregnant women (Mogren and Pohjanen, 2005; Wang *et al*., 2004). Low back pain in pregnancy can be very discomforting and affect quality of life as well as activities of daily living (Wang *et al*., 2004). As a result, women are always willing get involved in any strategy proposed to have relieving effects on back symptoms during pregnancy.

On the other hand, majority of the women who did not participate in ANE reported lack of interest and strength as well as insufficient information on ANE as their major barriers to ANE practices. This report agrees with previous studies (Clarke and Gross, 2004; Evenson *et al*., 2009; Mbada et al. 2014)which revealed tiredness, lack of feeling to exercise and insufficient information on exercise as the major reasons described by the women for not engaging in ANE. The issues of lack of interest and/or strength to participate in ANE are personal to such women and may require internal and external motivation to induce a lifestyle motivation. Such motivation can be achieved intensified maternal education on ANE. However, the issue of insufficient as reported by the women is suggestive of deficient or inadequate health promotion practices by their healthcare providers. Further evaluation of the patterns of ANE practiced by women in the present study revealed that generally, urban and rural dwellers predominantly engaged in aerobic and relaxation/breathing exercises. This finding is consistent with that of Mbada *et al*. (2015) which also revealed aerobic exercises as the most common ANE practiced by pregnant women in Western Nigeria.

It was also observed from the present study that most of the women exercised for 1-4 times weekly. This frequency below standard recommendations of 30 minutes for 5 or more days weekly (American College of Sports Medicine, 2000; Artal and Toole, 2003). Mbada *et al*. (2015) also reported a poor exercise frequency of 1-2 times weekly among pregnant women in Western Nigeria. This is to say that in as much as practice of ANE among these pregnant women is high, their patterns of practice are inadequate for maximum health benefits. Furthermore, it the present study reported that most of the women who engaged in ANE had these exercises prescribed by nurses. Physiotherapists who are the key professionals in the promotion, prescription and supervision of physical exercises in the clinical setting are surprisingly among the least prescriptors of ANE as reported by the women.

These findings suggests diminished participation of women's health physiotherapists in ANE education and further corroborates previous studies (Mbada *et*

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al., 2015; Ojukwu *et al*., 2017) which also suggested low participation of physiotherapists in maternal education programmes. In the clinical setting, physiotherapists who are abound with knowledge of kinesiology and biomechanics are in the best position to prescribe therapeutic exercises, bearing in mind the safety, effectiveness and efficiency of such exercises. In concordance, several studies had confirmed that ANE conducted and supervised by women's health physiotherapists had better and improved outcomes (Whitford *et al*, 2006; Hermansen *et al*, 2010). It is very necessary that physiotherapists get involved in the education and promotion of maternal exercise regimes in the urban and rural settings of Nigeria so as to ensure appropriate practices.

Conclusions/Recommendations

Generally, there is good knowledge and positive practice of antenatal exercises among Nigerian pregnant women, although urban dwellers showed more positive knowledge and attitude, as compared to the rural dwellers. Aerobic and relaxation/breathing exercises were the most commonly practiced exercises. Most of the pregnant women, especially the rural dwellers, did not meet up with the standard recommended duration of antenatal exercises and exercises were predominantly based on self-prescription. Physiotherapists were less involved in antenatal exercise education, prescription and supervision.

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AUTHORS' CONTRIBUTIONS

Ojukwu CP., and Nmecha CE were responsible for the design of the study and gathering of literature materials; Ojukwu CP, Nmecha CE and Anekwu EM were responsible for the data collection. Ojukwu, CP, Okemuo AJ, Nmecha CE, Anekwu EM and Uchenwoke CI were responsible for the review of literature, drafting of the manuscript, analysis of the data and presentation of the data; Ojukwu CP supervised the research work. All the authors read the manuscript.

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