Antenatal Exercise Practices: Associated Factors and Correlation with Antenatal Quality of Life

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

Original Research Article

ABSTRACT

Aims: The study aims to assess the relationship between antenatal exercise practice and health-related quality of life of Nigerian pregnant women.
Study Design: Cross-sectional descriptive correlational.
Place and Duration of Study: The study was carried out in University of Nigeria Teaching Hospital Ituku-Ozalla, Mother of Christ Specialist Hospital Ogui and Polly Clinic Asata, all in Enugu during February to April 2016.
Methodology: A questionnaire adapted from previous studies and SF36 forms were respectively used to obtain information on antenatal exercise practice and health-related quality of life from 300 pregnant women (age range of 17-45 years) who were attending three antenatal clinics in Enugu, Nigeria. Data were analysed with independent *t*-test and standard multiple regression at a significance level of 0.05.

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Results: Present study revealed that a greater percentage of the women practised antenatal exercise (72.3%), particularly aerobics (47.9%) and stretching exercises (24.0%). Majority demonstrated unsuitable duration (61.3%) and frequencies (74.7%) of antenatal exercise practices. Women who practised antenatal exercise significantly (*p*< 0.001) showed higher values in most health-related quality of life domains, as compared to those who did not exercise. Antenatal exercise practice significantly (*p* < 0.001) predicted health-related quality of life of the women while frequency and duration of antenatal exercise were not determinants of their health-related quality of life.
Conclusion: Maternal health education on antenatal exercise practices should be intensified and needs to incorporate relevant factors of antenatal exercise, including recommended frequency and duration of practice.

1. INTRODUCTION

Pregnancy is associated with numerous physical, emotional, and psychological changes [1,2] as well as changes in women's health-related quality of life (HRQoL) [3]. Pregnancy has been regarded as a vulnerable period relative to HRQoL as compared with other periods of life [2,3]. Several studies have reported significant declines in the physical functioning of women throughout pregnancy [2,4,5]. For safe maternity and neonatal outcomes, antenatal exercise (ANE) have been recommended as a routine practice for all pregnant women [6,7]. The American College of Obstetricians and Gynecologists [8] recommended regular low-impact, moderate-intensity exercises for pregnant women irrespective of their physical fitness level for approximately 30 minutes on most days of the week. Low maternal education [9], teenage pregnancies [10], multiparity [11], race/ ethnicity, lack of interest, and lack of strength [7] have been identified as common barriers to ANE. Although studies have shown decreased compliance with these exercise recommendations [9,12,13], numerous benefits have been associated with ANE practice.

Some of these benefits include improvement of physical fitness and cardiovascular endurance, prevention of excessive gestational weight gain and glucose intolerance, decrease in the occurrence of common pregnancy problems and improvement in psychological adjustments to changes in pregnancy, reduction of post-partum recovery period, among others [7,14,15]. Exercise practices prior to and during pregnancy have also been associated with improved health status in women within these periods and beyond [3,16-18]. Most of these associated benefits of ANE have been previously evaluated and documented. However, empirical evidence supporting the relationship between ANE and HRQoL are scarce, particularly among women in developing countries. Adequate information on this may objectively encourage a positive change in women's attitude towards ANE practice as well as suggest effective interventions to enhance women's HRQoL during pregnancy. In effect, this study was designed to evaluate the differences in pregnant women's HRQoL relative to their ANE characteristics. It further assessed the correlation between ANE characteristics and HRQoL.

2. MATERIALS AND METHODS

This cross-sectional study, descriptive correlational design involved a convenient sample of three hundred (300) pregnant women who were attending antenatal clinics in three government certified hospitals in Enugu, Nigeria. Each of these hospitals organises antenatal classes twice per week with midwives as the major personnel-in-charge of the clinics.

For this study, permission was sought from the hospital management as well as appropriate personnel. On their permission, the women were addressed collectively on the purpose and procedures of the study. Pregnant women who indicated interest were screened for their eligibility and conveniently recruited for this study. Women were excluded from this study based on the following criteria: medical advice on reduced physical activity levels diagnosed health conditions with existing effects of HRQoL, history of mental health issues affecting memory capabilities and inability to speak and/or understand English and Igbo languages. This study was approved by the University of Nigeria Health Research & Ethics Committee, and participants gave written informed consents prior to participation in the study.

A validated questionnaire adapted from previous studies [13,19] was used to obtain information on socio-demographic, maternal and obstetrics characteristics as well as antenatal exercise

practices of the participants. The Short Form Health Survey (SF 36) (questionnaire comprising of eight domains including physical functioning, vitality, bodily pains, general health, emotional role functioning, social role functioning, physical role functioning and mental health was also used to assess the quality of life of the respondents [20-22]. Validity and reliability of the SF 36 questionnaire has been previously documented with reliability coefficients ranging from a low of 0.65 to a high of 0.94 across scales in diverse populations [22].

2.1 Data Analysis

Data were summarised by using descriptive statistics of mean, standard deviation, frequency and percentages. Inferential statistics of independent *t*-test was used to evaluate the statistical differences between participants' HRQoL, based on their ANE characteristics. The correlation was used to assess correlations between ANE characteristics and HRQoL. Standard multiple regression analysis was further used to determine predictors of HRQoL. Data were analysed using Statistical Packages for the Social Sciences (SPSS, version 22.0).

3. RESULTS

Table 1 shows the socio-demographic characteristics of the participants. Majority of the women were between 25 - 39 years of age (77.7%), Christians (96.7%), unemployed (41.3%), and had obtained university degree (66.3%). Most of them earned between 10,000-50,000 naira monthly (44.3%), monogamous (79.7%), married (91.3%), and urban dwellers (90.0%).

The maternal and obstetric characteristics of the participants are presented in Table 2. Greater percentage of the women were experiencing their 2nd – 4th pregnancies (66.0%), had experienced 1 - 4 childbirths (55.0%), and had more than 5 children (60%).

Respondents' practice and patterns of ANE are presented in Table 3. Majority of the participants (46.3%) showed positive practice of ANE. Aerobics (47.9%) and stretching (24.0%) exercises were the commonest types of ANE practised by the respondents. Furthermore, majority of the women exercised for less than 5 days per week (50.74%) and less than 30 minutes per day (61.3%). Nurses (35.3%) were the major prescriptors of ANE among the respondents.

Table 4 presents the HRQoL values of the participants relative to their ANE practices. There were significant differences in the respondents' physical functioning (p= 0.003), energy/fatigue (p = 0.002), emotional well-being (p= 0.001), social functioning (p= 0.001), bodily pain (p= 0.001), and general health (p < 0.01) domains of women who practised antenatal exercise and those who did not. However, there were no significant (p > 0.05) differences in the HRQoL domains of the respondents relative to their frequency and duration of ANE practice.

Multiple regression results showing correlations among HRQoL domains and ANE characteristics of the participants are presented in Table 5. The regression model includes practice and duration and frequency of ANE, and explains a small percentage of participant's general health (5.5%), social functioning (3.5%), and physical functioning (3.7%). Among the three ANE attributes, practice of ANE makes the largest unique significant contribution in participants' HRQoL, as compared to duration and frequency of ANE.

4. DISCUSSION

This study investigated the ANE practices of pregnant women in Enugu, Nigeria as well as their correlations with maternal HRQoL. Interestingly, most of the women in this study commenced antenatal care within the first three months of gestation. Although several studies [23,24] had reported late commencement of antenatal care among Nigerian women, the present study has shown otherwise. Early commencement of formal antenatal care shown in the present study reflects an improvement in health care seeking behaviour of Nigerian pregnant women.

Prevalence of ANE practice was high among pregnant women in the present study. This finding corroborates with Mbada et al. [13], who reported a high prevalence of ANE practices among Western Nigerian women. The positive ANE practice profile of pregnant women in the present study is satisfactory and may indicate the impact of ongoing maternal health promotion programs targeted toward improving women (HRQoL) across the childbearing years.

Table 1. Socio-demographic characteristics of the participants (n= 300)

Variable	Frequency (n=300)	Percentage (100%)
Age (years)		
< 17	5	1.7
18 – 24	45	15.0
25 – 39	233	77.7
≥ 40	17	5.7
Religion		
Christianity	290	96.7
Islam	7	2.3
Traditional religion	3	1.0
Occupation		
Unemployed	124	41.3
Self employed	103	34.3
Civil Servant	73	24.3
Education		
None	7	2.3
Primary education	22	7.3
Secondary education	72	24.0
University degree(s)	199	66.3
Monthly Income (₦)		
Less than 10,000	91	30.3
10,000-50,000	133	44.3
50,000-100,000	52	17.3
100,000-150,000	20	6.7
150,000-200,000	4	1.3
Family		
Polygamy	36	12.0
Monogamy	239	79.7
Single parenting	25	8.3
Marital status		
Married	274	91.3
Single	17	5.7
Divorced	6	2.0
Widowed	3	1.0
Residence		
Urban	270	90.0
Rural	30	10.0

Table 2. Maternal and obstetrics characteristics of the participants (N= 300)

Variable	Frequency (n=300)	Percentage (100%)
Gravidity status (Number of pregnancy)		
1	102	34.0
2 - 4	139	46.3
≥ 5	59	19.7
Parity status (Number of childbirths)		
0	109	36.3
1 - 4	26	55.0
5 – 10		8.7
Number of children		
<5	120	40.0
≥5	180	60.0
Commencement of antenatal care (weeks)		
4 – 12	146	48.7
13 - 24	137	45.6
≥	17	5.7

Table 3. Practice and patterns of antenatal exercise

Practice of antenatal exercise	Frequency (n=300)	Percentage (100%)
Yes	217	72.3
No	83	27.7
Patterns of exercises (n=217)		
Types of exercise practiced		
Aerobics	104	47.9
Abdominal Exercise	13	6.0
Pelvic Floor Exercise	11	5.1
Back care Exercise	10	4.6
Swimming	4	1.8
Cycling	3	1.4
Stretching Exercise	52	24.0
Relaxation and Breathing Exercise	14	6.4
Muscle Strengthening Exercise	6	2.8
Frequency of exercise		
<5 days	162	74.7
≥5 days	55	25.3
Duration of exercise		
< 30 minutes	133	61.3
≥ 30minutes	84	38.7
Prescriptors of antenatal exercise		
Doctor	30	14.0
Nurse	77	35.3
Spouse	4	2.0
Physical Therapist	10	4.7
Self	42	19.3
Non-medical personnel	54	24.7

The study showed that majority of the women practised aerobics and stretching exercises. This finding coincides with previous studies [13,25,26] which reported aerobic exercise as the most common ANE practised pregnant women. Most aerobic exercises were performed without sophisticated equipments, making it easier for women to adopt in various environmental situations. It is also common practice for nurses or other related healthcare professionals to engage women in simple aerobic exercises as a part of the antenatal clinic processes. So, women usually adopt such aerobic practices which they are conversant as home programmes. Conversely, swimming and cycling were identified as the least practised ANE by the women in the present study. Such trend has been reported in previous studies [13,19]. Pregnancy-related hydrophobia and certain African cultural myths preventing pregnant women from swimming as well as limited availability of swimming pools may be responsible for these outcomes. Cycling exercises are not common in Nigeria as most roads have not been designed to accommodate bicycles as a transport facility. Commonly, bicycle ergometers are utilised for fitness programmes, but their high costs are known barriers of their affordability and availability to several individuals.

In this study, most pregnant women demonstrated positive attitudes towards ANE. Several studies [7,27,28] have also reported a positive shifts in attitudes towards ANE over the past two decades. Relative to the frequency and duration of ANE practices, majority of the women in the present study exercised for less than five days weekly and for less than 30 minutes daily. This is below the standard recommended exercise level of ≥30 minutes on most days of the week [8] but coincides with previous studies [13,19]. This implies that despite showing positive attitudes towards ANE, the patterns of practice among the respondents are unsuitable and insufficient to elicit optimum health benefits. Unsuitable health practices may stem from several factors, including inappropriate education or most especially health education from inappropriate personnel. Typically in most Nigerian settings, nurses and midwives are majorly in-charge of antenatal classes and majorly educate pregnant women on ANE, especially in the absence of physiotherapists.

Table 4. Independent t-test results showing differences in the participants. Health-related quality of life based on practice and patterns of antenatal exercises

Categorical distribution based on practice & pattern of ANE	Health-related quality of life							
	PF	RLPH	RLEP	EF	EWB	SF	PAIN	GH
Practice of ANE								
Yes (n = 217)	46.71±26.51	29.30±37.45	48.97±46.17	52.37±22.45	60.34±26.05	55.59±26.52	56.75±24.68	63.52±24.11
No (n = 83)	36.10±28.22	25.20±38.07	39.76±45.52	42.39±25.94	47.81±30.45	42.74±29.57	46.81±28.12	48.89±26.89
t-value	3.045	0.845	1.553	3.092	3.331	3.461	3.461	4.338
p-value	0.003**	0.399	0.122	0.002**	0.001**	0.001**	0.001**	0.000***
Duration of ANE								
< 30 mins	44.27±27.89	25.47±36.77	43.19±45.94	49.92±23.51	58.48±27.55	52.67±28.15	54.25±26.55	60.13±26.77
≥ 30 mins	47.01±25.58	31.75±37.92	53.51±45.51	53.92±21.10	60.26±24.85	56.27±25.56	57.76±23.40	64.30±21.33
t- value	-0.790	-1.303	-1.747	-1.385	-0.525	-1.037	-1.084	-1.341
p-value	0.430	0.194	0.082	0.167	0.600	0.301	0.279	0.184
Frequency of ANE								
< 30 mins	44.90±26.73	27.75±37.19	48.71±46.03	51.81±22.32	59.15±25..91	54.77±27.15	56.33±25.08	62.19±24.36
≥ 30 mins	57.69±27.88	38.46±41.60	37.31±45.36	50.77±27.15	59.08±32.99	51.15±26.15	45.00±23.12	61.52±26.75
t- value	-1.672	-1.003	0.869	0.161	0.009	0.467	1.590	0.096
p-value	0.096	0.317	0.386	0.872	0.993	0.641	0.113	0.924

*Key: Values are presented as mean ± standard deviation; ** indicates significance at P < 0.01; *** indicates significance at P < 0.001; ANE- antenatal exercise; PF- physical functioning; RLPH- role limitation due to physical activity; RLEP- role limitation due to emotional problem; EF- energy and fatigue; EWB- emotional wellbeing; SF- social functioning; PAIN- pain; GH- general health*

Table 5. Multiple regression results showing correlations among health-related quality of life and antenatal exercise characteristics of the participants

HRQoL	R square	Practice of ANE	Duration of ANE	Frequency of ANE
PF	0.037*	0.157 (0.147)*	0.109 (0.103)	0.101 (0.101)
RLPH	0.020	0.098 (0.092)	0.115 (0.108)	0.063 (0.063)
RLEP	0.025	0.107 (0.101)	0.146 (0.137)*	-0.058 (-0.058)
EF	0.020	0.114 (0.107)	0.127 (0.120)	-0.013 (-0.013)
EWB	0.020	0.146 (0.137)*	0.088 (0.082)	-0.008 (-0.008)
SF	0.035*	0.183 (0.172)*	0.127 (0.119)	-0.390 (-0.390)
PAIN	0.032	0.141 (0.133)*	0.108 (0.101)	-0.109 (-0.109)
GH	0.055**	0.233 (0.219)**	0.165 (0.156)*	-0.017 (-0.017)

*Key: Values are presented as Beta value (Part correlation coefficient); * indicates significance at P < 0.05; ** indicates significance at P < 0.01; ANE- antenatal exercise; PF- physical functioning; RLPH- role limitation due to physical activity; RLEP- role limitation due to emotional problem; EF- energy and fatigue; EWB- emotional wellbeing; SF- social functioning; PAIN- pain; GH- general health*

Education, supervision, and monitoring of therapeutic and clinically-prescribed exercises are particularly the roles of trained physiotherapists who are exceptionally knowledgeable in biomechanics, kinesiology and exercise therapy. However, the roles of physiotherapists in maternal care are limited by several factors, especially in Nigeria. This was obvious from the reports of the present study which revealed that only a few percentages (4.7%) of the women exercised under the prescription of a physiotherapist. This may result in inappropriate practices and mechanisms of performance of the reported ANE.

This study showed that for all HRQoL domains, women who practised ANE showed higher HRQoL values, compared to those who did not. This study also showed significant associations between HRQoL and practice of ANE among the women. This finding is in tandem with several previous studies that reported a close significant association between quality of life and practice of ANE [2, 29-31]. However, some previous studies had reported differently regarding the roles of ANE in improving HRQoL. Bahadoran and Mohamadiriz [32] identified social support as the only HRQoL domain that is significantly associated with physical activity practices in pregnant women. Vallim et al. [33] also reported that ANE (specifically, water exercises) had no association with HRQoL of pregnant Brazilian women.

Conversely, the present study showed that among women who exercised, there were no significant differences in their HRQoL values across all the studied domains, relative to duration and frequency of ANE. This suggests that frequency and duration of ANE are not determinants of HRQoL among pregnant women

in this study. Thus, the study further showed that among the three characteristics of ANE considered, ANE practice was the most important predictor of pregnant women's HRQoL, as compared to duration and frequencies of the exercises. However, this study was limited by its cross-sectional design and convenient sampling procedures. Thus, it is recommended that further studies should incorporate longitudinal or experimental designs in studying such relationships among ANE and HRQoL for better valid and generalizable outcomes.

5. CONCLUSION

Prevalence of ANE practices among pregnant women in this study is high. However, the frequency and duration of ANE practices were inadequate and predominantly below standard recommendations. There is a positive relationship between ANE practices and HRQoL whereas the frequency and duration of ANE exercise practices showed no associations with HRQoL. Maternal education on ANE should be improved with recommendations on the suitable patterns of practice. Finally, the involvement of physiotherapists in such maternal education and/or interventions should be increased.

CONSENT

All authors declare that written informed consent was obtained from the participants for publication of this survey. A copy of the written consent is available for review by the Editorial Board members of this journal.

ETHICAL APPROVAL

All authors hereby declare that ethical approval was obtained from the Health and Ethics Research Committee of University of Nigeria

Teaching Hospital, Ituku-Ozalla, Enugu before the commencement of the study. There was no grant obtained, so this study was funded by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/26520