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Variations in the health-related quality of life of Nigerian nursing mothers, relative to their practice and patterns of postnatal Exercises

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Abstract
Background: Postnatal exercises (PNE) have been associated with several maternal health benefits during the postpartum period. In the African context, studies are limited on the influences of PNE on postpartum health-related quality of life (HRQoL).
Aim of Study: This study investigated postnatal exercise practices, their associated factors and influences on HRQoL of postpartum women in Enugu, Nigeria.
Methodology: Three hundred and fifty (350) postpartum women (17-40 years) participated in this cross sectional descriptive survey. Participants completed a structured questionnaire assessing socio-demographic and maternal characteristics as well as practice of PNE while Short Form (SF-36) questionnaire was used to assess their HRQoL. Data were analyzed using the descriptive and inferential statistics with alpha level set at 0.05.
Results: Only 20% of the women practiced PNE. Frequency of PNE was below standard recommendations of ≥ 5 days weekly (78.6%). However, majority (68.6%) of the women exercised within the recommended duration of ≥ 30 minutes daily. Significant differences ($p > 0.05$) existed in the women's energy and fatigue, social functioning and GH- general health domains, relative to their practice of PNE. Considering the frequency and duration of PNE, most of the HRQoL domains did not reveal significant differences between women in the various categories.
Conclusion: Prevalence of PNE practice is poor among nursing mothers in Enugu, Nigeria. Frequency and duration of PNE were not significant factors in determining variations in HRQoL of nursing mothers. Improved maternal education of appropriate practice and patterns of PNE is recommended.

Keywords: postnatal exercise, quality of life, postpartum period, Nigeria

Introduction

The advocacy for exercise and physical activity during the postpartum period is of crucial value for its overall benefits (Mottola, 2002) [24]. The current American College of Obstetricians and Gynecologists (ACOG) guidelines for pregnant and postpartum women published in 2002 stated that many of the physiological and morphological changes persist 4-6 weeks postpartum; as a result, postnatal exercises (PNE)should only be resumed gradually after childbirth as soon as it is deemed physically and medically safe (Artal and O'Toole, 2003) [25]. Most commonly, PNE include aerobic, abdominal, cycling, relaxation and breathing exercises, pelvic floor, stretching and strengthening exercises (Mbada *et al*., 2015) [26]. The Centers for Disease Control and Prevention and the American College of Sports Medicine (CDC-ACSM) have recommended the accumulation of 30 minutes or more of moderate intensity physical activity on most days, preferably all days of the week (Artal and O'Toole, 2003) [25] during the postpartum period. Empirical evidences have shown that physical exercises during the postpartum period have maternal benefits including decreased incidence of postpartum depression (Koltyn and schultes, 1997) [27], improvement in aerobic fitness, high density lipoprotein-cholesterol levels, insulin sensitivity and psychological well-being (Larson-Meyer, 2002)[28]. PNE also enhances quality of life (Mrunal, 2002; Penedo *et al.*, 2005) [30], decreases occurrences of anxiety and sleep disorders (Scott, 2006) [31], prevention and treatment of urinary incontinence (Morkved and Bø, 2014; Scott, 2006) [30].

The postpartum period has been associated with some disorders, including depressive symptoms (Webb *et al*., 2008) [32], breast symptoms, vaginal discomfort, fatigue, increased sweating, acne, hand numbness or tingling, dizziness, sexual concerns, respiratory symptoms, and hair loss, hemorrhoids, poor appetite, constipation and hair loss (Gjerdingen *et al.*, 1993) [33]. Most of these disorders can be prevented or managed with adherence to postnatal physical activities and exercises. There are several factors hindering the practice of PNE among women (Evenson *et*

al., 2009) [34]. In Africa, many cultures and fatalistic views seclude and restrain mothers from exercise and physical activity after childbirth (Mbada *et al*., 2015) [26]. Consequently in Nigeria, most postpartum women are not aware they can engage in physical exercise during the postpartum period and hence most of them are not participating in the exercise (Adeniyi *et al*., 2013) [3]. However, Mbada *et al*. (2015) [26] reported that Nigerian postpartum women demonstrated high engagement in physical exercise which was mostly by self-prescription.

Considering the extensive maternal benefits of PNE, there is limited literature on PNE practices of African women as well as its effects on maternal HRQoL. As a result, there is need to assess the patterns and practices of PNE among Nigerian postpartum women as this has been only assessed in one study (Mbada *et al*., 2015) [26], to the best of our knowledge. This study was therefore designed to investigate the postnatal exercise practices, their associated factors and influence on the quality of life of postpartum women in Enugu Nigeria.

Materials and Method

Three hundred and fifty (350) apparently healthy postpartum mothers, conveniently recruited from the postnatal clinics of Abakpa Health Centre, University Of Nigeria teaching Hospital, Nike health centre, UNTH old site public and Mother of Christ Hospital, Balm Of Gilead, Ntasi-Obi Ndi no n' afufu hospital, Niger Foundation, St. Patrick's hospital, Nsukka General Hospital private health institutions in Enugu, Nigeria, participated in this cross-sectional survey. Women with known disease conditions affecting their physical, social and mental abilities were excluded from the study. The University of Nigeria teaching Hospital Health Research Ethics Committee approved this study and each participant gave a written informed consent prior to participation in the study.

An adapted questionnaire from a previous study (Mbada *et al*., 2015) [26] was used to assess participants' knowledge, practice and patterns of PNE. This questionnaire which was self-administered has four sections, assessing socio-demographic characteristics, maternal and obstetrics characteristics, types of postnatal exercises practiced as well as frequency, duration and prescriptors of the exercises. The Short Form 36 health survey questionnaire (SF-36) was also used to measure their HRQoL in eight domains of health status: physical functioning (10 items), physical role limitations (4 items), bodily pain (2 items), general health perceptions (5 items), energy/vitality (4 items), social functioning (2 items), emotional role limitations (3 items) and mental health (5 items) (Ware and Sherbourne, 1992; Ware *et al*., 1993; McHorney *et al*., 1994) [22, 23, 24]. The subscales are scored between 0 – 100 points, with 0 representing poor health and 100 for good health.

Data Analysis

Descriptive statistics of mean, standard deviation, frequency and percentage were used to summarize data. Inferential statistics of independent T-test was used to test for statistical differences between variables while Chi-square was also used to determine correlations between the variables at alpha level set at $p < 0.05$. Data were analyzed using the statistical package for social sciences (SPSS) version 21.

Results

Table 1 shows the sociodemo graphic characteristics of the participants. Majority of the women were within the age ranges of 25-29 years (71.7%), Christians (98.6%), business women (26%), married (96.9%), resided in the urban areas (59.1%) and had obtained a university degree (52%).

The maternal and obstetrics characteristics of the participants are presented on table 2. Majority of the women are multiparous (67.1%) and had 2-4 children (54.6%). A greater percentage commenced antenatal care between in their second trimesters (56%), had spontaneous vaginal deliveries (82%) and hospital deliveries (87.1%).

Table 3 shows the practice and pattern of post natal exercises. Most of the women (80%) showed negative practices of PNE. Among women with positive practices of PNE (20%), majority practiced aerobics (45.7%) and abdominal exercises (15.7%). 78.6% of the women exercised below the WHO recommendations of ≥ 5 days per week while a greater percentage (68.6%) of them exercised in line with the recommendation of ≥ 30 mins daily.

Table 4 shows the differences in the participants' Health-Related Quality of Life based on practice and patterns of postnatal exercises. Relative to the practice of PNE, there were significant differences existed in the Energy/Fatigue (p=0.006), social functioning (p=0.035) and general health (p=0.050) domains varied among women with positive practice of PNE and those with negative practices. Considering the duration of PNE practices relative to WHO guidelines, the entire QOL domains of women who exercised in accordance to the guidelines (≥ 30 mins daily) did not significantly differ from those of women who exercised below the standard recommendations. Between the two categories of PNE frequency, a significant difference only existed in the physical functioning domain ($p = 0.002$) of the nursing mothers

Table 1: Socio-demographic characteristics of the participants (N=350)

Variables	Frequency (N= 350)	Percentage (%)
Age (years)		
< 17	4	1.1
18 – 24	84	24.0
25 -29	251	71.7
>40	11	3.2
Religion		
Christianity	345	98.6
Islam	2	0.5
Traditional religion	3	0.9
Others	-	-
Occupation		
Homemakers	63	18.0
Trader	36	10.3
Business women	91	26.0
Civil servant	74	21.1
Students	46	13.1
Others	40	11.5
Educational level		
None	9	2.6
Primary education	17	4.8
Secondary education	142	40.6
University education	182	52
Family setting		
Polygamy	29	8.3
Monogamy	316	90.3
Single parenting	5	1.4
Marital status		
Single	8	2.3
Married	339	96.9
Divorced	1	0.3
Widowed	2	0.5
Residence		
Urban	207	59.1
Rural	143	40.9

Table 2: Maternal and obstetrics characteristics of the participants (N=350)

Variables	Frequency	Percentages (%)
Parity		
Primiparous	115	32.9
Multiparous	235	67.1
No of children		
1	118	33.7
2-4	191	54.6
≥5	41	11.7

Mode ofdelivery		
Spontaneous vaginal delivery	287	82.0
Caesarean section	63	18.0
Place of delivery		
Hospital	305	87.1
Home	19	5.4
Others	26	7.4
Period of commencement of antenatal care (trimester)		
First	105	30.0
Second	196	56.0
Third	49	14.0

Table 3: Practice and pattern of postnatal exercise of the participants

	Frequency	**Percentage (%)**
Practice of postnatal exercise (n = 350)		
Yes	70	20.0
No	280	80.0
Pattern of postpartum exercise (n = 70)[a b]		
Aerobics	32	45.7
Abdominal exercise	11	15.7
Pelvic floor exercise	9	12.9
Backcare exercise	3	4.3
Swimming	1	1.4
Cycling	2	2.9
Stretching exercise	3	4.3
Relaxation and breathing exercise	3	4.3
Muscle strengthening exercise	6	8.6
Frequency (days) (n = 70) [a]		
< 5	55	78.6
≥5	15	21.4
Duration (mins) (n = 70) [a]		
< 30	22	31.4
≥ 30	48	68.6
Prescriptors of practiced exercises (n = 70) [a b]		
Doctors	5	7.1
Nurses	5	7.1
Physiotherapists	11	15.7
My spouse	6	8.6
Myself	37	52.9
Others	6	8.6

[a] – respondents that performed postnatal exercises; [b] – multiple answers specified, where necessary.

Table 4: Independent t-test results showing differences in the participants' Health-Related Quality of Life based on practice and patterns of postnatal exercises

Categorical distribution based on practice & pattern of PNE	Health-related quality of life							
	PF	**RLPH**	**RLEP**	**EF**	**EWP**	**SF**	**PAIN**	**GH**
Practice of PNE								
Yes (n = 70)	90.71±21.74	84.27±33.02	84.76±34.37	72.02±17.28	83.73±15.10	84.90±23.13	81.04±23.13	82.11±13.17
No (n = 280)	94.23±14.60	85.68±32.43	89.33±34.37	78.63±17.99	86.43±12.21	91.18±16.67	85.28±23.60	85.43±12.49
t-value	-1.282	0.320	-1.027	-2.769	-1.385	-2.139	1.349	-1.969
p-value	0.203	0.749	0.307	0.006*	0.169	0.035*	0.178	0.050*
Duration of PNE (minutes)								
< 30 (n= 22)	86.67±24.61	73.81 ±40.68	80.95 ±37.38	72.94±17.96	82.57 ± 14.52	77.98 ±30.38	82.50 ± 21.14	81.00± 12.11
≥ 30 (n= 48)	91.96 ±20.99	89.13 ±28.70	85.51 ±34.18	72.07± 17.49	83.85 ± 15.19	87.93 ±19.21	79.62 ± 24.54	80.63 ±14.71
t-value	-0.853	-1.558	-0.475	0.189	-0.329	-1.383	0.491	0.398
p-value	0.399	0.130	0.637	0.853	0.744	0.178	0.626	0.693
Frequency of PNE (days per week)								
< 5 (n = 55)	88.15± 24.17	82.87 ± 34.62	82.72 ±36.48	71.20 ± 18.09	82.69 ± 14.36	83.24 ± 24.65	82.41 ± 24.65	80.81 ± 13.94
≥5 (n = 15)	99.23± 2.77	90.39 ±28.02	89.75 ± 28.50	77.05 ± 14.55	86.62 ± 17.15	91.35 ± 17.22	72.69 ± 30.47	82.09 ±14.06
t-value	-3.281	-0.827	-0.753	-1.238	-0.764	-1.389	1.087	-0.269
p-value	0.002*	0.417	0.459	0.229	0.456	0.177	0.294	0.770

Key: * indicates significance at p<0.05; values are presented as mean ± standard deviation; PNE- postnatal 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

Discussion

This study investigated the health-related quality of life of nursing mothers, relative to their postnatal exercise practices. Majority of the women in this study were multiparous and have more than one child, inferring their multiple experiences in postpartum lifestyles. The study results reveal poor practice of PNE among the nursing mothers. There are limited studies on PNE, as compared to antenatal exercises. However, the few available studies had revealed contradictory reports on the practice of PNE among postpartum mothers. Low prevalence of PNE practice has been reported in postpartum women previously (Albright *et al*., 2006; Adeniyi *et al*., 2013; Ojukwu *et al*., 2017; Okyay &Ucar, 2018) [16, 3, 17, 7]. Several barriers to postpartum physical activity participation have been documented previously, some of which include, perception of negative impact of exercise on milk production and breastfeeding (Scott, 2006) [18], lack of assistance with childcare and time constraints (Pivarnik *et al*., 2003; Smith *et al*., 2005) [20, 19], fatigue, lack of interest, motivation and confidence (Saligheh *et al*., 2016; Ojukwu et l., 2017) [14, 7], lack of access to affordable and appropriate activities, poor access to public transport (Saligheh *et al*., 2016) [14] and insufficient information on PNE. Contrary to the aforementioned findings, Mbada *et al*. (2015) [12, 26] reported a high prevalence for engagement in PNE among women in western Nigeria. More studies on exploring the barriers and enablers of PNE in sub-Saharan African countries is recommended.

Among the women who reported positive practice of PNE in the present study, almost a half of them practiced aerobics exercise, as compared to other forms exercise. Several forms of aerobics exercise have been reported as common practices during the postpartum period (Adeniyi *et al*., 2013; Mbada *et al*., 2015; Ojukwu *et al*., 2017) [3, 12, 26, 17]. Typically, various modes of aerobic exercise requires minimal or no equipment as well as expertise to perform them. Thus, it may be more convenient for women to engage in these exercises. Additionally, most antenatal and postnatal clinics include low intensity aerobic activities, including walking and dancing, as part of their routine practices, thereby making women more accustomed to these modes of exercise.

Important aspects of exercise as well as indicators of its efficacy are the frequency and duration of exercises. For maximum benefits, engagement in postpartum exercises is recommended for ≥30 minutes on at least five days of the week (ACOG, 2002) [2].

In the present study, more than two-third of the women exercised for less than five days per week, contrary to standard guidelines. However most of them revealed exercising for more than 30 minutes daily, in conformation with the guidelines. Inappropriate practices of physical exercises results in insufficient benefits. It may be possible that some of these women are oblivious of the standard guidelines of PNE. Adequate health promotion and education are key factors of appropriate lifestyle practices and are effectively offered by qualified health personnel and specialists. Relative to the prescriptors of PNE in this study, it was revealed that more than half of the women exercised based on self-prescription. This finding corroborates Mbada *et al*., (2015) [26] which reported a similar trend in the prescription of PNE. In the present study, the inadequacies in the women's practice of PNE may be attributed to this factor. Women's health physiotherapists, the most qualified health personnel for the prescription of PNE constituted a small percentage of exercise prescriptors, as reported by the women. There is need for improved involvement of women's health physiotherapists in the maternal education programmes.

Relative to the practice of PNE, the present study showed that the women's HRQOL significantly differed in three domains (energy and fatigue, emotional well-being and general health) of HrQOL with postnatal exercisers showing lower quality of life than those who did not exercise. Similar trends were observed in other domains although the differences were not statistically significant. These findings contradicted previous studies (Bahadoran *et al*., 2006; Claesson *et al*., 2014; Okyay and Ucar, 2018; Campolong *et al*., 2018) [6, 5, 7] which revealed higher quality of life in association with positive exercise practices. Bahadoran *et al*. (2006) instructed 62 women on postpartum exercises on the day of delivery and re-assessed their postpartum HrQOL on the fortieth day postpartum which revealed that postpartum exercise practice improved their postpartum HrQOL.Claesson *et al*. (2014) [6] also reported a higher quality of life and fewer depressive symptoms in 153 women who were physically active during pregnancy through postpartum, as compared to their counterparts with low physical activity levels. Similarly, in a cross-sectional study of 347 postpartum women, Okyay and Ucar (2018) [5] observed higher HrQOL in among women with higher physical activity levels, as compared with those with low and moderate physical activity levels. Campolong *et al*. (2018) [7] also reported that women who exercised adequately during Pregnancy and postpartum showed higher HrQOL values in most domains when compared with those that exercised inadequately. The conflicting findings among the present study and these previous studies may be attributed to some factors including the design of the studies. Most of the previous studies were experimental made inferences from their responses. In line with this, the present study did not evaluate the women's pre-HrQOL prior to the data collection period to enable them conclude that the ascertained responses were resultant effects of PNE and/or their physical activity levels. Based on these limitations, a cohort design is recommended for future studies. However, the present study's findings corroborated some previous studies (Vallim *et al*., 2011; Nascimento *et al*., 2011; Ojukwu *et al*., 2018) [10, 11] which showed no influence of physical exercise practice on postpartum HrQOL. Furthermore, this study revealed differences in the participants' HrQOL, relative to their patterns of PNE practice. Women who exercised for less than 30 mins daily had lower HrQOL values in most domains, as compared to those who exercised for ≥ 30 mins daily. The standard guideline for PNE is ≥ 30 mins daily (Artal and O'Toole, 2003) [25]. Exercising in accordance to this guideline resulted in higher HrQOL values in a group of pregnant Nigerian women (Ojukwu *et al*., 2018b) [9] whereas self-reported adherence to this guideline did not result in higher quality of life values of postpartum Nigerian women (Ojukwu *et al*., 2018a) [8]. Adherence to the recommended frequency of PNE (≥ 5 days per week) also showed a similar pattern of finding in the present study. It was observed that in most domains, women who exercised for ≥5 days weekly showed higher HrQOL values, as compared to those who exercised for less than 5 days weekly. Ojukwu *et al*. (2018b) [9] revealed that adherence to recommended physical exercise frequency was not a predictor of HrQOL in postpartum mothers. However, in some of the HrQOL domains, women who exercised for ≥5 days weekly showed higher HrQOL values than those who exercised for less than 5 days weekly. These conflicting findings in related studies infer the need for improved physiotherapy involvement in the prescription of maternal physical exercises, considering the expertise knowledge and skills of these professionals in exercise prescription. Effective monitoring of women while engaging in physical exercises during the childbearing years is also very important and can be deduced from the results of the aforementioned studies. Furthermore, there is need for constant evaluation of women's physical activity patterns in women's health practices during routine hospital visits, as against the sole evaluation of physical exercise practice which constitutes conventional assessment procedures.

Conclusions

Negative practice of postnatal exercises is prevalent among postpartum mothers in this study. Women with positive exercise practices showed lower health-related quality of life, as compared to those with negative exercise health practices. Appropriate exercise practices, based on recommended duration and

frequency, resulted in higher HrQOL in comparison to inappropriate practices.

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