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Knowledge and Attitude of Nigerian Nursing Mothers towards Postnatal Exercise: A Cross-Sectional Survey

Chidozie E. Mbada[1*] , Olubukayomi E. Adebayo[1], Adebanjo B. Adeyemi[2], Kikelomo E. Afolabi[3], Olabisi A. Akinwande[4], Ibidun Alonge[5]

[1] Department of Medical Rehabilitation, [2]Departments of Obstetrics, Gynaecology & Perinatology, [3] Department of Nursing Science College of Health Sciences, Obafemi Awolowo University, Ile – Ife, Nigeria
[4]Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, Nigeria.
[5]Department of Physiotherapy, University College Hospital, Ibadan, Nigeria.

[*]Corresponding author: Dr. Chidozie E. Mbada
Phone: +2348028252543

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Abstract

The benefits of exercise in pregnancy and postpartum remain largely unexplored among Africans. This study assessed knowledge and attitude of Nigerian nursing mothers towards postnatal exercises. A cross-sectional study of 176 mothers recruited from six selected hospitals from South-West Nigeria was carried out. A three-section questionnaire that assessed socio-demographics, maternal characteristics, knowledge and attitude towards postnatal exercises was employed. Descriptive and inferential statistics were used to analyze data at $p<0.05$ alpha level. The respondents were relatively young (28.6±5.26 years) and

mostly multiparous (54.5%). The most commonly known postnatal exercises were aerobics (35.8%), muscle strengthening (33.5%) and relaxation and breathing (33.5%) exercise respectively. However, swimming (25%) and cycling (18.2%) were rarely known as postnatal exercises. Quick postnatal recovery (67.4%), improvement in body awareness and posture after pregnancy (66.6%) and prevention excess weight gain (63.3%) were mostly considered as benefits of postnatal exercise. Extreme obesity or underweight (31.2%), back pain (29.6%) and muscle weakness (28.2%) after pregnancy were the most implicated contraindications to postnatal exercise. Tiredness and busy schedule (21.9%) and lack of feeling for exercise (20.7%) were the most linked factors for negative attitude towards postnatal exercise. There was significant association between parity and knowledge about benefits (X^2=7.604; p=0.022) and contraindications (X^2=7.011; p=0.030) to postnatal exercise respectively. A majority of Nigerian nursing mothers demonstrated positive attitude but had poor knowledge about types, benefits of and contraindications to postnatal exercises. Knowledge about benefit of and contraindication to postnatal exercise was significantly influenced parity.

Key words: Exercise; Knowledge, attitude, Nursing mothers, Nigeria, postpartum

Introduction

Improvement in physical, physiological, psychological and social well-being has been associated with physical exercise after pregnancy. Specifically, postnatal exercise has been linked with improvement in cardiovascular fitness [1,2], reconditioning of abdominal muscle tone which are stretched during pregnancy and labour [3-8], reduction of risk of becoming overweight or obese [9-11], enhanced lactation and breastfeeding [12,13], reduction of potential post-partum complications including musculoskeletal impairments, urinary and faecal incontinence and constipation [2, 14, 15] and reduction in pregnancy-related psychosocial dysfunction such as anxiety and depression [2, 16, 17].

Consequent to the foregoing, physical exercise has become a fundamental aspect of women's lives [18-20] and an essential contributor to maternal health [21]. However, several investigators have revealed that women in most cases are not meeting the post-partum physical exercise recommendations in spite of its potential benefits. Engagement in exercise during the post-partum period is still hamstrung by various factors not limited maternal socio-

demographic, psychosocial and environmental factors. Furthermore, safety concern of the physician/obstetricians on wellness of the woman [22-25] and race/ethnicity disposition to exercise have been implicated as important factors predisposing to postpartum exercise engagement or phobia. There is an apparent dearth of data on knowledge and attitude of women about postpartum physical exercise. Thornton et al [26] submitted that identifying factors that affect beliefs and behaviors would objectively encourage a change in attitude. An assessment of knowledge and attitude towards exercise after pregnancy may help to know whether or not women will participate in postnatal exercise. This study was designed to assess knowledge and attitude of Nigerian post-partum women towards postnatal exercises in a previously unexplored cultural context of sub-Sahara Africa.

Materials and Methods

One hundred and seventy six women were consecutively recruited into this cross-sectional survey. The respondents were nursing mothers who were attending postnatal immunization clinics from six selected hospitals namely Urban Comprehensive Health Centre, Enuwa Primary Health centre, Comprehensive Health centre Aderemi, Obafemi Awolowo University (OAU) Health Centre, OAU Teaching Hospitals Complex and Seventh Day Adventist Hospital in Ile-Ife, Osun state, South West, Nigeria. Ethical approval for the study was obtained from the Health Research Ethics Committee of the Institute of Public Health, OAU, Ile-Ife, Nigeria (IPHOAU/12/13). Informed consent of all respondents was required for participation in the study.

An adapted self-administered questionnaire developed from a similar study by Ribeiro et al [27] and subjected to expert reviews was employed in this study. The three sections questionnaire sought information on maternal socio-demographic characteristics, knowledge and attitude towards postnatal exercise. The Yoruba version (the local language spoken in the area where the study was conducted) of the questionnaire was administered to respondents who were not literate in English. The reliability of the Yoruba version of the questionnaire was assessed by a test-retest method among ten nursing mothers attending the UCHC of the OAUTHC, Eleyele, Ile – Ife, observing seven days between test and re-test. The summation of all the checked items on the questionnaire at test and retest were compared. The

questionnaire items yielded an agreement percentage that ranged from 87.4 – 99.6%, the intra-class coefficient was 0.985 and the confidence interval ranged from 0.94 to 0.996. Nursing mothers who were not literate in either English or Yoruba were excluded from the study.

Data Analysis

Descriptive statistics of mean, standard deviation, frequency distribution were used to summarize data. Inferential statistics of Chi square test was used to test the associations between knowledge and attitude of women towards postnatal exercises and the respondents' characteristics. Alpha level was set at 0.05. Data was analyzed using Statistical Package for Social Sciences software version 16.0 (SPSS Inc., Chicago, USA).

Results

One hundred and seventy six respondents participated in this study yielding a response rate of 88.0%. The mean age of the respondents was 28.6 ± 5.26 years. Socio-demographics and maternal – Infant characteristics of the respondents are presented in table 1. The respondents were preponderantly of Christian religion (76.1%) and were traders or business women (44.9%). A majority of the respondents had tertiary education (66.5%) and were within the level of income of $100 to $200 per month (27.0%). A majority of the respondents were multiparous (54.5%).

From the result of this study, a majority of the respondents did not know the different types postnatal exercise. Only 35.8% of the respondents had knowledge of aerobics. Muscle strengthening exercise and relaxation and breathing exercise were known by 33.5% of the respondents respectively. Stretching exercise (27.8%), pelvic floor exercise (26.7%) and abdominal exercise (25.6%) respectively were other known postnatal exercise among the respondents (table 2). However, swimming (25%) and cycling (18.2%) were the least known types of postnatal exercises. Also, 15.9% of the respondents had negative attitude towards postnatal exercise. Tiredness and busy schedule (21.9%) and lack of feeling for exercise (20.7%) were the most implicated factors for negative attitude towards postnatal exercises (table 2).

Table 1: Maternal socio-demographic characteristics (N=176)

Variable	n(%)
Socio-demographic characteristics	
Religion	
Christianity	134(76.1)
Islam	42(23.9)
Family Setting	
Polygamy	46(26.1)
Monogamy	117(66.5)
Single parenting	13(7.4)
Occupation	
Home maker	23(13.1)
Trading/Business	79(44.9)
Civil/Public service	44(25)
Schooling	21(11.9)
Not specified	9(5.1)
Educational qualification	
Primary	12(6.8)
Secondary	47(26.7)
Tertiary	117(66.5)
Income	
Less than $100	27(15.3)
$100 – $200	57(32.4)
$200 – $300	45 (25.6)
$300 – $500	15(8.5)
$500 – $1000	4(2.3)
Greater than $1000	5(2.8)
Non Disclosure	23(13.1)
Maternal – Infant characteristics	
Parity	
Primiparous	80(45.5)
Multiparous	96(54.5)
Mode of delivery	
Spontaneous Vaginal Delivery	163(92.6)
Caesarean Section	13(7.4)
Place of delivery	
Hospital	155(88.1)
Home	5(2.8)
Mission	16(9.1)
Previous antenatal care start time	
< 1 month	25(14.2)
1 – 3 months	49(27.8)
3 – 6 months	73(41.5)
6 – 9 months	29(16.5)

Table 2: Knowledge and attitude of respondents on different types of postnatal exercises (N=176)

Variable	Yes n(%)	No n(%)
Knowledge of respondents on postnatal exercises		
Aerobics	63(35.8)	113(64.2)
Pelvic floor exercise	47(26.7)	129(73.3)
Swimming	44(25)	132(75)
Stretching exercise	49(27.8)	127(72.2)
Muscle strengthening exercise	59(33.5)	117(66.5)
Abdominal exercise	45(25.6)	131(74.4)
Back care exercise	44(25)	132(75)
Cycling	32(18.2)	144(81.8)
Relaxation and breathing exercise	59(33.5)	117(66.5)
Attitude of respondents towards postnatal exercises		
Positive		148(84.1)
Negative		28(15.9)
Reasons for not exercising (n=82)		
I feel tired to exercise		18(21.9)
I don't feel like exercising		17(20.7)
I have busy schedule		18(21.9)
I have much child care activities		10(12.2)
I am afraid of exercise		3(3.7)
I don't have sufficient information on exercise		16(19.5)

Table 3 shows the knowledge of respondents' on benefits of and contraindications to postnatal exercises. Most of the respondents agreed that exercise after pregnancy promotes quick postnatal recovery (67.4%), improves body awareness, posture, coordination and balance after pregnancy (66.6%), and prevents excess weight gain (63.3%). Extreme obesity or underweight (31.2%), back pain (29.6%) and muscle weakness (28.2%) after pregnancy were mostly agreed as contraindications to post-partum exercise. Table 4 shows the result of the Chi – square test of association between knowledge about benefits/contra-indications of postnatal exercises and respondents characteristics. There was significant association between

Table 3: Knowledge of respondents' on benefits of and contraindications to postnatal exercises (N=176)

Items	Agree (%)	I(%)	DG(%)	AS(%)
Benefit				
1. Reduce risk of back pain after pregnancy	67.1	25.8	7.1	80
2. Prevents excessive weight gain after Pregnancy	63.3	26.8	9.8	76
3. Increase risk of urinary incontinence after Pregnancy	41.4	45.8	12.8	69
4. Increase risk of diabetes after pregnancy	36.7	45.8	17.5	66
5. Strengthen pelvic floor muscles after pregnancy	54.6	39.7	5.7	74
6. Increase formation of varicose veins after pregnancy	34	58.9	7.2	68
7. Increase risk of swelling of extremities after Pregnancy	51	39.5	9.6	73
8. Causes high blood pressure after pregnancy	59.2	33.2	7.7	76
9. Increase muscle tone, strength and endurance after pregnancy	54.7	37.3	8.0	76
10. Increased energy and stamina after pregnancy	62.5	29.3	8.2	77
11. Improvement of body awareness, posture, coordination and balance after pregnancy	66.6	31.2	2.2	80
`12. More rapid postnatal recovery	67.4	30.1	2.5	80
Contraindication				
1. Vaginal bleeding after pregnancy	11.5	41.6	46.9	70
2. Uterine contractions after pregnancy	16.2	44.1	39.7	53
3. Chest pain after pregnancy	12.1	47.7	40.3	68
4. Migraine after pregnancy	14.3	44.4	41.4	68
5. Difficulty in breathing after pregnancy	13.4	42.7	43.8	69
6. Swelling of extremities after pregnancy	27.1	44.4	28.5	59
7. Back pain after pregnancy	29.6	43	27.4	61
8. Extreme obesity or underweight after Pregnancy	31.2	42.2	26.6	58
9. Abdominal pain after pregnancy	17	40.5	42.5	67
10. Muscle weakness after pregnancy	28.2	40.5	31.3	59
11. Dizziness after pregnancy	14.3	42.5	43.2	69
12. Diabetes after pregnancy	13.1	43.3	43.6	51

Key: I – Indifferent; DG – Disagree; AS – Average Score; % - Percentage

Table 4: Chi – square test of association between knowledge about benefits/contraindications of postnatal exercises and respondents characteristics

	BAK (n=90)	AK (n=8)	AAK (n=78)	X^2	p-value
Knowledge about benefits of postnatal exercises					
Age group					
<30 years	54(60.0%)	5(62.5%)	51(65.4%)	0.517	0.772
≥30 years	36(40.0%)	3(37.5%)	27(34.6%)		
Educational qualification					
Primary	7(7.8%)	1(12.5%)	4(5.1%)	1.949	0.745
Secondary	25(27.8%)	3(37.5%)	19(24.4%)		
Tertiary	58(64.4%)	4(50.0%)	55(70.5%)		
Occupation					
Home maker	11(12.2%)	3(37.5%)	9(11.5%)	14.564	0.068
Trading/Business	46(51.1%)	0(0%)	33(42.3%)		
Civil/Public service	16(17.8%)	3(37.5%)	25(32.1%)		
Schooling	12(12.9%)	3(50.0%)	6(7.8%)		
Not specified	5(5.6%)	0(0%)	4 (5.1%)		
Parity					
Primiparous	50(55.6%)	3(37.5%)	27(34.6%)	7.604	0.022
Multiparous	40(44.4%)	5(62.5%)	51(65.4%)		
Knowledge about contraindications of postnatal exercises					
Age group					
<30 years	59(63.4%)	2(33.3%)	49(63.6%)	2.255	0.324
≥30 years	34(36.6%)	4(66.7%)	28(36.4%)		
Educational qualification					
Primary	7(7.5%)	1(16.7%)	4(5.2%)	4.142	0.387
Secondary	26(28.0%)	3(50.0%)	18(23.4%)		
Tertiary	60(64.5%)	2(33.3%)	55(71.4%)		
Occupation					
Home maker	11(11.8%)	2(33.3%)	10(13.0%)	13.570	0.094
Trading/Business	42(45.2%)	1(16.7%)	36(46.8%)		
Civil/Public service	23(24.7%)	0(0.0%)	21(27.3%)		
Schooling	12(13.3%)	2(25.0%)	7(9.0%)		
Not specified	5(5.4%)	0(0%)	4(5.2%)		
Parity					
Primiparous	51(54.8%)	2(33.3%)	27(35.1%)	7.011	0.030
Multiparous	42(45.2%)	4(66.7%)	50(64.9%)		

Key: BAK– Below Average Knowledge; AK–Average Knowledge; AAK–Above Average Knowledge * Significance at $\alpha = 0.05$

Table 5: Chi – square test of association between attitude towards postnatal exercise, and each of respondents' knowledge about postnatal exercise and socio-demographic characteristics

	NA (n=28)	PA (n=148)	X^2	p-value
Age group				
<30 years	20(71.4%)	90(60.8%)	1.133	0.287
≥30 years	8(28.6%)	58(39.2%)		
Educational qualification				
Primary	3(10.7%)	9(6.1%)	2.588	0.274
Secondary	10(35.7%)	37(25.0%)		
Tertiary	15(53.6%)	102(68.9%)		
Occupation				
Home maker	5(17.9%)	18(12.2%)	9.083	0.059
Trading/Business	11(39.3%)	68(45.9%)		
Civil/Public service	3(10.7%)	41(27.7%)		
Schooling	7(25.0%)	14(9.5%)		
Not specified	2(7.1%)	7(4.7%)		
Parity				
Primiparous	9(32.1%)	71(48.0%)	1.589	0.208
Multiparous	19(67.9%)	77(52.0%)		
Benefits of antenatal exercises				
Below Average Knowledge	15(53.6%)	75(50.7%)	3.382	0.184
Average knowledge	3(10.7%)	5(3.4%)		
Above Average Knowledge	10(35.7%)	68(45.9%)		
Contraindications to antenatal exercises				
Below Average Knowledge	14(50.0%)	79(53.4%)	1.419	0.492
Average Knowledge	2(7.1%)	4(2.7%)		
Above Average Knowledge	12(42.9%)	65(43.9%)		

Key: NA – Negative Attitude; PA – Positive Attitude; * Significance at $\alpha = 0.05$

knowledge about benefits of postnatal exercises and parity (X^2 = 7.604; p=0.022). Similarly, there was significant association between knowledge about contraindications to postnatal exercises and parity (X^2 = 7.011; p=0.030) (table 4). Chi – square test of association between attitude towards postnatal exercise, respondents' characteristics and knowledge about postnatal exercise is presented in table 5.

Discussion

This study assessed knowledge and attitude of nursing mothers towards postnatal exercise. Majority of the mothers were young, of Christian religion, multiparous and had tertiary education. It has been found from previous studies that subjects' characteristics such as age [27,28], level of education [27, 29] and experience in infant and maternal issues [30, 31] significantly influence knowledge, attitude and perceptions of nursing mothers. Therefore, the outcome of this study may have been influenced by the respondents' characteristics.

In line with literature, nursing mothers in this study correctly assert aerobics, muscle strengthening, relaxation and breathing, stretching, pelvic floor and abdominal exercises as postnatal exercises [11, 16, 17, 32-35]. Although, swimming and cycling are non-weight-bearing exercises with minimal level of risk of injury and are considered ideal during the postpartum period, however, they were the least known types of postnatal exercises in this study. Swimming provides the advantage of buoyancy with other benefits such as comfort and unloading of the joints of the extremities. However, swimming is not known as a way of life of the people in the study environment. Consequently, lack of swimming skills and limited availability of swimming pools may have contributed to low level of knowledge of swimming as an important postnatal exercise. In addition, walking or stationary cycling is an important aerobic exercise recommended by the ACOG for exercise during pregnancy and the postpartum period [34]. Unlike, the Eastern and Southern part of Nigeria, where bicycling is a norm among women, bicycling is a remote practice among women in the South-Western Nigeria. More so, poor knowledge of bicycling as important postnatal exercise in this study may have been complicated by danger inherent in lack of dedicated bikeways and bad roads. Furthermore, non-availability or non-affordability of bicycle ergometer for exercise may have

contributed to poor knowledge about stationary cycling among the women in this study.

From this study, the nursing mothers agreed that postnatal exercise mostly promotes quick postnatal recovery, improves body awareness, posture, coordination and balance after pregnancy and prevents excess weight gain. These assertions are in tandem with literature on benefits of exercise in the postpartum period. Specifically, postpartum exercise is effective in muscle reactivation and reconditioning [17, 32], improvement in maternal physical, psychosocial and general wellbeing [16, 17, 36], body awareness and postural re-adaptation [37] and reduction in weight gained during pregnancy and excess weight gain prevention [11, 17, 38]. Furthermore, women in this study opined that postpartum extreme weight gain or underweight, back pain and muscle weakness were contraindications to postnatal exercise. However, these conditions are at best relative contra-indications and not reasons for confinement or abstinence from exercise in the postpartum period. Artal and O'Toole [34] submitted that despite the fact that pregnancy is associated with profound anatomical and physiological changes, exercise has minimal risks and confirmed benefits for most women. Furthermore, it is recognized that habits adopted during pregnancy could affect a woman's health for the rest of her life [34]. Therefore, postnatal exercise is necessary for behaviour re-modification and alteration of habits adopted during pregnancy. Furthermore, the result of this study revealed that parity significantly influenced knowledge about benefits of and contraindications to postnatal exercises respectively. This finding is consistent with reports that found significant association between parity and adequate knowledge of physical exercise during pregnancy and postpartum [27, 39] while, some other studies reported no significant association [8, 40].

A majority of the women in this study demonstrated positive attitude to postpartum exercise. Emerging literature revealed a positive paradigm shift in the attitude of the women to exercise during pregnancy and postpartum [18, 20, 27, 41]. The drastic change in women’s attitude to exercise during pregnancy and postpartum has been implicated on improvement in knowledge on safety and benefit of physical exercise by the women [42, 43] and her physicians [18, 23, 44] and level of maternal education and family support [21, 25,

39]. However, tiredness, busy schedule and lack of feeling for exercise were the most implicated factors for negative attitude towards postnatal exercises in this study. These findings are consistent with previous reports [38, 42, 45-48].

Clinical implications of findings

This study provides an empirical data on knowledge and attitude of Nigerian nursing mothers towards exercise in the postpartum period. Hitherto, there is dearth of studies on exercise culture of nursing mothers in sub-Sahara Africa. Nursing mothers in this study demonstrated positive attitude but a wide range of knowledge and misconception about the benefits and contra-indications to exercise in the postpartum period. The incongruence between having positive attitude paradigm and inadequate knowledge may be implicated on the wide range of information that encourage exercise in pregnancy and postpartum in the media, print materials, surface internet and by family and friends that are largely based on anecdotal submissions and expert opinions which are often unreferenced and therefore confusing or lacking in specificity. In some cases, obstetricians and gynecologists who traditionally serves as gatekeepers for pregnant and nursing mothers are limited in knowledge with regards to required intensity and dose [23, 25] or do not recommend exercise to their clients [22, 24]. In some other settings where exercise experts such as obstetric physical therapists are not available, nurse professionals and at times community health workers often assume the role of exercise prescribers and trainers. Most of these important health care providers lack basic training on the principle and practice of exercise. The outcomes of this study draw attention to the need of health education programmes on benefits and contra-indications to exercise in the postpartum period among women from sub-Sahara Africa countries. More work is also needed in communicating empirical findings on exercise in pregnancy and postpartum to health care workers who in turns educate their clients.

Conclusion

A majority of Nigerian nursing mothers demonstrated positive attitude but had poor knowledge about types, benefits of and contraindications to postnatal exercises. Knowledge about benefit of and contraindication to postnatal exercise was significantly influenced parity.

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References

[1] Mottola MF (2002) Exercise in the postpartum period: Practical applications. Current Sports Medicine Reports. 1,362-8.

[2] Pivarnik JM, Chambliss H and Clapp J (2006) Impact of physical activity during pregnancy and postpartum on chronic disease risk. Medicine and Science in Sports and Exercise. 38, 989–1006.

[3] Thornton SL and Thornton SJ (1993) Management of gross divarication of the recti abdominis in pregnancy and labour. Physiotherapy. 79, 457–8.

[4] Mesquita LA, Machado AV and Andrade AV (1999) Physiotherapy for reduction of diastasis of the recti adbominis muscles in the postpartum period. Review Brasil Ginecol Obstet. 21, 267–272.

[5] Chiarello CM, Falzone LA, McCaslin KE, Patel MN and Ulery KR (2005) The effects of an exercise program on diastasis recti abdomi-nis in pregnant women. Journal of Women's Health Physical Therapy. 29,11–16.

[6] Benjamin DR, van de Water AT and Peiris CL (2013) Effects of exercise on diastasis of the rectus abdominis muscle in the antenatal and postnatal periods: a systematic review. Physiotherapy. S0031-9406(13)00083-7.

[7] Opala-Berdzik A and Dabrowski S (2009) Physiotherapy in diastasis of the rectus muscles of abdomen in women during pregnancy and postpartum. Fizjoterapia.17, 67–70.

[8] Abedzadeh M., Taebi M., Sadat Z and Saberi F (2011) Knowledge and performance of pregnant women referring to Shabihkhani hospital on exercises during pregnancy and postpartum periods. Journal of Jahrom University of Medical Sciences. 8(4), 212 – 18.

[9] Linne Y., Barkeling B and Rossner S (2002) Long-term weight development after pregnancy. Obesity Review. 3, 75–83.

[10] Siega-Riz A., Evenson K and Dole N (2004) Pregnancy related weight gain—A link to obesity? Nutrition Review. (Suppl II):S105–S111.

[11] Larson-Meyer DE (2002) Effect of postpartum exercise on mothers and their offspring: a review of the literature. Obesity Research. 10(8), 841-53.

[12] Dewey KG (1998) Effects of maternal caloric restriction and exercise during lactation. The Journal of Nutrition. 128(2 Suppl), 386S-389S.

[13] Carey GB and Quinn TJ (2001) Exercise and lactation: are they compatible? Canadian Journal of Applied Physiology.26, 44-74.

[14] Brook G.., Coldron Y., Evans G., Gulliford G., Haslam J., Hawkes R., Lee J, et al. (2008) Physiotherapy in Women's Health: Tidy's Physiotherapy, 14th edition. Stuart Porter. (5), 113 – 138.

[15] Mørkved S and Bø K (2013) Effect of pelvic floor muscle training during pregnancy and after childbirth on prevention and treatment of urinary incontinence: a systematic review. Br J Sports Med. 2014 Feb, 48(4), 299-310.

[16] Koltyn KF and Schultes SS (1997) Psychological effects of an aerobic exercise session and a rest session following pregnancy. Journal of Sports Medicine and Physical Fitness. 37(4), 287–291.

[17] Scott S (2006) Exercise in the postpartum period. ACSM's Health and Fitness Journal. 10(4), 40–41.

[18] American Congress of Obstetricians and Gynaecologists (ACOG); Committee on Obstetric Practice (2002). Exercise during pregnancy and the postpartum period. ACOG Committee Opinion Number 267. Obstetrics and Gynecology. 99, 171–173.

[19] Barakat R., Pelaez M., Montejo R., Luaces M and Zakynthinaki M (2011) Exercise during pregnancy improves maternal health perception: a randomized controlled trial. American Journal of Obstetrics and Gynaecology. 204(5), 402.e1-7

[20] Wolfe LA and Davies GA (2003) Canadian guidelines for exercise in pregnancy. Clinical Obstetrics and Gynecology. 46(2), 488-95.

[21] Evenson KR and Bradley CB (2010) Beliefs About Exercise and Physical Activity Among Pregnant Women. Patient Education and Counselling. 79(1), 124–129.

[22] Stafford R and Blumenthal D (1998) Specialty differences in cardiovascular disease prevention practices. Journal of the American College of Cardiology. 32, 1238–1243.

[23] Krans EE, Gearhart JG, Dubbert PM, Klar PM, Miller AL and Replogle WH (2005). Pregnant women's beliefs and influences regarding exercising during pregnancy. Journal of Mississippi State Medical Association. 46, 67–73.

[24] Entin P and Munhall K (2006) Recommendations regarding exercise during pregnancy made by private / small grup practice obstetricians in the USA. Journal of Sport Science and Medicine. 5, 449–458.

[25] Doran F and O'Brien AP (2007) A brief report of attitudes towards physical activity during pregnancy. Health Promotion Journal of Australia. 18(2), 155–158.

[26] Thornton PL, Kieffer EC, Sabarría-Peña Y., Odoms-Young A., Willis SK, Kim H and Salinas MA (2006) Weight, diet, and physical activity-related beliefs and practices among pregnant and postpartum Latino women: the role of social support. Maternal and Child

Health Journal. 10, 95-104.

[27] Ribeiro CP and Milanez H (2011) Knowledge, attitude and practice of women in Campinas, São Paulo, Brazil with respect to physical exercise in pregnancy: a descriptive study. Reproductive Health. 8, 31.

[28] Zhang J and Savitz DA (1996) Exercise during pregnancy among US women. Annals of Epidemiology. 6(1), 53-59.

[29] Evenson KR, Aytur S and Borodulin K (2009) Physical activity beliefs, barriers, and enablers among postpartum women. Journal of Women's Health. 18(12), 1925–1934.

[30] Willis SK, Hannon PR and Scrimshaw SC (2002) The impact of the maternal experience with a jaundiced newborn on the breastfeeding relationship. Journal of Family Practice. 51 (5), 465

[31] Al-Ayed IH (2010) Mothers' knowledge of child health matters: Are we doing enough? Journal of family and community medicine. 17(1), 22–28.

[32] Morkved S and Bo K (1996) The effect of post-natal exercises to strengthen the pelvic floor muscles. Acta Obstetricia et Gynecologica Scandinavica. 75, 382–5.

[33] Morkved S and Bo K (2000) Effect of postpartum pelvic floor muscle training in prevention and treatment of urinary incontinence: a one-year follow up. British Journal of Obstetrics and Gynaecology. 107, 1022–1028.

[34] Artal R and O'Toole M (2003) Guidelines of the American College of Obstetricians and Gynecologists for exercise during pregnancy and the postpartum period. British Journal of Sports Medicine. 37, 6-12

[35] Society of Obstetricians and Gynaecologists of Canada (SOGC) (2003) Exercise in pregnancy and the postpartum period. Available at http://sogc.org/wp-content/uploads. Accessed 22/09//2013.

[36] Bahadoran P., Abbasi F., Yousefi AR and Kargarfard M (2007) Evaluating the effect of exercise on the postpartum quality of life. Iranian Journal of Nursing and Midwifery Research. 12(1), 17-20.

[37] Livingstone L (1998) Post-natal management. In: Sapsford R, Bullock-Saxton J, Markwell S. Women's health: a textbook for physiotherapists. London: WB Saunders Co. Ltd.; pg. 220–46.

[38] Downs DS and Hausenblas HA (2004) Women's exercise beliefs and behaviors during their pregnancy and postpartum. Journal of midwifery and women's health. 49, 138–144.

[39] Gouveia R., Martins S., Sander AR, Nascimento C., Figueira J., Valente S., Correia S., Rocha E and Silva LJ (2007) Pregnancy and physical exercise: myths, evidence and recommendations. Acta Médica Portuguesa. 20, 209–214.

[40] Fell D., Joseph K., Armson B, et al (2009) The impact of pregnancy on exercise level. Maternal and Child Health Journal. 13 , 597–603.

[41] Liu N., Mao L., Sun X., Liu L., Chen B and Ding Q (2006) Postpartum practices of puerperal women and their influencing factors in three regions of Hubei, China. BMC Public Health, 6, 274.

[42] Clarke PE and Gross H (2004) Women's behaviour, beliefs and information sources about physical exercise in pregnancy. Midwifery. 20(2), 133-41.

[43] Duncombe D., Wertheim EH, Skouteris H., Paxton SJ, and Kelly L (2009) Factors related to exercise over the course of pregnancy including women's beliefs about the safety of exercise during pregnancy. Midwifery. 25430–438.

[44] Artal R (1999) Exercise during pregnancy: Safe and beneficial for most. Physician and Sports Medicine. 27, 51–60

[45] Pereira M., Rifas-Shiman S., Kleinman K., Rich-Edwards J., Peterson K and Gillman M (2007) Predictors of change in physical activity during and after pregnancy. Project Viva. American Journal of Preventive Medicine. 32, 312–319.

[46] Groth SW and David T (2008) New mothers' views of weight and exercise. American Journal Maternal Child Nursing. 33, 364–370.

[47] Cioffi J., Schmied V., Dahlen H., Mills A., Thornton C., Duff M., Cummings J and Kolt GS (2010) Physical activity in pregnancy: women's perceptions, practices, and influencing factors. Journal of Midwifery and Women's Health. 55(5), 455-461.

[48] Gaston A and Cramp A (2011) Exercise during pregnancy: A review of patterns and determinants. Journal of Science and Medicine in Sport. 14, 299 – 305.

Authors Column

Dr. Chidozie Emmanuel MBADA PhD – is a Senior Lecturer and Researcher at the Obafemi Awolowo University (OAU), Ile-Ife, Nigeria. He was the recipient of the Prize for Best Student in Medical Rehabilitation and the Faculty Prize for the candidate with Overall Highest Cummulative Score. He obtained an MSc and PhD in Orthopaedic and Sports Physiotherapy at the University of Ibadan (UI), Nigeria in 2007 and 2012 respectively. He was the recipient of the UI Postgraduate School Award for Publication of Articles from Ph.D Theses and also the 2nd Prize Winner Award for the Best Ph.D Thesis in UI, 2012. He was awarded a distinguished ADDRF fellow award for collaborative research work by the African Population and Health Research Centre, Nairobi, Kenya, in 2013. Dr. Mbada has more than 10 monographs, a book chapter and more than 85 scientific articles published in reputable peer-reviewed journals.

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