# PREVALENCE OF PHYSICAL INACTIVITY AMONG PREGNANT WOMEN IN NSUKKA LOCAL GOVERNMENT AREA

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## Abstract
*Physical inactivity has been identified as one of the leading causes of morbidity and mortality among pregnant women. It is a risk factor of many non-communicable diseases such as diabetes, cancer, hypertension and other cardiovascular problems. The purpose of the study was to investigate the prevalence of physical inactivity among pregnant women in Nsukka Local Government Area, Enugu State. Three research questions and two hypotheses were postulated to guide the study. The study utilized the survey research design. Population for the study consisted of 1,684 pregnant women accessing antenatal care services at health facilities in Nsukka Local Government Area from November 2016 to June 2017. The study sample consisted of 325 pregnant women. This sample size was in line with the assertion of Cohen, Mannion, and Morrison (2011), that when the population size is above 650 at 95% confidence level (4% confidence interval), the sample size should be 323 for determining the sample size of any definite population. The researcher sampled three hundred and fifty five respondents (355) to guide against poor return rate and those discarded due to incomplete information. The instrument for data collection was the International Physical Activity Questionnaire (IPAQ). The study adapted only the walking and moderate physical activity sections of the instrument. Cronbach alpha statistic was used to determine the reliability coefficient of the IPAQ. The reliability coefficient of the adapted IPAQ was 0.76. Data collected were transformed using MET-minutes/week. The MET for low-intensity activity such as walking activity was computed using 3.3 x days x time and MET for moderate-intensity activity was computed using 4.0 x days x time. Data were analysed using statistical package for social science. Participants were classified into three physical activity levels based on MET values (minute/week) as follows: inactive < 600 MET-min/week, minimally or sufficiently active <1500 MET-min/week and HEPA active >3000 MET-min/week. Frequencies and percentages were used to answer research questions. One –way ANOVA and independent T-test were used to test the hypotheses. The results revealed that majority of the pregnant women were inactive on walking activities. The result further indicated that majority of the pregnant women who attained tertiary education were more inactive ( > 600 METmin/week) in low intensity but they engaged more in moderate and vigorous activities than other educational levels. Also, majority in 2nd trimester and 3rd trimester were more physically inactive in low-intensity and vigorous activities. There was no significant difference in the physical activity levels of pregnant women across the four educational groups: WMETS, F (3,321) = .233, P = .87; MMETS, F (3,321) =.682, P = .56; VMETS, F (3,320) =1.333, P = .26. There were significant differences in physical inactivity levels of pregnant women across all trimesters in WMETS, F (2,322) = 5.353, P = .01 and MMETS, F (2,322) = 5.421, P = .01. The study recommended that pregnant women especially those in 2nd and 3rd trimester should be educated on the benefits of physical activity during antenatal clinic.*

**Key words:** *Prevalence, Physical inactivity, Pregnant women, Moderate-intensity*

## Introduction

Physical inactivity has been identified as a global health challenge to people of all ages including pregnant women. The World Health Organisation (WHO, 2010) emphasised that physical inactivity is the fourth leading risk factor (6%) for global mortality and a major risk factor for non-communicable diseases such as diabetes, cancer, hypertension and other cardiovascular problems. According to WHO report (2010) 23% of adults aged 18 and above were insufficiently physically active. Prevalence of physical inactivity ranges from 74.9%- 81% in adults aged 30 -70 years in Saudi Arabia (Al-Zalabani, Al-Hamdan & Saeed, 2015). A worldwide study indicated physical inactivity prevalence as 21.4% which signified that in every five adults around the world, one person is physically inactive (Dumith, Halla, Reis & Kohl, 2011). Thus, pregnant women in Nigeria being part of the global overview are not excluded from this estimation. Physical inactivity has grave implications for pregnant mothers because many women decrease their physical activity during pregnancy and this leads to excessive gestational weight gain (GWG) (Fell, Joseph, Armson, Dodd & Nelson, 2009: Smith &Campbell, 2013), which leads to improved glucose tolerance (Smith & Campbell, 2013) and child obesity (Wash, McGowan, Byne & McAuliffe (2011).

Pregnancy is a state of fertilisation and development of embryo in the uterus (Mayo Clinic, 2017). Pregnancy is also known as gravidity or gestation; thus these terms are used interchangeably in this paper. During pregnancy, a woman's weight tends to increase. Some women find this excess weight difficult to lose after the baby is born. This weight gain may contribute to the development of obesity and associated health problems in women (Mayo Clinic, 2017). In a bid to avert these health problems, ACOG (2002) and Center for Disease Control (CDC, 2015) recommended that healthy pregnant women should get at least 150 minutes or 30 minutes of moderate-intensity aerobic and muscle strengthening physical activity at least five days per week (2 hours and 30 minutes), such as brisk walking. Failure to attain this recommended level of physical activity is termed physical inactivity.

Intensity is how hard the body is working during aerobic activity. Moderate-intensity activity is an activity that causes a slight increase in breathing and heart rate, such as walking briskly, bicycling, domestic chores, dancing, swimming or some sports. In moderate intensity activity, one is able to talk but cannot sing during the activity and would be perspiring (HealthHub, 2015). Aerobic activity requires regular supply of oxygen to move large muscles of the body like arms and legs. It makes the heart beat faster, breathing is harder and requires pumping of oxygenated blood by the heart to circulate oxygen to the working muscles (Weil, 2018). Aerobic activity makes the heart and lungs stronger, improves blood circulation, stamina and decrease body fat (National

Institute of Health, 2018). Muscle strengthening activity increases bone strength and muscular fitness. It involves engaging in activity that uses the body weight for resistance like push-ups, pull-up, sit-up and climbing staircase (HealthHub, 2015).

In spite of efforts ACOG, CDC and WHO to reduce physical inactivity modern technology tends to perpetrate inactivity. People move around less, use cars rather than walk and deploy machines for most domestic chores such as washing clothes, grinding, cutting grasses and thus burn off less energy. Fewer people do manual work unlike the previous generation, and most people with jobs do not use physical effort (WHO, 2002)**.** Pregnant women being part of the technological society are not excluded from the adverse effects. In line with the above, Domingues and Barros, (2007) reported that most pregnant women did not practice any form of exercise and tend to decrease their level of physical activity, including household and occupational activities. Also, Wash, McGowan, Byrne and McAuliffe (2011) reported that only a small proportion of pregnant women are meeting the current recommendations for physical activity in pregnancy

Some demographic factors such as level of education and trimester may dispose pregnant women to physically inactive lifestyle. Studies have indicated that level of education plays significant role in engagement in physical activity. Level of education is the length or stage of education attained. This represents a broad system of education ladder that progresses from elementary to tertiary institution, embracing all fields and programmes in human endeavour. Adda, Celik and Hotkis (2008) asserted that level of education serves as a proxy for information, cognitive skills and values. Olubunmi, Gbadebo and Odusina (2012) emphasised that the impact of education is linked to increased health consciousness and access to information. It is however assumed that by virtue of education attained, many pregnant women may be well informed of the health problems associated with inactive lifestyle. Hamdan, Saeed, Kutbi, Choudhry and Nooh (2010) observed that adults who were more knowledgeable adopted positive lifestyles, while the illiterate adults adopted unhealthy lifestyles. Okoga (2007) study revealed that the higher a person's level of education, the more likely the person will be conscious of her health and the more likely the person will take positive actions capable of promoting good health. Also, Dumith *et al*. (2012) reported that higher level of schooling is a factor associated with higher level of physical activity in pregnancy. It is therefore assumed that the higher the educational level attainment, the higher the acquisition of knowledge, attitude and behaviour, while the lower the level of education, the less likely the knowledge of inactive lifestyle and the associated health problems. Similarly, Myo, Thaworn, Janthila, Nongluk, Suchart, Wilawan, Phatchanan, Puangpet, Nara, and Apiradee (2012) reported that those with primary school education

were likely to be aware of the implications of inactive lifestyle than those who did not attain primary school education. Anstey, Kingstan, Kiely, Luszez Mitchell and Jagger (2014) emphasised that low education is associated with a -- greater number of health risk behaviours. This may act as a proxy for leading inactive lifestyle. An educated pregnant woman will have higher self determination to seek ways and do other things to improve her health status for positive outcome on her pregnancy.

Trimester is another vital factor that may determine how physically active a pregnant woman will be. Trimester in this study means stage of pregnancy. Sui, Moran and Dodd (2013) reported that physical activity decline significantly between early pregnancy and 28 weeks gestation, with a further decline to 36 weeks. Hesketh and Evenson (2016) reported low physical activity (≤ 30 minutes /day of activity on most days/week) during pregnancy. Borodulin *et al.* (2008) in their study discovered that physical activity decrease in duration and intensity from the second to third trimester and that only a small proportion of pregnant women reached the recommended level of activity during pregnancy. This implies that physical activity gradually declines from early pregnancy to 36 weeks and factors like fatigue, pregnancy condition and safety issues may be attributed to it. This study determined whether level of education and trimester (stage of pregnancy) are variables that determine physical inactivity level of pregnant women in Nsukka Local Government Area.

**Research Questions**

The following research questions were posed to guide the study:

1. What is the level of physical inactivity among pregnant women in Nsukka Local Government Area?
2. What is the level of physical inactivity among pregnant women in Nsukka Local Government Area based on level of education?
3. What is the level of physical inactivity among pregnant women in Nsukka Local Government Area based on trimester?

**Hypotheses**

1. There is no significant difference in physical inactivity level among pregnant women in Nsukka Local Government Area based on level of education.
2. There is no significant difference in physical inactivity level among pregnant women in Nsukka Local Government Area based on trimester.

**Methodology**

The study used survey research design. Population for the study consisted of one thousand six hundred and eighty four pregnant women in Nsukka Local Government Area with gestational period from November 2016 to June, 2017. Convenience sampling technique was used to select three hundred and fifty six pregnant women assessing antenatal care services at health facilities in the study area. The instrument for data collection was the International Physical Activity Questionnaire (IPAQ) developed by Craig *et al.* (2003). The study adapted only the sections on walking and moderate-intensity activities. This is in line with ACOG's (2002) and WHO's (2015) recommendations that pregnant women should only engage in moderate-intensity aerobic and muscle strengthening exercise. The IPAQ covered domains of physical activities such as house work, house maintenance, caring for the family, and recreation and leisure activity such as walking. The instrument consisted of two sections (A & B). Section 'A' contained items that elicited information on personal data of the respondents. Section 'B' contained the adapted IPAQ items. Cronbach Alpha statistics were used to determine reliability coefficient of the adapted IPAQ which gave 0.76. Physical activities were assigned metabolic equivalent task (METs) values based on the formula for computing METs as recommended by Craig *et al.* (2003). The MET values of pregnant women who had up to ten or more minutes of activity were calculated using the formula as follows: for walking activity is 3.3 x walking days x time; for moderate activity is 4.0 x days x time. Data collected with the instrument were analysed using the Statistical Package for Social Sciences (SPSS), version 20) for descriptive statistic and testing of the hypotheses. Participants were classified into three categories of physical activity levels based on summation of their MET values as follows: Inactive < 600 MET-min/week; minimally or sufficiently active < 1500 MET-min/week and HEPA active > 3000 MET-min/week. Frequency and percentages were used to present participants responses One –way ANOVA and independent t-test were used to test the null hypotheses.

**Results**

**Research Question 1:** What is the level of physical inactivity among pregnant women in Nsukka Local Government Area.

**Table 1: Percentage responses showing levels of physical inactivity among pregnant women in Nsukka Local Government Area (n-325)**

| | Physical Activity Level (325) | |
|---|---|---|
| | Walking | Moderate intensity |
| Classification | n(%) | n(%) |
| Inactive (category 1) | 283(87.1) | 117(36.0) |
| Minimally active (category 2) | 37(11.4) | 149(47.0) |
| HEPA active (category 3) | 5(1.5) | 59(17.0) |

Key**:** Walking=WMET; Moderate- intensity=MMET; Health enhancing physical activity or a high active category=HEPA active

Table 1 shows that majority 283 (87.1%) of pregnant women were inactive, 37 (11.4%) were minimally or sufficiently active while only 5 (1.5%) pregnant women attained HEPA active category in walking activities. In moderate intensity activities 117 (36%) pregnant women were inactive, less than half 149 (47%) were minimally or sufficiently active, while only 59 (17%) achieved HEPA active category. The result implies that majority of the pregnant women were not sufficiently active to accumulate > 3000 MET-min/week which is considered HEPA active (health enhancing physic activity level) .

**Research Question 2:** What is the level of physical inactivity among pregnant women in Nsukka Local Government Area based on level of education?
Data answering the question are contained in Table 2.

**Table 2: Percentage responses showing levels of physical inactivity among pregnant women in Nsukka Local Government Area based on level of education (n-325)**

| | Physical Activity level by educational level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | No formal education (n=54) | | | Primary education (n=30) | | | Secondary education(n=121) | | | Tertiary education (n=120) | | |
| | LMET | MMET | VMET | LMET | MMET | VMET | LMET | MMET | VMET | LMET | MMET | VMET |
| | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Inactive (category) | 47 | 26 | 27 | 25 | 11 | 14 | 103 | 47 | 62 | 108 | 33 | 74 |
| | (87.0) | (48.1) | (50.0) | (83.3) | (36.7) | (46.7) | (85.1) | (38.8) | (50.8) | (90.0) | (27.5) | (61.7) |
| Minimally active (category) | 7 | 17 | 19 | 5 | 12 | 10 | 14 | 55 | 54 | 11 | 65 | 33 |
| | (13.0) | (31.5) | (35.2) | (16.7) | (40.0) | (33.3) | (11.6) | (45.5) | (45.0) | (9.2) | (54.2) | (27.5) |
| HEPA active (category) | 0 | 11 | 8 | 0 | 7 | 6 | 4 | 19 | 5 | 1 | 22 | 13 |
| | (0.0) | (20.4) | (14.8) | (0.0) | (23.3) | (20.0) | (3.3) | (15.7) | (4.2) | (0.8) | (18.3) | (10.8) |

Key: Walking=WMET; Moderate- intensity=MMET; Health enhancing physical activity or a high active category=HEPA active

Data in Table 2 reveals that majority over 80% of each educational level were inactive with particular reference to those who attained tertiary education who had 108 (90%) under low-intensity activities. All the educational levels had less than 17% minimally active in low-intensity activities. Only 3.3 % of those who obtained secondary education attained HEPA active category in low-intensity activities.

In moderate activities those who had no formal education were more inactive with 26 (48.1%) in low-intensity activities. Above half 65 (54.2) of those who obtained tertiary education were more minimally active in moderate activities, while less than 24 % in each group attained HEPA active or health sufficient activity in moderate activities.

In vigorous activities above half 27 (50.0) of those with non-formal education, 62 (50.8) of those with secondary education and 74 (61.7) of those with tertiary education respectively were inactive. Less than 46% of each level of education was minimally active in vigorous activities. However, those with primary education had the highest percentage of high active life with 6 (20.0).

**Research Question 3:** What is the level of physical inactivity among pregnant women in Nsukka Local Government Area based on trimester

Data answering the question are contained in Table 5.

**Table 3: Percentage responses showing levels of physical inactivity among pregnant women in Nsukka Local Government Area based on trimester (n-325)**

| | Physical Activity level by Trimester | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Classification** | **1st Trimester (n==81)** | | | **2nd Trimester (n=139)** | | | **3rd Trimester (n=105)** | | |
| | **L MET n (%)** | **M MET n (%)** | **V MET n (%)** | **L MET n (%)** | **M MET n (%)** | **V MET n (%)** | **L MET n (%)** | **M MET n (%)** | **V MET n (%)** |
| Inactive (category) | 63 (77.8) | 20 (24.7) | 40 (49.4) | 131 (94.2) | 57 (41.0) | 82 (59.0) | 89 (84.8) | 40 (38.1) | 54 (51.4) |
| Minimally Active | 14 ((17.3) | 40 (49.4) | 30 (37.0) | 8 (5.8) | 68 (48.9) | 49 (35.3) | 15 (14.2) | 41 (39.0) | 37 (35.3) |
| HEPA Active | 4 (4.9) | 21 (25.9) | 11 (13.6) | 0 (0.0) | 14 (10.1) | 8 (5.7) | 1 (1.0) | 24 (22.9) | 14 (13.3) |

Key: Walking=WMET; Moderate- intensity=MMET; Health enhancing physical activity or a high active category=HEPA active

The result in Table 3 shows that majority of all the trimester were inactive in low-intensity activities, The second trimester is the most inactive with 131 (94.2%), followed by third trimester with 89 (84.8) and then the first trimester with 63 (77.8%). In minimally active in low-intensity activities, those in first trimesters had a proportion of 14 [17.3%], 3rd trimester had 15 (14.2%) while

second trimester was the least with proportion of 8 (5.8). Also, in HEPA active categories under low intensity activities only 4 (4.9 %) in the first trimester and one person 1 (1.0 %) in the 3rd trimester attained high active life. No pregnant woman in the second trimester achieved HEPA category. In moderate activities, the table further shows that those in second trimester had 57 (41.0%), followed by third trimester with 40 (38.1%) and only 20 (24.7) of those in first trimester were inactive. In minimally active category in moderate activities first trimester had 40 (49.4 %) followed by second trimester 68 (48.9) and then third trimester 41 (39.0). In HEPA active category none of the trimesters had more than 26 % of pregnant women who attained high active life. In vigorous activities 82 (59.0) in second trimester, 54 (51.4 %) in third trimester and 40 (49.4 %) in first trimester were inactive. Concerning the minimally active category in vigorous activities, all the trimester had proportion below 37.5 %. Also, in HEPA active category, all the trimester had proportion below 14%.

**Hypothesis 1:** There is no significant difference in the physical inactivity level among pregnant women in Nsukka Local Government Area based on level of education.

**Table 4: One-way analysis of variance of difference in pregnant women physical inactivity according to level of education**

| Source | df | SS | MS | F | P |
|---|---|---|---|---|---|
| WMETS | | | | | |
| Between Groups | 3 | 90383.449 | 30127.816 | .233 | .87 |
| Within Groups | 321 | 41470290.35 | 129190.936 | | |
| MMETS | | | | | |
| Between Groups | 3 | 1385937.327 | 461979.109 | .682 | .56 |
| Within Groups | 321 | 217489745.6 | 677538.148 | | |
| VMETS | | | | | |
| Between Groups | 3 | 1618872.169 | 539624.056 | 1.333 | .26 |
| Within Groups | 320 | 129521574.8 | 404754.921 | | |

Keys:* P < .05; df=degree of freedom; SS =sum of squares; MS = Mean square; F = F- ratio value; P = P- value

Table 4 shows the result of one-way ANOVA conducted to explore the differences in the physical activity levels of pregnant women based on level of education ( no formal, primary, secondary and tertiary). There was no significant difference in the physical activity levels of pregnant women across the four groups: WMETS, F (3,321) = .233, P = .87; MMETS, F (3,321) =.682, P = .56;

VMETS, F (3,320) =1.333, P = .26. Since the P-values were greater than .05 level of significance, the null hypothesis was not rejected. This implies that pregnant women did not differ in their physical inactivity levels (WMETS, MMETS and VMETS) based on level of education. This however indicates that the proportion of those who were more active or minimally active than others were not significant to portray differences in activity level.

**Hypothesis 2:** There is no significant difference in the physical inactivity level among pregnant women in Nsukka Local Government Area based on trimester.

**Table 5: One-way analysis of variance of difference in pregnant women physical activity according to trimester**

| Source | df | SS | MS | F | P |
|---|---|---|---|---|---|
| WMETS | | | | | |
| Between Groups | 2 | 1337331.534 | 668665.767 | 5.353 | .01 |
| Within Groups | 322 | 40223342.26 | 124917.212 | | |
| MMETS | | | | | |
| Between Groups | 2 | 7129444.803 | 3564722.402 | 5.421 | .01 |
| Within Groups | 322 | 211746238.1 | 657597.013 | | |
| VMETS | | | | | |
| Between Groups | 2 | 1286569.793 | 643284.896 | 1.590 | .21 |
| Within Groups | 321 | 129853877.2 | 404529.212 | | |

Table 5 indicates the results of one –way ANOVA conducted to determine the difference in the physical inactivity levels of pregnant women based on trimester (0-3months, 4-6months and 7-9months). There were significant differences in physical inactivity levels of pregnant women across all trimesters in WMETS, F (2,322) = 5.353, P = .01 and MMETS, F (2,322) = 5.421, P = .01. The null hypothesis for WMETS and MMETS were rejected because the P-values for WMETS and MMETS were less than .05 level of significance

This means that pregnant women differed in their physical inactivity levels in WMETS and MMETS based on trimester. However, there was no significant difference in the physical inactivity level across all trimester in VMETS, F(2,321) = 1.590,P = .21. Since the P-value was greater than .05 level of significance, the hypothesis was not rejected. This means that pregnant women did not differ in their physical inactivity levels in VMETS based on trimester.

## Discussion

Results of the study showed that majority of the pregnant women were more inactive in walking or low-intensity activities, but engaged more in moderate activities as indicated in table 1. Pregnant women who attained tertiary education were more inactive in walking or low intensity physical activities. This finding was never expected thus surprising and in contrast with the report of Dumith *et al.* that higher level of schooling is a factor associated with higher level of physical activity in pregnant women. It equally contrasts with the opinion of Gbadebo and Odusina (2012) that education is linked to increased health consciousness and access to information.. It is however assumed that by virtue of education attained, many pregnant women may be well informed of the health problems associated with inactive lifestyle. The result contradicts the finding of Hamdan, Saeed, Kutbi, Choudhry and Nooh (2010) that adults who were more knowledgeable adopted positive lifestyles, while the illiterate adults adopted unhealthy lifestyles. The result also contrast with the study of Okoga (2007) that the higher a person's level of education, the more likely the person will be conscious of her health and the more likely the person will take positive actions capable of promoting good health. Their type of jobs may have contributed to this result especially in terms of inadequate time for physical activities.

The study also showed that majority of the pregnant women in second trimester were inactive in low-intensity activities and above half inactive in vigorous activities. However, no trimester reached 50% in minimally active and HEPA active category. This result however was expected and in line with the finding of Borodulin *et al.* (2008) that physical activities decrease from second and third trimester and that only small proportion of pregnant women reached the recommended level of activity. The result however buttresses the finding of Sui, Moran and Dodd (2013) who reported that physical activity decline significantly between early pregnancy and 28 weeks gestation, with a further decline to 36 weeks. The result is also in line with Hesketh and Evenson (2016) who found low physical activity (below the recommended guidelines) during pregnancy across all trimesters.

This decline in physical activity may be associated with physiological and anatomical changes in pregnancy, especially during second trimester, such as the heart which does not allow extra stress on pregnant women, a shift in the centre of gravity and hormonal changes (Melzer, Schutz, Boulvain & Kayer, 2010).

## Conclusion

Based on the findings of the study, there is high prevalence of physical inactivity among pregnant women in Nsukka Local Government Area. It was concluded that all pregnant women were inactive in walking activities and not sufficiently

active in moderate physical activities. From the study, advancement in stage of pregnancy is a contributing factor to physical inactivity. This could be due to pregnancy conditions such as weight of the fetus which may pose hindrance in physical functions .

The Federal Ministry of Health should carry out health promotion programmes through mass media to raise awareness of the benefits of being physically active to the masses with particular reference to pregnant women.

Health facilities should emphasise the importance of physical activities in maintaining good health to the pregnant women during antenatal clinic.

Government health policy should mandate antennal clinics to engage pregnant women on physical activities during antenatal visits as a way to foster habit of regular participation in physical activities.

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