KNOWLEDGE, PERCEPTION AND ATTITUDE TOWARDS EXERCISE AND RECREATIONAL ACTIVITIES AMONG PREGNANT WOMEN IN IBADAN NORTH LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

BY

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CERTIFICATION

This is to certify that this study was carried out by ADEDAPO, OMOLADE OLUBUNMI under my supervision in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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DEDICATION

I hereby dedicate this work to the Almighty God, for the strength and grace He granted me to complete this work. To Him alone is all the glory.

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ABSTRACT

Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective. Recreation is an activity of leisure, leisure being discretionary time. There has been an increase in the number of challenges during delivery among pregnant women which may not be totally attributed to physicians' deficiencies or hospital apparatus, but hinged on absence of relative required participation in exercises and recreational activities. Ignorance of the benefits of participating in exercises and recreational activities have been understood to be the main underlying factor posing a great risk against participation in exercises by most pregnant women, as what is not treasured, can never be held in high esteem. Conformity to most exercise prescribed for pregnant women during antennal care by physicians seem low and therefore some experience difficulty during labour. This study was conducted to investigate knowledge, perception and attitude toward exercise and recreational activities among pregnant women in Ibadan North Local Government Area.

A descriptive cross-sectional study was conducted using a multi-stage sampling technique with a validated 29-point semi-structured interviewer-administered questionnaire to elicit information on respondents' socio-demographic characteristics, knowledge, perception and attitude of 192 pregnant women towards exercise and recreational activities from selected antenatal clinics in Ibadan North Local Government Area. An 11-point knowledge scale was used to assess knowledge on the health benefits of exercise and recreational activities; Knowledge score (KS) < 5 was categorised as fair; KS ≥ 5 was categorised as good. A 9-point perception scale was used to determine the perception towards exercise and recreational activities; perception score < 4 was rated negative perception while perception score ≥ 4 was rated positive perception. Also a 9-point attitude scale was also used to determine the attitude towards exercise and recreational; attitude score < 4 was considered negative while a score ≥ 4 was considered positive attitude. Data were analysed using descriptive statistics such as Chi-square and Fischer's exact test at $p<0.05$ level of significance.

Age of the respondents was 27.5±5.6 years. The respondents comprised of (90.6%) married, respondents with secondary education were (49.5%) and those that had tertiary education were (32.3%). Knowledge score of the respondents was 7.6±1.7, (55.2%) had good knowledge, (92.7%) had positive perception and (93.8%) had a favourable attitude towards

exercise and recreational activities. While knowledge about exercise and recreational activities encouraged pregnant women to engage in these activities, the type of exercise, intensity and consistency of exercise during pregnancy had opposite effects. There was a statistically significant difference between perception and practice of recreational activities.

Knowledge, perception and attitude towards exercise and recreational activities were favourable. However, knowledge of the recommended exercise and recreational activities was low. Extra emphases should be placed on educating pregnant women on the various types of exercise and recreational activities they should engage in.

Keywords: Knowledge, Perception and Attitude, Exercise, Recreational Activities, Leisure, Participation, Pregnant women.

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GLOSSARY OF ABBREVIATIONS

AT	-	Anaerobic threshold
FITT	-	Frequency, intensity, type and time
GDM	-	Gestational diabetes mellitus
RI	-	Resistant index
VCO_2	-	Ventilation Carbon dioxide
VO_2	-	Ventilation Oxygen
S/D	-	Systolic-Diastolic

DEFINITION OF TERMS

Knowledge: Knowledge is a theoretical or practical understanding of subject matter.

Perception: Perception is an individual's thought belief or opinion concerning a subject matter.

Attitude: Attitude is an individual's temperament or state of mind. Attitude towards exercise and recreational activities among pregnant women include pregnant women's character towards exercise and recreational activities.

Exercise: Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective.

Recreational activity: Recreation is an activity of leisure, leisure being discretionary time. The need to do something for recreation is an essential element of human biology and psychology. Recreational activities are often done for enjoyment, amusement, or pleasure and are considered to be fun.

Pregnancy: Pregnancy also known as gestation is the time during which one or more offspring develops inside a woman**.**

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Pregnancy is a unique human process in which all the body control frameworks are altered to keep up maternal and foetal homeostasis (Wolfe et al., 1994). One of the most important changes during pregnancy is the metabolism of the mother, which results in an ordinary weight gain during pregnancy of around 9-11 kg. Any extra increment in the maternal weight is an energy reserve so that the mother can later feed her baby. However maternal overweight constitutes a health hazard (Mottola, Giroux and Gratton, 2010). Mother and foetal health is improved when the mother performs some simple exercises and recreational activities during pregnancy (Makinde, Florence and Benjami, 2014).

Physical activity can be defined as any bodily movement that involves the use of one or more large muscle groups and which raises the heart rate. This includes sport, exercise and recreational activities and incidental activity that accrue throughout the day (walking to the shops, climbing stairs). Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective. Recreation is an activity of leisure, the need to do something for recreation is an essential element of human biology and psychology. Recreational activities are often done for enjoyment, amusement, or pleasure and are considered to be fun.

The period of pregnancy is a physiological window during which numerous adjustments of the mother's body are required to verify the prosperity of the hatchling (Wolfe et al., 1994). Exercise and recreational exercises have been known experimentally and physically to elevate blood flow to the mother and the foetal indispensable organs which additionally improve pelvic bone and muscle tone upgrading typical safe conveyance of child during work (Dianne and Margaret, 2004).

Exercise and recreational activities lessen the danger of certain medicinal intricacies related with pregnancy; explicitly connected with a lower probability of hypertensive complexities during pregnancy, for example, preeclampsia (Martin, Brunner and Huber, 2010; Saftlas, Logsden-Sackett, Wang, Woolson, and Bracken, 2004; Sorensen et al., 2003).Furthermore, pre-natal exercise and recreational exercises is related with decreased hazard for extreme gestational

weight increase, gestational diabetes and pre-term birth. (Stuebe, Oken, and Gillman, 2009), which prompts postpartum weight retention and long-term obesity (Amorim, Rossner, Neovius, Lourenco and Linne, 2007; Mamun et al., 2010). Other benefits include enhanced cardiorespiratory fitness, attenuation of complaints including low back pain, pelvic girdle pain and urinary incontinence, prevention of gestational diabetes (Oken et al., 2006), improved feeling and wellness, self-image and state of mind steadiness, as well as shorter labour in women who start labour spontaneously and decreased incidence of operative delivery (Melzer, Keyser and Pichard, 2010; Kasawara et al., 2012).

The conventional recommendations with respect to exercise and recreational exercises during pregnancy have been founded more on cultural and social issues as opposed to scientific evidence. Indeed, even these days, questions exist among both obstetricians and sport scientists with respect to the sort, intensity, the duration, and the frequency of physical exercise and recreational exercises during pregnancy and its impact on the maternal mental perspectives. An increasingly significant perspective is the maternal view of health status. Adequate research in this area of science is accordingly essential. This turns out to be significantly increasingly clear when one takes into account the fact that everyday more women want to continue to exercise in some form, during their pregnancy (Haakstad and Bo, 2011).

The helpful impact of maternal physical activities and recreational interest during pregnancy on foetal development might be an effect of exercise on glucose tolerance. Moreover, women who exercise and engage in recreational exercises while pregnant are bound to experience improved postpartum recovery, self-esteem and body image, as well as increased quality of life. Sedentary behaviours have been associated with increased health risks for the baby (e.g., increased heart rate and fat mass).

1.2 Statement of the Problem

There has been an increase in number of perinatal challenges during delivery among pregnant women which may not be totally attributed to physicians' deficiencies or hospital apparatus, but hinged on absence of relative required participation in exercises and recreational activities (American Congress of Obstetricians and Gynecologists, 2015).Also, ignorance of benefit of participating in exercises and recreational activities have been understood to be the main underlying factor posing a great risk against participation in exercises by most pregnant women, as what is not treasured, can never be held in high esteem (Wang and Apgar, 1998).

Besides, poor perception of most pregnant women on the benefit of participating in exercise and recreational activities associated with respect to their socio-demographic characters such as poor education, age, income, ethnicity etc., seemingly compounds the necessity to engage in such helpful act (Barakat, Pelaez, Montejo, Luaces and Zakynthinaki, 2011).

Study showed that 65.6% of women are adequately informed about the practice of physical exercise and recreational activities during pregnancy and just barely 20% practised enough (Vladutiu, Evenson and Marshall, 2010). At the point when inquired as to why they were not physically active, pregnant women report barriers such as lack of time, insufficient vitality/being excessively worn out, and absence of resources, physical impediments and not knowing whether it is safe to be physically dynamic. Physical restrictions and not understanding whether exercise and recreational activities are safe are two distinctive factors related to sedentary behaviour during pregnancy. Studies have additionally showed that only very few women meet recommended levels of physical activity, and that there is a decrease in exercise frequency from pre-pregnancy levels and throughout the course of pregnancy (Evenson et al., 2004; Owe et al., 2009; Haakstad et al., 2011; Nascimento et al., 2012).

Generally, literature shows that support in exercise and recreational activities are lower among pregnant women than non-pregnant women. Women who see practice of exercises during pregnancy as beneficial to maternal or foetal wellbeing would have a higher inclination to engage in exercise and recreational activities (Clarke, and Gross, 2004). Some pregnant women believe exercise is just useful to the rich, as they have enough to eat after participation to recover lost energy (Ribeiro and Milanez, 2011). Increment in number of perinatal difficulties during delivery among pregnant women has been ascribed to absence of participation in exercises and recreational activities (American Congress of Obstetricians and Gynaecologists, 2002).

Research has shown that while women believe that exercising during pregnancy improves their pregnancy-related side effects and state of mind, majority of pregnant women experience a drop in their physical activity levels during pregnancy and postpartum when contrasted with their pre-pregnancy levels. Frequently, women might be encouraged by companions or by their specialists to practise a more sedentary lifestyle when pregnant, on the assumption that exercise may increase the danger of miscarriage or cause damage to the foetus. On other occasions, women themselves may settle on this choice. Pregnant mothers go to antenatal clinic late for the

exercise and recreational activities as they see little or no need for prenatal exercise (Makinde et al., 2014).

1.3 Justification for the Study

Involvement in exercises during pregnancy has been found to be of great support to women during delivery, as its absence can result into hard labour for some (Kardel and Kase, 1998). Studies have shown that most women do not find it so pleasant or appealing to be involved in physical exercises or recreational activities during pregnancy, due to the discomfort they experience within and supposed public traditional disapproval of such practice in the African continent (Awusi, Anyanwu and Okeleke, 2009).

Furthermore, a study carried out among pregnant women in Southwest Nigeria revealed that majority of women in Nigeria do not possess adequate knowledge with reference to the benefits of participating in exercises and recreational activities, but had great attitude when shown or taught the benefits (Chidozie, et al., 2014). The benefits associated with participation in exercise and recreation far outweighs the impending factors (Riemann and Hansen, 2000). Moderate exercise during pregnancy improves cardiovascular fitness, limits weight gain, and improves attitude & mental state, less complicated birth and a speedy postnatal recovery (Clapp, 2003). Conformity to most exercises prescribed for pregnant women during antennal care by physicians seem low and therefore some experience difficulty during labour (Chidozie et al., 2014). No study has discovered any negative impact of moderate intensity exercise on pregnancy result in a normal, healthy pregnancy (Duncombe et al., 2009). The American College of Obstetricians and Gynecologists (ACOG 2015) rules advice continuation of pre-pregnancy exercises and recommend that sedentary women start exercise during pregnancy.

Consequently, without medical or obstetrical contraindications, every single pregnant woman is urged to be physically active for at least 20 – 30 minutes per day, identical to at least 150 minutes per week stretch of moderate-intensity activity (ACOG 2015). Therefore, initiating a more systematic approach to enhance motivation for regular exercise participation during the antenatal period, for example through regular supervised group exercise sessions may be advantageous. This study is necessitated to determine the knowledge, perception and attitude of pregnant women towards exercise and recreational activities in Ibadan North Local Government Area, Oyo State.

1.4 Research Questions

The study will provide answers to the following research questions

1. What is the level of knowledge of pregnant women about the importance of exercises and recreational activities during pregnancy?
2. What are the perceptions of pregnant women about exercises and recreational activities during pregnancy?
3. What is the attitude of pregnant women about exercises and recreational activities during pregnancy?
4. What are the factors capable of influencing participation in exercise and recreational activities during pregnancy?

1.5 Broad objective of the Study

To investigate: knowledge, perception and attitude towards exercise and recreational activities among pregnant women in Ibadan North Local Government Area of Oyo State.

1.6 Specific Objectives

1. To assess the level of knowledge on the importance of exercises and recreational activities among pregnant women in IBNLA, Oyo State
2. To determine the perception towards exercises and recreational activities among pregnant women in IBNLA, Oyo State
3. To examine attitude towards exercise and recreational activities among pregnant women in IBNLA, Oyo State
4. To identify factors capable of influencing participation in exercises and recreational activities among pregnant women in IBNLA, Oyo State

1.7 Research Hypotheses

1. There is no statistically significant association between knowledge of the benefits of exercise and recreational activities and participation in exercise and recreational activities by pregnant women

2. There is no statistically significant relationship between perception towards exercise and recreational activities and participation in exercise and recreational activities by pregnant women

3. There is no statistically significant association between attitude towards exercise and recreational activities and participation in exercise and recreational activities by pregnant women

4. There is no statistically significant association between socio-demographic characteristics of respondents and participation in exercise and recreational activities by pregnant women.

CHAPTER TWO

LITERATURE REVIEW

2.1 Knowledge of Exercise and Recreational Activities among Pregnant Women

Precise and appropriate knowledge and positive attitudes regarding physical exercises among pregnant women has been proven to be vital in promoting practice of exercises (Mbada and Adebayo, 2014).Despite the well documented work on importance of exercise and recreational activities during pregnancy, the knowledge of pregnant women towards the importance of engaging in exercise and recreational activities is low. Most pregnant women only exercise when they attend antennal clinic why some even avoid exercising at the antennal clinic. Indeed, a high proportion of pregnant women follow neither physical activity nor exercise guidelines, (Gjestland and Owe, 2013) putting them at increased risk of obesity, gestational diabetes mellitus (GDM), and other pregnancy-related diseases and complaints.

Knowledge about benefit and contraindication to antenatal exercise significantly influenced the attitude of women towards exercise during pregnancy. There is ample and consistent evidence that promoting physical activity in women of reproductive age may be a promising approach for the prevention of excessive weight gain, gestational diabetes mellitus and subsequent complications suffered by children born to sedentary mothers (Ferraro, Rutherford, Keely, Dubois and Adamo, 2011). The findings of previous reports revealed that there is significant association between adequate knowledge of antenatal exercises and attitudes toward exercise during pregnancy.

While exercise is beneficial to the health of individuals across the ages (Sarfraz et al., 2013) it is even more critical for expectant women because a sedentary lifestyle places them at increases risks of pregnancy related health complications and compromised baby health. For many decades the relationship between exercise and women reproductive health has been a controversial issue with skepticism over safety and the benefits in pregnancy. The controversy is characterized by lack of understanding on the type of exercise and the exact effect on expectant women, knowledge and perception on the benefits by pregnant women, level of education, race/ethnicity. However modern medicine appreciates that expectant mothers need exercise for good health. Emerging evidence show that relevant exercises can be initiated and continued in pregnancy as it is safe and of significant benefits to the mother and foetus (Ribeiro and Milanez, 2011).

2.2 Attitude towards exercise and recreational activities during pregnancy

Attitude can be defined as an individual's disposition or state of mind. Attitude towards exercise and recreational activities among pregnant women therefore involves pregnant women's character towards exercise and recreational activities. This attitude can be positive or negative, optimistic or pessimistic. Attitude plays a pivotal role in influencing behavioural change or interest in participating in a health beneficial activity. A change in behaviour is difficult to achieve among individuals who are said to have substantial knowledge and skills to execute the behaviour but are still incapable to do so due to opposing barriers (Duncombe, Wertherm, Skouteris and Kelly, 2007). Studies suggest that perceived barriers which can affect attitude to antenatal exercise include physical discomfort from nausea, fatigue, beliefs such as embarrassment about appearances, uncertainty about how to exercise safely during pregnancy, concern about injury, lack of or incorrect information from healthcare providers, lack of care due to child care commitments (Evenson, Moos, Carnet and Siena-Rizl, 2008; Vladutiu, Evenson and Marshall, 2010; Leifermann Swibas, Marshall, and Dunn, 2011). Other factors that affect attitude to antenatal exercise could be number of children, mothers' occupation, age and educational level. These later factors will be investigated in this study.

Earlier research has established that women who are sedentary before the onset of pregnancy have the tendency of not engaging in exercise and recreational activities when pregnant, (Haakstad, and Voldner, 2013). Hence, to achieve higher rates of exercise during pregnancy, health promotion programs should target the general female population in their childbearing years.

2.3 What are Exercise and Recreational Activities during Pregnancy?

Exercise and recreational activities during pregnancy are those activities that are performed by pregnant women to improve their strength and fitness. They are physical activities that are planned structured and repetitive, and they involve bodily movement requiring physical or mental effort done to improve health. Scientific literatures encourage the debate that constant physical exercise during the period of pregnancy is of great importance in terms of both mental and physical health (Nascimento, Godoy, Surita and Pinto, 2014). Research have showed that, compared with less vigorous activities, exercise intensity that reaches at least 60% of the heart rate reserve during pregnancy and gradual increasing physical-activity expenditure reduces the risk of gestational diabetes. Engaging in exercise and recreational activities during pregnancy reduces the probability of developing pregnancy related complications such as, gestational diabetes mellitus, bladder bowel problem, weakness of muscles of the abdomen, obesity and it

also reduces difficulties linked with child delivery and promote the health of mother and the baby (Kisner and Colby, 2007). Pregnant women in perfect health condition are encouraged to take part in exercises and recreational activities safely according to medical recommendations (Artal and Toole, 2003).

Exercise and recreational activities have gained increasing popularity among women of fertile age, many women ask for medical advice on whether they can continue to exercise throughout their pregnancy (Madsen et al., 2007). The answer to their question demands that the influence of exercise on the mother and the foetus be properly understood (Barakat et al., 2011). Studies on the effects of exercise on maternal and foetal health have been around for 30 years, yet controversy still surrounds how it affects many pregnancy outcomes, including gestational weight at birth, the type of delivery, maternal weight gain among other outcomes (Downs et al., 2012).

The reason for this lies partly in that observational studies have made much use of questionnaires which are now known not to be very reliable in the assessment of physical activity while experimental studies have involved range, type, duration and intensity of exercise that comparisons between them have been difficult (Barakat et al., 2014).

Not all sports have the same impact on pregnancy, intensity and duration of exercise sessions should also be considered.

Leisure exercise, such as moderate walking or biking or swimming, generally involves aerobic work and causes limited increases in maternal heart rate and ventilatory frequency. On the other hand, competitive sport may involve frequent maximal or near-maximal performances when the aerobic–anaerobic threshold may be reached.

Maternal level of training and general fitness, particularly respiratory and cardiovascular reserves, set the safe level of exercise affordable by a pregnant woman. In at-risk pregnancies, discontinuation of exercise may be necessary, and it is important that such cases are managed by expert medical personnel. In the absence of maternal cardiovascular or respiratory problems, moderate exercise makes the mother enjoy a sense of well-being; it's also often associated with a shorter labor and a lower incidence of operative deliveries and may help in the management of conditions such as diabetes and hypertension.

2.4 Concept of Exercise and Recreational Activities among Pregnant Women

The period of pregnancy comes with numerous changes in the women's body due to hormonal changes such as; increased progesterone and relaxin (hormones of pregnancy) which reduce support and increased mobility in structures to which muscles and tendons are attached. Examples of these changes include softening of the cervix, mobility of the symphysis pubis, and relaxation of the joints of the pelvis and lower back especially the sacroiliac joints (Ribeiro and Milanez, 2011; Dignon and Reddington, 2013). Also there are other changes that occur in different organs within the body causing some uneasiness in pregnant women. Some of the minor discomforts in pregnancy include; low back pain, loss of balance, weakness of the pelvic floor muscles, urinary incontinences, sciatica among others. These discomforts can be relieved through appropriate antenatal exercises. The American Congress of Obstetrician and Gynaecologists (2015) recommended that pregnant women can exercise moderately for 30 minutes on most days of the week.

Different exercise programs are available for pregnant mothers; these exercises include aerobic exercises such as dancing, walking and swimming. Another type is Kegel exercise; this involves tightening of pelvic muscles to control urine flow (Sarfraz, Islami , Hameed , Hasan and Ahmad, 2013). The health of the mother and that of the foetus is improved when the mother performs some simple exercises during pregnancy. Exercise has been shown scientifically and physically to promote blood circulation to the mother and the foetal vital organs such as the brain, liver and heart etc; exercise also improve pelvic bone and muscle tone thus enhancing normal safe delivery of baby during labor (Dianne and Margaret, 2004).

Exercise session in antenatal clinic should be designed to stimulate interest in the physical changes occurring to promote body awareness and to facilitate physical and mental relaxation. Prenatal classes held early in pregnancy allow for advice and discussion relating to rest and work activities anticipated postural change and relief of common discomforts sessions covering position for labor and postnatal exercises are more appropriate during the third trimester of pregnancy.

Guidelines on physical activity or exercise and pregnancy encourage pregnant women to continue or adopt an active lifestyle during and following pregnancy (Davies, Wolfe and Mottola, 2003). The guidelines provide variable guidance on prenatal exercise, on how pregnant women might approach continuing or adopting sport activities (Szumilewicz, Worska and Rajkowska, 2015). However, most guidelines did not include important topics such as

prevalence and known risk factors for common pregnancy-related diseases and complaints, and the role of exercise in preventing and treating them.

2.5 Benefits of Exercise and Recreational Activities in Pregnancy

Exercise and recreational activities convey numerous benefits for the pregnant woman. Research indicates that excess weight gain can be attenuated by adhering to a regular program of prenatal exercise (Clapp, Kim, Burciu and Lopex, 2000). Regular exercise can help reduce back pain, improve or maintain tone, reduce leg cramps, swelling and constipation and improve sleep patterns. Women who exercise regularly often feel better about themselves and their changing body during pregnancy. Clapp and Little, (1995) found that pregnant women who maintained physical activity levels gained 20% less weight while pregnant than those who remained inactive. The same study also showed substantially lower 5-site skinfold thickness in the exercise group after the 15th week of the term. Another study found that resistance training during pregnancy substantially attenuated maternal weight gain over the course of term (Barakat et al., 2009).

2.5.1 Prevent Depression, Anxiety and Stress

The study conducted by Parker, (2003) revealed the following; Stress reactivity increases physiologically during pregnancy, pregnant women may experience additional stressors that are usually not experienced in a non-pregnant state, psychological stress in pregnancy is associated with adverse fetal outcome, exercise can be a method of stress reduction, exercise in pregnancy is not associated with adverse fetal outcome and exercise in pregnancy may provide benefit to the fetus. According to (Monire, 2014), anxiety is among the leading cause of pregnancy complications affecting maternal mental and physical health. He said relaxation training is an effective method of eliminating this condition. According to (Meenakshi, 2012) using pregnancy vitals such as pulse, systolic and diastolic blood pressure and investigations like Sr. Protein and haemoglobin, to measure the effect of yoga exercise among pregnant women, I t was observed that yogic practices has reduced the effect of anxiety and improved the psyche of patients.

2.5.2 Reduced Incidence of Gestational Diabetes

Gestational diabetes mellitus (GDM) is the most common medical complication associated with childbirth, affecting up to 10% of all pregnancies. Women with GDM are prone to developing diabetes postpartum. Compounding matters, children born to mothers with GDM are at an

increased risk of obesity, impaired glucose tolerance, and type II diabetes. Physically active women who exercise throughout pregnancy show substantially lower rates of GDM than women who do not (Dempsey et al., 2004). Compared to inactive women, those who exercise during pregnancy reduce their odds of acquiring GDM by 59%. This relationship endures after adjusting for age, race, education, parity, and body mass index (Liu et al., 2008). Those whose exercise levels are above the median do reduce their odds even further, indicating a benefit to performing a greater volume of exercise.

2.5.3 Decreased Incidence of Preeclampsia

Preeclampsia is a pregnancy-related disorder that encompasses maternal hypertension, proteinuria, and edema. It can bring about seizure and/or cerebral hemorrhage and is the second leading cause of maternal death in the United States. Although data on the subject are somewhat limited, research suggests that regimented prenatal exercise may prevent or oppose the progression of the disease. A case-controlled retrospective study performed by (Marcoux et al., 1989) reveals that women who engaged in regular exercise had a reduced incidence of preeclampsia and gestational hypertension, with risk decreasing as the volume of exercise increased. Similarly, (Sorensen et al., 2003) reported that light prenatal exercise reduced the incidence of preeclampsia by 24%, whereas the performance of vigorous exercise (equal to 6 metabolic equivalents or more) led to a 54% reduction. It was posited that this protective effect is because of the stimulation of placental growth and vascularity, reduction of oxidative stress, and or exercise-induced reversal of maternal endothelial dysfunction (Weissgerber et al., 2004).

2.5.4 Enhanced Body Image

The changes in body anthropometry associated with pregnancy often lead to a reduced sense of body image. Many women feel fat and unattractive, and there appears to be a sharp decline in body image perception from preterm into early pregnancy (Goodwin et al., 2000). According to (Marquez-Sterling et al., 2004) found that women who exercised during pregnancy had a significantly better body image than those who do not exercise, a trend that extended into the latter stages of pregnancy. Moreover, (Boscaglia et al., 2003) reported that pregnant women who exercised at least 90 minutes a week at moderate intensity were significantly more satisfied with their bodies throughout the term than low exercisers. Women who participate in neonatal fitness programs respond more favorably to pregnancy-related changes in their bodies compared with women who remain sedentary.

2.5.5 Better Psychological Well-Being

Pregnancy is associated with alterations in mood, often leading to depressive episodes. (Haas et al., 2005) reported that the prevalence of depressive symptoms rises from 11.7% before pregnancy to 25.2% during the third trimester. Hormonal shifts, body changes, and impaired physical function play a role in reducing a woman's feelings of psychological well-being. Studies show an inverse relationship between maternal physical activity and both the incidence and severity of depression (Poudevigne and O'Connor, 2006). Nordhagen and Sundgot-Borgen (2002) found that women who performed moderate amount of neonatal exercise had lower scores on a test measuring depressive symptoms during pregnancy and into the postpartum period in comparison with those who were not active. Similarly, (Koniak-Griffin, 1994) found that 6 weeks of exercise had profound effects on reducing anxiety in an ethnically diverse population study of pregnant teens. These findings are consistent with research in the general population that shows exercise to be effective as medication in treating mild to moderate forms of depression. Factors contributing to this anti-depressive effect are thought to include an increased biosynthesis of neurotransmitters, improved body composition, and better functional capacity. Moreover, exercise does not have to be prolonged to realize positive results. Even a single session of exercise has been shown to improve scores of mood in pregnant women during their second and third trimesters (Polman, Kaiseler and Borkoles, 2007).

2.5.6 Reduced Lower Back Pain

Lower back pain (LBP) is one of the most common pregnancy-related disorders, with 76% of women reporting lumbosacral pain at some point during the term (Kristiansson, Svardsudd and Von-Schoultz, 1976). LBP during pregnancy can have wide-ranging effects; including interfering with the performance of daily activities and disturbing normal sleep pattern. In some cases, the pain can become so unbearable that it forces a woman to take a leave of absence from work, often rendering them to bed rest. The genesis of prenatal LBP can be partially attributed to an increased lumbar lordotic curvature and altered center of gravity brought on by changes in body shape and composition, which places increased stress on the muscles of the lumbar region. This can be exacerbated by spinal ligament laxity resultant to an elevated secretion of the hormone relaxin. Given that increased mobility leads to a decreased joint stability, it stands to reason that the spinal joints are less capable of enduring the heightened physiological demands placed on them during pregnancy. Multiple studies show that exercise helps to counteract lumbar stress and alleviate symptoms associated with LBP (Suputtitada et al., 2002). Exercises that target the core musculature, herein defined as the postural muscles of the trunk, appear to

be particularly effective in improving maternal back health. (Garshasbi and Faghih, 2005) established that pregnant women who participated in an exercise program specifically designed to strengthen the core reported a significant reduction in the intensity of LBP and related discomfort throughout the term.

2.5.7 Improved Foetal Development

In the recent past, women were advised to refrain from exercising during pregnancy to avoid any adverse outcome and ensure a healthy delivery. Not only has this myth been debunked but also studies suggest that prenatal exercise actually can have positive impact on the fetus. Clapp et al., 2000) observed that children born to women who performed weight-bearing exercise 3–5 times per week throughout pregnancy were stronger and had more lean body mass than matched controls. (Barakat et al., 2009) found that pre-pregnancy maternal body weight was associated with increased bodyweight of the newborn in women who do not exercise, but not in those who performed resistance exercise. Positive effects of exercise on the fetus appear to extend into the postnatal period. The offspring of women who perform vigorous exercise throughout the term have been found to exhibit signs of heightened attentiveness and discipline, and by the age of 5, these children are neuro-developmentally more advanced compared with control subjects (Clapp., 2003). These results were attributed to the ability of regular exercise to increase blood volume, cardiac output, and placental function, which in turn increases 24-hour nutrient delivery to the placenta, thereby improving foetal nourishment.

2.5.8 Easier Labour

Exercise has been shown to have positive effects on multiple indices of labour, with high levels of resistance training showing a particularly beneficial effect. Women who are physically active during pregnancy have been shown to have a decreased risk of premature labour and a reduced incidence of cesarean delivery and shorter hospitalization. A randomised controlled study on the impact of resistance training on delivery showed similar results between exercisers and controls with respect to type of delivery, with no negative effects noted in those who lifted weights (Barakat et al., 2009). (Clapp, 2003) observed that frequent exercisers experienced a shorter duration of active labour and a lower incidence of abdominal (6% versus 30%) and vaginal (6% versus 20%) operative delivery. In addition, there was a reduced incidence of acute foetal stress in the exercise group as compared with controls. Taken as a whole, these findings indicate that adoption of a regimented program of maternal exercise has no negative effects on delivery and generally results in an easier pregnancy with fewer complications.

2.6 Physiological Effect of Exercise and Recreational Activities in Pregnancy

The increased hormonal production from the foeto-placental unit during pregnancy produces significant changes in several maternal parameters. Oxygen consumption (VO_2) increases, reaching its maximum at approximately 32 weeks. Ventilation, tidal volume, heart rate, and stroke volume also increase gradually. Carbon dioxide output (VCO_2) follows the same trend as VO_2, and peripheral resistance decreases while circulating plasma volume increases, producing a drop in the hematocrit. Body temperature rises by about 0.5°C. Forced vital capacity remains relatively constant, whereas expiratory reserve decreases (Spatling et al., 1992)

2.7 Exercise and Maternal Respiratory System

Carbon dioxide output at peak exercise is lower during pregnancy than during the postpartum period (Lotgering et al., 1995), and submaximal exercise produces higher ventilatory frequency, tidal volume, and lactate levels in pregnant women who engage in exercise than those who do not exercise. This response decreases gradually after delivery, but it takes several weeks to return to the normal, non-pregnant state. Fit women who continue to exercise regularly during pregnancy can engage in heavier physical activities than sedentary pregnant controls, without causing foetal hypoxia: the immediate post exercise recovery period can be riskier for the fetus, probably due to the fall in stroke volume (Webb et al., 1994). In addition, perceived maximal exertion is reached at a lower percentage of oxygen maximum during swimming, compared to cycling. Peak CO_2 output, peak ventilation, and lactic acid production are also lower during swimming than during cycling (Spinnewijn et al., 1996).

The anaerobic threshold (AT) normally decreases with advancing gestation in proportion to increasing maternal body weight. The maternal heart rate at the AT also declines, but without close relation to maternal body weight. Maternal heart rate increases with more difficulty during exercise with advancing gestational age, and this must be taken into account when the maximal heart rate is evaluated as an index of exercise intensity (Matsushita et al., 1996).

The amount of oxygen required to complete a three-step graded workload treadmill exercise test decreases significantly by 6% to 15% starting from the first weeks of pregnancy. In women who continue a moderate to high intensity exercise regime, oxygen requirements remain the same or are lower than before conception for the rest of the pregnancy and early postpartum. On the contrary, women who discontinue regular exercise experience a progressive increase in oxygen requirements by 2% per month, peaking at 37 weeks. The additional oxygen requirement caused

by weight gain must be considered when net physical efficiency is evaluated (Clapp, 1989). In fact, physical efficiency improves during normal pregnancy compared with the non-pregnant state, with an increase in the VO_2max and a lower production of lactate when the AT is exceeded (Kusche et al., 1986).

A significant increase in VO_2 uptake during exercise is observed in late pregnancy, compared to the postpartum period, if measurements are taken at rest, during a steady-state exercise on a bicycle ergometer, and for 10 minutes during recovery. The oxygen debt produced by the exercise is also higher compared to 12 weeks postpartum (Pernoll et al., 1975). Maximal trans diaphragmatic pressure remains unchanged when healthy women perform progressive cycle exercise tests at 33 weeks and 12 weeks postpartum, and the higher tidal volume produces an increase in minute ventilation (Field et al.,1991).

2.8 Exercise and the Maternal Musculoskeletal System

Women who exercise during pregnancy report less frequent legs edema, muscle cramps, fatigue, and shortness of breath than sedentary pregnant controls (Horns et al., 1996). Abdominal muscle function is affected by the structural adaptations that occur during pregnancy, particularly the increasing size of the uterus, and the ability to stabilize the pelvis against resistance decreases until approximately 8 weeks postpartum (Gilleard et al., 1996). In addition, there is generalized ligament laxity, a result of increasing levels of relaxin. This is a peptide hormone of the insulin-like growth factor family produced since the first weeks of pregnancy by the corpus luteum and the placenta. Laxity of the cruciate ligaments of the knee is common, but exercise programs using minimal to moderate weight bearing do not produce abnormal knee laxity (Dumas and Reid, 1997). Severe low back pain that interferes with daily life activities develops in approximately 10% of pregnant women, and the ability to perform sit-ups decreases significantly because of the inefficiency of the abdominal muscles (Fast et al., 1990).

2.9 Exercise and Maternal Cardiovascular System

Exercise produces an increase in cardiac output. The blood flow to muscles, myocardium, and skin increases whereas sympathetic vasoconstriction reduces the flow to organs and tissues not directly involved in the exercise. The response to exercise, although influenced by physiologic conditions such as menstrual cycle and pregnancy, does not differ significantly from the one occurring in men. The cardiac response to exercise in pregnancy (increased heart rate and stroke

volume), which is greater than in non-pregnant controls, decreases by 2 months postpartum, but a longer period of time is required to return to non-pregnant conditions (Sady, 1990). Activation of the sympathetic nervous system, either at rest or during strenuous exercise, is blunted in pregnancy, and the circulatory system is affected by the increased activity of the renin–angiotensin system. In particular, plasma noradrenalin increases less significantly in pregnancy during standing and isometric exercise than in non-pregnant controls. Adrenalin response is less affected by pregnancy, with a linear correlation between heart rate and urinary excretion of adrenalin, both at rest and during exercise (Barron et al., 1986). Changes in submaximal exercise VO_2 during pregnancy are dependent on the type of exercise. At the same workload, VO_2 increases during weight-bearing exercise but does not differ from postpartum values during weight-supported exercise.

Exercise arterial-venous oxygen difference is lower during pregnancy than in the non-pregnant state, probably because the higher cardiac output is distributed to vascular districts not directly involved in the exercise. Perfusion of muscles would not increase significantly during exercise, and the increased cardiac output can therefore cover the requirements of blood flow to the uterus. (Sady and Carpenter, 1989). Aerobic dancing at an intensity of approximately 65% of expected maximal heart rate in the third trimester produces a significant increase in blood pressure and an increase in heart rate that may continue for up to 20 minutes. Systolic peak velocity and flow volume in the femoral arteries increase significantly, and the pulsatility index decreases. On the foetal side, the systolic peak velocity and the pulsatility index of the umbilical artery do not change significantly, but the foetal heart rate can increase in relation to maternal heart rate (Asakura et al., 1994).

Specific electrocardiographic changes occur in pregnancy: T-wave inversion in V2 is present in early and late pregnancy more frequently, while Q-waves in II, III, and aVF are less common than in non-pregnant subjects. With bicycle exercise, the time to onset of maximum ST depression is significantly shorter during pregnancy (Veille et al., 1989). In another study, a depression of ST segment was found in 12% of pregnant women undergoing a strenuous bicycle exercise who did not show any signs of ischemia (VanDoorn, 1992). Knowledge of this helps in the correct evaluation of the electrocardiogram in pregnancy.

The systolic–diastolic (S/D) ratio remains basically unchanged, when measured in the uterine artery before and within 3 minutes of a submaximal stationary bicycle exercise in healthy women with singleton pregnancies between 16 and 28 weeks. This suggests that submaximal

exercise does not compromise uterine artery blood flow in healthy women with normal pregnancies. Also, peak velocities and mean blood flow velocities increase with no variation in the vessel diameter in the femoral and carotid arteries and femoral vein of healthy pregnant women, performing sitting bicycle ergometry with a workload of 100 W for 3 minutes. The systolic and end-diastolic velocities in the femoral artery also increased, with a reversal of the post-systolic flow, which normally shows negative velocity at rest. An improvement in maternal circulation with exercise has been confirmed by other studies: a bicycle stress test in the third trimester, by healthy pregnant women in a semi-supine position at 75 W for 3 minutes, shows a significant decrease of the resistant index (RI) of the maternal femoral artery (from 93% to 69%), a rise in maximum systolic velocity (from 73 to 194 cm/sec), and a rise in maximum diastolic velocity (from 5 to 61 cm/sec). In the maternal carotid artery and utero-placental vessels, these parameters remain basically unchanged.

Foetal cardiotocograph results remain within normal limits in all cases. These studies confirm that, provided placental function is normal, utero-placental and foeto-placental circulations are not affected negatively by moderate physical exercise. When the exercise intensity increases, there can be negative effects on uterine circulation. Submaximal maternal exercise at approximately 75% of VO_2max during the third trimester can induce a gradual increase of the S/D ratio of the uterine artery, with a maximum at one minute of recovery. No change has been found in the S/D ratio of the umbilical artery, but the foetal heart rate can increase markedly. Maternal blood pressure response to exercise is not affected by pregnancy and is inversely related to the individual capacity to perform isometric exercise. Isometric exercise (hand-grip test) at 28 weeks predicts in which women pregnancy-induced hypertension and preeclampsia will develop. The test was positive when the systolic blood pressure increased by 15 mm Hg or more during isometric exercise or decreased by 14 mm Hg or more immediately after isometric exercise.

2.10 Exercise and the Foeto-Placental Unit

Exercise confined to early pregnancy increases the parenchymal component of the placenta, total vascular volume, and surface area. Exercise carried out throughout pregnancy increases these and other histo-morphometric variables associated with the rate of placental perfusion and transfer, with significant changes confined only to villi with a diameter of more than 80 _m (Bell et al., 1995). Placental blood flow is lower in pregnant women with hypertension, diabetes, and cholestasia than in depression of ST segment was found in 12% of pregnant

women undergoing a strenuous bicycle exercise who did not show any signs of ischemia (VanDoorn et al., 1992). Submaximal exercise does not compromise uterine artery blood flow in healthy women with normal pregnancies (Moore et al., 1988). Also, peak velocities and mean blood flow velocities increase with no variation in the vessel diameter in the femoral and carotid arteries and femoral vein of healthy pregnant women, performing sitting bicycle. The systolic and end-diastolic velocities in the femoral artery also increased, with a reversal of the post-systolic flow, which normally shows negative velocity at rest (Baumann et al., 1986). However, there is an improvement in maternal circulation with exercise during pregnancy. Studies confirm that, provided placental function is normal, utero-placental and foeto-placental circulations are not affected negatively by moderate physical exercise (Drack et al, 1988).

2.11 Exercise Prescription

Before advising the initiation or continuation of physical activity during pregnancy, a physician must assess the woman's risk level. Healthy women without contraindications to exercise are advised to exercise whereas; women with certain chronic medical conditions, including cardiovascular, respiratory, and systemic diseases or relative contraindications are considered high risk. (Bredin et al., 2013). Familiarity with absolute and relative contraindications to exercise is thus important for both the physician and patient. Absolute contraindications include gestational hypertension, preeclampsia, ruptured membranes, incompetent cervix, bleeding in the second or third trimester, multiple gestations at risk for premature labor, placenta previa, and premature labor. Relative contraindications include intrauterine growth restriction, extremes of weight, and poorly controlled medical comorbidities, such as type 1 diabetes mellitus, hypertension, seizure disorder, and thyroid disease. Pregnant women should also stop exercising based on signs and symptoms that may develop (Zarorsky and Longo, 2011). The frequency, intensity, type, and time duration (FITT) should be outlined according to her physical activity state prior to pregnancy.

2.12 Exercise type

Aerobic: low impact activities are recommended such as walking, dancing, swimming, and biking. Strength training: 1 set of 12 repetitions of exercises targeting major muscle groups are recommended in the form of circuit training. Strength exercise should be performed at controlled speeds and with low weights. The use of elastic bands can also be used.

2.13 Intensity

There is an increase of 10 to 15 beats per minute in resting heart rate in pregnancy. However, at maximal exercise levels, there is a blunted heart rate response as compared to the non-pregnant state (Avery et al., 2001). Therefore, it is suggested that the use of conventional heart rate target zone be modified to account for this reduction in maximal heart rate reserve. Other measures of exercise intensity include the "talk test" and a visual rating of perceived exertion. As the term "talk test" implies, the woman is exercising at a comfortable intensity if she is able to maintain a conversation during exercise, and should reduce the exercise intensity if this is not possible. Exercising women can also use a visual scale to assess their exercise intensity. A target rating of 12 to 14 on Borg's scale of perceived exertion is suggested during pregnancy (Canadian Society for Exercise Physiology, 2002).

Intensity should fall within the light to moderate range, depending on the fitness level of the women. Heart rate should be between 60% and 70% of maximum heart rate [209 − (0.73 × age)], or 4 to 8 METs. However, heart rate might not be a good physiological indicator of intensity in this population so we suggest the use of easier tools. Such tools include an effort perception scale, with scores from 0 to 10, where sitting is assigned 0 and sprinting 10. According to this scale, a light intensity of exercise would correspond to a score of 0–2, light to moderate intensity to one of 4–5, and moderate to vigorous intensity to one of 5–6. In women with little or no previous experience with exercising, the talk test could be used to assess exercise intensity.

2.14 Duration

Pregnant women should engage in 150 minutes/ week of light to moderate intensity aerobic exercise spread across the week: ideally, 30 minutes/day for at least 5 days/week. Bouts of about 10 minutes can also be performed. For previously sedentary pregnant women, a lighter exercise regimen might also induce health benefits. It is not advisable to perform exercise for periods longer than 60 minutes. Nevertheless, overall exercise duration will vary much depend on exercise intensity, fitness level, and on the duration of resting periods.

2.15 Frequency

Physical activity should be carried out at least 5 days/week. It is likely that sedentary women will gain benefits from 3 days of physical activity per week. The recommended frequency of

many exercise programs for pregnant women is 3 days/week, such that at least a further 2 days of physical activity should be added.

2.16 Ideal Exercises during Pregnancy

1. Walking
2. Low impact aerobics
3. Water aerobics
4. Pregnancy exercise classes
5. Cycling
6. Swimming
7. Light weight training (see your instructor for assistance with your program)

2.17 Exercises to avoid during Pregnancy

1. Heavy weights
2. Bouncing – especially star jumps, or similar activities
3. Contact sports
4. Excessive breaststroke at the end of your pregnancy, as this puts stress on your pelvis
5. Any activities or exercises which can cause pain
6. Excessive twisting and turning activities
7. Exercises that require you to hold your breath
8. Asymmetrical weight bearing activities (i.e. Those involving standing on one leg for a period of time as these can place excessive strain on your pelvis)
9. Pushing off with one leg at a time when swimming – try to push off with both feet when you turn at the end of the pool
10. Prolonged standing static exercises
11. Highly choreographed exercises or those which involve sudden changes in direction
12. Lifting your hip up to the side (hip abduction) while kneeling on your hands and knees
13. Activities involving sudden changes in intensity
14. Exercises which increase the curve in your lower back (your lumbar spine)
15. Prolonged bouncing as this can outstretch the pelvic floor muscles.

2.18 Factors Influencing levels of Exercise and Recreational Activities

Women may not be involved in exercise and recreational activities for a range of reasons, including:

1. Perceptions that being physically active may harm the baby;
2. Limited facilities (e.g. pools, gymnasiums) or infrastructure (eg walking paths), particularly in some rural areas (NRHA 2011);
3. Limited access to group activities and/or facilities specifically for women;
4. Costs of attending activities;
5. Perceptions that being physically active for the sake of it is a waste of time and money;
6. Limited time for physical activity due to other commitments (e.g. looking after other children, working); and
7. Perception of personal safety in public places.

2.19 Do's and Don'ts of Exercise during Pregnancy

Every pregnant woman must take special precautions and considerations with exercise during pregnancy. Some essential guidelines are listed below to help you with a safe exercise program during your pregnancy.

Do consult your doctor, specialist or midwife

When starting a new exercise program, or continuing with current exercise program in pregnancy, it is important to consult with doctor, obstetrician, or medical specialist and/or midwife. If there are any specific problems or discomforts, these should be discussed to determine if there is need to take any special precautions. The type and amount of exercise that is normally done and have been done recently will influence the advice doctor or midwife provides when giving advice regarding exercise during pregnancy.

Do not overheat

Avoid exercise on extremely hot days. Do not use the solarium, spa, steam room or overheated pools. Keep fluid intake up before, during and after exercise. Drink small amounts of fluid frequently. Avoid exercise in the heat of the day.

Watching heart rate

Keep heart rate under 150 bpm. Exercise at comfort level.

Wear a bra

Always wear a good supportive bra while exercising. Check bathing costume for support also if doing water aerobics. Wear a bra under your costume.

Do not exercise for long on the back

Do not spend a long time exercising while lying on back. Choose exercises/stretches that are done while seated or upright. It is not recommended to exercise lying on the back from 16-18 weeks of pregnancy or after the first trimester. There are some exercises that can be modified and performed on the side as an alternative.

Be aware of the effects of relaxin

This hormone softens the joints, which may increase the risk of injury during pregnancy. Take care when stretching and avoid contact sports after the first trimester, or on advice of medical practitioner. Always brace abdominal muscles when lifting and maintain good posture.

Eat carbohydrates before exercise

Blood sugar levels can fluctuate rapidly during pregnancy. Always eat food containing carbohydrates 1-2 hours before exercising. Carry juice with you to drink if you feel faint or dizzy. If this occurs, slow down or stop exercising.

Do pelvic floor exercises

Pelvic floor muscle exercises are essential. You must exercise pelvic floor muscles before, during and after pregnancy.

Watch posture

Always maintain correct posture during exercise. Brace abdominal muscles and be aware of back at all times. To maintain good posture when standing, lift up tall, stand with abdominal muscles braced shoulders back and gently nod chin in. Try to maintain this position regularly during the day.

2.20 Signs Indicating Exercise should be Terminated while Pregnant

1. Vaginal Bleeding
2. Dyspnea prior to exertion
3. Dizziness
4. Headache
5. Chest pain
6. Muscle weakness

7. Calf pain or swelling
8. Preterm labour
9. Diminished foetal movement
10. Amniotic fluid leakage

2.21 CONCEPTUAL FRAMEWORK

The PRECEDE model is a planning model developed by Green, Kreuter, and Associates in 1980, that provides a multiple alternatives for identifying suitable intervention strategies to address community problem and health issues associated with lifestyle such as motorcycle riding mishaps, preventive behaviours for type 2 diabetes mellitus in high-risk individuals, fitness-emphasized physical activity and many others. It also provides a road map for designing health education and health promotion programs to address such mishap. Conversely, PRECEDE model guides planners through a process that starts with desired outcomes and works backwards to identify a mix of strategies for achieving stated objectives, as the model views health behaviours as being influenced by both individual and environmental forces**.**

The PRECEDE acronym stands for Predisposing, Reinforcing, Enabling Constructs in Educational/ Environmental Diagnosis and Evaluation. These components of the model posit that an educational diagnosis is needed to design a health promotion intervention, just as a medical diagnosis is needed to design a treatment plan. During the diagnostic steps of the model, practitioners employ various methods to learn about the community's perceived and actual needs, as well as the regulatory context in which the intervention will operate.

Therefore, to conduct social assessment, the practitioner may use multiple data collection activities (e.g., key informant interviews, focus groups, participant observation, surveys etc.) to understand pregnant women perceived needs with reference to participation in exercises and recreation. On the other hand, epidemiological assessment may include secondary or original data analysis to prioritize the community's health needs and establish program goals and objectives, while the behavioural and environmental assessment will help to identify factors hindering pregnant women from participating in exercise and recreation within Ibadan North Local Government Area.

For instance, in educational and ecological Assessment, the Health promoter strives to identify antecedent and reinforcing factors that must be in place to initiate and sustain positive change in behaviour and compliance with respect to perception and attitude of pregnant women in Ibadan

North Local Government Area to participating in exercises and recreational activities. Behaviour such as eating right (balance diet), availability of time and encouragement from social support, engagement of women in exercises and recreational activities during pregnancy, accessing ante-natal care etc., is shaped by predisposing, reinforcing, and enabling factors

Further Application of the PRECEDE Model to the Study

The three basic influencing factors to apply include:

1. **Predisposing factors:** refers to factors which motivate or provide a reason for specific behaviour such as knowledge of pregnant women on benefits of participating in exercises and recreational activities; awareness of likely perinatal difficulties associated with non-participation during delivery, attitude of pregnant women towards participating in exercises and recreational activities etc.
2. **Enabling factors:** are factors which enables pregnant women to act on their predispositions; these factors include: the cost of engaging in exercises and recreational activities, accessibility to a health centre for antenatal care and routine exercises, availability of food, availability of supportive policies of the government etc.
3. **Reinforcing factors:** are factors which come into play after the behaviour of the pregnant women have been positively influenced to participate in exercises and recreational activities such as: messages on dangers of sedentary lifestyle during pregnancy, accessibility and affordability of antennal care on Radio, TV, Billboards e.g Splash FM, Amuludun FM, NTA and BCOS etc.); health talks in religious centres (e.g. Mosques and Churches) on involvement in exercises and recreational activities, encouragement from significant others such as peers, family, healthcare workers, health agencies etc., to enable pregnant women comply.

In conclusion, the predisposing component of the PRECEDE model will be used for this study because it will adequately help to determine the knowledge, perception and attitude towards exercise and recreational activities among pregnant women in Ibadan North Local Government Area of Oyo State.

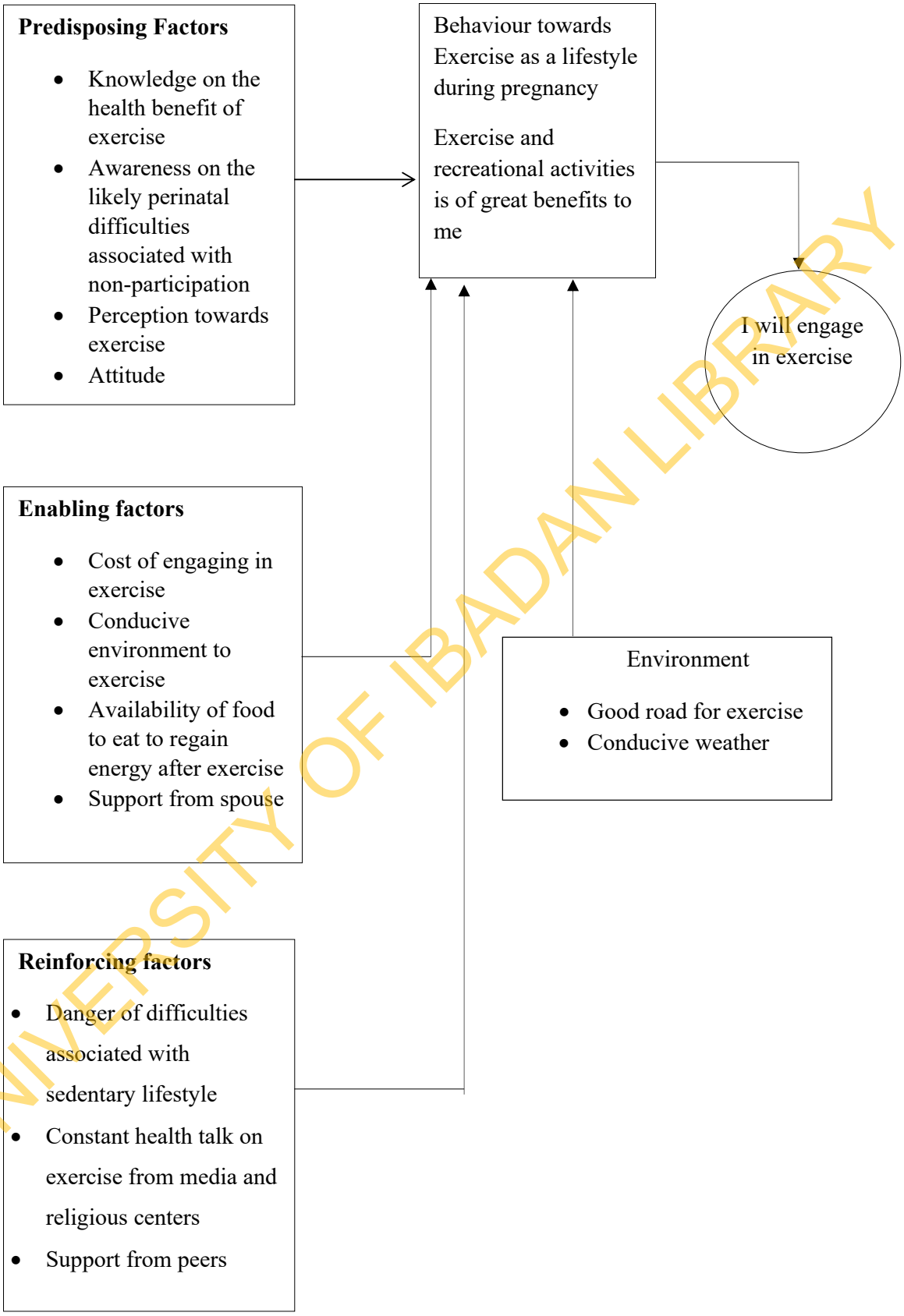

Figure 2.1 Diagram Illustrating Precede Model

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The design of the study was a descriptive cross-sectional study; a semi-structured interviewer administered questionnaire was employed. This study design is used to evaluate a sample or a proportion of a specific population at an exact point in time; it can also be referred to as snapshot of the occurrence and characteristics of a condition in a population at a specific point in time. This study design allows collection and analysis of collected data easy for the researcher.

3.2 Study Area

The study area was Ibadan North Local Government Area in Oyo State, Nigeria. The local government was one of the five Local Government Area carved out of the defunct Ibadan Municipal Government in 1991. The Local Government Area covers a landmass of 132.500 square kilometers with a population density of 2,626 persons per square kilometer. Growth rate of 3.2% from 2006 census was used to estimate the 2010 population for the Local Government area which was put at 347,998. Ibadan North local government area is subdivided into 12 wards. This local government area was created to ensure that resources coming from the upper tier government are used efficiently and effectively and services are provided in accordance with the best value principles to best meet the needs of the people at the grassroots level.

Akinyele and Lagelu Local Government Area bound it to the north, Egbeda Local Government to the east, Ibadan North West to the west and Ibadan North East to the south. There are little or no serious farming activities in the area being an urban centre. It is also a home for small, medium and large-scale industries. Trading and other commercial activities are also predominant in the area. It has the highest concentration of virtually all different tribes and ethnic groups in the country. Two notable Federal Institutions in its domain, the University of Ibadan and the University College Hospital (UCH) are located in the area. The choice of this LGA was due to the fact that it houses many health care facilities and it cover large in the state.

3.3 Study Population

This study was conducted among pregnant women attending antenatal clinics within Ibadan North Local Government Area, Ibadan, Oyo State, Nigeria.

3.4 Sample size Determination

The study population consisted of pregnant women attending antenatal clinics within Ibadan North Local Government Area of Oyo State. To determine the number of pregnant women attending antenatal clinics to be interviewed in the study area, it was established that the desired level of reliability should not exceed 0.05 with 95% confidence interval. The percentage of pregnant women attending antenatal clinics in Oyo state of 85.4% according to Nigeria Population Commission (NPC, 2018) was used

Fischer's formula was used to calculate the sample size

$$n = \frac{Z^2Pq}{d^2}$$

Where, n = Sample size

Z = Standard normal deviate set at 1.96[96% confidence level (CI)]

P = Proportion of pregnant women attending antenatal clinic (NPC,2018)

q = 1 – Proportion

d = desired level of accuracy set at 0.05

z = 1.96; p. 85.4% i.e. 85.4/100 = 0.854 (NPC, 2018)

q = 1 – 0.854 = 0.146

$d^2 = 0.05 \times 0.05 = 0.0025$

. $= \frac{1.96 \times 1.96 \times 0.854 \times 0.146}{0.0025} = \frac{0.4790}{0.0025} = 191.6$

10% Non-response rate = 192/ (1-0.10)

= 213 (approximately)

However, the figure was raised from one hundred and ninety-two to adjust for 10% attrition rate or non-response rate.

A total of two hundred and thirteen respondents were used for this study.

3.5 Sampling Technique

A multi-stage sampling technique was employed for this study

1. Four wards were selected using random sampling among the 12 wards found in the local government
2. The total number of antenatal clinics in the selected wards were counted
3. Proportionate sampling technique was used to select antenatal clinics that participated in the study
4. Systematic random sampling technique was used to select number of participants from each of the selected antenatal clinic.

3.6 Inclusion Criterion

Pregnant women with age between 18-40 years in any trimester

3.7 Exclusion Criteria

Pregnant women who cannot communicate, or not fit to participate in exercise and recreational activities.

3.8 Instrument for Data Collection

The study was carried out with the aid of a structured, pre-tested, semi –structured interviewer administered questionnaire. The instrument for this study was designed with the aid of information obtained from reviewed literatures.

The questionnaire consisted of set questions that were both open-ended and closed-ended.

The questionnaire comprised of five sections:

Section A: This section contained Socio - demographic characteristics of the respondents.

Section B: This section was designed to assess knowledge on the health benefits of exercise and recreational activities. It contained five open-ended questions.

Section C: This section was used to determine perception towards participating in exercises and recreational activities among pregnant women.

Section D: This section was designed to assess attitude towards participation in exercises and recreational activities among pregnant women.

Section E: This section was used to determine participation in exercises and recreational activities among pregnant women.

3.10 Data collection Technique

A quantitative method of data collection was used with the aid of a semi – structured questionnaire for the purpose of this research which was administered over a defined period. It was interviewer administered for the respondents. The data was collected by the researcher and facilitators trained and monitored.

3.10.1 Data collection procedure

For the study, serially numbered interviewer-administered questionnaire was used. The data was collected by the researcher with the use of two (2) research assistants who were trained prior to the time of data collection. The research assistants moved from one antenatal clinic to another within the selected clinics to select the eligible participants. Then, after the questionnaire have been filled, the researcher checked for completeness and errors before leaving the field.

3.11 Validity of Instrument

Validity refers to the accuracy of an instrument that is, how well it measures what it is supposed to measure (Joppe, 2000). In order to establish validity of the instruments, the researcher ensured validity of the instrument by reviewing relevant literature. The instrument was also subjected to scrutiny by experts to validate the instrument and my supervisor was consulted to give a valid template of how the instrument should be.

3.12 Reliability of Instrument

Reliability of an instrument is a measure of the consistency in which the instrument will measure what it is supposed to measure (Mugenda and Mugenda, 2003). An instrument is reliable if it gives similar results after several administrations under similar conditions.

In establishing the reliability of the instrument, a pre-test technique was employed. The Pre-test technique is a process of administering 10% of the research instrument in another representative population. The pre-test of this study was carried out among similar population in Ibadan North West Local Government which also had a similar population as the study area. The pre-test was administered among 24 pregnant women attending antenatal clinics within the local government area. The pre-test gave an insight to the respondents understanding of the research topic and necessary adjustments were made accordingly to establish validity and reliability. The pre-test questionnaires were coded and analyzed, also a Cronbach's Alpha measurement and reliability co-efficient measure was carried out. A Cronbach's Alpha co-efficient of 0.73 was obtained, hence the instrument was considered to be reliable.

3.13 Management and Data Analysis

All completed questionnaires were checked for completeness and consistencies of variables. The questionnaire used were manually sorted out and a coding guide was developed before the information supplied there in were entered into the computer and then Statistical Product for Service Solution (SPSS) version 25 was used for the analysis of the data collected. A descriptive (Chi-square) and Fisher's Exact statistical analysis was carried out. Tables and figures were used to present the result obtained and the level of significance was set at $P \leq 0.05$. Knowledge, perception and attitude of respondents were scored. Knowledge of exercise and recreational activities was measured using an 11-point knowledge scale. Knowledge score (KS) < 5 was categorized as fair; KS ≥ 5 was categorized as good knowledge. Perception of the respondents was scored using a 9-point perception scale; perception score < 4 was classified as negative perception while perception scores ≥ 4 showed positive perception. Questions on attitude were scored on a 9-point attitude scale; attitude scores < 4 was classified as negative attitude while scores ≥ 4 represent positive attitude. The proposed hypotheses were examined to establish different level of significant relationship between variables

3.14 Ethical Considerations

Ethical approval was sought and obtained from the Oyo state Ministry of Health research ethics committee and the clinic selected for the study before data collection. Also, informed consent was obtained from the respondents. Confidentiality of research participants was ensured, identifiers such as names and other information that can reveal the identity of research participants was excluded in the research instruments. The nature of the study, benefits and objectives were explained to the respondents and they were assured that the information given would be treated with utmost confidentiality. Respondents were also intimated about the opportunity to withdraw their consent freely at any point during the study. Confidentiality of each participant was maximally maintained during and after the collection of their information. Information gathered from the respondents was stored in the computer for analysis by the researcher while copies of the filled instruments were kept for maximum safety.

3.14.1 Confidentiality

The data of all respondents were identified by codes. The printed data was kept safe in secured office lockers during and after the study and electronic data was stored in a password-protected computer system.

3.14.2 Informed Consent

The purpose of the research was adequately communicated to research respondents and the entire community and every individual respondent was gave verbal consent prior to enrolment for the study.

3.14.3 Voluntariness

Verbal informed consent was obtained from each respondent and they were informed that they have full rights to withdraw at any stage of the study.

3.14.4 Feedback

The final outcome of this study and recommendations would be communicated to all stakeholders at the conclusion of the study.

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CHAPTER FOUR

RESULTS

Section 4.1: Socio Demographic Characteristics

There were one hundred and ninety-two pregnant women recruited for this study. About one-third of the respondents belong to the age group 21 to 25 years (31.3%) and (29.7%) belong to the age group 26 to 30 years, the mean age was 27.5±5.6 years. More than half of the respondents (58.9%) were Christians and majority (80.2%) were of Yoruba ethnicity. About (50%) had secondary education while (32.3%) had tertiary education which indicates that majority of the respondents were literate and 44.3% were traders (Table 4.1a). Majority (90.6%) were married while more than one-third (36.5%) just had their first pregnancy and more than one-third were in their second trimester (37.5%) and third trimester (35.4%) (Table 4.1b).

Table 4.1a Socio-Demographic Characteristics of the Respondents (N=192)

Socio-Demographic Characteristics	Frequency	Percent (%)
Age		
20 years an d below	24	12.5
21-25 years	60	31.3
26-30 years	57	29.7
31-35 years	27	14.1
36-40 years	24	12.4
Religion		
Christianity	113	58.9
Islam	78	40.6
Traditional	1	0.5
Ethnicity		
Yoruba	154	80.2
Igbo	17	8.9
Hausa	12	6.3
Others	9	4.6
Level of Education		
Primary	22	11.5
Secondary	95	49.5
Tertiary	62	32.3
Others	12	6.2
No Formal Education	1	0.5
Occupation		
Trading	85	44.3
Artisan	46	24.0
House wife	29	15.1
Civil Servant	24	12.5
Others	8	4.1

Table 4.1b Marital Status and Parity of the Respondents (N= 192)

Socio-Demographic Characteristics	Frequency	Percent (%)
Marital Status		
Single	15	7.8
Married	174	90.6
Divorced	2	1.1
Widowed	1	0.5
Number of Children		
0	70	36.5
1	61	31.8
2	34	17.7
3	20	10.4
4	6	3.1
5	1	0.5
Stage of Pregnancy		
1st Trimester	52	27.1
2nd Trimester	72	37.5
3rd Trimester	68	35.4

Section 4.2: Knowledge of the respondents on the importance of exercise during pregnancy

More than half of the respondents had good knowledge about exercise during pregnancy with a mean score of 7.6±1.7 on 11-scale point (Figure 4.1). Many of the respondents didn't know the definition of exercise and recreational activities, however, few (15.6%) defined it has a way of getting physically fit. Some mentioned dancing (41.1%), walking (38.0%) and sit up (38.0%) to mention few as types of exercise. Two-third (63.5%) agreed that pregnant women should engage in physical activities daily (Table 4.2a). One third of the respondents mentioned delayed labour (37.5%) and fatigue (30.7%) to be the health problems that may occur when a pregnant woman does not engage in exercise and recreational activities and also one third mentioned easy delivery (35.9%), body fitness (31.3%) and healthy baby and mother (32.3%) as the benefits of exercise and recreational activity during pregnancy (Table 4.2b).

Table 4.2a Knowledge of respondents on exercise during Pregnancy (N= 192)

	Frequency	Percent (%)
Definition of exercise and recreational activities		
No Definition	115	59.9
Activities that make us physically fit	30	15.6
Activities that make us build strength	12	6.3
Activities to burn excess calories	13	6.8
Activities that help us tone our muscles	11	5.7
Activities that help relief stress	6	3.1
Activities that involve movement of body part	5	2.6
Types of exercise**		
Dancing	79	41.1
Brisk walking	73	38.0
Sit up	73	38.0
Running	62	32.3
Jumping/Jogging	56	29.2
Domestic chores	39	20.3
Swimming	20	10.4
Sex	9	4.7
How often a pregnant woman should engage in physical activities		
Daily	122	63.5
Twice in a week	32	16.7
Three times a week	14	7.3
Once in a while	24	12.5

*** Multiple responses***

Table 4.2b Knowledge of respondents on Exercise during Pregnancy (N=192)

	Frequency	Percent (%)
Health problems that may occur when a pregnant woman does not engage in exercise and recreational activities**		
Delayed labour	72	37.5
Fatigue	59	30.7
Obesity (In Mother or child)	19	9.9
It may lead to Caesarean section	18	9.4
Depression	7	3.6
Benefits of exercise and recreational activity during pregnancy **		
Easy delivery	69	35.9
Body fitness	60	31.3
Healthy baby and mother	62	32.3
Prevent depression	10	5.2
Allow blood circulation	6	3.1

*** Multiple responses***

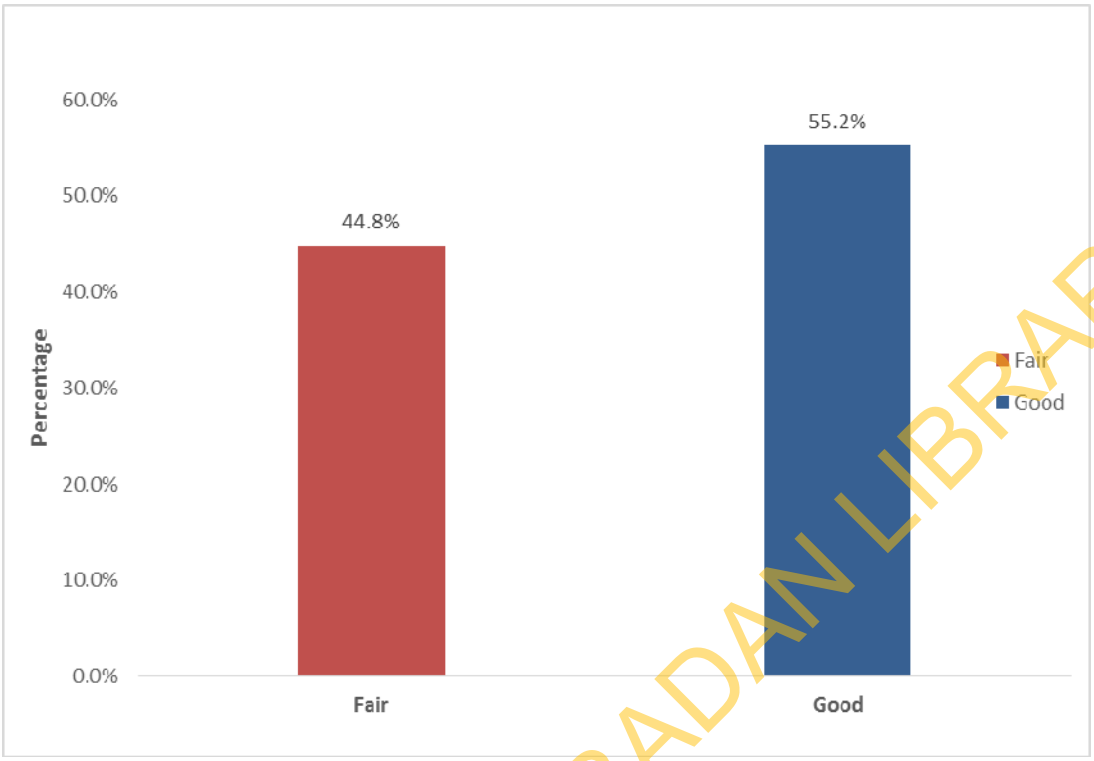

Figure 4.1 Rating of the respondents according to their knowledge on the need for exercise during pregnancy (N=192)

Section 4.3: Perception of respondents towards exercise during pregnancy

Majority (92.7%) had positive perception towards exercise during pregnancy with a mean score of 6.8±1.6 on a 9-point scale (Figure 4.2). More than half (57.3%) of the respondents disagreed that whether or not a pregnant women engage in exercises during pregnancy, it will not affect labour. One-fourth (26.0%) agreed that an inactive woman should not engage in exercise during pregnancy and more than one tenth (15.1%) agreed that pregnant mothers performing physical exercises does not suit our culture. However, many (70.3%) disagreed that performing day to day household activities gives adequate physical exercises to pregnant women and they do not have to perform recommended exercises during pregnancy and most (83.3%) agreed that pregnant women should be recommended to exercise at a moderate intensity. Also, many of the respondents (73.4%) disagreed that exercise during pregnancy increases the risk of low birth weight babies, majority (81.3%) agreed that pregnant women who engage in constant prenatal exercise should be encouraged to continue and majority (83.9%) disagreed that exercise during pregnancy is only recommended for full time house wife and not working-class mothers (Table 4.3).

Table 4.3a Perception of respondents towards exercise during pregnancy (N= 192)

Perception statements	Agree N (%)	Disagree N (%)
Whether a pregnant woman engage in exercises during pregnancy or not, will not affect labour	82(42.7)	110(57.3)
An inactive woman should not engage in exercise during pregnancy	50(26.0)	142(74.0)
Asking Pregnant mothers to perform physical exercises is against our culture	29(15.1)	163(84.9)
During pregnancy the priority should be improvement of nutrition only and not physical exercises	38(19.8)	154(80.2)
Performing day to day household activities is enough as physical exercises for pregnant women and they do not need to perform recommended exercises during pregnancy	57(29.7)	135(70.3)
During pregnancy women should be advised to exercise moderately	160(83.3)	32(16.7)
Exercise during pregnancy increases the risk of low birth weight babies	51(26.6)	141(73.4)
Pregnant women who engage in constant prenatal exercise should be encouraged to continue	156(81.3)	36(18.8)
Exercise during pregnancy is only recommended for full time house wives and not working-class mothers	31(16.)	161(83.9)

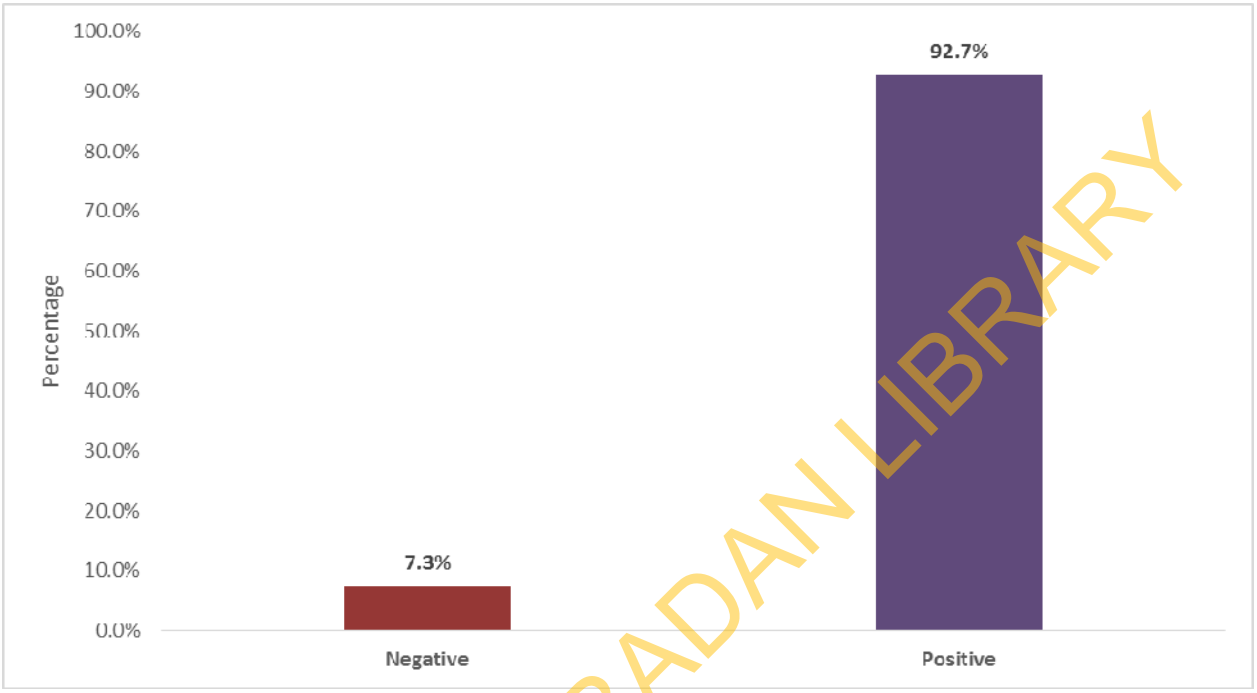

Figure 4.2 Perception category of respondents towards exercise during pregnancy (N=192)

Section 4.4: Attitudes of respondents towards exercise during Pregnancy

Majority (93.8%) had a positive attitude towards exercise during pregnancy with a mean score of 7.0±1.7 on a 9-point scale. About one-third of the respondents felt lazy (28.1%) and had a busy schedule (29.7%) to exercise. Majority disagreed to having a lot of child care activities (84.4%) and being afraid of exercising (80.7%), about one-fourth (24.5%) did not have sufficient information on exercise while some agreed that exercise is only for the rich who has food to eat to regain lost energy (17.2%) and pregnant women who add too much weight during pregnancy (15.1%). Majority (80.7%) disagreed that exercise is too expensive and time consuming, many (65.1%) also disagreed that exercise consumes too much energy (Table 4.4).

Table 4.4a: Attitudes of respondents towards Exercise during Pregnancy (N=192)

Attitude statements	Agree N (%)	Disagree N (%)
I feel lazy to exercise	54(28.1)	138(71.9)
I have busy schedule	57(29.7)	135(70.3)
I have a lot of child care activities	30(15.6)	162(84.4)
I am afraid of exercise	37(19.3)	155(80.7)
I do not have sufficient information on exercise	47(24.5)	145(75.5)
Exercise is only for the rich who has food to eat to regain lost energy	33(17.2)	159(82.8)
Exercise is only for pregnant women who add too much weight during pregnancy	29(15.1)	163(84.9)
Exercise is too expensive and time consuming	37(19.3)	155(80.7)
Exercise consumes my energy anytime I participate in it	67(34.9)	125(65.1)

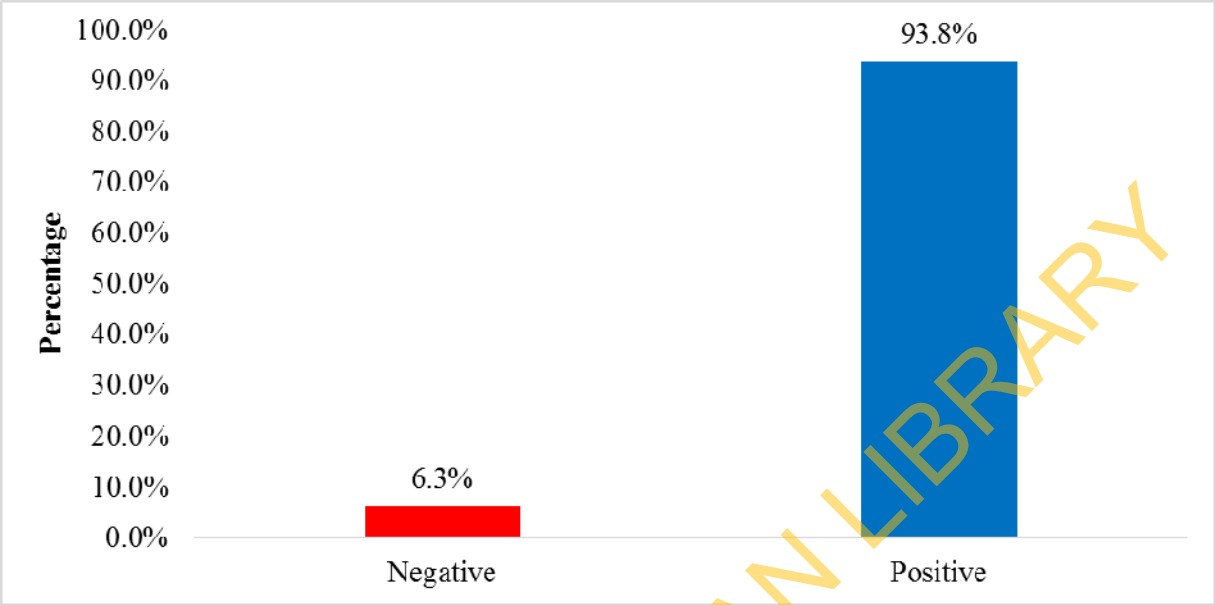

Figure 4.3: Attitudes of respondents towards exercise during Pregnancy (N=192)

Section 4.5: Participation in exercise during pregnancy

Most of the respondents (79.2%) engaged in exercise during pregnancy which more than half (53.9%) performed exercise daily. However, half of the pregnant women gave reasons for not engaging in exercise. About (50%) said their environment was not conducive for any form of exercise and some said their job prevented them from exercising (50%) (Table 4.5).

Table 4.5: Participation in exercise during pregnancy (N=192)

	Frequency	Percent (%)
Engage in exercise		
Yes	152	79.2
No	40	20.8
Frequency of performing exercising (N=152)		
Daily	82	53.9
Twice a week	39	25.7
Thrice a week	31	20.4
Reasons for not engaging in exercise (N=40)		
My environment is not conducive for any form of exercise	20	50.0
My job prevents me from exercising	20	50.0
My husband does not support exercise during pregnancy	16	40.0
I can't exercise without supervision	12	30.0
Doctor has advised me not to engage in any form of physical activity	9	22.5
My culture does not allow pregnant women to engage in physical activities	9	22.5
I have too many children to take care of	8	20.0

Section4.6: Test of Hypotheses

Hypothesis 1: There is no statistically significant association between knowledge of the benefits of exercise and recreational activities and participation in exercise and recreational activities by pregnant women

Table 4.6.1 presents the result of the cross tabulations between respondents' knowledge on exercise during pregnancy and participation in exercise among pregnant women

Chi-square analysis revealed that there was no statistically significant difference between the knowledge of respondents on exercise during pregnancy and participation in exercise among pregnant women with a p-value > 0.05. Thus, this suggests that we fail to reject the null hypothesis.

Table 4.6.1: Respondents' knowledge on benefits of exercise during pregnancy and participation in exercise among pregnant women

Variables	Engage in Exercise		Df	X^2	p-value
	Yes (%)	No (%)			
Knowledge Category					
Fair	66 (34.4)	20 (10.4)	1	0.554	0.479
Good	86 (44.8)	20 (10.4)			
TOTAL	**152**	**40**			

Hypothesis 2: There is no statistically significant relationship between the perception of respondents on exercise during pregnancy and participation in exercise by pregnant women

Table 4.6.2 presents the result of the cross tabulations between respondents' perception on exercise during pregnancy and participation in exercise among pregnant women

Chi-square analysis revealed that there was a statistically significant relationship between the perception of respondents on exercise during pregnancy and participation in exercise among pregnant women with a p-value of 0.011 which is less than 0.05, however, that the null hypothesis was rejected.

Table 4.6.2: Respondents' perception on exercise during pregnancy and participation in exercise among pregnant women

Variables	Engage in Exercise		Df	X^2	p-value
	Yes (%)	No (%)			
Perception Category					
Negative	7(3.6)	7(3.6)	1	7.78	0.011**
Positive	145(75.5)	33(17.2)		9	

***** Statistically significant***

Hypothesis 3: There is no statistically significant association between the attitude of respondents on exercise during pregnancy and participation in exercise by pregnant women

Table 4.6.3 presents the result of the cross tabulations between respondents' attitude on exercise during pregnancy and participation in exercise among pregnant women

Fisher's Exact analysis revealed that there was no statistically significant association between the knowledge of respondents on exercise during pregnancy and participation in exercise among pregnant women with a p-value > 0.05. Thus, this suggests that we fail to reject the null hypothesis.

Table 4.6.3 Respondents' attitude on exercise during pregnancy and participation in exercise among pregnant women

Variables	Engage in Exercise		Df	Fisher's Exact	p-value
	Yes (%)	No (%)			
Attitude Category					
Negative	8(4.2)	4(2.1)	1	1.213	0.465
Positive	144(75.0)	36(18.8)			

Hypothesis 4: There is no statistically significant association between the socio-demographic characteristics of respondents and participation in exercise by pregnant women.

Table 4.6.4 presents the result of the cross tabulations between respondents' socio-demographic characteristics and participation in exercise among pregnant women

Fisher's Exact analysis revealed that there was a statistically significant association between the age, ethnicity, marital status, parity, stage of pregnancy and participation in exercise among pregnant women with a p-values of 0.033, 0.048, 0.005, 0.026 and 0.033 respectively and which are less than 0.05, however, that the null hypothesis was rejected.

Table 4.6.4a Respondents' socio-demographic characteristics and participation in exercise among pregnant women

Variables	Engage in Exercise		Df	Fisher's Exact	p-value
	Yes (%)	No (%)			
Age					
20 years and below	19(9.9)	5(2.6)			
21-25 years	46(24.0)	14(7.3)			
26-30 years	41(21.4)	16(8.3)	4	10.275	0.033**
31-35 years	22(11.5)	5(2.6)			
36-40 years	24(12.5)	0(0.0)			
Religion					
Christianity	91(47.4)	22(11.5)			
Islam	61(31.8)	17(8.9)	2	3.271	0.205
Traditional	0(0.0)	1(0.5)			
Ethnicity					
Yoruba	126(65.6)	28(14.6)			
Igbo	12(6.3)	5(2.6)	3	7.237	0.048**
Hausa	6(3.1)	6(3.1)			
Others	8(4.2)	1(0.5)			
Level of Education					
Primary	14(7.3)	8(4.2)			
Secondary	74(38.5)	21(10.9)			
Tertiary	53(27.6)	9(4.7)	4	5.148	0.264
Others	10(5.2)	2(1.0)			
No Formal Education	1(0.5)	0(0.0)			
Occupation					
Trading	70(36.5)	15(7.8)			
Artisan	31(16.1)	15(7.8)			
House wife	23(12.0)	6(3.1)	4	5.966	0.183
Civil Servant	20(10.4)	4(2.1)			

Table 4.6.4b Respondents' socio-demographic characteristics and participation in exercise among pregnant women (Cont'd)

Variables	Engage in Exercise		Df	Fisher's Exact	p-value
	Yes (%)	No (%)			
Marital Status					
Single	10(5.2)	5(2.6)			
Married	142(74.0)	32(16.7)	3	10.803	0.005**
Divorced	0(0.0)	2(1.0)			
Widowed	0(0.0)	1(0.5)			
Number of Children					
0	57(29.7)	13(6.8)			
1	45(23.4)	16(8.3)			
2	23(12.0)	11(5.7)	5	11.804	0.026**
3	20(10.4)	0(0.0)			
4	6(3.1)	0(0.0)			
5	1(0.5)	0(0.0)			
Stage of Pregnancy*					
1st Trimester	36(18.8)	16(8.3)			
2nd Trimester	56(29.2)	16(8.3)	2	6.656	0.033**
3rd Trimester	60(31.3)	8(4.2)			

** ***Statistically significant***

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECCOMMENDATIONS

5.1 Discussion

Exercise and recreational exercises lessen the danger of certain medicinal intricacies related with pregnancy. Women who get involved in exercise and recreational activities while pregnant are bound to experience improved postpartum recovery, self-esteem and body image, as well as increased quality of life. Sedentary behaviors have been associated with increased health risks for both the baby and mother. Good knowledge, positive perception and positive attitude towards exercise and recreational activities during pregnancy, will affect engagement in exercise and recreational activities positively. In this study, knowledge of the respondents on the health benefits of exercise and recreational activities was average, also their perception and attitude was positive.

However most of the respondents do not have the required skills to engage in these activities adequately and as recommended. Most of the respondents only engage in exercise and recreational activities only when they come for their routine antenatal visit. It was also revealed that majority of the respondent replace exercise and recreational activities with the daily household activities they engage in. Some believe that carrying out their daily job schedule is enough exercise for them and they do not need to engage in other activities to exercise their body. Young expectant mothers were found to engage more in these activities; also the parity of the respondent played an important role because it was observed that first time mothers and women who are carrying their second pregnancy engage more in exercise and recreational activities. Pregnant women in their third trimester engage more in exercise than women in their first and second trimester. Occupation of pregnant women also influences their engagement in exercise and recreational activities, traders are found to exercise more than other occupation.

Inadequate orientations and practice of the recommended exercise during antenatal visit can be attributed to the inability of pregnant women to exercise at the recommended intensity and consistency and this has a negative impact on engaging in these activities when they are alone. Exposure and awareness of the health benefits among young and educated pregnant women is responsible for their engagement in these activities.

5.1.1 Socio-demographic Profile of the Respondents

There were one hundred and ninety-two pregnant women recruited for this study. About one-third of the respondents belong to age group from 21 to 25 years (31.3%) and 26 to 30 years (29.7%) the mean age was 27.5±5.6 years. More than half of the respondents (58.9%) were Christians and this is in accordance to the findings of (Mbada et al, 2014). Majority (80.2%) were of Yoruba ethnicity. About (50%) had secondary education while (32.3%) had tertiary education which indicates that majority of the respondents were literate and (44.3%) were traders. Majority (90.6%) were married which is expected due to the study population which more than one-third (36.5%) of them just had their first pregnancy and more than one-third were in their second trimester (37.5%) and third trimester (35.4%).

5.1.2 Respondents Knowledge on Exercise and Recreational Activities

Knowledge on health benefits of exercise and recreational activities play a very important role in influencing participation, it is impossible to engage in a particular activity without proper knowledge of its benefits. The result obtained from this study revealed that more than half of the respondents (55.2%) had good knowledge about benefits of exercise and recreational activities during pregnancy with a mean score of 7.6±1.7 on an 11-scale point.

Also the findings revealed that there is a statistically significant difference between age, parity and knowledge .This is in accordance with the findings of (Mbada et al, 2014) and (Ribeiro and Milanez, 2011). High knowledge on exercise and recreational activities among pregnant women can be attributed to the influence of constant health education received during antenatal visit, age, parity and their level of exposure and education. However most of the respondents are not familiar with the different types of exercise and recreational activities that is recommended for pregnant women.

5.1.3 Respondent Perception toward Exercise and Recreational Activities

Perception towards participation in exercise and recreational activities among the respondents was positive; majority of the respondents (92.7%) had a positive perception towards exercise and recreational activities during pregnancy with a mean score of 6.8±1.6 on a 9-point scale. The finding is in line with a study carried out by (Sarfraz et al, 2013) which revealed that (95.2%) of pregnant women had a positive perception towards exercise and recreational activities. This can be attributed to increase in knowledge on health benefits of exercise and recreational activities.

The findings revealed that there is a statistically significant difference between the perceptions of respondents on the benefits of exercise during pregnancy and participation in exercise among pregnant women. This finding is in line with that of (Makinde et al., 2014), which reported that there were significant relationships between perceptions of pregnant women on the benefits of exercise during pregnancy and participation in exercise.

5.1.4 Respondent Attitudes towards Participation in Exercise and Recreational Activities

Majority (93.8%) of the respondent had a positive attitude towards exercise and recreational activities with a mean score of 7.0±1.7 on a 9-point scale. This is in accordance with the result obtained from a study carried out by (Mbada et al, 2014). This finding is also in accordance with recent studies that have reported a positive pattern in attitudes toward exercise during pregnancy over the past two decades with increasing numbers of pregnant women engaging in physical activities, exercises, and sports activities (Barakat, Pelaez, Montejo, Luaces and Zakynthinaki, 2011).

However, (28.1%) of the respondents said they feel lazy to exercise while (29.7%) had busy schedule and (24.5%) reported that they do not have sufficient information on exercise. This is also in accordance with the study conducted by (Sujindra et al., 2015). The above group of respondents can be motivated to engage in exercise and recreational activities through adequate awareness programme. Positive attitude found among majority of the respondents can be credited to their socio-demographic characteristics of the respondents and their exposure to adequate awareness on exercise and recreational activities.

5.1.5 Respondent Participation in Exercise and Recreational Activities

The knowledge, perception and attitude shown among the respondents influenced their participation in exercise and recreational activities positively. Majority of the respondents (79.2%) engage in exercise and recreational activities and (53.9%) of those that participate in these activities engage in its daily. However the remaining (20.8%) who do not engage in exercise gave reason for not participating. Reasons given include; un-conducive environment, the kind of job they do, and lack of feeling to exercise, (Duncombe et al., 2009) also documented similar result. There was a statistically significant difference between socio-demographic characteristics of the respondents such as age, parity and stage of pregnancy and participation in exercise and recreational activities.

Less participation was also observed among women who are pregnant for the first time. Also women in their 2nd and 3rd trimester were found to participate more in exercise and recreational activities than women in their first trimester.

5.1.6 Implication of finding for Health Promotion and Education

The result obtained from this study has several implications for planning, development and implementation for health promotion and education on exercise and recreational activities among pregnant women. Health promotion and education strategies can be employed to compliment the healthcare workers effort in promoting exercise and recreational activities among pregnant women.

Health talk on exercise types, intensity and consistency that pregnant women should engage in. This can further be achieved by producing short video clips on recommended exercise and recreational activities for antenatal clinics. This will help in training pregnant women during antenatal section and it will also influence them to engage in these activities in their various homes. The media can also help increase knowledge and participation through the use of jingles on the importance of consistent exercise and recreational activities during pregnancy.

5.2 Conclusion

This study revealed that most of the pregnant women had high knowledge and positive perception and attitude towards engaging in exercise and recreational activities and this had a positive impact on their participation. However, some pregnant women do not engage in exercise and recreational activities despite the level of education and awareness they are exposed to. Measures should be put in place to educate pregnant women on the recommended exercise and recreational activities.

5.3 Recommendations

Based on the result obtained from this study, the following recommendation are made

1. Extra emphases should be placed on educating pregnant women on the various types of exercise and recreational activities they should engage in during pregnancy. Pregnant women should be encouraged to engage in exercise aside the exercise they perform during their antenatal visit. When extra emphasis is placed on the benefits of exercise and recreational activities, pregnant women are likely to adopt it as an important part of their daily activities.

2. Health care providers in antenatal clinics should educate family members such as their spouse to encourage their pregnant wives to engage in exercise and recreational activities by joining them to carry out these activities.

3. Pregnant women who live in the same community should be encouraged to form exercise group within their community, this will provide social support for them. They can also organize recreational activities within their community; this will help to prevent depression among pregnant women.

4. Health care providers in antenatal clinics should also create avenue for pregnant women to engage in other types of exercise other than singing and clapping of hands. This can be done by involving physiotherapist to teach pregnant women recommended exercise. This will increase the knowledge of pregnant women on the type of exercise they should engage in. It will also increase their participation.

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APPENDICES

APPENDIX I

INFORMED CONSENT

Dear Respondent,

I am a post graduate student at the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. The purpose of this study is to obtain information about the KNOWLEDGE, PERCEPTION AND ATTITUDES TOWARDS EXERCISE AND RECREATIONAL ACTIVITIES AMONG PREGNANT WOMEN IN IBADAN NORTH LOCAL GOVERNMENT AREA, IBADAN, NIGERIA. Please note that your participation in this study is completely voluntary. Each questionnaire has been given a CODE NUMBER to conceal your identity. All information that would be collected during this study will be treated with utmost confidentiality.

Your participation in this study is very important as it would help to better understand the benefits of participating in exercise and recreational activities during pregnancy. Please also note that there is no right or wrong answer to the questions asked or the statements made. The time needed to complete this questionnaire is approximately 20 minutes. Your willingness to be interviewed implies you have given consent to participate.

Thank you for cooperating

We can start now
Date ……..
Serial Number_____

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Instruction: Kindly respond appropriately to the following by ticking or writing as appropriate in the space provided.

1. Age in years _____
2. Religion: i. Christianity ( ) ii. Islam ( ) iii. Traditional ( ) iv. Others ( )
3. Marital status: i. Single ( ) ii. Married ( ) iii. Divorced ( ) iv. Widowed (
4. Ethnicity: i. Yoruba ( ) ii. Igbo ( ) iii. Hausa ( ) iv. Others ( )
5. Level of education: i. Primary ( ) ii. Secondary ( ) iii. Tertiary ( )iv. Others ( )
6. Occupation: i. Civil servant ( ) ii. Artisan ( ) iii. House wife ( ) iv. Trading ( ) v. Others _____
7. Number of children: _____
8. Stage of pregnancy: i. 1st trimester ( ) ii. 2nd trimester ( ) iii. 3rd trimester ( )

SECTION B: Knowledge of Participants on Exercise During pregnancy

S/N	Knowledge statements	Response
9.	Define exercise and recreational activities	1pt
10.	Mention three types of exercise you know	3pt
11.	How often do you think pregnant women should engage in physical activities	1pt
12.	State three health problems that may occur when a pregnant woman does not engage in exercise and recreational activities	3pt
13.	Highlight three benefits of exercise and recreational activity during pregnancy	3pt
14.	**Total score obtained**	11pt
15	**Code = Score of score > 5 (good knowledge)** **. Score of < 5 (fair knowledge)**	

SECTION C: Perception of Participant towards Exercise during Pregnancy

S/N	Perception statements	Agree	Disagree
16.	Whether a pregnant woman engage in exercises during pregnancy or not, will not affect labour		
17.	An inactive woman should not engage in exercise during pregnancy		
18.	Pregnant mothers performing physical exercises does not suit our culture		
19.	During pregnancy the priority should be improvement of nutrition only and not physical exercises		
21.	During pregnancy women should be recommended to exercise at a moderate intensity		
22.	Exercise during pregnancy increases the risk of low birth weight babies		

23.	Pregnant women who engage in constant prenatal exercise should be encouraged to continue		
24.	Exercise during pregnancy is only recommended for full time house wife and not working-class mothers		
25	**Total score obtained (Each variable has 1pt)**		**9pt**
26	**Code = Score of> 4 (Good perception)** **Score of < 4 (Poor perception)**		

SECTION D: Attitudes of Participants towards Exercise during Pregnancy

S/N	Attitude statement	Agree	Disagree
27.	I feel lazy to exercise		
28.	I have busy schedule		
29.	I have a lot of child care activities		
30.	I am afraid of exercise		
31.	I do not have sufficient information on exercise		
32.	Exercise is only for the rich who has food to eat to regain lost energy		
33.	Exercise is only for pregnant women who add too much weight during pregnancy		
34.	Exercise is too expensive and time consuming		
35.	Exercise consumes my energy anytime I participate in it		
35	**Total score obtained (Each variable has 1pt)**		**9pt**
36	**Code = Score of> 4 (Good perception)** **Score of <4 (Poor perception)**		

SECTION E: Participation in Exercise during Pregnancy

32. Do you engage in exercise? (I) Yes (II) No

33. If yes, how often do you exercise? (I) Daily (II) Twice a week (III) Thrice a week

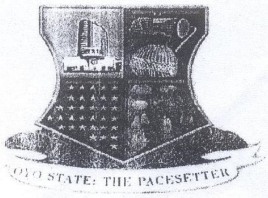
If no, please answer the following questions

S/N	Factors that can influence non-participation	Yes	No
37.	My culture does not allow pregnant women to engage in physical activities		
38.	My husband does not support exercise during pregnancy		
39.	My environment is not conducive for any form of exercise		
40.	Doctor has advised me not to engage in any form of physical activity		
41	I have too many children to take care of		
42.	My job prevents me from exercising		
43.	I can't exercise without supervision		

APPENDIX II

ETHICAL APPROVAL LETTER

TELEGRAMS..... TELEPHONE.....



MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....

All communications should be addressed to the Honorable Commissioner quoting

Our Ref. No. AD 13/479/ 1440

30th September, 2019

The Principal Investigator,
Department of Health Promotion and Education,
Faculty of Public Health,
College of Medicine,
University of Ibadan,
Ibadan.

Attention: Adedapo Omolade

ETHICS APPROVAL FOR THE IMPLEMENTATION
OF YOUR RESEARCH PROPOSAL IN OYO STATE

This is to acknowledge that your Research Proposal titled: "Knowledge, Perception and Attitude towards Exercise and Recreational Activities among Pregnant Women in Ibadan North Local Government Area, Oyo State." has been reviewed by the Oyo State Ethics Review Committee.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, the Committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of findings as this will help in policy making in the health sector.

4. Wishing you all the best.

Signature & Date

Dr. Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethics Review Committee