

# Knowledge and Practice of Exercise During Pregnancy Among Pregnant Women Receiving Antenatal Care in Selected Public Health Facilities in Lusaka, Zambia

Margaret Phiri<sup>1</sup>, Rosemary Ndonyo Likwa<sup>2</sup>, Margaret Mutale Mweshi<sup>3</sup>, Loveness Anila Nkhata<sup>3,\*</sup>

<sup>1</sup>Department of Physiotherapy, Kabwe Women New Born and Children's Hospital, Kabwe, Zambia

<sup>2</sup>Department of Population Studies and Global Health, School of Public Health, University of Zambia, Ridgeway Campus, Lusaka, Zambia

<sup>3</sup>Department of Physiotherapy, School of Health Sciences, University of Zambia, Ridgeway Campus, Lusaka, Zambia

## Email address:

magzukadeb@gmail.com (Margaret Phiri), likwandonyodr@gmail.com (Rosemary Ndonyo Likwa),

srmweshi@gmail.com (Margaret Mutale Mweshi), loveness.nkhata@unza.zm (Loveness Anila Nkhata)

\*Corresponding author

## To cite this article:

Margaret Phiri, Rosemary Ndonyo Likwa, Margaret Mutale Mweshi, Loveness Anila Nkhata. (2024). Knowledge and Practice of Exercise During Pregnancy Among Pregnant Women Receiving Antenatal Care in Selected Public Health Facilities in Lusaka, Zambia. *American Journal of Nursing and Health Sciences*, 5(1), 17-22. <https://doi.org/10.11648/j.ajnhs.20240501.13>

**Received:** December 26, 2023; **Accepted:** January 5, 2024; **Published:** January 18, 2024

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**Abstract:** Exercise during pregnancy improves women's psychological well-being, reduces caesarean section rates, risk of being overweight during pregnancy, lower back pain, and length of labor and recovery time. However, physical inactivity during pregnancy is a major problem in most low-and middle-income countries (LMICs) in Africa and often this contributes to the risk of adverse pregnancies and birth outcomes that creates significant maternal care costs such as, increased caesarean section rates, increased health care utilization, and increased length of hospital stay. We determined the level of knowledge and practice of exercise during pregnancy among pregnant women who were receiving antenatal care in selected public health facilities in Lusaka, Zambia. We also assessed factors associated with knowledge and practice of physical exercise among participants. A descriptive study was conducted among 250 pregnant women and data was collected using the modified knowledge, attitude and practice (KAP) questionnaire. Descriptive analysis of data was conducted in Stata version 20.0 for windows and the multivariate logistic regression analysis was employed to evaluate the relationships between the study variables at 0.05 statistical level of significance. Most of the participants (78%) had sufficient knowledge about exercise and engaged in some form of exercise activities regularly during pregnancy of which walking was the commonest (49%) mode of physical exercise. Further, majority of them (75%) indicated medical personnel as their main source of knowledge. Skilled health workers have a vital role to play in the provision of information on physical activity among pregnant women during ANC. Their activity including that of exercise experts must be encouraged to improve participation and effective practice of exercise during pregnancy. The outcomes on exercise activities such as walking are very practical for LMICs settings and must be promoted because they are easily accessible, can be performed at home and requires minimal equipment.

**Keywords:** Knowledge, Attitudes, Practice, Exercise, Pregnancy, Antenatal, Care

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## 1. Introduction

Exercise is a planned, structured and repeated activity that aims to condition the body. Literature shows that exercise during pregnancy improves women's psychological well-being, reduces caesarean section rates, risk of being overweight during pregnancy, lower back pain, and length of

labor and recovery time [1]. In addition, exercise during pregnancy can improve the pregnant women's posture and reduce discomfort and fatigue [2]. Also, babies born to exercising mothers have reduced fat mass and improved placental fetal growth [1-3]. The prenatal period is an important part of a woman's reproductive life, and the body undergoes many physical and biological changes [3]. Regular exercise during this period has shown to reduce the rate of

preterm birth, improves sleep, and reduces stress and anxiety [1, 2]. The American College of Obstetricians and Gynecologists (ACOG), highlight that most women are able to maintain a regular routine during pregnancy as long as there are no obstetric or medical complications [3].

Physical inactivity during pregnancy is a major problem in most low- and middle-income countries (LMICs) in Africa [4, 5] and this contributes often to risk of adverse pregnancy and birth outcomes that creates significant maternal care costs [4]. For instance, obesity during pregnancy is associated with increased caesarean section rates, increased health care utilization, and increased length of hospital stay [6]. Undesirably, most women in LMICs in Africa have a higher risk of physical inactivity during pregnancy because they remain inactive compared to women in western countries, who enroll in exercise and prenatal education as soon as they fall pregnant [4]. Cultural and religious beliefs, caring for other children, professional and family responsibilities or obligations, and limited access to facilities and resources are consistently conveyed as factors limiting physical activity during pregnancy in these LMICs settings [5].

In Zambia, a LMIC country, antenatal care services are provided free of charge in all public health care facilities [7] and midwife-nurses lead the team. Anecdotally, although exercise can be explained to pregnant women, the midwives do not prescribe exercise methods and standard of practice documentation for antenatal care in the public health facilities has no clear indicators on physical activity during pregnancy, making it difficult to assess physical activity participation among pregnant women. This study aimed to determine the level of knowledge and practice of physical exercise during pregnancy among pregnant women who were receiving antenatal care in selected public health care facilities in Lusaka, Zambia. We also assessed factors associated with knowledge and practice of physical exercise among participants in this study. There are inadequate studies on practice of physical exercise among pregnant women in Zambia currently despite their benefits for the mother's health and that of the unborn child, and even beyond childbirth. Hence it was believed that outcomes would add to the existing body of knowledge and would be of benefit to not only health workers but also policy makers in planning and implementation of intervention strategies around physical exercise activities in antenatal care.

## 2. Methodology

This was a descriptive cross-sectional study conducted in four level 1 public health facilities in Lusaka, Zambia. These facilities provide inpatient and outpatient services as well as public health inventiveness such as antenatal and postnatal care, maternity services, general medical consultations, immunizations and emergency care. Additionally, the facilities offer family planning services, laboratory testing and health education programs for the community [8]. These healthcare facilities served as a crucial backdrop for our

study and were selected as study sites because of a significant proportion of the general population that frequently accesses their services. Before the study was conducted, we obtained clearance from the University of Zambia Biomedical Research Ethics Committee (UNZABREC), the study sites and we ensured that consent was obtained from all the study participants.

The study population included all pregnant women aged between 15-49 years who were receiving antenatal care from the facilities at the time of this study regardless of the stage of the pregnancy. Approximately 450-700 women access antenatal health care services at the facilities every month [9]. Using the stratified random sampling method at 95% confidence interval (0.53-0.44), Proportion 0.49 and SE 0.002 our sample size was 250 pregnant women with each facility contributing at least 63 participants.

Participants were given a modified semi-structured questionnaire [5]. The questionnaire consisted of four parts. Part A included patient demographics such as age, education, occupation, and marital status. Section B assessed prenatal history, Section C assessed exercise knowledge, and Section D assessed exercise practice and experience. After data collection, coding was performed and information was entered into STATA version 20.0 for descriptive analysis. Logistic regression analysis was used to determine the relationship between variables, and the significance level for all statistics was fixed at 5%.

## 3. Results

### 3.1. Participant's Social Demographic Description

Approximately 250 participants were enrolled in this study. As presented in table 1 below the most common age range (40%) was 20-25 years. It can also be seen that 48% of the participants had attained secondary level of education, 70% were in employment (formal/informal), 85.2% reported being married and 65% indicated parity of 1-2.

*Table 1. Participant's social demographic description (n=250).*

Participants' demographic descriptions		N (%)
Age in years	15-19	38 (15)
	20-25	100 (40)
	26-30	75 (30)
	31-40	38 (15)
Educational background	Primary	75 (30)
	Secondary	120 (48)
	Tertiary	55 (22)
Occupational background	Unemployed	75 (30)
	Employed	175 (70)
	Student	13 (5)
Marital status	Married	213 (85.2)
	Unmarried	26 (10.4)
	Divorced/widowed	11 (4.4)
Parity	1-2	163 (65)
	3-4	75 (30)
	5-6	13 (5)

### 3.2. Participant's Antenatal History

Table 2 below shows that 88% of the participants in the current pregnancy attended antenatal care regularly. Further, 82% of the participants in previous pregnancies regularly attended antenatal care sessions. Participant's reasons for not attending antenatal sessions included; no specific reason 51.7%, long distance to facility 24% and ignorance 6.90%. Reasons for attending antenatal sessions included; knowing their health and that of the baby (50.4%) and preparing for labour (9.7%).

Table 2. Participants' Antenatal history (n=250).

Participants' Antenatal history		N (%)
Attends antenatal regularly in the current pregnancy	Yes	220 (88)
	No	30 (12)
Attended antenatal regularly in previous pregnancies	Yes	204 (82)
	No	28 (11.2)
	No response	18 (7.2)

### 3.3. Participant's Knowledge and Practice of Physical Exercises

In table 3 it can be seen that 78% of our participants exhibited adequate levels of knowledge on physical exercise. Most of them (75%) indicated health workers as their source of knowledge. When it came to practice of physical exercise majority (82%) reported practice of physical exercise and walking (49%) was the commonest mode of physical exercise. On frequency of physical exercise performance majority (65%) of the participants indicated performing activities daily and these were mostly conducted at home (85%).

Table 3. Participant's knowledge and practice of physical exercises (n=250).

Participants' knowledge and practice of physical exercise		N (%)
Level of knowledge	Adequate	195 (78)
	Inadequate	48 (19)
	No knowledge	7 (3)
Source of knowledge	Medical personnel	187 (75)
	Books	30 (12)
	Friends/internet	33 (13)
Practice physical exercises	Yes	205 (82)
	No	35 (14)
	No response	10 (4)
Types of exercise activities performed	Ball games	27 (11)
	Walking	123 (49)
	General household chores	40 (16)
	Free leg exercises activities	60 (24)
Frequency of physical exercise	Daily	162 (65)
	Weekly	68 (27)
	Not specified	20 (8)
Place where exercises is conducted	Home	212 (85)
	Healthcare facility	25 (10)
	Community gymnasium	13 (5)

### 3.4. Association of Factors for Level of Knowledge and Practice of Physical Exercise Among Participants

Association of factors in table 4 below shows that level of knowledge was significantly associated with physical exercise practice at p-value <0.001. In addition, primary school level of education and parity of 5-6 was also significantly associated with participant's knowledge and practice of physical exercise at p-value 0.03 and 0.05 respectively.

Table 4. Association of factors for level of knowledge and practice of physical exercise among participants.

Outcome: Knowledge of PE		Crude Odds Ratios: Models 1			Adjusted Odds Ratios: Model 2				
	Covariates	OR	95% CI	p values	OR	95% CI	p values		
1	PE performance	15.62	5.57	43.74	<0.001*				
2	Age group (ref: 15-19 yr.)								
	20-25 years	1.77	0.69	4.54	0.23				
	26-30 years	2.86	0.94	8.71	0.06				
	31-35 years	2.94	0.69	12.53	0.15				
	36-40 years	3.31	0.35	31.00	0.30				
3	Education (ref: None)								
	Primary	1.47	0.48	4.54	0.50	2.76	1.09	7.00	0.03*
	Secondary	3.99	1.22	12.97	0.02	3.43	0.32	36.85	0.31
4	Parity (ref: Parity 1)								
	1-2	2.02	0.90	4.52	0.09	1.18	0.34	4.13	0.79
	3-4	3.34	0.90	12.41	0.07	3.33	0.91	12.10	0.07
	5-6	1.95	0.21	17.89	0.55	5.29	1.00	28.04	0.05*
5	Marital Status (ref: Single)								
	Unmarried	4.09	1.80	9.32	0.00	1.40	0.55	3.56	0.48
	Married	5.65	0.61	52.58	0.13	3.23	0.73	14.26	0.12
	Divorced/widowed	1.40	0.20	9.64	0.73	2.61	0.21	32.65	0.46

\*significant at 5% level

## 4. Discussion

This paper reports on the levels of knowledge and practice of exercise during pregnancy among pregnant

women receiving antenatal care in selected public hospitals in Lusaka, Zambia a low- and middle-income setting in Africa. In addition, the paper highlights factors associated with the knowledge and practice of physical exercise among participants in this study. Regular exercise has been

shown to improve the health and well-being of the general population [1, 2]. During pregnancy, regular exercise has been shown to help reduce pregnancy discomfort and actually improve health and well-being through effects such as better sleep, pain relief, and increased participation in activities of daily living [10]. Our study outcomes (table 3) shows that most participants had adequate levels of knowledge on physical exercise and frequently practiced some form of exercise activities during pregnancy. These results correspond with Riberio *et al.*, [11] who indicated that over two-thirds of their study participants were shown to be adequately knowledgeable concerning the practice of physical exercise in pregnancy and their attitude towards exercising was favorable. These outcomes are very encouraging and backs up the widely accepted advice that pregnant women should be encouraged to exercise and kept up to date on the importance of exercise during pregnancy especially in LMICs settings where facilities and resources are frequently limited. In determining the relationship between factors, our study found that level of knowledge was significantly associated with practice of physical exercise. In addition, the primary education level of the participants in this study, and reported parity of 5-6, was significantly related to their knowledge and practice of physical exercise. This outcome is also similar to Riberio *et al.*, [11] and Janakiraman *et al.*, [12] who also recorded significant results between level of knowledge and education among pregnant women.

In terms of types of physical activity engaged in by pregnant women, most of our study participants reported walking as the most common form of exercise, followed by regular housework. Participants also stated that they perform these activities at home every day. These results are consistent with Negash *et al.*, [13] and Coll *et al.*, [14], who showed that walking is the most common activity for pregnant women. We felt this outcome was obtained in our settings because walking and general house work would be convenient for most people and would not place an additional burden on the family especially with regard to finances. Consequently, pregnant women should be encouraged to adopt and maintain these healthy behaviors throughout life, and health practitioners involved in ANC have an important role to play in advising women whether to start or continue exercise during pregnancy.

Pregnant women seek information to prepare for the responsibilities of motherhood during pregnancy. As a result, they are exposed to a wide range of sources and opportunities for antenatal education, including informal education through family and friends, formal education in the context of antenatal care and discussions with health professionals and midwives. Satisfying women's information needs therefore depends on their access to relevant sources and their ability to understand what is presented to them [15]. It is important that pregnant women have access to the right amount of information at the right time to meet their needs. This is because providing relevant and adequate information is the first and most important step to help pregnant women make

informed decisions and that helps to reduce their degree of confidence. The sources of information about physical exercise in this study were mainly health workers, especially nurses (midwives). While some women got this information from, books, or the Internet. These results are similar to those of Vogels-Broeke *et al.*, [15] and Kamali *et al.*, [16] who reported that almost all women received information from midwives at some point during pregnancy. This concurs with the Zambia Demographic and Health Survey [7] which notes that maternal education is directly related to the availability of skilled health workers for antenatal services. Therefore, information on the physical activity of pregnant women during ANC should be considered to improve participation and effective practice. Safe and effective exercise programs during pregnancy to promote participation are important for our settings. Therefore, physical therapists, as exercise experts, must act as catalysts to promote and increase safe exercise regimens for pregnant women.

The survey results showed that the most common age range was 20 to 25 years old and that most of the participants had completed secondary education and were employed (Table 1). These results are consistent with the GPS Education Report [17] which found that higher levels of education lead to greater employability and that people in the 25-year-old age group are more likely to have completed their education secondary or post-secondary. This is evident in our study, where most participants had secondary education and received regular antenatal services. Antenatal care (ANC) is attention given to pregnant women and is recognized as contributing to maternity services to support and improve health outcomes for both mothers and new-borns. ANC is one of the "four pillars" of safe motherhood, used to promote and achieve good health during pregnancy and the early postpartum period [18]. In our study it is encouraging to note that most participants visited ANC at their facilities regularly (table 2) and understood the importance of being at ANC. This is in line with the world health organisation (WHO) approach which recommends that a pregnant woman without complications must have at least four ANC visits before delivery [19]. We believe this has been possible because antenatal care services are widely and freely available in all public health facilities and are conducted by skilled healthcare providers [8]. However, we captured a few individuals in this study who indicated not attending antenatal services regularly because they were either ignorant or were hindered by long distances to the nearest clinic. These outcomes are similar to Ali *et al.*, [20] who reported low coverage in their study that was associated with long distance to clinics and low education. On the other hand, when we cross examined the participant's details we observed that these participants had indicated not being in employment and were parity 1-2. This may suggest that women who are employed might have better access of knowledge, peer pressure, awareness and understanding about early ANC services [21]. Furthermore, they may have exposure and access to media where they obtained further information on ANC [21] hence,

more strategies should be identified to ensure maximum coverage for ANC.

The results of this study were based on subjective self-reported data by the participants. Therefore, it is important to consider response biases. Furthermore, although the results of this study may be somewhat similar, they cannot be generalized to other settings or to women because it was conducted among individual participants in public health facilities which have unique settings and operational background.

## 5. Conclusion

Our survey results demonstrate that most participants had sufficient knowledge about exercise and engaged in some form of exercise regularly during pregnancy. Level of education was significantly related to practice of physical exercise. In addition, primary education level and parity of 5-6 in this study were significantly related knowledge and practice of physical exercise. For most participants walking was the most common form of exercise, followed by regular household chores which were performed daily at home. This is very inspiring and development of safe and effective exercise programs for pregnant women must be prioritized and Physical therapists have the power to improve and prescribe prenatal physical exercise activities. These results from a LMIC setting are very encouraging because the pregnant women practice methods were easily accessible, can be performed at home and requires minimal equipment. However, this was a cross-sectional study, so longitudinal studies are needed to learn more about exercise during pregnancy and determine which prenatal physical exercise interventions activities are most effective over time.

## Acknowledgments

This article is derived from MP's dissertation submitted to the University of Zambia (UNZA) for the award of a Master of Public Health degree in population studies. Profound gratitude to everyone who contributed in making this work a success.

## ORCID

<https://orcid.org/0000-0002-7067-9624> (Margaret Mutale Mweshi)

<https://orcid.org/0000-0001-8388-8188> (Loveness Anila Nkhata)

## Conflicts of Interest

The authors declare no conflicts of interest.

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