



Knowledge, Attitude, and Practice of Antenatal Exercises and Physical Activity Levels among Pregnant Women in Islamabad and Rawalpindi: A Cross-Sectional Study

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A B S T R A C T

Background: A healthy and active pregnancy period benefits both the mother and the fetus indicating the value of antenatal exercise knowledge and which was not as well discussed. Pregnant women who pay little attention to antenatal exercise and physical activity may gain too much weight and experience additional problems during and even after pregnancy.

Objective: To evaluate the knowledge, attitudes, and practices related to antenatal exercises and to identify the levels of physical activity among the pregnant women.

Methodology: The Polish Version of the Pregnancy Physical Activity Questionnaire (PPAQ-Pi) and the knowledge Attitude and Practice Questionnaire (KAP) were used in a descriptive cross-sectional study with a sample size of 137 pregnant women to gauge their level of physical activity and knowledge. We determine the relationship between age, miscarriage history, and knowledge score using a chi-square. Physical activity and KAP patterns were interpreted as Frequency tables. SPSS version 25 was used for data entry and analysis.

Results: Current study show that 55% of participants have adequate knowledge of antenatal exercises, while 44% lack sufficient knowledge. 47% of women engage in physical activity, whereas 51% do not meet the recommended levels.

Conclusion: This study explored pregnant women (primigravida, multigravida) knowledge and practices regarding antenatal exercises and physical activity. Factors like age, family size, and daily habits were found to impact their understanding and adoption of healthy physical activity during pregnancy.

Keywords: Antenatal, Exercise, Pregnancy, Physical Activity

Introduction

Regular exercise has generally been demonstrated to enhance conditioning, decrease the muscle and skeletal problems that are typically associated with pregnancy, promote wellness, enhance body image, and lessen weight gain in mothers.¹ Regular exercise throughout pregnancy also helps to maintain or improve physical conditioning, prevent weight gain, and promote psychological well-being.

Pregnancy-related physical activity can potentially enhance cardiovascular health, depending on its type, frequency, and intensity. To ensure that the patient has no contraindications, a thorough clinical evaluation is required before recommending and implementing a physical activity program. Women's lives now revolve around exercise, which is also crucial for prenatal care.² On most days of the week, pregnant women should be able to engage in moderate activity for 30 minutes. According to the American Congress

of Obstetricians and Gynecologists (ACOG) and the National Institute for Health and Care Excellence (NICE), antenatal exercise (ANEx) has few risks along with many advantages, but the changes are important according to the mother's and the fetus needs.³ Most pregnant women fall below the ACOG recommendations for sedentary behavior, with a high prevalence of sedentary behavior (76-79%). One of the most crucial treatments for reducing maternal and newborn mortality worldwide is antenatal care. Common pregnancy-related problems require high-quality prenatal treatments and antenatal care.⁴

Exercises and active lifestyle during pregnancy relax the abdominal muscles and reduce stiffness, aiding the developing baby. The pelvic floor muscles, which can strain during birth, are strengthened with Kegel exercises. Robust pelvic floor muscles prevent both bladder and bowel leakage. Techniques for breathing and relaxation are also useful for managing labor pain and emotional stress. Rapid breathing brought on by aerobic exercise raises the heart rate, blood flow, and oxygen needed by the muscles.⁵ Swimming, dancing, calisthenics, and strolling can all do the same thing. Additionally, antenatal activities prevent excessive gestational weight gain and reduce the formation of fat tissue. Programs for prenatal exercise and pregnancy health management must involve professionals such as physical therapists. Although the benefits of these activities have been established, it is imperative to increase awareness among the local populace, who currently support bed rest and minimal activity throughout the antenatal period.³

Frequent moderate physical exercise by healthy pregnant women is favorably associated with the health of the mother, fetus, and newborn. The health of the woman and her unborn child are directly related, and research suggests that physical exercise during pregnancy has an epigenetic effect that promotes a balanced and healthy intrauterine environment both during and beyond the gestational period.⁶ Similarly, and directly related to the mother's and her unborn child's health, research suggests that physical activity during pregnancy has an epigenetic effect that promotes a balanced and healthy intrauterine environment, which is the foundation of health during and after pregnancy.^{7, 8} A worldwide review of the scientific literature has demonstrated a favorable correlation between the well-being of the mother, fetus, and infant and the frequent practice of moderate physical activity by healthy pregnant women.⁹ Women did not believe that exercise had any beneficial effects during pregnancy, and their understanding of the topic was below average. Inadequate prenatal exercise instruction was the primary cause of the lack of information.¹⁰ So, this study was conducted to

ascertain pregnant women's awareness of antenatal exercise and to assess the pregnant women's degree of physical activity.

Methodology

The Cross-sectional survey study was conducted in Gynecology and Obstetrics OPDs of Combined Military Hospital (CMH) and National Institute of Health (NIH), Pakistan. The study was completed over 06 months (June 2024- December 2024) after the approval of the synopsis with ECCR Ref no. **(BI-117/DPT-2024)**. Pregnant women in the hospitals admitted before delivery were included in the study. The minimum sample size was estimated using the single population proportion formula with a 95% confidence interval, 8.6% margin of error, and an expected proportion of 50%. Given an unknown large population, this yielded a required sample of 130 participants. Data of 137 pregnant women was collected. A non-probability convenient sampling technique was applied to select the females. Knowledge, attitude, and practice questionnaire and the Polish version of the pregnancy physical activity questionnaire were used. The reliability of the instruments was assessed using Cronbach's alpha. The Polish Version of the Pregnancy Physical Activity Questionnaire (PPAQ-PI) showed excellent reliability ($\alpha = 0.783$) and the knowledge Attitude and Practice Questionnaire (KAP) also demonstrated excellent reliability ($\alpha = 0.918$). After informed consent, eligible participants were recruited for the study. Demographic Data (i.e., age) of all participants were recorded on a self-structured questionnaire. Data was collected through the questionnaire KAP (knowledge, attitude, and practice), and PPAQ-PI (Polish version of physical activity level). For descriptive analysis frequencies and percentages were used. Data was analyzed through statistical packages for social sciences (SPSS version 25). Inclusion Criteria include participants aged 20-35 years, housewives or working, and women without any underlying disease. Exclusion Criteria included participants unwilling to participate, associated medical disorders, and illiterate.

Results

The demographics including Age and history of miscarriage are shown in the following figures 1 and 2 respectively. Most females between ages 24- 27 were recruited in this study, while most of the females had no history of miscarriage.

Figure 03 shows the overall physical activity among pregnant women with 55% having less than 50 and 45% having greater than 50 score indicating that more women have lower levels of physical activity.

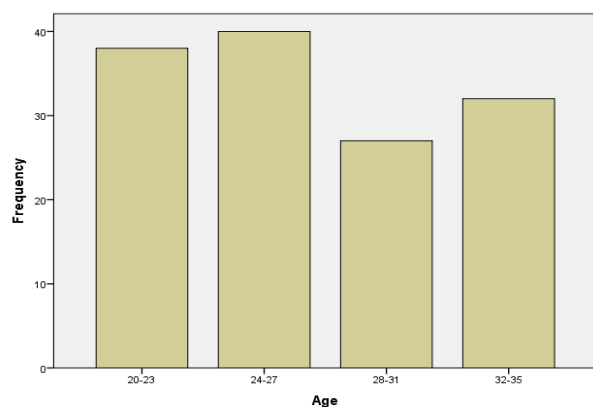


Figure 1: Age of the participants

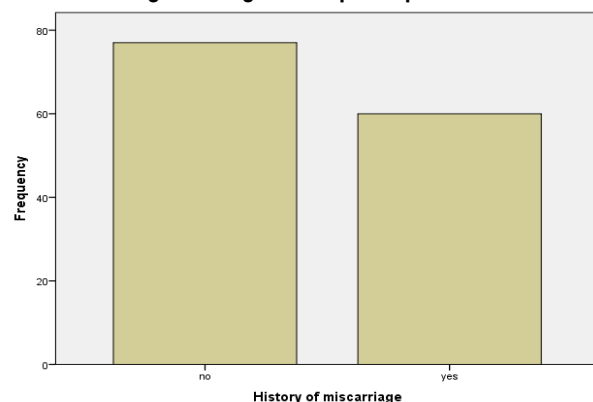


Figure 2: History of miscarriage among the participants

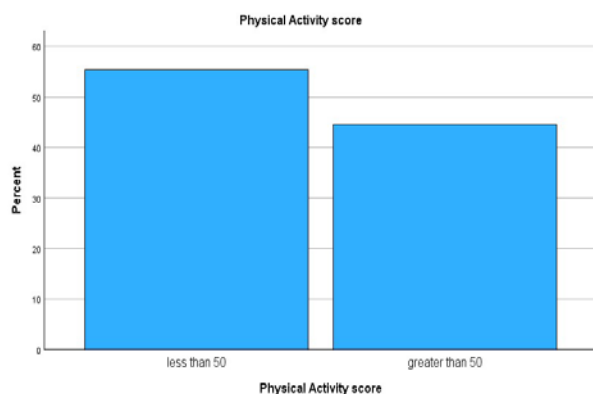


Figure 3: Physical Activity Score

Knowledge, attitude and practice of antenatal exercises; whereby 76% have adequate knowledge and 23.4% do not have adequate knowledge, 81% know ANEx is essential and 19% do not think it is important. 56.2% believe ANEx suits our culture and 43.8% think it's not. 70.1% think ANEx does not harm my baby and 29.9% think it does. 65.7% believe ANEx will help me get back to shape and 34.3% think it's not. 59.9% have good family support and 40.1% do not. 46.0% have enough time to exercise and 54% do not have time. 33.6% like to do exercise and 66.4% do not like to do

exercise. 58.4% think ANEx will prevent complications and 41.6% do not think this. 68.8% think ANEx will promote faster recovery in post-natal stage and 31.4% do not know. 46% think ANEx is better as it is according to individuals needs and 54% do not think. 62.8% think ANEx can give a feeling of energetic and 37.25% do not think this. 68.6% think ANEx must be done by advice and 31.4% do not think. 39.4% practicing ANEx in their current pregnancy and 60.6% do not think this. 39.4% practicing ANEx in current pregnancy and 60.6% do not practice. This table also shows that 62.8% do brisk walking and 37.2% do not do this. 8% do relaxation exercises and 92% do not do this. 9.5% agree to do breathing exercises and 90.5% do not agree. 8.8% do ankle and toe exercises and 91.2% do not know this. 5.8% do back care exercises and 94.2% do not. 3.6% know about aerobics and 96.4% do not know about this. 5.1% do pelvic floor exercises and 94.95 do not know this. 5.8% know about yoga and 94.2% do not know this. 32.1% think the exercise is adequate and 67.9% do not think so. (Table 1)

In preparing meals 13.1% spend no time, dressing, bathing, feeding while you are sitting 20.4% spend no time, dressing, bathing, feeding while you are standing 19.7% spend no time, playing with children while you are sitting or standing 33.6% spend no time, playing with children while you are walking or running 59.1% spend no time, 48.2% spend no time carrying children, taking care of older adults, 61.3% spend no time, sitting and using a computer or writing, while not at work 76.6% spend no time, Watching TV or a video 48.9% spend no time, 86.1% spend no time playing with pet, 30.7% spend no time in shopping, in heavier cleaning 77.4% spend no time, 89.1% spend no time mowing while on a riding mower, in gardening 89.1% spend no time, walking slowly to go places 47.4% spend no time, walking slowly to go places such as bus or school 47.4% spend no time, driving or riding in a car or bus 62% spend no time, walking slowly or exercise 55.5% spend no time, walking more quickly or exercise 82.5% spend no time, walking quickly up for fun and exercise 93.4% spend no time, in Jogging 94.9% spend no time, in swimming 97.1% spend no time and in dancing 97.1% spend no time. (Table 2)

The association of overall knowledge score with age and history of miscarriage by applying the Chi-square test which shows non-significant results. (Table 3)

Table 1: Knowledge, Attitude and Practice (KAP) towards Antenatal Exercises		
Overall, Knowledge Score		
	Frequency	Percent
Adequate Knowledge (>12)	105	76.6
Inadequate Knowledge (<12)	32	23.4
Attitude towards Antenatal Exercises		
Statement	Yes	No
	Frequency (%)	Frequency (%)
ANEx is Essential	111 (81)	26 (19.0)
ANEx Suits Our Culture	77 (56.2)	60 (43.8)
ANEx Does Not Harm Baby	96 (70.1)	41 (29.9)
ANEx Helps Rapid Postnatal Recovery	43 (68.8)	94 (31.2)
ANEx Prevents Complications	80 (58.4)	57 (41.6)
ANEx Helps Get Back in Shape	90 (65.7)	47 (34.3)
Family Support Available	82 (59.9)	55 (40.1)
Enough Time for Exercise	63 (46)	74 (54)
Likes Doing Exercises	46 (33.6)	91 (66.4)
Individualized Exercise is Better	63 (46)	74 (54)
Exercise Gives an Energetic Feel	86 (62.8)	51 (37.2)
Exercise Should be Done on Advice	94 (68.6)	43 (31.4)
Practice of Antenatal Exercises		
Exercise Type	Yes	No
	Frequency (%)	Frequency (%)
Practicing Antenatal Exercise Currently	54 (39.4)	83 (60.6)
Brisk Walking	86 (62.8)	51 (37.2)
Relaxation Exercises	11 (8.0)	126 (92.0)
Breathing Exercises	13 (9.5)	124 (90.5)
Ankle and Toe Exercises	12 (8.8)	125 (91.2)
Back Care Exercises	8 (5.8)	129 (94.2)
Aerobics	5 (3.6)	132 (96.4)
Pelvic Floor Exercises	7 (5.1)	130 (94.9)
Yoga	8 (5.8)	129 (94.2)

Table 2: Physical Activity Pattern (PPAQ)	
Activity	Majority Spending No Time
	Frequency (%)
Preparing Meals	18 (13.1)
Dressing, Bathing Sitting	28 (20.4)
Playing Sitting or Standing	46 (33.6)
Carrying Children	66 (48.2)
Taking Care of Elderly	84 (61.3)
Sitting Using Computer	105 (76.6)
Watching TV/Video	67 (48.9)
Heavier Cleaning	106 (77.4)
Walking for Travel	65 (47.4)
Jogging	130 (94.9)
Prenatal Exercise Class	128 (93.4)
Swimming	133(97.1)
Dancing	133 (97.1)

Table 3: Association of Knowledge with Age and Miscarriage		
Factor	p-value	Significant
Age vs Knowledge	0.540	No
Miscarriage History vs Knowledge	0.419	No

Discussion

The current study revealed the knowledge and attitude towards antenatal exercises and physical activity levels in pregnant women in Islamabad and Rawalpindi. Results obtained through the KAP and PPIQ questionnaire showed that 56% had adequate knowledge of antenatal exercises and 44% had inadequate knowledge about them, study also showed that 47% of women have adequate physical activity levels and 51% have inadequate physical activity levels. Variables that impact knowledge and physical activity level include the number of children, history of miscarriage, age, knowledge of antenatal exercises, attitude and practice toward exercise, and daily chores (preparing meals, clothing children, taking care of adults, playing with children, using phone or watching TV, going out for shopping or grocery, heavy cleaning, traveling in car or bus or walking) all these factors influence knowledge and physical activity level.¹⁰ The results of this investigation are corroborated by a facility-

based survey that was carried out between November and December of 2021. Data was gathered through a standardized questionnaire and an interview. After being cleaned, coded, and entered, the data was exported into SPSS 25 for examination. The study had a 100% response rate since every participant finished the interviews. A mean score of 42.2% was obtained for acceptable knowledge.¹¹ During pregnancy, 63.7% of respondents had positive attitudes regarding physical activity, and 35.8% of them practiced it regularly.¹² In terms of exercise, the majority of participants (95.9%) walked, while just 11 (8.9%) women engaged in pelvic floor exercises, which were the most and least popular. Regarding exercise awareness, the well-known advantages of physical activity were reducing excess weight (72.1%) and boosting energy (53.2%).¹³

The study validates our findings by evaluating Thai pregnant women's knowledge, attitudes, and practices (KAP) regarding pelvic floor muscle training (PFMT). A total of 110 pregnant Thai women who visited a tertiary care hospital's antenatal clinic were chosen. The gestational age was 20.8±10.8 weeks, and the mean ±SD of age was 30.5±5.4 years. Only seventeen participants (27.9%) properly answered all the questions, which are categorized as perceptive, despite sixty-one participants (55.5%) recognizing PFMT. Their educational attainment and PFMT expertise did not correlate ($p = 0.63$). Most of them (98.4%) were aware that PFMT may be done while pregnant and thought it had no bearing on the outcome of the pregnancy. Only 10.7% of the women who were aware, however, engaged in irregular PFMT throughout pregnancy. Most women believed that PFMT improved their quality of life, sex, emotions, and health. Information on PFMT and encouragement to continue practicing the exercises.¹⁴

This study demonstrated that one of the fundamental human requirements is physical activity, which is also the most important need for preserving and improving health at every stage of life. Nowadays, the fourth most important risk factor for death worldwide is physical inactivity.¹⁶ Analyzing the degree of physical activity among Polish women in their reproductive years (before to conception) and pregnant women was the aim of the study that was presented.¹⁷ The study group included 6,252 pregnant mothers and 3,940 women (730 girls under the age of 15 and 3,210 women above the age of 15). School children and students were

surveyed in the last quarter of 2011, while pregnant women were surveyed twice: in the second quarter of 2010 and the third quarter of 2011.¹⁸

This study confirmed our findings by analyzing the correlation and agreement between subjective and objective measures of physical activity to advise researchers and medical professionals on the best way to measure physical activity.¹⁹ Total of 48 pregnant women between the ages of 26 and 28 weeks were recruited. The Actigraphy accelerometer and Yamax pedometer were worn for five to seven days while living freely and following the completion of the International Physical Activity Questionnaire (IPAQ). We compared the more reliable and accurate accelerometer data with IPAQ and pedometer estimates of activity.²⁰ The pedometer and accelerometer showed a strong correlation in estimating daily steps ($\rho = 0.69$, $p < 0.01$) and a low systematic error with good absolute agreement (mean difference: 505 ± 1498 steps/day).²¹

Limitations: A small sample size may be linked to an increased risk of error. Women with pre-existing medical conditions or those who develop conditions during pregnancy, such as gestational diabetes, were excluded from this study. The results and conclusion of the study were only applicable to the population of Islamabad and Rawalpindi.

Recommendations: This study will help enhance awareness among pregnant women about the importance of physical activity and encourage them to engage or incorporate it into their daily routine. In addition, future research on pregnant women also considering primigravida pregnancy should investigate environmental factors, posture, and positioning factors also investigate to determine whether any of these factors are primary contributors to pregnancy complications. Furthermore, it is recommended that this study should be conducted across diverse cities in Pakistan to ensure the generalizability of the results.

Conclusion

The present study concludes most participants have adequate knowledge about antenatal exercises and more than 50% of participants do not engage in physical activity and less than 50% of participants have adequate knowledge. A significant majority of participants showed adequate understanding of antenatal exercise, However, a substantial proportion (over 50%) failed to engage in physical activity, revealing a notable gap between knowledge and action.

Conflict of Interest: None

Funding Sources: None

Data Availability Statement: The datasets generated and/or analysed during the current study are not publicly available due to ethical, legal, and participant confidentiality considerations but may be available from the corresponding author upon reasonable request, subject to institutional approval where applicable.

Disclaimer: We as authors want to declare that we used AI-assistant tools in this article for improving language. We authors are fully responsible for the accuracy, originality, integrity, and scientific validity of this article.

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Author's contribution: ^{1,5,6} Substantial contributions to the conception or design of the work for the acquisition, analysis or interpretation of data for the work. ⁴⁻⁶ Drafting the work or reviewing it critically for important intellectual content, ¹⁻⁶ Final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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