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Antenatal exercise in Saudi Arabia: Knowledge, attitude and practice

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Abstract

Aim: The objective of this study was to estimate the knowledge, attitude and practice of antenatal exercises among mothers in Saudi Arabia.

Methods: A cross sectional study evaluated 399 mother's knowledge, attitude and practice regarding antenatal exercises in Saudi Arabia.

Results: The majority of participants have good knowledge, a positive attitude and good practice. The knowledge about antenatal exercise was significantly associated with the educational level only, while knowledge about the contradictions was influenced by age. Other variables (medical condition, complications or number of pregnancies) showed no association.

Conclusions: Whilst maternal knowledge and attitudes were generally good, some participants demonstrated a demonstrably low level of knowledge regarding the importance of antenatal exercise, a finding which can be attributed to inadequate health education programmes. One possible response to the dearth of knowledge could be the execution of a health education initiative offered to all pregnant women.

Keywords: Pregnancy health, exercise, antenatal exercise, mother's knowledge, KAP study, pregnant women, knowledge, attitude, practice, Saudi Arabia

Introduction

Physical exercise is a bodily activity that improves or maintains physical fitness and overall health and wellness ^[1].

Pregnancy is an ideal time for maintaining or adopting a healthy lifestyle ^[2]. The benefits of prenatal physical activity for both mother and infant are widely acknowledged and considered to include weight control, mood enhancement, the reduction of discomfort, and the sustenance of energy levels. There are also indications of a correlation between prenatal exercise and a reduced risk of gestational diabetes. Moreover, exercise can help prepare mothers for the demands of labour and delivery. Babies born to mothers who have actively participated in prenatal exercise have reduced body fat, more advanced brain functioning, and healthier hearts ^[3].

Mothers strive to act according to the best interests of their unborn children, during the course of which endeavour they are the recipients of vast quantities of information and guidance. However, research in the area of maternal awareness of prenatal exercise is limited. In particular, more evidence is required as to levels of knowledge, the variables which influence knowledge, types of knowledge, and attitudes towards knowledge. The overwhelming evidence regarding insufficient knowledge about prenatal exercise indicates that poor education is the principal determinant ^[4].

Literature review

Research into the prenatal exercise knowledge, attitudes, and practices of pregnant women in Ethiopia indicated both poor awareness and positive attitudes. It also revealed poor adherence to recommended levels of prenatal exercise amongst expectant mothers (39.5%) in Ethiopia ^[5].

A recent study in Iran uncovered a meaningful correlation between the educational level of expectant mothers and their appreciation of the importance of prenatal exercise ^[4].

Nevertheless, there was no discernible relationship between knowledge related to prenatal exercise and age, parity, income, maternal weight, and comorbid conditions, such as diabetes or hypertension.

A sample of 250 pregnant women in Lahore was evaluated to determine their levels of knowledge regarding prenatal exercise. The study concluded that the most commonly known exercises involved breathing techniques, relaxation methods, and back care exercises. Moreover, any measures designed to address back pain, excess weight gain, muscle strengthening, and the ability to manage labour were regarded positively. The Lahore research concluded that most participants had insufficient awareness of prenatal exercise and that 87.2% were unenthusiastic about prenatal exercises [6].

Ribeiro *et al.*, 's research investigated expectant mothers in receipt of antenatal care at National Health Service (Sistema Único de Saúde – SUS) at primary health care units. The participants in this study had no physical impediments which might comprise an exercise-related risk. Whilst 65.6% of the women possess adequate knowledge and 93.8% viewed prenatal exercise favourably, only 20% of the expectant women in the study undertook recommended levels of exercise [7].

This contrasts with the findings of a 2017 study wherein 87.2% of the participants expressed negative attitudes towards prenatal exercise. Attitudes in this research were found to be shaped by variables such as time availability, affordability, perceived benefits, and barriers related to family, work, or social commitments [8].

According to the American College of Obstetricians and Gynecologists, further research is required in order to understand the link between exercise and different gestational conditions and outcomes. Only then will it become possible to elucidate relevant methods of guidance and counselling. It is also necessary to expand research into prenatal physical activity in order to determine its impact upon maternal, fetal, and infant health [9].

The literature review reveals considerable evidence of the advantages of physical activity during pregnancy. However, thus far, no research specific to the Kingdom of Saudi Arabia has been conducted. The current study seeks to redress this gap in scholarship by both examining prenatal exercise knowledge amongst mothers in Saudi Arabia and identifying the variables which shape knowledge levels. In addition, this research explores the determinants of prenatal exercise practices and attitudes.

This research aims to remedy the absence of data pertaining to the Saudi Arabian context, thereby enabling relevant practitioners to undertake necessary steps to augment appreciation of the importance of prenatal exercise. Moreover, this study supports contemporary initiatives to advance obstetric health provision in Saudi Arabia.

Methodology

The research design is cross-sectional and was implemented in the Kingdom of Saudi Arabia between 1 August 2020 and 31 October 2020. The unprecedented conditions arising as a consequence of the COVID-19 pandemic precluded access to Obstetric clinics. Hence, it was necessary to obtain data using a self-administered online questionnaire, which was distributed via social media platforms, including Twitter, Telegram, and WhatsApp. Convenience sampling was employed to recruit participants

who were either pregnant or who had given birth in the preceding twelve-month period to eliminate recall bias. Mothers of various age groups (aged from 18-49 years), gestational age and parity were included. The snowball sampling method was harnessed whereby existing participants were invited to recommend other potential participants.

The single proportion formula was employed to determine the sample size. Thus, the estimated number of participants was deemed to be 384, with a 95% confidence level, a 5% margin of error, and a 50% prevalence level [5]. In total, 420 participants were initially selected in order to generate an enhanced response rate. Once the questionnaires containing incomplete responses were eliminated, the data from 399 was available for analysis.

The survey utilized in the current research is a modified version of the survey employed to evaluate prenatal exercise knowledge amongst expectant mothers in Ethiopia [5].

Originally constructed in English, two bilingual translators with professional skill in English and Arabic translated the questionnaire into Arabic and then back-translated into English. After translation, a family physician and a community medicine specialist checked the tool for meaning preservation, and content validity.

The questionnaire tool was piloted on ten participants in order to evaluate its validity and consistency. These participants were subsequently excluded from the main study. The small study also enabled to time required to complete the questionnaire, the information, and the language to be gauged.

The questionnaire commenced with a section requesting demographic data from the expectant mothers, including age, nationality, parity, educational level, and occupations. There were twenty-five questions pertaining to knowledge of prenatal exercise. These were divided into three domains, to wit: benefits (seven questions), precautions (five questions), and contraindications (thirteen questions). Sixteen questions were designed to gather data related to maternal attitudes towards prenatal physical activity. The final set of questions focused on the amount of exercise in which the pregnant women participated and the existence of any barriers to exercise performance.

Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA) was employed to conduct the data analysis, wherein the continuous variables were represented as mean \pm standard deviation and the categorical variables were presented as percentages. A t-test and ANOVA test were applied in respect of the continuous variables, whilst a chi square test was employed for the categorical variables. The presence of a p-value of 0.05 was deemed to possess statistical significance.

Institutional ethical permission for the study was obtained. The participants were only enrolled after giving informed consent.

Research results

The finalized study sample comprised 399 mothers, with a mean (\pm SD) age of 33.1 (\pm 1.4). The largest groups of participants (33.6%) were in the age group of 23-27 years old, 94% of participants were Saudi nationals, 67.7% have a university educational level, and 34.6% of participants were employed. In terms of gestation, 21.6% of the women were in their third trimester and 50.9% had given birth in the preceding twelve-month period. Furthermore, 54.1% of the

participants had experienced pregnancy complications, and 54.6% had experience of normal deliveries. Table 1 demonstrates the extent to which the participants were aware of the advantages of prenatal exercise. Typically, the participants had an elevated knowledge of the benefits of physical activity, the mean (\pm SD) total knowledge score being 1.741 (\pm 0.297). The lowest score was recorded in respect of the question asking the

participants whether they knew that prenatal exercise could reduce the risk of gestational diabetes. The correct answer of yes was supplied by 60.4% of participants, wherein there was a mean score of 1.56 (\pm 0.607). Conversely, the highest score was for the question related to the benefits of exercise in relation to pelvic floor strengthening, which was correctly answered by 89.7% of respondents, the mean score being 1.89 (\pm 0.315).

Table 1: Mothers’ knowledge of antenatal exercises benefits

| | | Yes | Don't know | No | Mean | Std. deviation |
|---|---|-------|------------|-----|------|----------------|
| Reduces risk of back pain during pregnancy | N | 304 | 89 | 6 | 1.75 | 0.469 |
| | % | 76.2% | 22.3 | 1.5 | | |
| Prevents excessive weight gain in pregnancy | N | 280 | 81 | 38 | 1.61 | 0.656 |
| | % | 70.2% | 20.3 | 9.5 | | |
| Strengthens pelvic floor muscle in pregnancy | N | 358 | 40 | 1 | 1.89 | 0.315 |
| | % | 89.7% | 10.0 | 0.3 | | |
| Reduce risk of GDM | N | 245 | 128 | 24 | 1.56 | 0.607 |
| | % | 61.4% | 32.1 | 6.0 | | |
| Increases energy and stamina during pregnancy | N | 312 | 74 | 11 | 1.76 | 0.489 |
| | % | 78.2% | 18.5 | 2.8 | | |
| Better ability to cope with labour and delivery | N | 342 | 47 | 5 | 1.86 | 0.387 |
| | % | 85.7% | 11.8 | 1.3 | | |
| More rapid post-natal recovery | N | 310 | 81 | 5 | 1.77 | 0.450 |
| | % | 77.7% | 20.3 | 1.3 | | |
| Weighted Mean | | 1.741 | | | | |
| Std. Deviation | | 0.297 | | | | |

Table 2: Weighted Level

| Weighted mean | Level |
|---------------|---------------------------------------|
| 0 – 0.66 | Low level of Benefit |
| 0.67 – 1.32 | Moderate level of Benefit |
| 1.33 – 2 | High level of knowledge about Benefit |

The score regarding the knowledge of the benefits of prenatal exercise had a significant correlation (P 0.009) with educational level. However, there were no significant correlations with the variables of age, medical status, complications, or parity, all of which were recorded as $P > 0.05$.

There was a high correct response level to the question concerning the need to take precautions when exercising, with a total mean score of 1.422 (\pm 0.306) (see Table 5) Conversely, 55.4% of respondents, indicating a mean score of 1.37 (\pm 0.791), erroneously believed there was no need to consumer additional water whilst exercising, despite the fact that the need to consumer water prior to exercise was appreciated by 64.9%, thereby indicating a mean score of 1.55 (\pm 0.684). Most respondents (84.7%) incorrectly assumed it was necessary to consume additional caffeine. Overall, no correlations were identified between the precaution level and any socio-demographic variables.

Table 3: Mothers’ knowledge of antenatal exercises precautions

| | | Yes | Don't know | No | Mean | Std. deviation |
|---|---|-------|------------|------|------|----------------|
| Drink plenty of water before exercise | N | 259 | 91 | 43 | 1.55 | 0.684 |
| | % | 64.9 | 22.8 | 10.8 | | |
| Drink plenty of water during exercise | N | 76 | 93 | 221 | 1.37 | 0.791 |
| | % | 19.0 | 23.3 | 55.4 | | |
| Do exercise outside when it is humid | N | 217 | 138 | 42 | 1.44 | 0.678 |
| | % | 54.4 | 34.6 | 10.5 | | |
| Standing or lie on back during exercise | N | 90 | 183 | 124 | 0.91 | 0.730 |
| | % | 22.6 | 45.9 | 31.1 | | |
| Drink plenty of caffeine | N | 338 | 50 | 9 | 1.83 | 0.433 |
| | % | 84.7 | 12.5 | 2.3 | | |
| Weighted Mean | | 1.422 | | | | |
| Std. Deviation | | 0.306 | | | | |

Table 4: Show the Weighted

| Weighted mean | Level |
|---------------|------------------------------|
| 0 – 0.66 | Low level of Precaution |
| 0.67 – 1.32 | Moderate level of Precaution |
| 1.33 – 2 | High level of Precaution |

Participant knowledge of contraindications was generally good, the mean score being 1.439 (\pm 0.340). Correct answers to questions regarding gestational diabetes and premature

labour represented the extremes, with correct answer scores of 12.3% and 87.5% respectively. Knowledge levels demonstrated correlations with respondent ages, but not with educational level, medical status, complication, or parity. The respondents presented with an overall positive attitude towards prenatal exercise, the mean score being 1.43 (\pm 0.336), wherein the most positive attitude concerned the propositions that exercise expedites normal delivery, with a

score of 1.86 (± 0.391), and that prenatal exercise raises energy levels, the mean score for this point being 1.82 (± 0.485). The most negative responses related to the questions Have you ever been advised to do exercise? And do you have sufficient information on exercising during pregnancy? Scoring 0.82 (± 0.971), and 0.92 (± 0.956) respectively. The only variable which correlated significantly with attitudes towards prenatal exercise was age ($P < 0.015$).

In respect of exercise performance, 45.9% reported taking exercise three or more times per week, whilst 35.8% engaged in prenatal exercise less than once per week. Ankle-toe exercise was undertaken less than three times weekly by 15.3%, and 75% stated they did not do this exercise at all. The abdominal strengthening exercise was neglected by almost 70% of participants, as were pelvic floor exercises by 53.9%. Over one-third of respondents reported practicing breathing exercises ≥ 3 times a week, with 27.1% performing these exercises < 3 times a week. Overall, the respondents reported a reasonable level of exercise performance, the mean total score being 0.70 (± 0.548).

There was a significant correlation ($P < 0.05$) between the variables of medical condition, pregnancy complications, and parity. Those free from medical conditions demonstrated higher performance levels, at 13.8% and 25.1% for ≥ 3 times and < 3 times per week respectively, compared with 4.8% and 8.8% for participants with medical conditions. In addition, 28.1% of participants with medical conditions reported non-performance, compared with 19.3% of respondents with no conditions. Hence, the p-value was 0.023.

Table 5 indicates the barriers which hinder the performance of prenatal exercise, wherein tiredness was reported as a challenge by 67.2% of the respondents, insufficient time by 52.6%, and inadequate guidance by 42.6%.

Table 5: Barriers to practice antenatal exercises

| | Yes | % | Rank |
|--------------------------------|-----|------|------|
| Lack of time | 210 | 52.6 | 2 |
| Lack of information/training | 170 | 42.6 | 3 |
| Harmful to fetus | 132 | 33.1 | 4 |
| Lack of family support | 54 | 13.5 | 6 |
| Feel tired | 268 | 67.2 | 1 |
| Don't like exercising | 47 | 11.8 | 7 |
| Family advise not to | 45 | 11.3 | 8 |
| Uncomfortable during pregnancy | 77 | 19.3 | 5 |
| Other | 44 | 11 | 9 |

Discussion

The principal objective of the current study is to evaluate the knowledge, attitudes, and practices of expectant mothers in Saudi Arabia in respect of prenatal exercise. The findings indicate generally positive attitudes, high knowledge levels, and reasonable levels of performance.

Research in Ethiopia revealed the existence of a low level of knowledge, low performance, and a positive attitude amongst expectant mothers [5]. These findings contrast somewhat with the results of the current study which revealed that pregnant women Saudi Arabia possess enhanced knowledge and practice. However, positive attitudes were present amongst both Saudi and Ethiopian women. Results emerging from research in India suggest that knowledge and performance are both lower there than

in Saudi Arabia [10]. However, attitudes in India were comparable to those in Saudi Arabia. The many differences between these national contexts might be a consequence of diverse educational levels, differences in the guidance offered to expectant mothers, and cultural factors.

The fact that most participants in the Ethiopian study were ignorant of the importance of pelvic floor exercises contrasts with the current study [5]. Specifically, pelvic floor strengthening, precipitous postnatal recovery, and the ability to manage labour scored highly as benefits of prenatal exercise. Other research has also demonstrated that exercise can assist back pain, ease labour and delivery, and reduce excessive weight gain [11]. High scores were noted in the Ethiopian research in respect of improved stamina and weight management [5]. Other studies have confirmed that expectant mothers regard prenatal exercise as beneficial to back pain, weight management, and labour and delivery [12, 13]. Observation-based research has revealed that exercise comprises a non-invasive therapy for GDM management and prevention amongst antenatal patients [14]. However, nearly 40% of respondents in the current study were unaware of the fact that antenatal exercise lessens the risk of GDM.

Knowledge of contraindications associated with prenatal exercise was lower amongst the respondents in the current research than was evident for the participants in the Indian study, not least in respect of diabetes and chest pain. Correct responses in relation to these two conditions scored 12.3% and 54.6% in the current study and 68%, and 71% in the Indian research [10]. Moreover, research by Ekelin *et al.* [15] revealed that, despite their positive attitudes, participants encountered difficulties in practicing exercises in the absence of support from antenatal care practitioners or family members. These finds accord with the conclusions reached in the current research wherein a lack of guidance coexisted with positive attitudes. Respondents in the current research reported hindrances, such as tiredness and lack of available time [15, 16, 17]. Other research [17, 18] has shown that attitudes to exercise were influenced by variables such as tiredness and poor information provision. The research in India [10] also reported that exercise performance has impeded by tiredness, insecurity, and poor information, thereby indicating that it is possible to use awareness programmes to motivate women who feel that exercise is unnecessary.

Other research has confirmed the value of prenatal exercise guidance, such as personal counselling, as a means of sustaining activity in expectant mothers [19].

There is also evidence that knowledge, attitudes, and practices are shaped by multiple traits, including age [20], educational level [17, 21], and experience [22]. The present research suggests that the only variable influencing appreciation of the advantages of prenatal exercise was maternal educational level, whilst age influenced knowledge of exercise contraindications. Similar results regarding contraindication knowledge emerged from the research conducted by Mbada *et al.*, However, this research identified no correlation between socio-demographic variables and knowledge of the benefits of prenatal exercise [11].

Research conducted in the past twenty years suggests a paradigmatic shift whereby positive attitudes regarding exercise in pregnancy have discernibly improved. That is, increasing numbers of expectant mothers are engaged in

various forms of physical activity [23, 24], thereby confirming the findings emerging from the current research.

To conclude, the present study comprises empirical evidence of the attitudes, knowledge, and practices of expectant mothers in Saudi Arabia in respect of prenatal exercise. This research represents an attempt to redress the lack of scholarship in this area. The findings indicate a need for health awareness initiatives regarding prenatal exercise. Enhanced appreciation of the benefits and contraindications associated with prenatal exercise can not only facilitate improved attitudes, engagement, and outcomes, but also reduce the burden on the health care system of avoidable pregnancy-related complications.

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