

# Exploring Primigravid Women's Awareness, Perception, And Practice With Pelvic Floor Muscle Exercises During Pregnancy: A Cross-Sectional Study

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## Abstract

**Background:** Pelvic floor exercise are recommended during pregnancy to strengthen pelvic floor muscles, potentially reducing urinary incontinence and aiding labor. However, the perception and practice of these exercises among primi gravid women remain under explored.

**Objective:.** The primary aim was to determine the level of awareness, perception, and practice of kegel exercise among primi gravid women. The secondary aim was to find the association between awareness perception and practice with participants' demographic characteristics.

**Methods** A cross-sectional study was conducted among 150 primigravid women attending antenatal clinics in at PMCH&RI, Chennai. Data were collected using a validated, self-administered questionnaire assessing socio demographic characteristics, Awareness, Perception and practice of Pelvic floor exercises. Descriptive and inferential statistics were used for analysis.

**Statistical Analysis:** Results were obtained as percentages. Chi-square test was used to check for the association between awareness and perception with variables such as age, educational qualification, occupation, family income, and parity

**Results:** According to the study's findings, 80.9% of participants knew a lot about PFME. Most people (65.9%) do PFME at home (81.3%), with the pelvic floor exercise being the most commonly used (93.3%). Forgetfulness was revealed to be the main factor influencing the use of PFMEs ( $2.81 \pm 0.85$ ). Understanding, instruction

There was a significant correlation between attainment and PFME practice ( $p = 0.001$  and  $p = 0.041$ , respectively).

**Conclusion:** Expectant mothers actively practise and are knowledgeable about PFME. However, forgetfulness has been found to be the main element influencing the habit. The use of PFMEs was positively impacted by knowledge and educational attainment. Therefore, it is recommended that the PFMEs program be integrated into weekly prenatal sessions and that pregnancy education be promoted.

**Keywords :** Pelvic floor muscle exercises, primigravid women, Perception, Pregnancy.

## 1. Introduction

Pelvic floor exercise named after Dr. Arnold Kegell, involve repeated contraction and relaxation of pelvic floor muscles to enhance strength and endurance. These exercises are particularly beneficial during pregnancy, as they support pelvic organs, improve bladder control, and prepare muscles for labor. Primigravid women, experiencing pregnancy for the first time, may face unique challenges due to limited prior exposure to antenatal care practices.

Pregnancy and delivery are physiologic methods, unique for all women, which usually progress normally. Additionally, assuming there are no problems for either the mother or the fetus, the pregnancy period is a humble, joyous, and healthy time. Therefore, one of the most important and fundamental functions of mother and child health promotion

Public health organizations and Millennium Development Goals. Prenatal care is well-known for preventing pregnancy-related problems, managing pregnancy and delivery-related medications, and assisting in the management and modification of biological, behavioral, and social risks to maternal health and gestation. (Tuncalp et al., 2017 &Baghdari et al., 2016).

The uterus, vagina, bladder, and colon are among the organs of the pelvis that are supported by the pelvic floor, a network of muscles, ligaments, and connective tissues. By allowing the bladder's assortment to expel urine while also calming the muscles around the bladder, the pelvic floor muscles function as assortment. urethra to facilitate the discharge of urine. Similar muscle motions occur during sexual activity, birth, and evacuation (Balaya et al., 2016).

Exercise during pregnancy is a prerequisite for a healthy conception, fetal growth, birth, and the puerperium period, according to extensive scientific research. According to a groundbreaking 2015 research by the American College of Obstetricians and Gynecologists, inactivity during pregnancy is a dangerous attitude. Health care professionals that specialize in physical activity and are more qualified in relation to international educational standards ought to encourage mothers to engage in prenatal exercise. (2018, Szumilewicz)

Pelvic floor exercise are a sort of physical activity that can be done while pregnant. It involves relaxing and contracting the pelvic floor muscles at different times throughout the day for a certain amount of time in order to strengthen them. In addition to helping to identify and reduce risks like a lower rate of prolonged second stage of labor, a lower rate of episiotomy, a lower incidence of cesarean section, perineal pain, and a lower degree of postpartum pain, Pelvic floor exercise strengthen the pelvic floor muscles, which may be extended during delivery (Elsehemy et al., 2019; Elsebeiy, 2018 & Farrag et al., 2016).

Maternity nurses are essential in protecting women's health from adverse childbearing experiences. Therefore, they should implement a number of measures during pregnancy to lower the risk of a protracted second stage of labor, lower the incidence of perineal tears after delivery, and lower the degree of discomfort associated with episiotomy. One of these responsibilities is to inform expectant mothers about the value of prenatal Pelvic floor exercise (Elsehemy et al., 2019; El-Shamy & Abd El Fatah, 2018).

Urinary incontinence (UI) affects 35–67% of pregnant women, with stress urinary incontinence being the most common type. Pelvic floor exercise have been shown to reduce the incidence and severity of UI when performed consistently. Despite these benefits, studies suggest variable knowledge and practice levels among pregnant women, particularly in low-resource settings.

This study focuses on primigravid women to understand their perceptions and practices regarding Kegel exercises, aiming to identify barriers and facilitators to inform targeted interventions. The research question was: What are the knowledge, attitudes, and practices of primigravid women regarding Pelvic floor exercise during pregnancy, and what factors influence their engagement

### **Significance of the study**

Reducing the number of births via cesarean section is the aim of Health People 2030. According to the most recent Egypt Demographic and Health Survey (EDHS), 52% of women in Egypt had a cesarean section during the past ten years. Researchers have discovered that Pelvic floor exercise during pregnancy may help lower the rate of cesarean sections (Abdeltawab et al., 2018 and ElShamy&AbdElFatah,2018).

Pregnant women should engage in physical activity to maintain their physical and mental well-being, according to evidence-based studies. Among its many advantages are risk reduction and the avoidance of problems such as caesarean sections, perineal tears, instrumental deliveries, and lumbo pelvic discomfort. (Davis & Artal, 2019; Canadian Guidelines, 2019).

Pelvic floor exercise training during the third trimester of pregnancy has many important health benefits for women, including improving the adverse maternal outcome, lowering the risk of episiotomy, prolonged labor, and perineal tears, and enhancing vaginal delivery. Larios et al. (2017), Elsehemy et al. (2019), and Abd-El Hamid et al. (2012). Although Pelvic floor exercise are crucial for maintaining women's health, they are neither a standard hospital procedure in Egypt or an essential component of nursing interventions. Thus, the purpose of this study was to evaluate the impact of Pelvic floor exercise on mother outcomes throughout the third trimester of pregnancy.

**SUBJECTS AND METHODS** Study design and population A cross-sectional analytical study was carried out between June and August 2023 at PMCH&RI. The participants in 1st and 2nd trimesters of pregnancy visiting Obstetrics Outpatient Department (OPD) at PMCH&RI and fulfilling the inclusion criteria were included in the study

**PARTICIPANTS** The study included women in the age group of 18–35 years who were in their 1st and 2nd trimester of pregnancy. Both Primiparous and multiparous women who are able to read and write in English, and Tamil languages were eligible to participate. In addition, pregnant females having co morbid conditions such as hypertension, gestational diabetes mellitus, and thyroid problems were also included. Participants who are unwilling to participate and cannot read and write were excluded.

**SAMPLE SIZE** The representative sample size required was 125.85, with a margin error determined as 5%, confidence level determined as 95%, and expected proportion was 0.91. We aimed to gather more than the estimated sample size to overcome potential exclusions.

**PROCEDURE** An ethical clearance was obtained from the institutional ethical committee of PMCH&RI. A convenience sampling design was used to select 150 participants visiting the obstetrics OPD at PMCH&RI satisfying the inclusion criteria. A semi-structured self-reporting questionnaire was used for the collection of data. The questionnaire included demographic data such as name, age, occupation, educational qualification, parity, and family income followed by close-ended questions on the health of the mother, physical activity, awareness of antenatal exercise, perception of antenatal exercise, and practice [Annexure]. Questionnaires were distributed in four languages, i.e., English, & Tamil Consent forms providing necessary information about the study and voluntary participation were obtained before the distribution of questionnaires

**Inclusion criteria** - Age 18 - 35 years - Can read and write. - Primipara and Gravida 2. - Third trimester (gestational age 28-32 weeks). - Previous normal vaginal delivery. - Singleton pregnancy. - Fetal in vertex presentation.

**Exclusion criteria** - High risk pregnancy - Pregnant women had indications for caesarean section

**Sample size calculation-** The sample size of the present study was calculated based on reviewing the records of the antenatal clinic KafrElSheikh Hospital for the admission number of the parturient women. The records revealed that approximately 116 women attended to antenatal clinic per year. Therefore, the recommended sample size for a population of 110, with a confidence level of 95% and a margin of error (degree of accuracy) of 5%. Accordingly, the total sample size was calculated as 110 of pregnant women, divided into two groups. The interventional group (n=55) who practice Pelvic floor exercise during 3rd trimester. The control group (n=55) who received a routine hospital antenatal care only.

The questionnaire was validated through a pilot study (Cronbach's  $\alpha=0.78$ ). It was administered in [language, e.g., English/local language] after obtaining written informed consent.

Data Analysis

Data were analyzed using SPSS version 25.0. Descriptive statistics (frequencies, percentages, means) summarized sociodemographic characteristics and responses. Chi-square tests assessed associations between knowledge, attitudes, practice, and sociodemographic variables. Logistic regression identified predictors of practice. A p-value  $<0.05$  was considered significant.

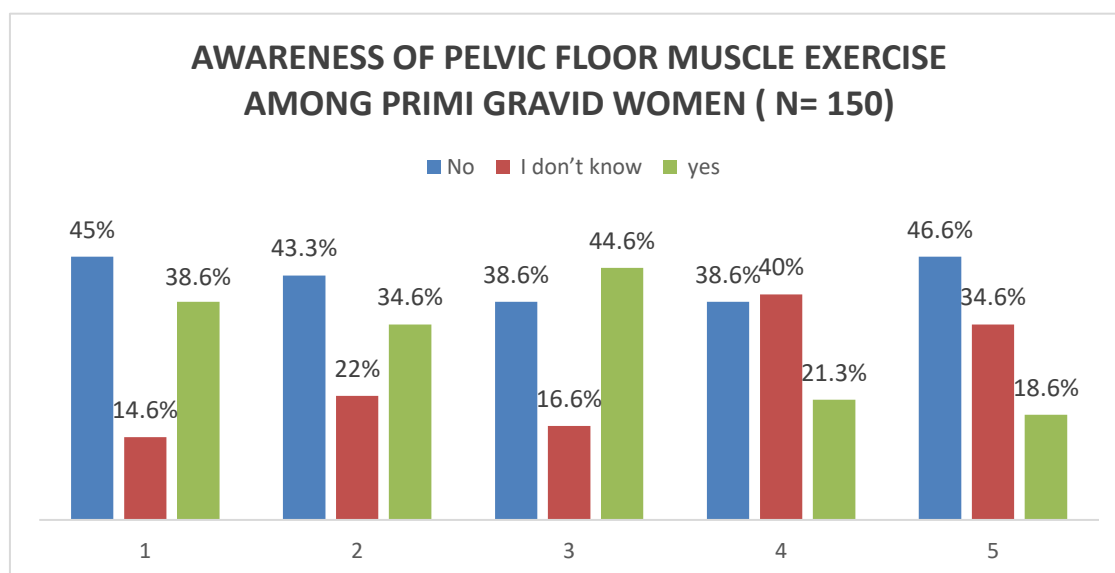
## RESULTS

**TABLE : 1 AWARENESS OF PELVIC FLOOR MUSCLE EXERCISE AMONG PRIMI GRAVID WOMEN ( N= 150)**

| S.NO | CHARACRERISTICS                                                                          | No        | I don't know | yes       |
|------|------------------------------------------------------------------------------------------|-----------|--------------|-----------|
| 1.   | Do you consider pelvic floor exercise to be within the scope of pelvic health practice   | 70 (45%)  | 22(14.6%)    | 58(38.6%) |
| 2    | Do you know about pelvic floor exercise for pregnant women                               | 65(43.3%) | 33(22%)      | 52(34.6%) |
| 3    | Do you know that pelvic floor exercise during pregnancy may help improve labour outcomes | 58(38.6%) | 25(16.6%)    | 67(44.6%) |

|   |                                                                                                       |           |           |           |
|---|-------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|
| 4 | Do you know that pelvic floor exercise reduce medical intervention during labour                      | 58(38.6%) | 60(40%)   | 32(21.3%) |
| 5 | Do you know that pelvic floor muscle exercise reduce the hazard of perinatal and post natal back pain | 70(46.6%) | 52(34.6%) | 28(18.6%) |

Overall, 70 (45%) participants had know pelvic floor exercise for pregnant women. Only 65 (43,3%) correctly identified the pelvic floor muscles, Knowledge was significantly higher among women with tertiary education ( $p=0.02$ ) and those in urban settings ( $p=0.04$ ).



**TABLE 2 : KNOWLEDGE OF PELVIC FLOOR MUSCLE EXERCISE AMONG PRIMIGRAVID WOMEN ( N=150)**

| S.NO | KNOWLEDGE QUESTIONNAIRE                                       | N         | %              |
|------|---------------------------------------------------------------|-----------|----------------|
| 1    | Are you familiar with exercises for the pelvic floor muscles? |           |                |
|      | YES                                                           |           |                |
|      | NO                                                            | 104<br>46 | 69.33<br>30.66 |
| 2    | From which source did you hear of it                          |           |                |
|      | Health practitioner                                           | 92        | 61.33          |
|      | TV/ RADIO                                                     | 5         | 3.33           |
|      | School                                                        | 26        | 17.33          |
|      | Social media                                                  | 5         | 3.33           |
|      | Others                                                        | 22        | 14.66          |
| 3    | Which pelvic floor muscle exercise do you know?               |           |                |
|      | Kegel exercise                                                |           |                |
|      | Marches                                                       | 90        | 60.0           |
|      | Heel slides                                                   | 7         | 4.6            |
|      | Happy baby pose                                               | 8         | 5.33           |

|    |                                                                                                                                                                                                |                |                         |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|
|    | Diaphragmatic breathing                                                                                                                                                                        | 9<br>36        | 6.0<br>24.0             |
| 4  | <p>Pelvic floor muscle exercises are exercises that help to maintain the strength and contractile force for the efficient functioning of the pelvic floor</p> <p>YES<br/>NO<br/>Don't know</p> | 80<br>50<br>30 | 53.33<br>33.33<br>20.0  |
| 5  | <p>Exercise for the pelvic floor muscles improves postpartum wellness.</p> <p>YES<br/>NO<br/>Don't know</p>                                                                                    | 91<br>22<br>37 | 60.66<br>14.66<br>24.66 |
| 6  | <p>Exercise for the pelvic floor muscles protects the pelvic organ from prolapsing.</p> <p>YES<br/>NO<br/>Don't know</p>                                                                       | 95<br>35<br>20 | 63.33<br>23.33<br>13.33 |
| 7  | <p>Exercise for the pelvic floor muscles enhances sexual function.</p> <p>YES<br/>NO<br/>Don't know</p>                                                                                        | 72<br>37<br>41 | 48.00<br>24.66<br>27.33 |
| 8  | <p>Pelvic floor muscle exercise can be performed during pregnancy</p> <p>YES<br/>NO<br/>Don't know</p>                                                                                         | 62<br>47<br>41 | 41.33<br>31.33<br>27.33 |
| 9  | <p>Exercises for the pelvic floor muscles can be done at any stage of life.</p> <p>YES<br/>NO<br/>Don't know</p>                                                                               | 63<br>70<br>17 | 42<br>46.66<br>11.33    |
| 10 | <p>Pelvic floor muscle exercise can only be performed by pregnant women</p> <p>YES<br/>NO<br/>Don't know</p>                                                                                   | 54<br>64<br>32 | 36<br>42.66<br>21.33    |
| 11 | Overall Knowledge                                                                                                                                                                              |                |                         |

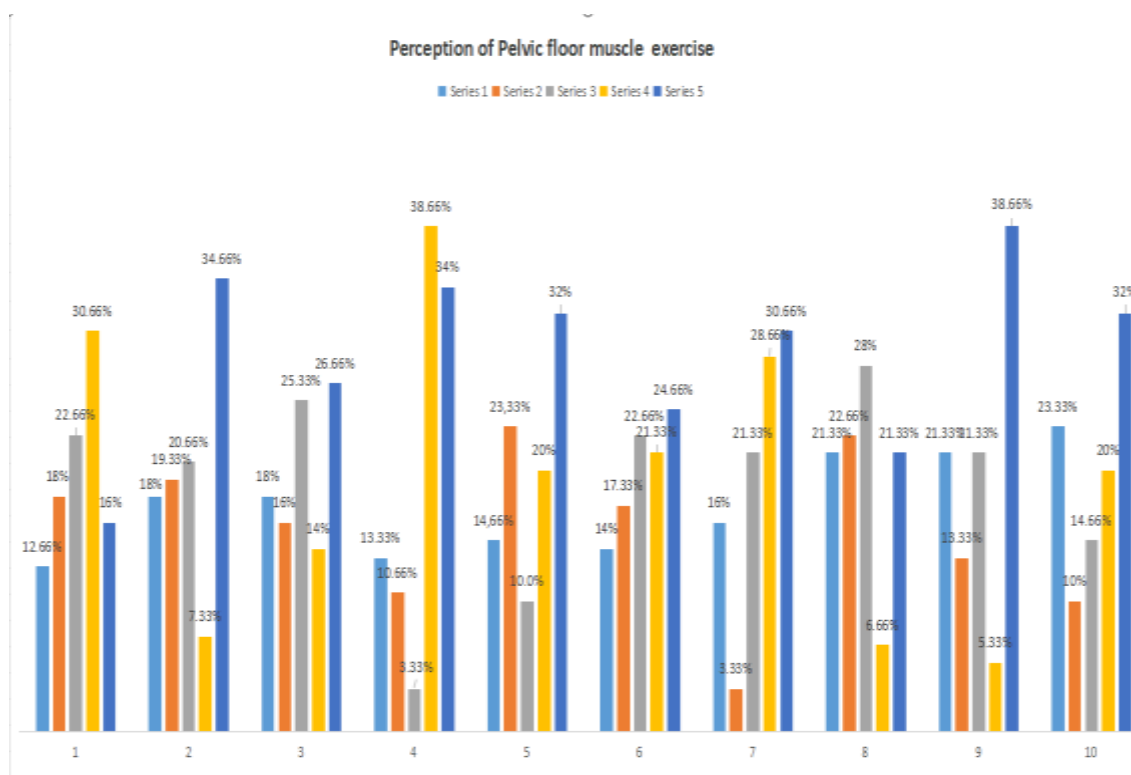
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|--|------------------------------|-----|----|
|  | Good (knowledge score >50%)  | 105 | 70 |
|  | Poor (knowledge score ≤ 50%) | 45  | 30 |

#### Perception of PELVIC FLOOR MUSCLE EXERCISE Among primi gravid women

**Table 3 : perception of Pelvic floor muscle exercise**

| S.NO | ITEMS                                                                                   | Strongly Disagree 1 | DisAgree 2  | Neutral 3   | Agree 4     | Strongly agree 5 |
|------|-----------------------------------------------------------------------------------------|---------------------|-------------|-------------|-------------|------------------|
| 1    | Pelvic Floor Exercise Help In Preventing Urinary In Continence During Pregnancy         | 19 (12.66%)         | 27 (18%)    | 34(22.66%)  | 46 (30.66%) | 24 ( 16%)        |
| 2    | Doing pelvic floor exercise regularly makes labour and delivery easier                  | 27 (18%)            | 29 (19.33%) | 31 (20.66%) | 11 (7.33%)  | 52 (34.66%)      |
| 3    | Pelvic floor exercise improve post natal recovery                                       | 27 (18%)            | 24 (16%)    | 38 (25.33%) | 21 (14%)    | 40 (26.66%)      |
| 4    | I believe pelvic floor exercise can strengthen pelvic muscle s effectively              | 20 (13.33%)         | 16 (10.66%) | 5 (3.33%)   | 58(38.66%)  | 51 (34%)         |
| 5    | Pelvic floor muscle contribute to better control over bladder and bowel function        | 22 (14,66%)         | 35 (23,33%) | 15 (10.0%)  | 30 (20%)    | 48 (32%)         |
| 6    | Performing pelvic floor exercise reduces the risk of vaginal a [prolapse after delivery | 21 (14%)            | 26 (17.33%) | 34 (22.66%) | 32 (21.33%) | 37 (24.66%)      |
| 7    | Practicing these exercise can reduce the risk of complications during delivery          | 24 (16%)            | 5 (3.33%)   | 32 (21.33%) | 43 (28.66%) | 46 (30.66%)      |
| 8    | I feel confident that pelvic floor exercise are safe delivery during pregnancy          | 32 (21.33%)         | 34 (22.66%) | 42 (28%)    | 10 (6.66%)  | 32 (21.33%)      |

|    |                                                                                        |                |                |             |           |                |
|----|----------------------------------------------------------------------------------------|----------------|----------------|-------------|-----------|----------------|
| 9  | I believe thes exercise should be taught in every ANTENATAL VISIT                      | 32<br>(21.33%) | 20<br>(13.33%) | 32 (21.33%) | 8 (5.33%) | 58<br>(38.66%) |
| 10 | I would practice pel vic floor exercise , if I understood their benefits of the health | 35<br>(23.33%) | 15 (10%)       | 22 (14.66%) | 30 (20%)  | 48 (32%)       |



**TABLE 4 PRACTICE OF PELVIC FLOOR MUSCLE EXERCISE among primi gravid women**

| S.NO | PRACTICE QUESTIONNAIRE                                          | N  | %      |
|------|-----------------------------------------------------------------|----|--------|
| 1    | Do you work out your pelvic floor muscles                       |    |        |
|      | yes                                                             | 93 | 62%    |
|      | no                                                              | 57 | 38%    |
| 2    | Which exercises do you undertake for your pelvic floor muscles? |    |        |
|      | Kegel exercise                                                  | 73 | 48.66% |
|      | Marches                                                         | 25 | 16.66% |
|      | Heel slides                                                     | 21 | 14%    |
|      | Happy baby pose                                                 | 10 | 6.66%  |
|      | Diaphragmatic breathing                                         | 21 | 14%    |

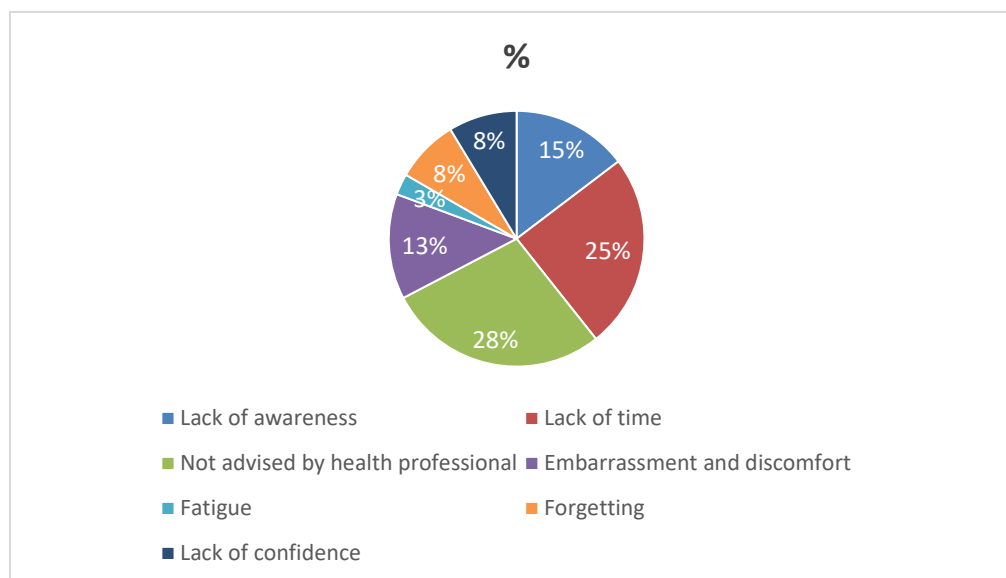
|   |                                                                                  |    |        |
|---|----------------------------------------------------------------------------------|----|--------|
| 3 | Where do you perform pelvic floor muscle exercises?                              |    |        |
|   | Home                                                                             | 80 | 53.33% |
|   | Workplace                                                                        | 42 | 28%    |
|   | School                                                                           | 23 | 15.33% |
|   | Others – everywhere, gym and hospital                                            | 5  | 3.33%  |
| 4 | How long do you typically spend working out your pelvic floor muscles at a time? |    |        |
|   | Below 10 minutes                                                                 | 42 | 28%    |
|   | 10 minutes                                                                       | 26 | 17.33% |
|   | 20 minutes                                                                       | 39 | 26%    |
|   | 30 minutes                                                                       | 33 | 22%    |
|   | 40 minutes and above                                                             | 10 | 6.66%  |
| 5 | When did you begin doing exercises for your pelvic floor muscles?                |    |        |
|   | First trimester                                                                  | 26 | 17.33% |
|   | Second trimester                                                                 | 25 | 16.66% |
|   | Third trimester                                                                  | 85 | 56.6%  |
|   | At all time                                                                      | 14 | 9.33%  |
| 6 | How many contractions do you perform at a time                                   |    |        |
|   | 1-3                                                                              | 40 | 26.66% |
|   | 3-6                                                                              | 34 | 22.66% |
|   | 6-9                                                                              | 24 | 16%    |
|   | 9-12                                                                             | 9  | 6%     |
|   | above 12                                                                         | 21 | 14%    |
|   | no response                                                                      | 22 | 14.66% |
| 7 | What posture do you maintain when working out your pelvic floor muscles?         |    |        |
|   | Sitting                                                                          | 47 | 31.33% |
|   | Lying                                                                            | 27 | 18%    |
|   | Standing                                                                         | 28 | 18.66% |
|   | Others – squatting, any position                                                 | 50 | 33.33% |

Antenatal care programs should integrate structured Kegel education, including hands-on demonstrations by physiotherapists or midwives. Mobile health applications could provide reminders and instructional videos to overcome barriers like time constraints.

**Table :5 Barriers to practice pelvic floor exercise**

| Barriers to practice               | No of participants in | %     |
|------------------------------------|-----------------------|-------|
| Lack of awareness                  | 22                    | 14.67 |
| Lack of time                       | 37                    | 24.67 |
| Not advised by health professional | 42                    | 28.00 |

|                              |    |       |
|------------------------------|----|-------|
| Embarrassment and discomfort | 20 | 13.33 |
| Fatigue                      | 4  | 2.67  |
| Forgetting                   | 12 | 8.00  |
| Lack of confidence           | 13 | 8.67  |



## Discussion

It has been demonstrated that antenatal exercises support the mother's and the developing fetus's health and lessen delivery-related difficulties. stage.[14,15] Women who participated in prenatal exercise programs and received health education had an improvement in their health-related quality of life.[16] The awareness, perception, and practice of prenatal exercises among Goan women were evaluated in the study. Females who visited the obstetric outpatient department at Goa Medical College took part in the questionnaire-based study. Sixty percent of those surveyed said they were in good health. A small percentage of participants (13.33%) experienced health issues, with diabetes mellitus accounting for the largest percentage (4.67%)

According to a study by Gari et al. in Saudi Arabia, those who completed university-level education had greater knowledge and awareness regarding antenatal exercises, and those who completed degree-level education were more likely to exercise during pregnancy than other groups.

In terms of knowledge of prenatal workouts, just 43.33% of participants were aware of them, while the majority (56.67%) were not. This was found to be in line with other research conducted by Margaret et al. at the University of Calabar, where study participants had a higher level of awareness, and Gari et al. in Saudi Arabia . The most popular source of information is the internet, , which is followed by friends and obstetricians. Nevertheless, earlier research came to the conclusion that not all of the data offered by websites and other e-health media is consistently trustworthy. The current study's findings regarding women's perceptions of prenatal exercise are consistent with earlier research, which found that women believed that exercise during pregnancy was beneficial for both the mother and the unborn child .

A session on prenatal exercises was attended by 1.33% of the total attendees. A study carried out in Sri Lanka produced similar findings. The findings are consistent with the current study, which found that while awareness and perception were adequate, only a small percentage of individuals participated in or attended prenatal exercise sessions. Correct perception of antenatal exercises was found to be substantially correlated with age, with the 25–29 age group showing superior perception in comparison to the other groups. Gari et al. revealed similar results in a study where the 18–25 age group shown greater awareness than the other categories. Additionally, there was a significant correlation between age group and the degree of awareness and understanding of prenatal workouts.

Data analysis revealed a strong correlation between education level and awareness of prenatal activities ( $P = 0.0460$ ), with degree-level education being associated with greater awareness than other educational levels. Since they demonstrated a greater comprehension of antenatal exercises than others, higher education and degree level of education were linked to the level of perception ( $P = 0.0190$ ). The findings are consistent with other research from Saudi Arabia and Ethiopia that demonstrated that people with greater educational qualifications are more aware of and perceive prenatal activities better, suggesting that education plays a

There were not many restrictions on this investigation. The results may not be representative of the whole Goan female population since the sample size of 150 is too small. This could be because there is insufficient statistical power to identify meaningful correlations or differences in the variable being studied. Due to respondents giving socially acceptable replies (social desirability bias) or forgetting information (recall bias), the data gathered through questionnaires may contain errors.

Due to the use of a particular set of inclusion and exclusion criteria that could introduce sampling bias, the study's findings might not apply to pregnant women who are not within the designated age range, trimester, or language proficiency, limiting their generalizability to a larger population.

Pregnant women who obtain care at other healthcare facilities may not be included if only female patients visiting the Goa Medical College Obstetrics OPD are taken into consideration. This could impact the representation of various demographics and result in sample bias.

## CONCLUSION

Prenatal exercise awareness and perception were found to be good, but practice was shown to be low. The most popular exercise among pregnant women was walking. Awareness and perception were correlated with age, income, and education. An prenatal exercise education program is advised to close the gap by raising awareness, reversing misconceptions, and promoting women's practice.

## CLINICAL IMPLICATIONS OF THE STUDY

Following an evaluation of the health outcomes, advantages, and effects of regular exercise during pregnancy, intervention studies involving behavioral, educational, and digital intervention studies could be used to guarantee the efficacy of awareness programs and help establish health promotion strategies after identifying possible areas for improvement for the adoption of antenatal exercises. The continuance of exercise habits and their effects on postnatal health and well-being could be investigated through postnatal follow-up research.

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## CONFLICTS OF INTEREST

There are no conflicts of interest.

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