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# Pelvic floor muscle strength and sexual function in primigravid and multigravid women: An observational study

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## Abstract

**Background:** Weakened pelvic floor muscles can affect the female sexual response cycle phases: desire, arousal, lubrication and orgasm. The aim of this study was to evaluate the relationship between pelvic floor muscle strength and sexual function in non-pregnant women and examine the influence of the number of pregnancies.

**Methods:** This observational study was conducted on 48 pregnant women (24 primigravid and 24 multigravid women with the age range of 25 to 40 years in Belagavi city. The Female Sexual Function Index (FSFI) questionnaire was used to evaluate the sexual function. The floor muscle strength was evaluated by vaginal using the oxford scale. Spearman correlation tests was used to check the strength and direction of the linear relationships between pairs of variables.

**Results:** The mean age of the women was 37.08 ± 5 years. Female sexual function was positively correlated with pelvic floor muscle strength (rho= 0.50, P= 0.001). Pelvic floor muscle was negatively correlated with age (rho= -0.37, P= 0.010) and parity (rho= -0.52, P= 0.001). In addition, female sexual function was negatively correlated with age (rho= -0.41, P= 0.004) and parity (rho = -0.52, P= 0.001).

**Conclusion:** The results suggest that multigravida women have lower pelvic floor muscle strength and worse sexual function than primigravid women.

**Keywords:** Muscle Strength, Pelvic floor, Pregnancy, Sexuality

## Introduction

Weakness to the pelvic floor muscles causes pelvic floor dysfunctions such as urinary incontinence, pelvic organ prolapses, pain and sexual disorders. The World Health Organization and the world association for sexual health stated that sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity (1). Female sexual function comprises sexual activity, sexual behavior, and also physiological, psychological, social, cultural, spiritual aspects of sexual activity, and the female sexual response cycle includes four phases: excitement (desire), plateau (arousal), orgasm (climax), and resolution (2, 3).

Female sexual dysfunction is defined as changes in the sexual response cycle including lack of sexual desire, impaired arousal, inability to achieve orgasm or the presence of pain dyspareunia and vaginismus. According to the diagnostic and statistical manual of mental disorders (DSM IV), sexual dysfunction is classified into 1) sexual desire disorders, 2) sexual arousal disorders, 3) orgasmic disorders and 4) sexual pain disorders i.e. dyspareunia and vaginismus. According to the diagnostic and statistical manual of mental disorders (DSM V, 2016), there are three components to diagnose that the female is having sexual dysfunction. They are: 1) sexual interest/arousal, 2) orgasmic disorder and 3)/ penetration disorder or genito-pelvic pain (1, 2).

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During pregnancy, physiological and anatomical changes occur in women, which have significant impact on their sexual behavior. The increase in relaxin hormone during pregnancy can affect not only ligamentous laxity but also vaginal tissue by enlarging the circumference of the vaginal lumen and increasing epithelial cells, potentially leading to a reduction in sensitivity and contractile muscle capacity. While the frequency of sexual coitus, sexual desire and satisfaction, and also the ability to achieve orgasm decrease during pregnancy, dyspareunia increases (4). Sexual function and activity decrease in sexually active women during pregnancy (2). During the third trimester of pregnancy, there is a significant difference in primipara and multipara regarding the sex life. During this period, the frequency of sexual activity decreases in primipara, whereas the sexual life of multipara does not undergo any changes (5).

Pelvic floor dysfunctions such as urinary incontinence, pelvic organ prolapse, pain and sexual disorders are all caused due to the weakness of pelvic floor muscles (6). Previous studies have reported that pregnancy can affect pelvic floor muscles and function. Weakened pelvic floor muscles can affect the female sexual response cycle phases: desire, arousal, lubrication and orgasm. Some studies demonstrated that pelvic floor muscle training can improve the impact on a woman's sexual life by enhancing in arousal, lubrication and orgasm, and also increase pelvic floor muscle strength (7, 8).

The existing literature indicates that any trauma to pelvic floor muscles during vaginal childbirth plays an important role in the pathogenesis of pelvic floor disorders. There are many studies reporting that pelvic floor muscle is forcibly stretched during vaginal childbirth, compressed and bruised, leading to pelvic floor muscle injury. similarly, many other studies concluded that most of the women experienced sexual dysfunction after childbirth. There are myriads of studies done to compare the pelvic floor muscle strength with sexual dysfunction in postmenopausal women and non-pregnant women with primiparous women, but there is paucity in research correlating the pelvic floor muscle strength with sexual function in primiparous and multiparous women. Hence, the aim of this study is to find the correlation of pelvic floor muscle strength with the sexual function in primigravid and multigravid women.

## Materials & Methods

Ethical clearance was obtained from institutional ethical committee. An observational study was conducted on 48 non-pregnant women (24 primigravid and 24 multigravid). The participants were included in the study based on the inclusion and exclusion criteria. The inclusion criteria were; age (25-40), sexual intercourse at least once during the last four weeks, and willingness to participate in the study. The exclusion criteria were: pregnancy, cognitive impairment, neurological conditions, degenerative diseases, and active urinary tract infection.

The Female Sexual Function Index (FSFI) questionnaire was used to evaluate the sexual function. The questionnaire consists of 19 multiple choice questions, and each item is assigned to six domains: arousal, desire, lubrication, orgasm, satisfaction and pain. Each domain is assigned a value from 0 to 6. The total score is from 0-36, and lower numbers indicate sexual dysfunction. The reliability and validity of the questionnaire was 0.74 and 0.86, respectively (9).

For the assessment of pelvic floor muscle (PFM), all women were taught how to perform three maximal contractions lasting 5 seconds with maximum muscle strength and 1-min break between the contractions throughout vaginal examination in supine position. The PFM of women was examined by vaginal examination with lubricant gel and sterile gloves. Through vaginal examination, scoring of PFM strength was done using oxford scale from 0 (absence of muscle response) to 5 (strong contraction). All assessment was done by just one trained researcher. The reliability and validity of Oxford scale of pelvic floor muscle strength were 0.929 and 0.80, respectively (10). Spearman correlation test was used to check the strength and direction of the linear relationships between pairs of variables.

**Statistical analyses:**

The statistical analysis was performed using SPSS version 23. The basic features described by descriptive statistics and Spearman correlation tests were used to check the strength and direction of the linear relationships between pairs of variables. The P-value of 5% or less indicated statistical significance.

## Results





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The mean age was 37.1±5 years. The mean score of female sexual function and pelvic floor muscle were 19±3.8 and 2.0±0.9 (Table.1).
The female sexual function was positively correlated with the pelvic floor muscle strength (rho = 0.50, P=0.001). The pelvic floor muscle strength was negatively correlated with age (rho = -0.37, P=0.010) and parity (rho = -0.52, P=0.001). In addition, the female sexual function was negatively correlated with age (rho = -0.41, P=0.004) and parity (rho = -0.52, P=0.001) (Table 2). When the scores of the pelvic floor muscle strength and sexual function of multigravid (n=24) were compared with primigravid (n=24), it was found that the multigravid women who had a lower pelvic floor muscle strength had a lower sexual function than primigravid women (p< 0.05). In addition, the multigravid women showed more sexual dysfunction and reduced pelvic floor muscle strength than primigravid women.

**Table 1.** Characteristics of the participants

| | Mini | Max | Mean | SD |
|---|---|---|---|---|
| Age (years) | 26.0 | 44.00 | 37.1 | 5.0 |
| Weight (kg) | 44.0 | 74.00 | 57.3 | 8.1 |
| Height (cm) | 125.0 | 167.00 | 154.9 | 10.5 |
| BMI) (kg/m2) * | 19.0 | 43.50 | 24.3 | 6.3 |
| FSFS** | 19.0 | 33.0 | 27.4 | 3.8 |
| PS*** | 2.0 | 5.0 | 3.4 | 0. 9 |

*BMI: Body mass index; **FSFS: Female sexual function index questionnaire, range score: 0 (sexual dysfunction) to 36;
*** PS: Pelvic floor muscle, range score: 0 (absence of muscle response) to 5

**Table 2.** Correlation coefficients between female sexual function with pelvic floor muscle and variables of age, and parity with them

| Variable X | Variable Y | r-value | p-value |
|---|---|---|---|
| FSFS score* | PFM score** | 0.924 | 0.001 |
| Age | FSFS score | -0.405 | 0.004 |
| | PFM score | -0.369 | 0.010 |
| Parity | FSFS score | -0.519 | 0.001 |
| | PFM score | -0.519 | 0.001 |

*FSFS: Female sexual function index questionnaire
** PS: Pelvic floor muscle, range score

## Discussion

The problems regarding sexual dysfunction in women are not commonly discussed due to social and cultural limitations. Thus, sexual dysfunction is a major problem remaining unaddressed even if it affects the majority of the population (11). Sexuality is a multidimensional phenomenon associated with biological, psychological, environmental, physiological, socio-cultural, and interpersonal factors; therefore, the evaluation of sexual function is complex. FSFI is a tool with questions covering all the domains, which can easily evaluate female sexuality (6).

The prevalence of sexual dysfunction among women after child birth has been reported worldwide from 5% to 35% after caesarian section and 40% to 80% after normal vagina delivery with episiotomy (1). The factors affecting sexual function in postpartum period are perineal discomfort/pain, perineal trauma, vaginal tears, and episiotomy. The strength of pelvic floor muscles is decreased after childbirth, and vaginal delivery is accepted as the major cause of pelvic floor damage (7, 12).

The present study investigated the correlation between the parity of female sexual function scale scores and the pelvic floor muscle strength, which was statistically significant. It was also found that women with more parity have weaker pelvic floor muscles strength and sexual dysfunction. We also found that when multigravid women were compared with primigavid women, they showed less pelvic floor muscle strength and a compromised sexual life. Similar to the findings of the present study, results from a research conducted by Y.B. Baytur et al demonstrated that pregnancy affects pelvic floor muscle strength and function and that the weakness in pelvic floor muscles can affect the phases of female sexual response (8). A cross-sectional study done by Sehhatie et al on 386 women at 10-16 weeks postpartum also found similar results (11).

The current study focused on the association between female sexual function index scale scores and the pelvic floor muscle strength, which was found significant indicating that women with stronger pelvic floor muscle have better sexual function. Likewise, other studies conducted on the correlation of pelvic floor muscle strength and sexual function by de Menezes Franco et al on postmenopausal women and Martinez et al on females aged 20–28 years reported the same results (6, 13).

The prevalence of sexual dysfunction increases by age as shown in the present study. A population-based study conducted by Dennerstein et al. on menopause and sexual functioning reported that with the increase in age, estrogen deficiency is seen, which can affect the function of pelvic floor muscle causing sexual dysfunction (14).

Golmakani et al conducted a study on the effect of pelvic floor muscle exercise program on sexual self-




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efficacy in primiparous women after delivery and concluded that the pelvic muscle exercise can increase the sexual self-efficacy in women after delivery. Therefore, considering the significant relationship between sexual function and pelvic floor muscle strength in parous women, a pelvic floor muscle exercise program is a necessity after delivery (15).

There were several limitations. First of all, there was low sample size for each group, which might have reduced statistical power of the study. Second, we evaluated the relation between Pelvic floor muscle strength and sexual function just during pregnancy. Its assessment by a longitudinal study in pre-pregnancy, during pregnancy, and postpartum could yield more useful results. Third, the participants had privacy and security issues to answer, although a well-trained clinical investigator conducted the examinations and the interviews. Fourth, we did not assess the urinary leakage or urinary incontinence, the lifestyle, and the physical activity of participants before or during pregnancy.

## Conclusion

The results illustrated that multigravid women have a worse sexual function and lower pelvic floor muscle strength than primigravid women. Women with greater age demonstrated lower pelvic floor muscle strength and a reduced sexual function. There is a direct correlation between pelvic floor muscle strength and sexual function.

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## Conflicts of Interest

We declare that we have no competing interests.

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