International Journal of Physiotherapy and Research,
Int J Physiother Res 2022, Vol 10(3):4280-84. ISSN 2321-1822
DOI: https://dx.doi.org/10.16965/ijpr.2022.126

Original Research Article

Association of Pelvic Floor Distress with Pelvic Floor Function, Diastasis Recti and Core Strength In Primiparous Women Postpartum 6 Weeks: A Cross-Sectional Study

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ABSTRACT

Introduction: Pelvic floor plays an important role in maintaining continence. Pelvic floor distress reduces muscle strength, evaluation of pelvic floor muscle function is important.

Methods: Microsoft-Excel 2016 was used for data entry and basic Descriptive Statistics. Based on normality of the data as p value is less than 0.05, Spearman's correlation coefficient test was used.

Results: There was fair significant association found between pelvic floor distress & diastasis recti below level of umbilicus.

Conclusion: The results of the current study reject alternate hypothesis and states that fairly significantly correlates with diastasis recti below level of umbilicus pelvic floor distress is not correlated with pelvic floor function, diastasis recti above umbilicus, core strength.

KEYWORDS: Pelvic floor, distress, muscle strength.

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Access this Article online	Journal Information
Quick Response code	**International Journal of Physiotherapy and Research** ISSN (E) 2321-1822 | ISSN (P) 2321-8975 **https://www.ijmhr.org/ijpr.html** **DOI-Prefix:** https://dx.doi.org/10.16965/ijpr
DOI: 10.16965/ijpr.2022.126	**Article Information** Received: 29 Apr 2022 Accepted: 15 May 2022 Peer Review: 30 Apr 2022 Published (O): 11 Jun 2022 Revised: None Published (P): 11 Jun 2022

INTRODUCTION

Pelvic Floor is a well-defined muscular structure which plays role in several urological, gynaecological and pulmonary functions [1]. The International Continence Society (ICS) identifies signs of normal pelvic floor muscle function as voluntary contraction, voluntary relaxation, involuntary contraction, and involuntary relaxation [2].

Pelvic floor distress/dysfunction refers to a broad constellation of symptoms & anatomic changes related to abnormal function of the pelvic floor musculature. Pelvic floor distress can be urinary incontinence, faecal incontinence,pelvic organ prolapse, sexual dysfunction, overactive bladder, etc [3].

Cross-sectional studies amongst parous women in later life suggest that women who have delivered vaginally have a higher prevalence of pelvic floor symptoms than women who undergo caesarean deliveries [4,5]. Physiological forces acting on pelvic floor during normal delivery, stretches pelvic floor and surrounding fascia [3]. It has been shown that Pelvic floor disorders reduce pelvic floor strength [6]. Hence evaluation of pelvic floor muscle function is important.

Diastasis recti abdominis (DRA) is defined as

an impairment with midline separation of the 2 rectus abdominis muscles along the linea alba [7]. Hormonal, postural changes, multiparity, obesity are major predisposing factors that results in diastasis recti abdominis [8]. DRA is diagnosed by measuring the distance between the medial borders of the 2 rectus abdominis muscles, the so-called inter-rectus distance (IRD).

Core muscles are considered as the centre of the functional kinetic chain and has an important role in proximally stabilizing the distal mobility [9,10,11]. Core muscles facilitate the transfer of torques and angular moments between upper and lower extremities during the execution of whole-body movements. These muscles primarily include Transeverse Abdominis, Lumbar multifidus, Internal oblique & Quadratus lumborum. Recent advances have shown that there is relation between reduced core strength and low back pain. Low back pain remains constant complaint in postpartum period. Hence it is important to assess core strength amongst postpartum women.

MATERIALS AND METHODS

A cross-sectional study was conducted among 75 postpartum women from Novemeber 2020 to june 2021. We included postpartum primiparous women six weeks to six months in age group of 18-35 years who have delivered via full term normal delivery & we have excluded women with twin gestatation & women who were not willing to participate.

Data collection procedure: Data collection was initiated in November 2021. Women meeting inclusion criteria were undertaken. PFDI scale was asked in interview format. PFMC scale was assessed visually by observing women's perineum. Pelvic floor strength and endurance was assessed by digital palpation. Diastasis recti assessment was measure with the help of digital nylon calliper and core strength was assessed using Pressure Biofeedback Unit (stabilizer) Unit. Each of the study participants were explained the purpose of the study and they were ensured about the confidentiality and anonymity of data.

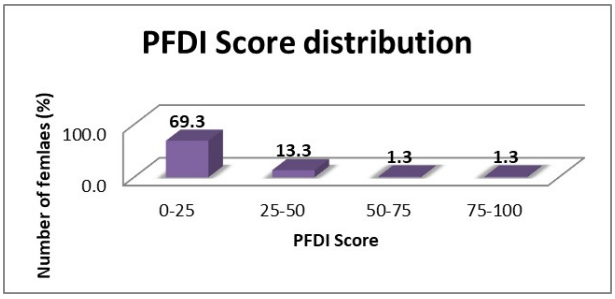
Statistical analysis: The data thus collected were entered in a Microsoft Excel spreadsheet and data was analyzed by using SPSS version 22 statistical software. The results were shown in the form of proportion or percentages and where necessary it was also shown in the form of tables & graphs.

Ethical clearance: The study was approved by the Mahatma Gandhi Mission's Dental College & Hospital Institutional Ethical committee.

RESULTS

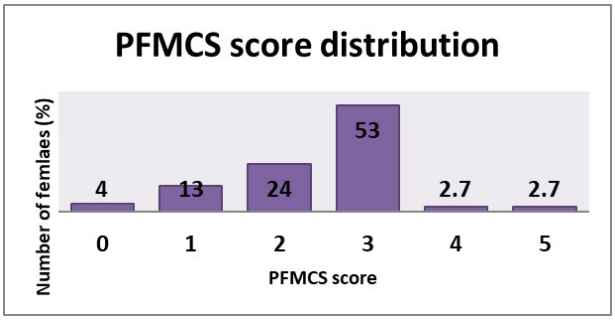
Table 1: Analysis of basic descriptive statistics by describing subject characteristics (Mean & SD of all variables).

Variables	Mean	Standard deviation
Age in years	24.42	3.06
PFDI Score	34.78	21.48
Total PFMCS Score	2.44	0.98
Pelvic floor muscle strength (oxford scale)	1.13	0.34
Pelvic floor muscle endurance (seconds)	4.58	1.45
Diastasis recti 3 cm above level of umbilicus(mm)	8.36	2.68
Diastasis recti 2 cm below level of umbilicus(mm)	7.12	7.39
Core strength (mmhg)	3.09	1.48



Graph 1: Distribution & Severity of pelvic floor distress in postpartum women using PFDI.

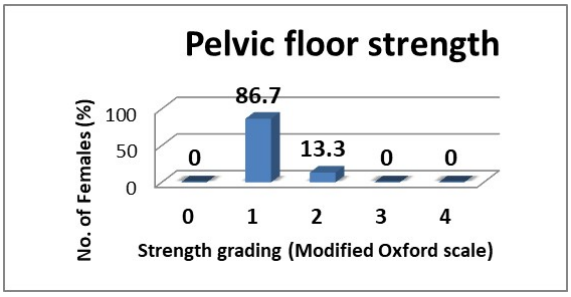
Interpretation: Amongst 75 participants, 69.3% women had PFDI score between 0-25. Hence this shows that maximum number of postpartum women did not experience pelvic floor distress.



Graph 2: Distribution of Pelvic floor muscle co-ordination in postpartum women using PFMC scale.

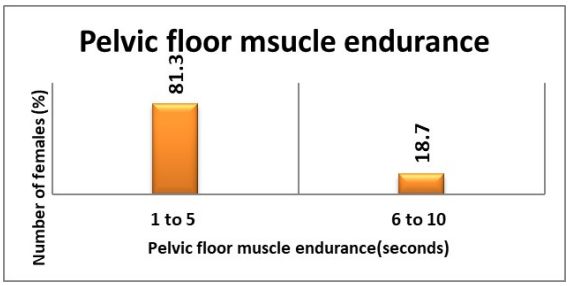
Interpretation: Amongst 75 postpartum women, 53% women had PFMCS score of 3

which shows that maximum number of postpartum women had co-ordinated pelvic floor muscles. Overall score was less, hence we can conclude that maximum almost all post partum women had co-ordinated pelvic floor.



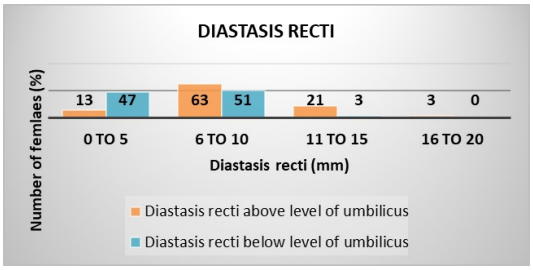
Graph 3: Analysis of pelvic floor function using pelvic floor strength in postpartum women.

Interpretation: Amongst 75 postpartum women 86.7% women had grade 1 pelvic floor muscle strength on modified oxford scale. This concludes that postpartum women had lesser pelvic floor muscle strength.



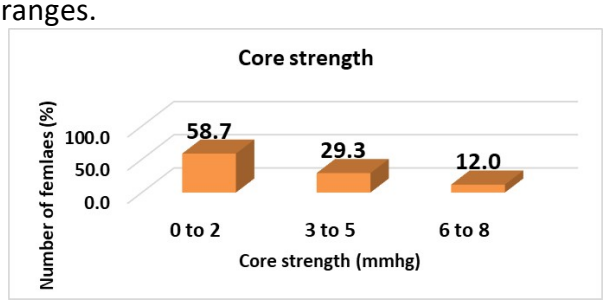
Graph 4: Analysis of pelvic floor function using pelvic floor endurance in postpartum women.

Interpretation: Amongst 75 women 81.3% women had pelvic floor endurance between 1-5 seconds. This concludes that postpartum women had lesser pelvic floor muscle endurance.



Graph 5: Analysis of diastasis recti in postpartum women.

Interpretation: Normal range for diastasis recti above & below level of umbilicus was upto 28 mm & 21mm. Above mentioned graph shows that none of the postpartum women had diastasis recti abdominis above & below level of umbilicus as values were below normal ranges.



Graph 6: Analysis of core strength in postpartum women.

Interpretation: Amongst 75 women 58.7% women had core strength between 0-2 mmhg that is there was weak TrA activation. Graph concludes that core strength was weak amongst postpartum women.

Normality: Shapiro-Wilk test was used to analyse normality of the data. The test indicated non-significant values of PFDI, PFMCS, pelvic floor muscle strength & endurance, diastasis recti & core strength as value was less than 0.05 explaining that the data was not normally distributed.

Interpretation: There was no association found between pelvic floor distress & pelvic floor muscle co-ordination, pelvic floor muscle strength & endurance, diastasis recti above level of umbilicus & core strength. There was significant fair association found between pelvic floor distress & diastasis recti below level of umbilicus.

Table 2: Correlation analysis of pelvic distress with pelvic floor function, diastasis recti & core strength.

			Corelation coefficient	Sig. (1-tailed)
Spearmen's rho	PFDI SCORE	PFMCS Score	0.097	0.203
		Pelvic floor muscle strength	0.076	0.259
		Pelvic floor muscle endurance	0.027	0.409
		Diastasis recti above level of umbilicus	0.121	0.151
		Diastasis recti below level of umbilicus	0.252*	0.015
		Core strength	0.104	0.187

*. Correlation significant at 0.05 level (1-tailed).

DISCUSSION

The study aimed at finding the association between pelvic floor distress with pelvic floor function, diastasis recti and core strength in primiparous women postpartum six weeks to six months. Total 75 patients were recruited for the study.

Pelvic floor distress was assessed using PFDI-20 scale, which consists of pelvic organ prolapse, colorectal-anal and urinary distress subscales. None of the women in our study had pelvic organ prolapse distress symptoms.

Pelvic floor muscle function is an umbrella term. We assessed three components under pelvic floor functions those are pelvic floor muscle co-ordination (measured by PFMC scale), pelvic floor strength and endurance (measured using Digital palpation).

Overall, 58% had dysfunctional pelvic floor muscles. This suggests that more number of women had dysfunctional coordination of pelvic floor. This may be due to lack of antenatal pelvic floor training. Data regarding this is limited. According to Modified Oxford scale suggest that postpartum women had weak pelvic floor muscle strength. According to previous literature, normal vaginal delivery is the risk factor for reduced pelvic floor muscle strength. Pelvic floor endurance amongst women was less. E Quarterly, etal. found same results. With increasing age, there is an increase in the proportion of type I fibres in women, resulting in greater muscular endurance in levator ani [12].]

Our data interprets none of the postpartum women had absence of diastasis recti above and below level of umbilicus. Reason would-be women delivering at tertiary health care centre were prescribed exercise protocol immediately after delivery.

We found majority (58.7%) postpartum women had weak TrA activation that is values were below 4mmhg.

Association of Pelvic floor distress and Pelvic floor muscle function: We found no association between pelvic floor distress and pelvic floor function . This proves that only pelvic floor function is not responsible for pelvic floor distress. Other factors can be perineal trauma or perineal tear, other soft tissues surrounding pelvic floor muscles. This can be considered & further investigations can be done [13].

Association of Pelvic floor distress and Diastasis recti abdominis: We found no association of pelvic floor distress with diastasis recti above level of umbilicus and fair significant relationship between pelvic floor distress and diastasis recti below level of umbilicus. A possible explanation for the observed differences below and not above the umbilicus might be due to the different tendinous fibres from the abdominal muscles in the anterior and posterior rectus sheath above and below the umbilicus. In addition, a regional variation in the morphology of the linea alba, with more transverse collagen fibres than oblique collagen fibres below the umbilicus [14].

Further research can be done to assess factors responsible for weak correlation.

Association of Pelvic floor distress and Core strength: We found no correlation between pelvic floor distress & core strength. Sample size is less. Data regarding this is limited. Hence we can hypothesize that pelvic floor is one of the important component of core, as mentioned above pelvic floor distress is not correlated with pelvic floor function, the same thing can be applied to the core. Further research will be required to evaluate pelvic floor distress with core strength.

CONCLUSION

The results of the current study reject alternate hypothesis and states that pelvic floor distress is not correlated with pelvic floor function, diastasis recti above umbilicus, core strength and fairly significantly correlates with diastasis recti below level of umbilicus.

ACKNOWLEDGEMENTS

I'm grateful to my Principle, Guide, other college faculty & my Colleagues for their assistance.

Conflicts of interest: **None**

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How to cite this article: Shrutika P. Sawant, Jyoti Parle. Association of Pelvic Floor Distress with Pelvic Floor Function, Diastasis Recti and Core Strength In Primiparous Women Postpartum 6 Weeks: A Cross-Sectional Study. Int J Physiother Res 2022;10(3):4280-4284. **DOI:** 10.16965/ijpr.2022.126