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A STUDY ON DIASTASIS RECTI: COMPARING LEAN AND OBESE PRIMIPAROUS WOMEN

Muqadas Chaudary[1], Fizza Masood[2], Mamoona Anwar[3], Tamknat Ilyas[4], Nazneen Fatima[5], Sania Maqbool[*6]

[1,2,4]*Assistant Professor SHS UMT*
[3]*Lecturer SHS UMT*
[5]*Student DPT*
[*6]*Consultant Physiotherapist Saadan Hospital Lahore*

[1]muqadas.chaudary@umt.edu.pk, [2]fizza.masood@umt.edu.pk, [3]mamoona.anwar@umt.edu.pk, [4]tamknat.ilyas@umt.edu.pk, [5]nazneenfatima590@gmail.com, [*6]saniamaqbool28@gmail.com

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Corresponding Author: *
Sania Maqbool

Abstract

Introduction: *Diastasis recti is a separation of the two bellies of the rectus abdominis muscles along the linea alba with widening and fibrous division of the linea alba. Pregnant women, women in menopause, and new mothers are more likely to developDRA. However, a number of risk factors have also been identified as advanced age, multiple parities, BMI, C sections, weight gain, high birth weight, numerous pregnancies,ethnicity, and benign joint hypermobility syndrome*

Objective: *To determine the association between inter rectal distance and BMI inprimiparous women and the prevalence of diastasis recti in lean and obese primiparous women.*

Methodology: *This cross-sectional survey was conducted after approval from the ethical committee. In this study 172 primiparous non pregnant women aged 18-35, having BMI less than 24.9 or greater than 30 and women with spontaneous vaginal or C- section delivery were included with non-probability, non-convenience sampling technique. Structured questionnaire and 2 finger width measurement method were used to measure inter recti distance (IRD). The data were analyzed through SPSS version 21.*

Results: *The result of this study shows that there is no significant association between diastasis recti and BMI in primiparous females because according to Chi-square test the P value is greater than 0.05 value. It comes that there was equal prevalence of mild diastasis recti both groups that was 58, while remaining 28 and 27 females with moderate diastasis recti were lean and obese respectively. Severe diastasis recti were found in lean was 2 and in obese was 3.*

Conclusion: *We found that there was not significant but slight association of BMI and diastasis recti in primiparous females. As both showed equal prevalence of diastasis recti in both lean and obese primiparous females. It is evident that primiparous women either lean or obese has developed mild to moderate diastasis recti.*

INTRODUCTION

Diastasis recti is brought on by the linea alba's expansion and the splitting of two bellies, the rectus abdominis.{Jaiswal, 2021 #93}The rectus abdominis is the abdominal muscle that is most visible. It is the long, flat muscle that runs between the pubis and the fifth, sixth, and seventh ribs vertically (Hafeez et al., 2022). The strong tendinous sheath known as the Linea Alba also known as six pack muscles, can partially or entirely split the rectus abdominis muscle. (Kausar, 2022) By flexing the spinal column, the rectus abdominis aids in reducing the distance between the ribs and the pelvis (Jaiswal et al., 2021). RA muscles are connected by the linea alba. It is an important structure because it houses three additional important muscles as well as the main insertion location for the RA muscle. The strain on the abdominal walls grows as the pregnancy proceeds, stretching the abdominals beyond the midline and potentially leading to IRD (inter recti distance) (Anwar et al., 2022).

Pregnant women, women in menopause, and new mothers are more likely to develop DRA. DRA is 100% frequent during gestation and is particularly prevalent at 35 weeks' gestation. (Kausar, 2022). It is one of the most typical pregnancy complications and it may even stay elevated in the first few hours after giving birth (Kousar et al., n.d.). As the uterus grows and begins to apply pressure on the abdominal wall, a hormone called "Relaxin" is generated during pregnancy, causing body tissue like ligament to loosen up and allowing for required changes in childbearing women's bodies. One of these changes is the shifting of the abdominals (Hafeez et al., 2022). Multiparous women are more likely to acquire diastasis recti because their abdominal muscles are repeatedly and extensively strained during this process. Contrary to non-pregnant women, pregnant women have weaker abdominal muscles. During the third trimester of pregnancy, the rectus abdominis diastasis increases from 66% to 100%, then decreases to 53% after delivery (Kousar et al., n.d.). Some techniques used to assess diastasis recti abdominis include the finger width method, ultrasound, (MRI), (CT) scan, callipers, and tape measuring.(Jaiswal et al., 2021). Tape measurement and the finger-width method are intended to evaluate diastasis recti abdominis due to their affordability and accessibility. A digital calliper is made to measure the inter-rectal distance widening by 2.5 cm or more at one or more evaluation stages while diagnosing diastasis recti (Kousar et al., n.d.). Diastasis recti abdominis is associated with urinary incontinence, faecal incontinence, uterus prolapse, myofascial pelvic discomfort, rectal prolapsed, herniation, back pain, lumbopelvic pain and bladder prolapsed. Multiparous women are more likely to have diastasis recti abdominis just below umbilicus, whereas this condition is more common at the umbilicus level (Jaiswal et al., 2021) However, a number of risk factors have also been identified, notably advanced age, multiple parities, C sections, weight gain, high birth weight, numerous pregnancies, ethnicity, and benign joint hypermobility syndrome (Kausar, 2022).

WHO claims that the postpartum period is the most important time in a woman's life, however both the mother and the newborn have been ignored at this time. The woman experiences a number of physiological and psychological changes throughout this stage that will affect her motherhood (Bhandiwad & Bhandiwad, 2016). Moreover, it is seen that the BMI factor is also an important factor developing diastasis recti. Body mass index is calculated by height divided by weight. The normal value ranges from 18.5 to 24.9. Individuals less than this range are considered lean, above this range is considered as overweight and if the value goes beyond 29.9 then the individual will fall in the obese category. It has been reported by the research that the prevalence of the DRA in overweight females was 61.5% (Frequency of Diastasis Recti and Lumbopelvic Pain during Pregnancy and Factors Associated with Diastasis Recti, n.d.).

Exercise has many advantages for pregnant women, including maintaining strength, muscle tone, and endurance. The patient's wellbeing is also enhanced by exercises that lessen labour pain and low back pain. The primary purpose of the abdominal muscles is to regulate the trunk.

Surgery for diastasis recti might lessen its effects, such as back pain. Non-surgical treatments for treating diastasis recti include back care and posture training, cardiovascular workouts, and supportive equipment's such as corsets and tubigrips (Kousar et al., n.d.). Lifestyle modifications are important element for preventing and reducing the complications of diastasis recti.

There are many research studies on prevalence of diastasis recti in pregnant females and mostly done on multiparous women. But very few are done on the association of Diastasis recti and BMI in primiparous women. As we know that DRA is common complication in pregnancy and there is also another risk factor for DRA that is BMI and most of the females don't consider this seriously. DRA along with pregnancy and BMI can cause even worse consequences which mostly females do not pay attention.So, this is very important for us to educate them about maintaining their BMI and healthy lifestyle and focusing on physiotherapy before and after pregnancy to avoid further complications caused by DRA.

MATERIALS AND METHODS:

This cross-sectional study was conducted from December 2022 to February 2023.We recruited 172 females with non-probability, non-convenience sampling technique.Data was collected from different Tertiary care hospitals.

Data Collection Tool **Analysis Technique:** **Ethical considerations:**	Structured questionnaire was used, while 2 finger width measurement method was used to measure inter recti distance (IRD). DRA was measured by palpating the level of umbilicus, 3 cm above and below umbilicus. The women were tested in a standardized supine and knees (hook lying position) on the stretcher with arms crossed over the chest and they were instructed to lift head and chin toward knee. The women were classified into four groups: (1) less than 2 finger breadths normal separation, (2) separation of 2-3 The data were analyzed through SPSS version 21. The mean, percentages and standard deviations were calculated for all variables. The Chi-square test was applied to test association of diastasis recti with BMI. And T-test was applied to compare two groups of lean and obese primiparous women. All the data was collected through informed consent of the patients. Confidentiality of the participants was maintained. Throughout the research we encountered no ethical issues and problems.

Inclusion criteria :	**Exclusion criteria :**
• Primiparous women aged 18-35 • Lean women • Obese women • Women with spontaneous vaginal or C-section delivery were included.	• Multiparous women • Females having previous spinal or abdominal surgery • Females with any kind of psychological problem • Females having obesity due to any systemic issue were excluded

Results:

The aim of the study is to find the prevalence of diastasis recti in primiparous women. The sample size was 172 primiparous females, 86 were lean and other 86 were obese. Data was collected by a structured questionnaire and using 2 finger width measurement. Table 1 shows the age of the participants in study group. There were two categories of age one was 18-25 and other was 26-33. 46 Lean primiparous females fall in first group and remaining 40 fall into second group respectively. While, 36 obese primiparous females fall in first group and remaining 50 fall into the second group.

Figure 1 shows the bar chart of age of the participants in the study group. Table 2 shows the severity of the diastasis recti in primiparous females by comparing lean and obese primiparous females. It comes that there was equal prevalence of mild diastesis recti both groups that is 32.56%. Moderate diastasis recti was present in 16.28% and 15.7% in lean and obese respectively. And lastly the severe diastasis recti 1.16% and 1.74% in lean and obese respectively. Figure 2 represents the severity of the diastasis recti in lean and obese primiparous females. Table 3 shows the location of the diastasis recti of following participants in the study group. The bar chart (figure 03) shows 27.91% and 30.81% above navel diastasis recti in lean and obese respectively. Below navel diastasis recti is 9.3% and 11.3% in lean and obese respectively. And completely open diastasis recti were 12.79% and 6.98% in lean and obese respectively.

Age of Patients * BMI of Patients Crosstabulation

	BMI of Patients		Total
Age of Patients	Lean	Obese	
18-25	46	36	82
26-33	40	50	90
Total	86	86	172

Table 1 shows the distribution of the age in lean and obese primiparous women

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	2.331[a]	1	.127	
Likelihood Ratio	2.336	1	.126	
N of Valid Cases	172			

BMI of Patients	Mild	Moderate	Severe	Total
Lean	56	28	2	86
Obese	56	27	3	86
Total	112	55	5	172

Table 1. 1 shows the association between age and BMI.
The correlation issignificant at the level 0.05.

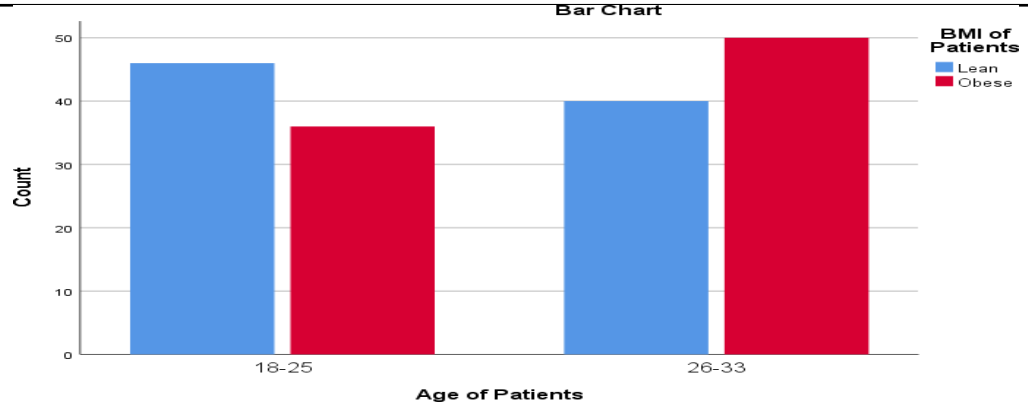


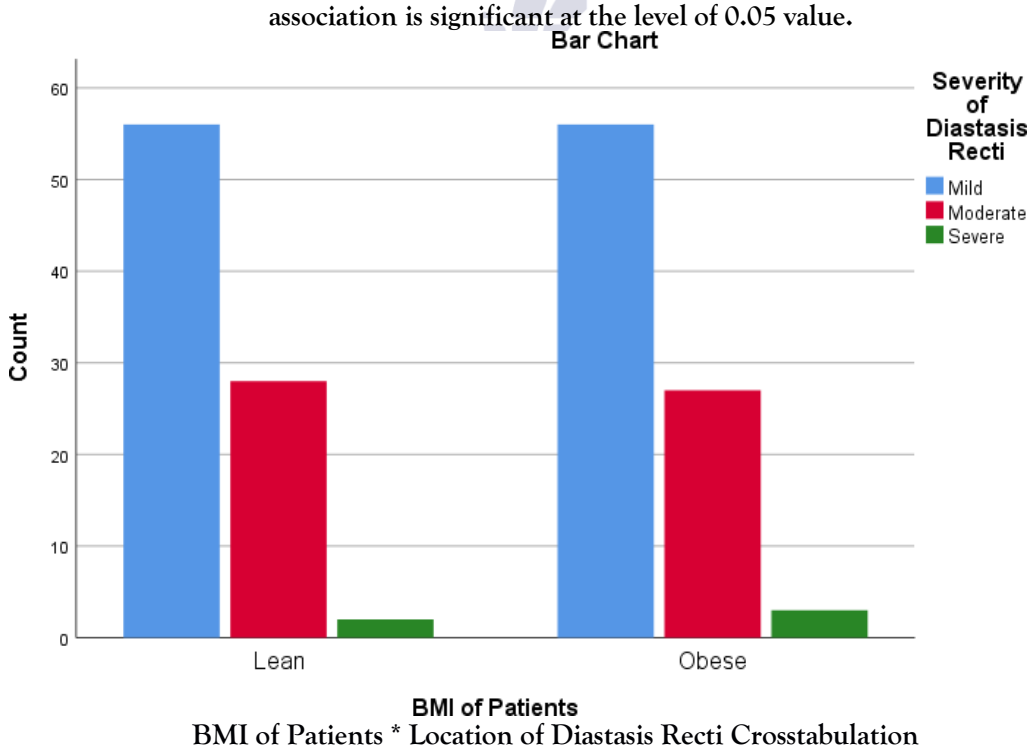
Table 2 **BMI of Patients * Severity of Diastasis Recti Cross tabulation Severity of Diastasis Recti**

Table 2. 1 shows the association between BMI and severity of diastasis recti.

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.218[a]	2	.897
Likelihood Ratio	.220	2	.896
N of Valid Cases	172		

Table 2. 2 a. 2 cells (33.3%) have expected count less than 5. The minimumexpected count is 2.50.b. association is significant at the level of 0.05 value.



BMI of Patients * Location of Diastasis Recti Crosstabulation

Location of Diastasis Recti

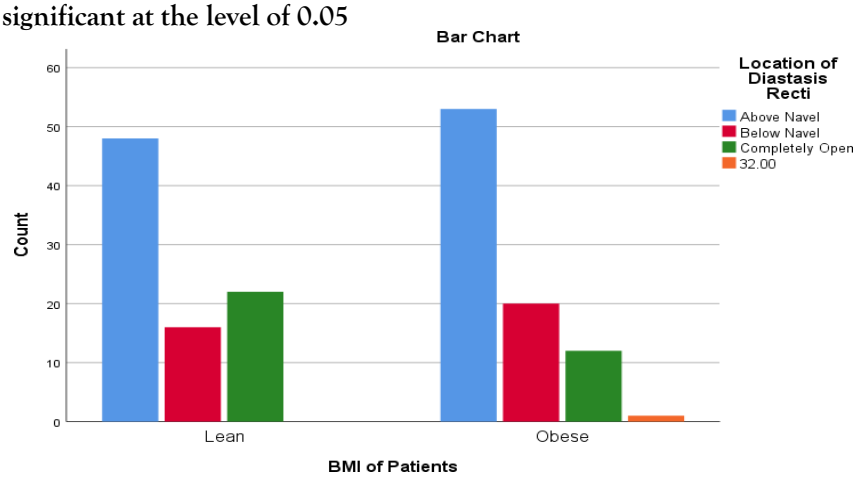
BMI of Patients	Above Navel	Below Navel	Completely Open	32.00
Lean	48	16	22	0
Obese	53	20	12	1
Total	101	36	34	1

Table 3 shows the association between the BMI and location of the diastasis recti.

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.943[a]	2	.230
Likelihood Ratio	3.070	2	.215
N of Valid Cases	172		

Table 3. 1 a. 2 cells (33.3%) have expected count less than 5. The minimumexpected count is 2.38.b. association is significant at the level of 0.05



Discussion:

Our studies showed no significant relationship between BMI and Diastasis Recti. Neither the age factor contributed to any variable. This is in contrast to the popular cross sectional study reports of increased chances of Diastasis Recti with increasing age and BMI (*Frequency of Diastasis Recti and Lumbopelvic Pain during Pregnancy and Factors Associated with Diastasis Recti*, n.d.) (Jaiswal et al., 2021) as shown in Table 2 and 2.2. These result outcomes might have occurred because the subjects under investigation lied in the mean ranges of BMI and none of them belonged to the extreme border of BMI. This study also analyzed the comparison of severity of Diastasis Recti in obese vs lean, and found that the severity of Diastasis Recti followed the same trend in both i.e. most were having mild diastasis recti followed by moderate and then severe as shown in table3 and 3.2 After analyzing these trends of BMI and age we observed that neither of them are directly associated to diastasis recti.

We cannot exclude the possibility that changes in the measurement using 2 finger width method and its reporting may create a bias. While we believe these limitations have not impacted the primary outcome of the study, future work could seek to include additional controls. Moreover, taking subjects with extreme BMI ranges like morbidly obese and underweight can diversify the results.

CONCLUSION

The study was done to highlight the importance of physiotherapy in all pregnant females either lean or obese to maintain their BMI in the average range, hence to prevent the serious complications after pregnancy from which one of the frequently occurring complication is diastasis recti. This research was done on the participants from all over the hospitals located in Lahore and included participants of every socioeconomic status. We found that there was not significant but slight association of BMI and diastasis recti in primiparous females. As both showed equal prevalence of diastasis recti in both lean and obese primiparous females. But it is evident that primiparous women either lean or obese has developed mild to moderate diastasis recti.

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