




KNOWLEDGE AND BELIEFS TOWARDS PELVIC FLOOR MUSCLE TRAINING DURING PREGNANCY AND POSTPARTUM PERIOD; A CROSS-SECTIONAL OBSERVATIONAL STUDY IN THE URBAN POPULATION OF PAKISTAN


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ABSTRACT

Background of the Study: This study aimed to assess knowledge and beliefs about pelvic floor muscle training to prevent urinary incontinence (UI) during pregnancy and postpartum in Karachi. Also, to determine the prevalence of urinary incontinence.

Methodology: This cross-sectional study was conducted at the Department of Gynecology and Obstetrics, Dow University Hospital, Karachi. Non-probability sampling technique was done on N=380. QUID scale questionnaire and items to assess knowledge and beliefs were executed. Participants were invited either during their consultancy visit or post-delivery. The logistic regression analysis using SPSS Version 26.0 was performed to predict the knowledge level of PFMT, classification of gravida and parity, delivery type and other variables.

Results: The study founded lack of awareness regarding pelvic floor muscle training and an inadequate level of knowledge during the antenatal period

(n=168). It was found that 23.0% responded the question as they are currently "Doing Pelvic Floor Muscle Exercise" in the antenatal period. Logistic analysis showed that women with cesarean-section delivery have more probabilities of adequate knowledge (OR=1.65, 95% CI=1.03-2.64, p-value= 0.035). Women strongly believe that urine leakage is normal during pregnancy.

Conclusion: The study concluded that stress incontinence and urge incontinence are most common among others. Lack of awareness regarding pelvic floor muscle training was found among both groups. In contrast, a high level of knowledge regarding pelvic floor muscles' anatomy and function and urinary incontinence was found in the postpartum group.

Keywords: *Urinary disorder, postpartum period, puerperium, urogenital diseases, urologic disease, female urogenital diseases and pregnancy complications, parity, gravidity.*

Introduction

Kegel exercises, also known as Pelvic Floor Muscle Training (PFMT), is a physical activity deliberated as the leading treatment option for urinary incontinence (UI). PFMT during pregen-

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Citation: Paracha H, Rasheed A, Hasan AJ, Yamin F, Rehman A, Anwer A. KNOWLEDGE AND ATTITUDE TOWARDS PELVIC FLOOR MUSCLE TRAINING DURING PREGNANCY AND POSTPARTUM PERIOD A CROSSSECTIONAL OBSERVATIONAL STUDY IN THE URBAN POPULATION OF PAKISTAN. Pakistan Journal of Rehabilitation. 2024 July 6;13(2):88–99. Available from: <https://doi.org/10.36283/pjr.zu.13.2/012>

Received: Fri, March 08, 2023

Accepted: Wed, June 05, 2024

Published: Sat, July 06, 2024

ancy may lessen the risk of reporting UI in late pregnancy and postpartum¹. The utmost communal and mutual type of incontinence, due to overpressure on the urethra found in younger women is stress urinary incontinence (SUI)^{2,3}. Whereas in urge incontinence, the urine outflow occurs, subsequently creating a strong, unexpected urge to urinate before one can get to a bathroom. Urge incontinence is occasionally called an “overactive bladder”⁴. It can occur during a nap when you perceive or touch running water². Complaints are related to urgency, exertion, effort, sneezing, or coughing, which is called mixed Incontinence⁵. Constipation, pre-pregnancy UI, former postpartum UI, and family past of UI were the most associated with UI in pregnancy⁶. The training can be performed daily which is beneficial in pregnancy because the training of pelvic floor muscles can prevent the occurrence of weakness that leads to urinary incontinence. Other than childbirth, increasing age and decreased physical activity and Vitamin D3 also plays a role in the rate of Urinary Incontinence⁷. Raheela Mohsin Rizvi and Muhammad Haris Nazim conducted a study on the Frequency of Urinary Symptoms in Women Attending Gynecology Clinics at the Aga Khan University Hospital Karachi. They concluded that 44.4% of the total population has Stress Urinary Incontinence (SUI) with an incidence rate of 17.2%. Parity is strongly associated with the occurrence of SUI. Both desire to urinate and mixed incontinence are significantly linked to age but not to parity and delivery type⁵. Okeke Humphrey et al. conducted a study on the Knowledge and Practice of Pelvic Floor Muscle Exercises among Pregnant Women in Enugu Metropolis, Nigeria. A high level of knowledge of PFMEs was found, but the level of practice was low. Hence, it was recommended that antenatal care workers should discover new means of educating exercise regimes⁸. Hill Marie Anne also conducted a cross-sectional survey on “Pregnant women's awareness, knowledge, and beliefs about pelvic floor muscles: a cross-sectional survey”. They concluded in their study that pregnant women require more health education regarding PFMs. Education should be provided using diverse modes, especially for women from migrant backgrounds and women who do not plan to attend formal antenatal exercises classes⁹. In 2020, Hsu Yuan Ting and Juraci A. studied urinary incontinence among pregnant women in Southern Brazil. That study concluded that 14.7% (95%CI: 13.4%-16.1%) of the participants had complained of urinary incontinence during gestation. The occurrence of UI had different presentations varying according to women's characteristics¹⁰. In 2020, Maisa H. Al Kiyumi, et al conducted a study on Urinary Incontinence among Omani Women Prevalence, risk factors, and impact on quality of life. That study concluded that two-third of populations had opposing effects on Quality of life. They also concluded that Body mass Index and age play a role in urinary incontinence¹¹. There is a general lack of information about the disease, as it is neglected by most of women in Pakistan. Our study focused on the knowledge and beliefs towards PFMT, along with the prevalence of various types of urinary incontinence in antenatal and postnatal women in Pakistan. This research will help gather data regarding the prevalence of different types of urinary incontinence among postnatal women. The study objective was to assess knowledge and beliefs of pelvic floor muscle training to prevent urinary incontinence during pregnancy and postpartum in Karachi, Pakistan.

Methodology

This cross-sectional survey was conducted at Dow University Hospital in January-October 2021 after the approval from the departmental research committee (Ref: DUHS/SPH/2021/06-2332); Second or third-trimester pregnant or postpartum women were included. Participants who had any gynecological complication or where pelvic training was not recommended were excluded. N= 380 sample was obtained through open epi 3.01 using the frequency of participants' knowledge regarding PFMT as 55.5%¹², confidence limit of 5% design effect of 1% & confidence level of 95%. Data was collected using the non-probability sampling technique and after voluntary acceptance. Participants were invited to the study during their regular visits and post-delivery. After fulfilling the inclusion criteria and voluntary acceptance, a questionnaire which included demographic data of age, type of delivery, type of urinary incontinence, pregnancy trimester, classification of gravida and parity, and knowledge and beliefs towards pelvic floor

muscle training were given. For urinary incontinence, (QUID) scale was used with the author's permission (Urdu version of the questionnaire was used for less literate participants). The responses of participants were recorded by the principal investigator. To use this questionnaire in our population, with the consultation of experts and translators, it was translated into the Urdu language and after an anonymous review; it was translated back into English with minor variations. The sensitivity and specificity of QUID were 85% and 71% for Stress Incontinence and 79% and 79% for Urge Incontinence respectively. The Optimal cut-off score for diagnoses of Stress incontinence is ≥ 4 , and for urge incontinence score is ≥ 6 ¹³. Questionnaire items to assess the awareness of PFMT and its usage and beliefs were designed by a women's health physiotherapist (JW). Content validity assessment among pregnant women was also performed in that research, and questions were piloted and modified⁹. We used this questionnaire in our population with the permission of the author. A participant was classified as having adequate knowledge if she identified 4 or more correct answers out of 6 questions. Data was stored in and analyzed by SPSS Version 26.0. Frequencies and percentages were shown as all qualitative variables. Descriptive statistics were presented for quantitative variables. Chi-square test was used to identify the significant relationship between qualitative variables (P-value ≤ 0.05 was considered as significant). A binary variable about knowledge ($>50\%$: adequate knowledge and $\leq 50\%$: Inadequate knowledge) was created. Logistic regression analysis was also used.

Result

This study included 380 women, 168 of whom were in the antenatal period and 212 in the postpartum period. The analyses were done in terms of study participant distribution. Table 1 shows that in the antenatal period women's mean age was 27.74 ± 4.25 years, with 89.9% of women having a range of gravida 1-4, and 93.5% of females having parity between 0-3. In 168 females postpartum period females had a mean age of 27.93 ± 4.413 years, with 89.2% of females having a range of gravida 1-4; and 68.4% of the females were classified as multiparous. When they were asked about their knowledge and awareness of Pelvic floor Muscle Training, only 51.9% were aware. In the antenatal period women, 14.9% of females had symptoms of stress urinary incontinence whereas 12.7% had symptoms of urge urinary incontinence; and 11.8% had symptoms of mixed urinary incontinence in the postpartum period respectively.

		Antenatal Period (n=168)	Postpartum Period (n=212)
		Frequency (%)	Frequency (%)
Gravida	1—4	151(89.9)	189(89.2)
	>=5	17(10.1)	23(10.8)
Parity	0—3	157(93.5)	172(81.1)
	>=4	11(6.5)	40(18.9)
Trimester	2 nd	58(34.5)	NA
	3 rd	10(66.5)	NA
Abortus	Yes	46(27.4)	36(17.0)
	No	122(72.6)	176(83.0)
Classification	Primigravida	45(26.8)	NA
	Multigravida	123(73.2)	NA
	Primiparous	NA	67(31.6)
	Multiparous	NA	145(68.4)
Type of delivery	Normal Delivery	63(37.5)	121(57.1)
	Cesarean Section	61(36.3)	91(42.9)
Urinary Incontinence^a	No Incontinence	117(69.6)	140(66.0)
	Stress Urinary Incontinence	25(14.9)	20(9.4)
	Urge Urinary Incontinence	10(6.0)	27(12.7)
	Mixed Urinary Incontinence	16(9.5)	25(11.8)
Do you know about Pelvic Floor Muscle Training?	Yes	55(32.7)	110(51.9)
	No	77(45.8)	52(24.5)
	Don't Know	36(21.4)	50(23.6)
Do you ever perform Kegels exercises?	Yes	37(22.0)	64(30.2)
	No	76(45.2)	59(27.8)
	Doing PFME	11(6.5)	43(20.3)
	Don't know	44(26.2)	46(21.7)
	Physiotheapist	40(23.8)	89(42.0)
Where have you heard of Pelvic floor muscle training	Internet	19(11.3)	23(10.8)
	Did not hear	109(64.9)	100(47.2)
		Mean ± SD	Mean ± SD
Age		27.74±4.258	27.93±4.413

^a Classification according to QUID scale;

Table 01: Study participants' demographic characteristics with awareness & distribution of type of incontinence

Table 2 shows that 33.9 % of antenatal group participants and 66.1% of postpartum females correctly identified the function of pelvic floor muscles, whereas 56.7% and 43.3% didn't know their response showed significant association (p-value, 0.001). In the antenatal period, females, 80.4% of the participants had inadequate knowledge, while in the postpartum period females the ratio decreased to 64.2%.

		Antenatal	Postpartum	P-value
		Period	Period	
		Frequency (%)	Frequency (%)	
What does your Pelvic floor muscles do?	Prevent UI	14(42.4)	19(57.6)	0.001*
	Prevent Fecal Incontinence	4(44.4)	5(55.5)	
	Support your back	20(33.3)	40(66.7)	
	All of the above	41(33.9)	80(66.1)	
	Don't know	89(56.7)	68(43.3)	
Where do your pelvic floor muscles go around?	Bladder exit	22(43.1)	29(56.9)	0.027*
	Vagina	7(43.8)	9(56.3)	
	Bowel exit	8(38.1)	13(61.9)	
Should your pelvic floor muscles and lower tummy work together?	All of the above	42(33.9)	82(66.1)	0.14
	True	54(37.0)	92(63.0)	
	False	15(50.0)	15(50.0)	
	Sometimes	18(43.9)	23(56.1)	
Why might women leak when they are pregnant?	Don't know	81(49.7)	82(50.3)	0.212
	They are pregnant	77(47.0)	87(53.0)	
	Their Bladder is too small	24(55.8)	19(44.2)	
	Their PFMs do not work properly	23(34.3)	44(65.7)	
	Only the last above is correct	19(42.2)	26(57.8)	
If I leak urine When I am pregnant?	Don't know	25(41.0)	36(59.0)	0.437
	I don't know if there is	13(43.3)	17(56.7)	
	I will ask for help	80(48.8)	84(51.2)	
	I won't think Incontinence is a Problem	28(42.4)	38(57.6)	
How often should you exercise pelvic Floor muscles?	I won't ask for help as I will be embarrassed	47(39.2)	73(60.8)	0.8
	Daily, or two or more times per week	68(43.9)	87(56.1)	
	Once per week	26(40.0)	39(60.0)	
	Once	6(40.0)	9(60.0)	
Level of Knowledge	Don't know	68(46.9)	77(53.1)	0.035
	Adequate knowledge	33(19.6)	76(35.8)	
	Inadequate knowledge	135(80.4)	136(64.2)	

*Chi-square test is used, P-value ≤ 0.05 was considered significant

Table 02: Respondent Knowledge about the Anatomy and Functions of Pelvic Floor Muscle, Knowledge about Urinary Incontinence and Level of Knowledge

In table 3, it is shown that postpartum period women had more adequate knowledge; 35.8% in comparison to the antenatal period 19.6%, showing a significant association (p-value < 0.001). It was found out that inadequate knowledge was higher in normal delivery 74.5% than in cesarean section cases 63.8% showing a significant association (p-value 0.035).

		Adequate Knowledge Frequency (%)	Inadequate Knowledge Frequency (%)	p - Value
Gravida	1—4	100(29.4)	240(70.6)	0.361
	>=5	9(22.5)	31(77.5)	
Parity	0—3	93(28.3)	236(71.7)	0.648
	>=4	16(31.4)	35(68.6)	
Duration	Antenatal Period	33(19.6)	135(80.4)	<0.00*
	Postpartum Period	76(35.8)	136(64.2)	
Abortus	Yes	21(25.6)	61(74.4)	0.487
	No	88(29.5)	210(70.5)	
Classification	Primigravida	7(15.6)	38(84.4)	0.005*
	Multigravida	26(21.1)	97(78.9)	
	Primiparous	26(38.8)	41(61.2)	
	Multiparous	50(34.5)	95(65.5)	
Type of delivery	Normal Delivery	47(25.5)	137(74.5)	0.03*
	Cesarean Section	55(36.2)	97(63.8)	

Table 03: Association of Demographics and Type of Delivery with Level of Knowledge

Table 4 shows that in logistic regression analysis, postpartum females are 2.28 times more likely to have adequate knowledge as compared to antenatal period females (95% CI: 1.42-3.68, p-value=0.001). The patients who had cesarean section were 1.65 times (95% CI: 1.03-2.64, p-value=0.035) more likely to have adequate knowledge when compared with females who had a standard delivery. Similarly, Multiparous females had 1.96 more chances to have adequate knowledge as compared to Primigravida females (95% CI: 1.13 - 3.41, p-value=0.01). It was also found that females with gravida >=5 are 0.697 times less likely to have adequate knowledge as compared to those females who have gravida 1-4 (p-value= 0.363). Those women who have parity > 4 are 1.160 times more likely to have adequate knowledge as compared to those whose parity are between 1-3 (p-value= 0.648). Similarly, females with no history of abortion have 1.21 more chances of adequate knowledge when compared to females with a history of abortion (p-value =0.487).

		OR(95% CI)	P-Value
Duration	Antenatal Period	1	0.001*
	Postpartum Period	2.28(1.42-3.68)	
Abortus	Yes	1	0.487
	No	1.217(0.699-2.120)	
Type of delivery	Normal delivery	1	0.035*
	Cesarean delivery	1.65(1.03-2.64)	
Gravida	1—4	1	0.363
	>= 5	0.697(0.320-1.517)	
Parity	0—3	1	0.648
	>=4	1.160(0.613 -2.196)	
Classification	Primigravida	1	0.006*
	Primiparous	2.36(1.22- 4.55)	0.01*
	Multigravida	0.68(0.27-1.7)	0.42
	Multiparous	1.96(1.13-3.41)	0.01*

Table 04: Logistic regression analyses; Association of Level of Knowledge with Demographics and Type of delivery.

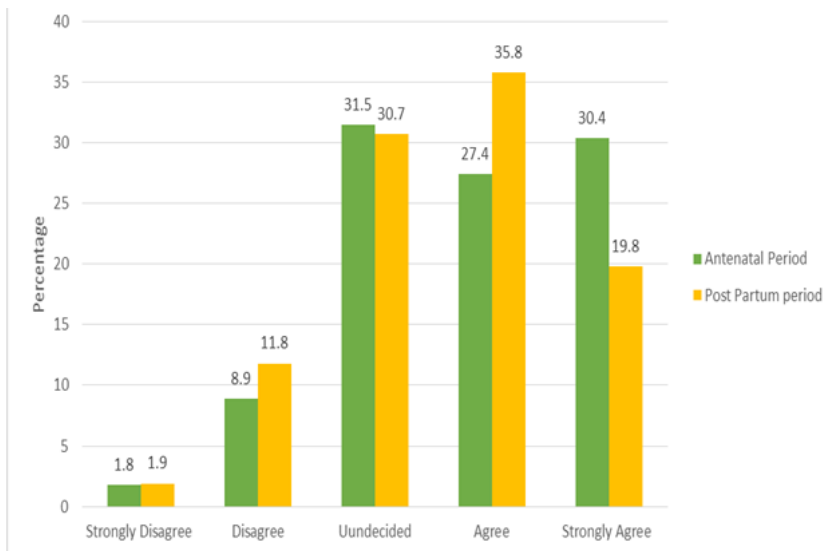


Fig 01: Is it normal to leak urine when pregnant

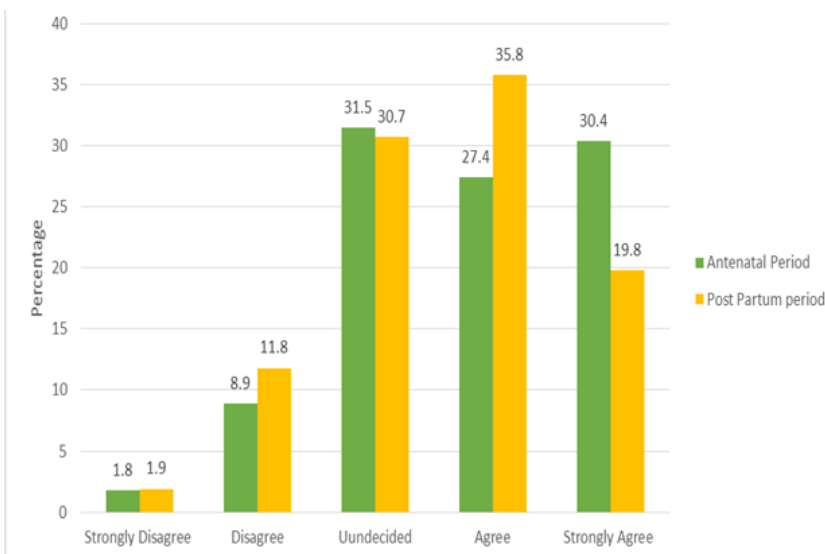


Fig 02: There is treatment for leaking urine when pregnant

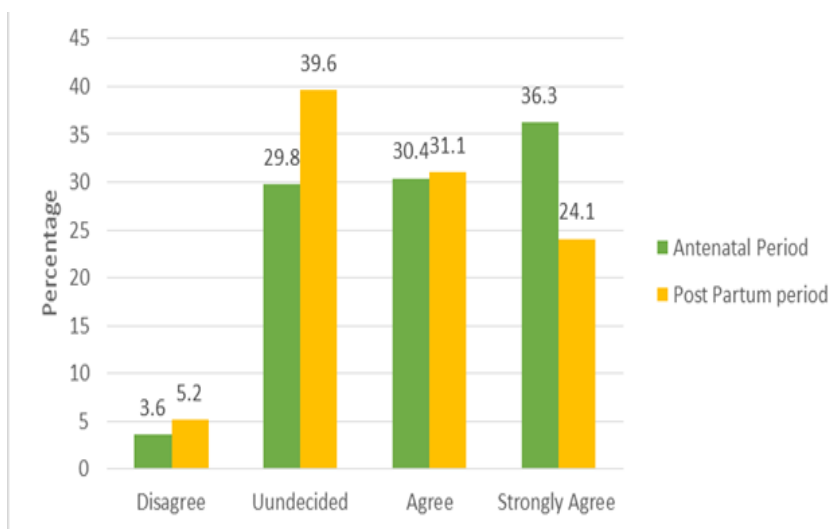


Fig 03: I intended to follow advice about pelvic floor muscles exercise

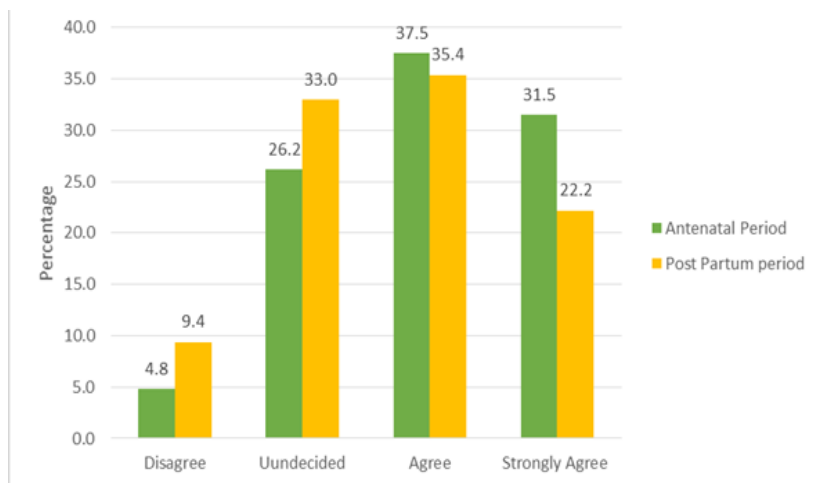


Fig 04: Does the Pelvic floor muscle exercises prevent/ improve the leakage the of urine

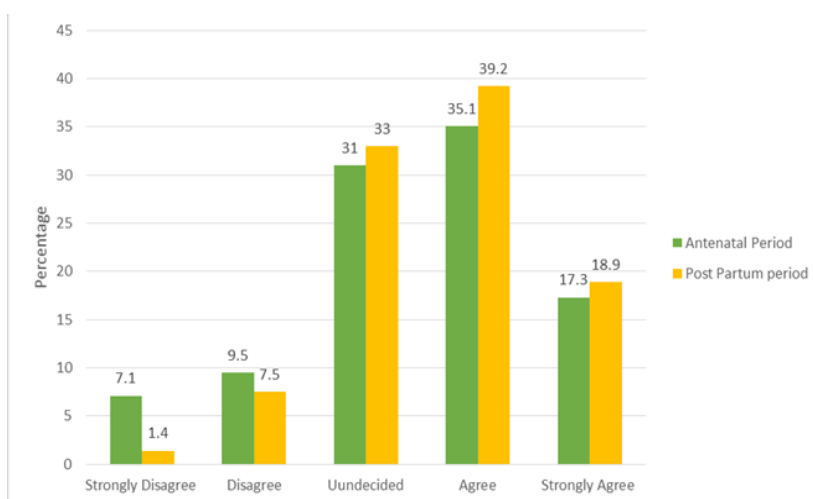


Fig 05: I will start to leak urine when I will be pregnant

Figure 01 shows beliefs about urine leakage, availability of treatment, and susceptibility to urine leakage in later pregnancies. Firstly, during antenatal period, 50.6% of the participants believed that urine leakage is normal during pregnancy, whereas only 1.8% of the population knew that it is not normal to leak urine during pregnancy. In the post-partum period 35.8 % of the study participants had an idea that there must be a treatment for urine leakage during pregnancy. Also, 39.6% of females remain undecided whether they will follow any advice regarding pelvic floor muscles if given or not. It was found out that 37.5% of antenatal period women agree upon the belief that Pelvic Floor muscles exercises prevent the leakage of urine. In postpartum females, 35.4% agreed upon the role of PFM’s.

Discussion

PFMT is closely related to urinary disorders regardless of the urinary incontinence type. According to our study results, 45.8% lack awareness about pelvic floor muscle training during the antenatal period was found, whereas 51.9% of postpartum females had awareness. The frequency of the females that currently have heard about PFMT was 30.25% and the frequency of females performing pelvic floor muscle training was found to be 20.3% during their post-partum period. On the other hand, in the antenatal period, 45.2% of females have not heard and 6.5% of the study participants participated in PFMT. The main source of awareness was physiotherapists. 23.0% antenatal period & 42% postpartum period, and the internet is the second most common- source- 11.3% and 10.8% in both groups respectively. Similar findings of less awareness and practice

during pregnancy were reported in other studies^{9, 14}. This might be because of the low educational status of our study participants. The plausibility can be due to low or no practice of PFMT during the antenatal period. A study contradicted our study finding where they concluded that knowledge acquisition was 44.4% from the internet source¹⁴. In our study, most of the patients, whether in the antenatal or postpartum period, had no symptoms of UI. It was found that 14.9% of females had experienced the symptoms of SUI during pregnancy, whereas 12.7% experienced symptoms of urge incontinence and 11.8% of mixed urinary incontinence in the postpartum period, respectively. In the study conducted in the Netherlands, more than half of all postpartum women from 6 weeks to one-year post-childbirth experienced 57.1% UI as reported by Moossdroff et al¹⁵. In another study, the higher number of gravidities is associated with an increase in UI at the age of 18 or above; and, with normal vaginal delivery¹⁶. Maori et al concluded that 33.4% (168 out of 503) of the antenatal women, 26.5% (100 out of 377) postpartum women, reported urinary incontinence with stress incontinence being utmost common (p-value=0.03)¹⁷. In China, a study concluded that 30.6% of multiparous females had SUI subsequently 1 year of delivery¹⁸. In our study population, most women had no symptoms of UI regardless of the period in which they were, but when considering the type of UI, we also found SUI to be the most prevalent. It was found during our study that 43.3% of the respondents in the postpartum period and 56.7% in the antenatal period replied that they didn't know the function of PFM's. In the postpartum period, 66.1% of respondents were able to identify correctly the function of PFM by selecting all the above options. A study conducted by Hill et al. reported that 76% correctly identified that PFMs function to prevent UI, but only 27.3% knew that the PFMs also function to prevent faecal incontinence: 20.7% of participants, however, could not identify any of the PFM functions. Only 5.4% of respondents correctly answered the question, "what do your PFMs go around?"⁹. The reason for the lack of knowledge in our study population might be no concept of antenatal classes where they can learn about the description, importance, as well consequences of not performing PFMT. When comparing the antenatal period, postpartum period women had better knowledge because of the induction of Physiotherapy treatment techniques as part of postnatal care in tertiary health care setups of Pakistan. Adequate knowledge was found in females of the postpartum group which was 35.8% whereas inadequate knowledge was found in the antenatal period (80.4%) respectively. It was also found that level of knowledge is highly associated with the number of parity where 28.3% of women with children between 0-3 and 31.4% having parity ≥ 4 reported adequate knowledge. In our study, 36.2% of females with a history of cesarean section and 25.5% of participants with normal vaginal delivery had adequate knowledge and showed significant association. De Freitas et al. also reported similar findings of low levels of PFM knowledge with no relationships between PFM knowledge and the pervasiveness of UI¹⁹. Another study concluded that the type of safe exercises during pregnancy and its knowledge was found limited in the rural population [20] another study conducted in Tamil Nadu also concluded that only 22% of their study population has adequate knowledge about postnatal exercise²¹. Another study reported low practice of PFME, although they found good knowledge²². A cross-sectional study conducted in China among 3rd-trimester females concluded that PFME should be practiced as a part of routine care²³. In our study population, increased levels of knowledge in multiparous females and those with caesarean section deliveries are due to higher implementation of PFMT in the postpartum period than during Pregnancy. The odds ratios for adequate knowledge for the groups of postpartum, cesarean women, primiparous and multiparous are 2.28, 1.65, 2.36 and 1.96 respectively. Multigravida females are less likely to have adequate knowledge (OR=0.68). The role of PFMT is supported by a study conducted by Davenport et al. It concluded that PFMT decreases both – the chances of occurrences and severity of symptoms in antenatal and postnatal UI²⁴. The higher chances of adequate knowledge in primiparous or multiparous women can be reasonable since the females belonging to these two classifications of parity are currently doing PFME. This study also found that 89.2% of postpartum females and 81% of antenatal women strongly agree that urine leakage is normal during pregnancy. When the study participants were asked about their intention to follow the

advice, if given, 75.2% and 66.7% of both groups replied as strongly agreed respectively. It was also found that 69% of antenatal females believed that PFME helps to treat urine leakage while 33.0% of postnatal females were unable to decide. Regarding the belief of urine leakage in the next pregnancy, 58.1% of postpartum females marked their answer as either strongly agrees or agree. Another study on Pakistani women also concluded that there is a lack of knowledge and awareness of PFMEs²⁵. Hill et al. reported similar beliefs with 41.4% strongly agreeing that it was normal to leak urine when pregnant. They also reported that 28.2% were undecided about the presence of any treatment for UI during pregnancy⁹. The discrepancies in respondent frequencies in this study's participants can be correlated to the previous practice of PFMT, caste differences and low socioeconomic status.

Conclusion

This current study concluded that there is a lack of awareness in antenatal and postnatal females. The level of knowledge about PFM's anatomy and their function, including UI, was higher in the postpartum group rather than the antenatal group. Most of the females also believed that urine leakage is normal and that they will face the problem of urine leakage in the next pregnancy. Females were also keen to follow treatment advice if given. Overall, the females belonging to the postpartum period or cesarean section delivery are more likely to have adequate knowledge. Also, SUI is more prevalent than mixed urinary incontinence in the antenatal period. Similarly, urge incontinence is most common in the postpartum period.

AUTHORS' CONTRIBUTION:

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Hafsa Paracha, Faisal Yameen, Abdur Rasheed

Acquisition, Analysis or Interpretation of Data: Jahan Ara Hassan, Atiq Ur Rehman, Areesha Anwar, Hafsa Paracha, Abdur Rasheed

Manuscript Writing & Approval: Areesha Anwar, Atiq Ur Rehman, Abdur Rasheed, Jahan Ara Hassan

All authors acknowledge their accountability for all facets of the research, ensuring that any concerns regarding the accuracy or integrity of the work are duly investigated and resolved.

ACKNOWLEDGEMENTS: We thanks all the participants in this study.

INFORMED CONSENT: Written Informed Consent was taken from each patient.

CONFLICT OF INTEREST: The author (s) have no conflict of interest regarding any of the activity perform by PJR.

FUNDING STATEMENTS: None declared

ETHICS STATEMENTS: The protocol of the present study was registered by the local ethics committee of School of Public health, DUHS approval code Ref: DUHS/SPH/2021/06-2332/registered.

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