

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20205251>

Original Research Article

Prevalence of pelvic floor dysfunction in women attending obstetrics and gynaecology OPD at PES Institute of Medical Sciences and Research, Kuppam

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Received: 10 October 2020

Accepted: 13 November 2020

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ABSTRACT

Background: Millions of women are affected with pelvic floor dysfunction globally. But when the literature was reviewed, studies assessing the prevalence of PFD (pelvic floor dysfunction) and related factors were limited in India. Hence the present study was undertaken to assess the prevalence of PFD.

Methods: 300 women aged 18-70 years attending Obstetrics and Gynaecology OPD at Kuppam were interviewed and details like age, number of children, mode of delivery, BMI, education, occupation as primary outcome variables and type of pelvic floor dysfunction as explanatory variable were collected using a semi structured questionnaire. Frequency and proportions were calculated for quantitative variables and Chi-square test was used for comparison of categorical variables. p-value of <0.05 was considered using SPSS (Version 22).

Results: 58 out of 300 women had Pelvic floor dysfunction. Majority of them 52 (17.33%) had Pelvic organ prolapse. Among them 43 (74.14%) women were >45 years old, 38 (65.52%) women had 2 or 3 children, and 12 (20.69%) women had ≥4 children. 47 (81.03%) had vaginal delivery. 37 (63.79%) subjects had no schooling and 13 (22.41%) were unskilled workers. 36 (62.07%) participants BMI ranged between 25 to 34.99. Age, education, occupation, number of children, mode of delivery, BMI were found to be associated with increased incidence of pelvic floor dysfunction.

Conclusions: In conclusion the study assessed high prevalence of pelvic floor dysfunction associated with vaginal delivery, increased age, number of children and BMI.

Keywords: Faecal incontinence, Pelvic floor disorders, Pelvic organs, Prevalence, Pelvic organ prolapse, Urinary incontinence

INTRODUCTION

The pelvic floor in females is required for various functions which include parturition, urination and urinary continence, defecation and faecal continence, pleasure and sexuality. Pelvic floor functions are controlled by the central nervous system and could be impaired due to anatomical injury or neurological dysfunction. Pelvic floor dysfunction is also referred to as pelvic floor disorders or pelvic floor weakness.¹ Pelvic floor dysfunction is manifested as urinary incontinence (UI),

faecal incontinence (FI), and pelvic organ prolapse (POP). The prevalence of PFD is estimated to be in the range of 12 to 42% and increases with age. PFDs are usually associated with a high number of pregnancies and heavy lifting. The tendency to develop PFDs increases with age due to the weakening of pelvic floor muscles mostly after the age of 55 years.² With the advancement of age, the probability of pelvic floor dysfunction, particularly urinary or faecal incontinence increases. Among various risk factors of pelvic floor dysfunction, pregnancy and childbirth are considered to have a major

impact. Injury to pelvic floor muscles and the connective tissue or partial denervation of the pelvic floor, which occurs due to mechanical stretching during delivery may cause PFD after delivery.

The weakening of muscles and ligaments of pelvic floor cause concavity of pelvic diaphragm and pelvic contents located on the surface of the pelvic diaphragm which causes weakening of the hammock effect. Ligament attachments also weaken, exposing the bladder and vagina to intra-abdominal pressure. This pressure may result in prolapse of uterus and vagina which disturbs natural dynamics of organs located parallel with them, namely the bladder and rectum.

This, along with increased abdominal pressure, will press the bladder neck in the opposite direction to normal physiological closure causing urine leakage. Prolapse may not be limited to bladder alone.³ Pelvic organ prolapse a type of manifestation of PFD affects 30% of women in the age group of 20-59 years. Assessing pelvic organ prolapse requires a laborious quantitative pelvic examination or imaging studies. Prolapse is one of the common indications for gynaecological surgery in developed countries. In spite of this fact, its prevalence is not studied much. The extent and consequences of pelvic floor dysfunction have also not been studied extensively.⁴

PFD causes social, economic, physical and psychological problems in women lowering their quality of life and productivity. With an increase in life expectancy, PFD prevalence is bound to increase, causing an economic burden on both developing and developed nations. It has been found that though PFD negatively affects the quality of life of an individual, very few women with PFD seek medical care due to many prevailing misconceptions. 81% of women with urinary incontinence, one of the main forms of manifestation of PFD, perceive the condition to be normal arising due to childbirth or age and has no treatment. Ignorance that PFD is a treatable medical condition combined with personal embarrassment attached with these conditions prevent many women from seeking medical care.⁵

Many factors which include female gender, age, pregnancy, childbirth, type of delivery, number of births, obesity, menopause have a role to play in aetiology of PFDs. Dysfunction of pelvic floor muscles which have important functions is found to be the major cause of PFD. Impairment of one or more of the above functions will result in PFD.⁶ Pelvic floor weakening depends on multiple factors, but there are a large number of predisposing factors which are preventable. Understanding clinical presentation and management of PFD will help to strengthen treatment and management practices.

The previous epidemiological studies showed global prevalence of POP between 2% and 20% among women ≤ 45 years of age. However, estimates in developing

countries vary extensively, ranging from 3.4% in South India to as high as 56% in Egypt. The weighted prevalence rate of one or more pelvic floor disorder in the United States was 25.0%, including 17.1% of women with moderate-to-severe urinary incontinence, 9.4% (95% CI 8.6, 10.2) with faecal incontinence, and 2.9% with prolapse.⁷ Various conditions of PFDs coexist. 16% of women with PFDs have more than one condition. It was found that 9% of women have both urinary incontinence and faecal incontinence and 7% had both urinary incontinence and pelvic organ prolapse.⁸

Literature has various studies on different types of pelvic floor dysfunction and their association with various risk factors. But there are very few Indian studies on the prevalence of pelvic floor dysfunction among different populations. With this background the present study is conducted with the objective to assess the prevalence of PFD and related factors in females attending outpatient at PESIMSR, Kuppam.

METHODS

The present study was a Cross-sectional study conducted among females visiting the department of Obstetrics and Gynaecology at PESIMSR, Kuppam. A sample size of 300 calculated using the formula was selected through convenient sampling method. The subjects were recruited from January 2018-june 2019. Females in the age group of 18-70 years were included. Females with acute illness, who had a history of recent abdominal/ gastrointestinal/ gynaecological surgery, musculoskeletal issues, spinal cord injury, cerebral palsy and who could not comprehend the questionnaire were excluded from the study. Study was approved by institutional human ethics committee. Informed written consent was obtained from all the study participants. Confidentiality of the study participants was maintained.

Data collection

All the relevant parameters were documented in a structured study proforma which was pre-tested and validated by pilot study.

The questionnaire consists of socio-demographic details, obstetric history and screening questions related to different types of urinary incontinence and anal incontinence and pelvic organ prolapse. Obstetric history included number of children and mode of delivery.

Educational qualification in women was classified as those who had no schooling, those who had primary schooling (Class 1-10), and those with secondary schooling (Class 11 and 12), undergraduates and postgraduates.

The occupation was classified as housewives, professional (Postgraduate lecturer, Lawyer, engineer), white-collar jobs (Nurse, LIC agent, Lab technician,

School teacher, Clerical job, office accountant), skilled worker (Tailor, Beautician), semiskilled worker (Bidi rolling) and unskilled worker (Fish seller, coolie, attender, agricultural laborer).

Statistical methods

Age, number of children, education, occupation, BMI, sexual symptoms were considered as primary explanatory variables. PFD was primary outcome variable. Type of PFD was considered as the secondary outcome variable.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Non-normally distributed quantitative variables were summarized by median and interquartile range (IQR). Data was also represented using appropriate diagrams like pie diagram.

All quantitative variables were checked for normal distribution within each category of explanatory variable by using visual inspection of histograms and normality Q-Q plots. Shapiro-Wilk test was also conducted to assess normal distribution AND a p value of >0.05 was considered as a normal distribution.

Categorical outcomes were compared between study groups using Chi square test /Fisher's Exact test (If the overall sample size was <20 or if the expected number in any one of the cells is <5, Fisher's exact test was used.) Indeandent sample T test / Mann Whitney U test was applied for numeric parameters comparison with categorical variables. P value <0.05 was considered statistically significant. IBM SPSS (version 22 Armonk, NY: IBM Corp.) was used for statistical analysis.¹⁰

RESULTS

A total of 300 subjects were included in the final analysis of which 58 were having PFD. Figure 1 shows the data of females with and without pelvic floor dysfunction. Majority of them 52(17.33%) had Pelvic organ prolapse, followed by POP with UI, urinary incontinence and faecal incontinence was 1%, 0.67% and 0.33% respectively.

Among the females with PFD, 43 (74.14%) were aged >45 years, 38 (65.52%) had 2 or 3 children, and 12 (20.69%) had ≥4 children. 47 (81.03%) had Vaginal Delivery. 8 (13.79%) had no schooling, 41 (70.69%) had education from class 1 to 10, 37 (63.79%) were no schooling and 13 (22.41%) were unskilled workers. 36 (62.07%) participants BMI was ranged between 25 to 34.99. 2% has dyspareunia (Table 1). Strong statistical significance was seen with age, number of children, mode of delivery and BMI (body mass index) in females with PFD (p value<0.005). There was no statistical significance with education, occupation and sexual symptoms in PFD.

Table 1: Distribution of study subjects according to baseline variables with PFD (n=58).

Baseline variables	Frequency	Percentage
Age groups (yrs)		
18- 25	1	1.72
26-35	2	3.45
36-45	12	20.69
>45	43	74.14
Number of children		
Nulli para	2	3.45
One child	6	10.34
2-3	38	65.52
>4	12	20.69
Type of delivery		
Instrumental	2	3.45
Caesarion	7	12.07
Vaginal	47	81.03
Education		
No schooling	8	13.79
Class 1-10	41	70.69
Class 11- 12	6	10.34
UG	2	3.45
PG	1	1.72
Occupation		
Housewife	37	63.79
White collar	6	10.34
Unskilled	13	22.41
Semiskilled	1	1.72
Skilled	1	1.72
BMI index		
18- 24.99	22	37.93
25 -34.99	36	62.07
≥35	0	0
Dyspareunia (Sexual symptoms)	2	3.45

Among study population the mean Age was 37.49±10.32 (19 to 63) and 180 (60%) had vaginal delivery, 97 (32.2%) had LSCS and 3 (15%) of them had Forceps delivery. 257 (85.66%) of them had completed their schooling, 34 (11.3%) of them had not completed their schooling and 7 (2.3%) of them completed they're Under Graduation. 183 (61%) of them were homemakers, 86 (28.7%) of them un-skilled workers, 23 (7.66%) of them were Skilled labour and 8 (2.7%) of them were Semi-skilled (Table 2).

Among the study population 52 (17.3%) had POP, 5 (1.7%) of them had UI and (0.3%) had FI. There was no association of age, number of children, occupation, BMI, education and 3 types of PFD and was not statistically significant. The p-value was not-significant for type of delivery, urinary incontinence index, vaizey incontinence score and sexual symptoms with the types of PFD. No statistical test was applied due to 0's in cells, \$ independent sample T test was applied for age and BMI and #Mann Whitney U test for number of children. These were not statistically significant (Table 3).

Table 2: Comparison of baseline characteristics with PFD (n=300).

Baseline characteristics	PFD		Chi square	P value
	Women with PFD (n=58) N (%)	Women without PFD (n=242) N (%)		
Age group (yrs)				
18 To 25	1 (1.72)	60 (24.79)	118.945	<0.001
26 To 35	2 (3.45)	55 (22.73)		
36 To 45	12 (20.69)	105 (43.39)		
>45	43 (74.14)	22 (9.09)		
Number of children				
Nulli Para	2 (3.45)	18 (7.44)	31.230	<0.001
1	6 (10.34)	59 (24.38)		
2&3	38 (65.52)	159 (65.7)		
≥4	12 (20.69)	6 (2.48)		
Type of delivery				
Caesarean section	7 (12.07)	90 (37.19)	19.861	<0.001
Instrumental	2 (3.45)	1 (0.41)		
Vaginal delivery	47 (81.03)	133 (54.96)		
Education				
No schooling	8 (13.79)	26 (10.74)	4.596	0.331
Class 1 To 10	41 (70.69)	161 (66.53)		
Class 11 and 12	6 (10.34)	49 (20.25)		
UG	2 (3.45)	5 (2.07)		
PG	1 (1.72)	1 (0.41)		
Occupation				
House wife	37 (63.79)	146 (60.33)	3.148	0.533
White collar	6 (10.34)	14 (5.79)		
Unskilled	13 (22.41)	73 (30.17)		
Semi-skilled	1 (1.72)	7 (2.89)		
Skilled	1 (1.72)	2 (0.83)		
BMI classification				
18 To 24.99	22 (37.93)	82 (33.88)	*	*
25 To 34.99	36 (62.07)	158 (65.29)		
≥35	0 (0)	2 (0.83)		
Sexual symptoms				
Dyspareunia	2 (3.45)	18 (7.44)	1.197	0.385
None	56 (96.55)	224 (92.56)		

Table 3: Comparison of baseline characteristics with PFD (n=300).

Parameter	Groups			P value
	POP (n=52)	UI (n=5)	FI (n=1)	
Age	48.8±8.45	52.40±4.56	34±0	0.134\$
Number of children	3 (1, 2)	2 (1, 1)	2	0.46#
Type of delivery				
Forceps	0 (0%)	1 (20%)	1 (100%)	*
LSCS	7 (14.0%)	0 (0%)	0 (0%)	
Vaginal delivery	43 (86%)	4 (80%)	0 (0%)	
Education				
No schooling	7 (13.5%)	1(20%)	0 (0%)	*
Schooling	43 (82.7%)	3 (60%)	1 (100%)	
Under graduation	1 (1.9%)	1 (20%)	0 (0%)	
Post graduation	1 (1.9%)	0 (0%)	0 (0%)	

Continued.

Parameter	Groups			P value
	POP (n=52)	UI (n=5)	FI (n=1)	
Occupation				
Home maker	34 (65.4%)	3 (60%)	0 (0%)	
Skilled	5 (9.6%)	2 (40%)	0 (0%)	
Un-skilled	12 (23.1%)	0 (0%)	1 (100%)	*
Semi-skilled	1 (1.9%)	0 (0%)	0 (0%)	
BMI	27.51±4.44	27.38±2.85	23.6±0	0.673\$
Urinary incontinence index	-	6 (5 to 7)	-	*
Vaizey incontinence score	-	-	-	*
POP Q	2 (2 to 3)	-	-	*
Sexual symptoms				
Dyspareunia	0 (0%)	0 (0%)	1 (100%)	*
None	52 (100%)	5 (100%)	0 (0%)	

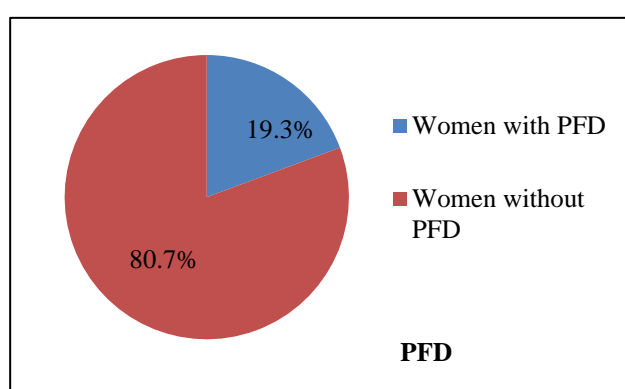


Figure 1: Pie chart of PFD in the study population (n=300).

DISCUSSION

The present study explored the prevalence of PFD and related factors in women. Out of 300 sample size, 58 of the women were diagnosed with PFD. Among them Majority were >45 years old (74.14%), 90% of the women had >2 children, 47 (81.03%) had vaginal delivery, 41 (70.69%) of them had schooling from class 1-10, 37 (63.79%) were housewives and 36 (62.07%) had high BMI. Millions of women are affected with PFD globally.

PFDs are not only a major health problem but affect the quality of life of women reducing their productivity. Symptoms of urinary incontinence or faecal incontinence, pelvic organ prolapse, sexual dysfunction and chronic pain syndromes are different types of PFD which may occur separately or coexist in a single individual of which urinary incontinence and pelvic organ prolapse are the most common.

Pelvic organ prolapse is herniation of pelvic organs which include bladder, uterus, small bowel or rectal ampulla through levator hiatus. Urinary incontinence is the involuntary leakage of urine.¹¹ PFDs cause serious economic, social, physical and psychological problems in

women. Even with high prevalence and their debilitating effect on the quality of life, there are not many studies which assess the prevalence of PFDs, particularly in developing countries like India. Most of the PFD are treatable, but many women continue to live with the condition due to many reasons.

One of the main reasons for women not seeking medical treatment is the embarrassment and stigma attached with PFD and lack of knowledge. Clinical profiling will help to assess the magnitude of the problem. It will help to increase awareness of various PFD conditions, their risk factors and available treatment options.

A total of 300 subjects were included in the final analysis out of which 58 were having PFD. Among the study population, 19.33% of participants had one or more types of PFD and remaining 80.67% of participants were without PFD. This prevalence of PFD found in this study is in comparison to a study done in India by Rao et al, which showed a prevalence of 21.0% and in another study conducted by Wu et al, in the USA which showed a prevalence of 25.0%.^{7,9} On the other hand, in another study by Megabiaw et al, in Ethiopia reported a prevalence of 12.0%, which is in contrast to the present study.¹²

Majority of participants with PFD were more than 45 years of age which is in comparison with a study by Hallock, which mentioned that prevalence of PFDs increased from 2.91% among 20 to 29 year old participants, to 16.16% among 70 years and older.⁸

Among the participants with Pelvic floor dysfunction 17.33% had Pelvic organ prolapse, followed by POP with urinary incontinence, urinary incontinence and faecal incontinence which were 1%, 0.67% and 0.33% respectively. This finding of pelvic organ prolapse in 17.33% of participants is in comparison to a study by Walker et al, where the mean prevalence for pelvic organ prolapse was 19.7% and in contrast to a study by Megabiaw et al, in which anatomical pelvic organ prolapse stage II-IV was detected in 55.1% of women.^{4,12}

The percentage of participants with 2 and 3 children was almost same in participants with PFD and without PFD. It is reported in the literature that Pelvic floor muscles weaken after delivery. It was reported in a study by Hilde et al that pelvic floor muscle strength decreases after the first vaginal delivery.¹³

The finding in this study is in contrast from the present study. In a study by Özdemir et al, it was found that women who had 1-3 deliveries had the highest Pelvic floor muscle strength; and that this strength decreased as the number of deliveries increased.¹⁴ This may be considered as the reason for the percentage of participants with 2 and 3 children being the same in women with and without PFD.

81.03% of participants with PFD and 54.96% without PFD had a vaginal delivery. The finding of a higher percentage of participants with vaginal delivery can be compared to that found in a study by MacLennan et al, which reported pelvic floor dysfunction in 58% of women who had a spontaneous vaginal delivery, compared with 43% of those who underwent caesarean section.¹⁵

It has also been reported in previous studies that increased pressure on the bladder during pregnancy causes an increase in the ureterovesical angle, and a decrease in the support of the bladder neck and urethra, which may be responsible for urethral hypermobility as well as UI.¹⁶ Denervation, disruption and damage to levator complex caused during vaginal delivery increase the risk of development of POP. Ureterovesical angle is found to be increased in women after childbirth compared to non-pregnant women.¹⁷

The finding of a higher percentage of vaginal deliveries in PFD participants in the present study and higher percentage of POP among other PFDs in this study can be compared to the findings in two studies one by Handa et al, in which it was reported that operative vaginal birth significantly increased the odds for all pelvic floor disorders, especially prolapse and in another study by Quiroz et al it was concluded that the odds of pelvic organ prolapse were almost 10 times higher after a single vaginal birth.^{18,19}

Very less percentage of participants are educated to graduation level, and very less percentage of participants are working professionals in the present study. Because of this, the majority of participants may not have PFD knowledge. Absence of sufficient knowledge results in the belief that they are simply “a normal part of ageing,” or being unaware that treatment options exist.

Additional barriers to presentation include personal embarrassment, being unaware that PFDs are medical conditions, and being unaware that treatment options exist.²⁰ This is reported in a study by Chen et al.⁵ A study by Mandimika et al, mentions that increasing knowledge

of these conditions has demonstrated to increase compliance with treatments.²¹

The pelvic floor is subjected to chronic stress in obese women which is due to elevated intra-abdominal pressure, and this may cause stress incontinence and other pelvic floor disorders. Additionally, it may affect the neuromuscular function of the genital tract and thereby contribute to the pelvic floor and urethral dysfunction. Age and parity are the two factors that work with obesity to cause an increased incidence of urodynamic stress incontinence.²²

The most important lifestyle factor is considered to be a high body mass index. The most probable mechanism of POP development among obese women is increase in intra-abdominal pressure which causes weakening of pelvic floor muscles and fascia.²³ The present study finding indicates higher BMI ranging from 25 to 34.99 in majority of participants with PFD which is in comparison with a study by Hendrix et al, in which it was shown that percentage of prolapses increased with increased BMI values.²⁴

The major limitation of the study includes a hospital based and small number of samples recruited. Hence the results cannot be generalized on the whole. To clarify the issue a large sample size and different hospitals from other geographical areas should be considered that will reflect the overall situation.

CONCLUSION

The present study concluded a high prevalence of Pelvic floor dysfunction similar to the reported global trends. Age, mode of delivery, obesity and number of children, BMI were found to be risk factors associated with pelvic floor dysfunction. Knowledge and education about the above risk factors can help in preventing PFDs to some extent. The participants with PFD mostly had a low level of education which can be linked with lack of knowledge regarding PFD conditions and the ignorance to the fact that early medical intervention will help in conservative management of PFD.

ACKNOWLEDGMENTS

Authors acknowledge the technical support in data entry, analysis and manuscript editing by “Evidencian Research Associates”.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Gaddam R, Gangadharan K, Shivaraju P, Basappa PK. Prevalence of pelvic floor dysfunction in women attending obstetrics and gynaecology OPD at PES Institute of Medical Sciences and Research, Kuppam. *Int J Reprod Contracept Obstet Gynecol* 2020;9:5087-93.