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Knowledge and practice of pelvic floor exercise among pregnant women attending an antenatal clinic

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ABSTRACT

Objectives: To assess the knowledge and practice of pelvic floor muscle exercises (PFMEs) among pregnant women.

Material and Methods: This three-month cross-sectional study was carried out at the Enugu State University Teaching Hospital (ESUTH) in Enugu, Nigeria, from January to March 2024. One hundred and four expectant mothers attending antenatal sessions at this centre were involved in the study. Utilising a self-structured questionnaire, data was gathered. A mean score of ≥2.5 was regarded as acceptable.

Results: The findings of the study indicated that 77.9% of the participants had a good knowledge of PFMEs. The majority (77.9%) perform PFMEs at home (88.9%), primarily utilising the Kegel pelvic floor exercise (91.3%). The primary factor influencing the use of PFMEs was found to be forgetfulness (2.81 ± 0.85). Knowledge, educational attainment and PFME practice were significantly correlated ($p = 0.001$; $p = 0.041$), respectively.

Conclusion: Pregnant mothers are well versed in PFME and actively implement it. However, the primary identified factor impacting the practice is forgetfulness. Knowledge and educational attainment had a positive effect on the application of PFMEs. Thus, the PFMEs programme should be incorporated into weekly prenatal sessions and girl education should be encouraged.

Keywords: Antenatal care, Pelvic floor exercises, Antenatal clinic, Pregnancy, Pregnant women

INTRODUCTION

Most nations utilise the antennal programme in their efforts to promote and prevent health issues. Pregnancy health and improved neonatal outcomes require it. That is why the prenatal talks that some of our hospitals give to expectant mothers during prenatal visits mainly consist of lectures on antenatal exercises. Because of its many advantages, it is primarily recommended that people engage in mild to moderate physical activities frequently.

Pregnant women in many countries had little to no knowledge a few decades ago about the safety and health benefits of mild to moderate exercise for both the developing foetus and the expectant mother. However, recent research has demonstrated that engaging in these kinds of activities regularly largely carries no risk and is advantageous for both physical and mental health.[1] Pregnant women should engage in specific exercises to maintain the strength of their pelvic muscles, support the healthy function of their abdomen, including the bladder, and prevent the common condition known as urinary incontinence, as pregnancy puts a lot of strain on these

muscles. It is possible to avoid complications caused by weak pelvic muscles by adhering to the recommended pelvic floor muscle exercises (PFMEs).[2] PFMEs are simple and effective; they do not require performance. These can be performed in any posture, such as sitting, standing or lying down with the knees apart. It only requires effort to find and use the right muscles.

The best exercises for managing pelvic dysfunctions and strengthening the pelvic muscles are the Kegel exercises.[3] This exercise is named after the American gynaecologist Arnold H. Kegel, who originally published a description of it in 1948. Kegel's exercise aims to strengthen the pelvic muscles through repeated contractions and relaxations. To complete the Kegel exercise, the bladder must be empty. While sitting or lying down, the person contracts their pelvic muscles, maintains the position and counts for three to five seconds. It can be modified or developed further to produce new versions. It is typically recommended to perform this exercise several times a day for a few minutes at a time. It needs to be done for at least one to three months to start having the desired effect.[4–6]

Numerous studies show the advantages of this kind of conservative care, suggesting that it is a good option for treating pelvic dysfunctions, particularly urinary incontinence, brought on by the stress that childbirth and pregnancy place on the pelvic muscles.[7] Performing these exercises increases muscle mass, which helps to stabilise the urethra.[8] Although the value of PFMEs during pregnancy was known, there was little practice, according to a study done in Lahore, Pakistan.[9] Similarly, while knowledge of PFMEs was relatively high among participants in a study conducted in the Enugu Metropolis, Nigeria, practice of the concept was low.[10]

Numerous studies highlight the advantages of this kind of conservative care, suggesting that it is a feasible therapeutic approach for pelvic dysfunctions, particularly urinary incontinence brought on by the stress that childbirth and pregnancy place on the pelvic muscles.[7] Completing these exercises result in an increase in muscle mass, which stabilises the urethra.[8] A study carried out in Lahore, Pakistan, revealed that while there was awareness of the importance of PFMEs during pregnancy, there was little practice.[9] Similarly, although participants in a study conducted in the Enugu Metropolis had a relatively high level of knowledge about PFMEs, the practice was low.[10] Regretfully, few women in our country know about the benefits of pelvic floor exercises.

The majority of them believe that exercising during pregnancy is not a good idea because it might harm the developing foetus. To begin with, they are not aware of the pelvic dysfunctions brought on by pelvic muscle weakness. Some women feel uncomfortable bringing up these issues with their gynaecologists. Few people receive knowledge about these PFMEs from other medical specialists. The majority of women acknowledge that they do not follow the suggested exercise regimen.[9]

This study was therefore created to evaluate PFME knowledge and practice among pregnant patients receiving antenatal care at the Enugu State University Teaching Hospital (ESUTH) and in light of the claims made by some studies that proficiency in the PFMEs does not imply proficiency in the routine performance of the PFMEs.

MATERIAL AND METHODS

This was a descriptive cross-sectional method. All expectant mothers who visited the ESUTH Parklane between January and March 2023 were included in the study.

The ESUTH Parklane is situated in the southeast Nigerian state of Enugu, inside the Enugu Metropolis. There are numerous universities in Enugu. The state is one of the Federal Republic of Nigeria's 36 Federating States. The ESUTH Parklane, located in the Enugu North Local Government area of Enugu State, served as the study's site. The hospital is at the intersection between Park Avenue, Parklane, and Hospital Avenue and behind the popular shopping mall Shoprite. It is located within the Enugu city area and extends over an area of 272 hectares. It has about 17 units and other academic departments. Specifically, the study was conducted in the antenatal clinic located in the maternity building. This clinic is located in the basement adjacent to the newborn intensive care unit and opposite the orthopaedic clinic. Antenatal clinics have an estimated number of five consulting rooms, one chief nursing office room, one record room, one orderly room, one nursing changing room and the area where pregnant women stay.

During the period under study, 104 pregnant women who attended antenatal care were recruited and included in the study. Hence, it was a total study of 104 respondents.

A self-administered questionnaire was employed, with two senior lecturers in the Department of Nursing Sciences, including the project supervisor, face-validating the instrument. To measure the respondents' comprehension and applicability of the questionnaire's contents, a pilot test of the instrument was conducted at the Poly Subdistrict Hospital in Asata, Enugu, with respondents who were similar to the test subjects – the pregnant women. The participants provided feedback on how to improve the questionnaire's contents to measure the study's goals. The Cronbach alpha coefficient pilot test results showed 0.875.

The Ethics and Research Committee of the Ministry of Health in Enugu State granted ethical approval (ESUTH/REF/VOL

1/107). Participants in the study faced little to no risk from the study. Moreover, no invasive procedures were performed during the study. Therefore, verbal informed consent was obtained from each participant after the study's purpose was explained. Additionally, by locking the data and utilising code numbers rather than personal identifiers, the confidentiality of the information was ensured.

The data were analysed using both descriptive and inferential statistics. The descriptive statistics of mean and standard deviation, frequency and percentage were used to compile the questionnaire's items. When evaluating scaled items using mean and standard deviation, the respondents deemed an item to be accepted if its mean was greater than 2.5 and rejected if its mean was less than 2.5. Each respondent's total knowledge score was calculated by adding all their right answers to the knowledge items. If the knowledge score was 50% or lower, it was classified as poor; otherwise, it was classified as good. At the 5% level of significance, the hypothesis was tested using inferential statistics, specifically the Chi-Square test and Fisher's exact test. If the p-value was less than 0.05, a significant relationship was thus present; otherwise, there was no significance. These analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Excel.

RESULTS

The age ranges of the participants were between 17 and 44 years, with a mean and standard deviation of 27.19 ± 5.37 and modal age group between 25 and 29 years (54.8%). The majority were married (54.8%). Most had tertiary education (80.8%). They were mostly professionals (29.8%), traders (19.2%) and civil servants (17.3%). The majority of them had one to two children (49.0%) [Table 1].

Table 1: Demographic characteristics of the pregnant mothers (n = 104)

	Frequency	Percentage	Age range	M ± SD
Age			17–44	27.19 ± 5.37
<25	32	30.8		
25–29	43	41.3		
30–34	10	9.6		
35+	13	12.5		
No response	*6*	*5.8*		
Marital status				
Single	38	36.5		
Married	57	54.8		
Divorced/ Separated	6	5.8		
Widowed	3	2.9		
Educational status				
Primary	1	1.0		
Secondary	19	18.3		
Tertiary	84	80.8		
Occupation				
Civil Servant	18	17.3		
Housewife	12	11.5		
Farmer	4	3.8		
Trader	20	19.2		
Professional	31	29.8		
Others – Student	17	16.3		
No response	*2*	*1.9*		
Number of children				
1–2	51	49.0		
3–4	27	26.0		
5 and above	7	6.7		
No response	*19*	*18.3*		

M: Mean, SD: Standard deviation.

The results showed that knowledge of PFME among the mothers was good (77.9%). Specifically, virtually all mothers had heard of the PFME (91.3%), mostly the Kegel exercise (83.7%) and mainly from health practitioners (50.0%). Known benefits of the exercise included maintaining the strength and contractile force for the efficient functioning of the pelvic floor (75.0%), preventing stress urinary incontinence (71.2%), enhancing postpartum health (87.5%), preventing prolapse of pelvic organ (72.1%) and improving sexual function (76.0%). The majority of the mothers knew it could be performed during pregnancy (62.5%) and at any time in one's life (59.6%). Not many, however, knew the exercise is not only for pregnant women (41.3%) [Table 2].

The majority of the mothers practised PFME (77.9%), mainly the Kegel exercise (90.1%), which they performed at home (88.9%). A majorityy performed the exercise at least for ten minutes (72.8%); 53.1% performed for at least 20 minutes; and 29.6% for at least 30 minutes. The exercise started in the first trimester for the majority of the mothers (50.6%). The number of contractions was largely between one and three (35.8%) and three and six (29.6%), while the sitting position was largely adopted for the exercise (58.0%) [Table 3].

Forgetfulness was the major factor influencing the practice of pelvic floor exercise (2.81 ± 0.85) followed by the stress of pregnancy (2.70 ± 0.75) [Table 4].

There is statistically a significant relationship between the mothers' knowledge and practice of PFMEs ($p < 0.001$). Mothers with good knowledge associated with the practice (88.9%) were more than those with poor knowledge of the practice (39.1%) [Table 5].

More so, educational status was significantly related to the practice of PFME ($p = 0.041$). Specifically, mothers with higher education who practised PFME (82.1%) were more than those with lower education (60.0%). Practice of PFME

Table 2: Knowledge of pelvic floor muscle exercise (n = 104)

Items	Frequency	Percentage
Have you heard of pelvic floor muscle exercise?		
Yes	95	91.3
No	9	8.7
From which source did you hear of it		
Health Practitioner	52	50.0
TV/Radio	7	6.7
School	26	25.0
Social media	36	34.6
Others	5	4.8
Which pelvic floor muscle exercise do you know?		
Kegel exercise	87	83.7
Marches	11	10.6
Heel slides	7	6.7
Happy baby pose	9	8.7
Diaphragmatic breathing	19	18.3
Pelvic floor muscle exercises are exercises that help to maintain the strength and contractile force for the efficient functioning of the pelvic floor		
Yes	78	75.0
No	4	3.8
Don't know	22	21.2
Pelvic floor muscle exercise prevents stress urinary incontinence		
Yes	74	71.2
No	6	5.8
Don't know	24	23.1
Pelvic floor muscle exercise enhances postpartum health		
Yes	91	87.5
No	1	1.0
Don't know	12	11.5
Pelvic floor muscle exercise prevents prolapse of the pelvic organ		
Yes	75	72.1
No	8	7.7
Don't know	21	20.2
Pelvic floor muscle exercise improves sexual function		
Yes	79	76.0
No	8	7.7
Don't know	17	16.3
Pelvic floor muscle exercise can be performed during pregnancy		
Yes	65	62.5
No	16	15.4
Don't know	23	22.1
Pelvic floor muscle exercise can be performed at any time in one's life		
Yes	62	59.6
No	12	11.5
Don't know	30	28.8
Pelvic floor muscle exercise can only be performed by pregnant women		
Yes	34	32.7
No	43	41.3
Don't know	27	26.0
Overall Knowledge		
Good (knowledge score >50%)	81	77.9
Poor (knowledge score ≤ 50%)	23	22.1

Table 3: Practice of pelvic floor muscle exercise (n = 104)

	Frequency	Percent
Do you perform pelvic floor muscle exercises?		
Yes	81	77.9
No	23	22.1
Which pelvic floor muscle exercise do you perform? (n = 81)		
Kegel exercise	73	90.1
Marches	2	2.5
Heel slides	1	1.2
Happy baby pose	10	12.3
Diaphragmatic breathing	11	13.6
Where do you perform pelvic floor muscle exercises? (n = 81)		
Home	72	88.9
Workplace	12	14.8
School	2	2.5
Others – everywhere, gym and hospital	5	6.2
How long do you normally perform pelvic floor muscle exercises at a time? (n = 81)		
Below 10 minutes	22	27.2
10 minutes	16	19.8
20 minutes	19	23.5
30 minutes	14	17.3
40 minutes and above	10	12.3
At what trimester did you start practicing pelvic floor muscle exercises? (n = 81)		
First trimester	41	50.6
Second trimester	30	37.0
Third trimester	9	11.1
At all time	1	1.2
How many contractions do you perform at a time? (n = 81)		
1–3	29	35.8
3–6	24	29.6
6–9	14	17.3
9–12	9	11.1
Above 12	4	4.9
No response	1	1.2
What position do you stay in while performing pelvic floor muscle exercises? (n = 81)		
Sitting	47	58.0
Lying	27	33.3
Standing	28	34.6
Others – squatting, any position	3	3.7

was not significantly related to their age (p = 0.418), marital status (p = 0.192), occupation (p = 0.188) and number of children (p = 0.842) [Table 6].

DISCUSSION

This study aimed to evaluate pregnant women attending a clinic at the ESUTH about their knowledge and practice of PFME.

The results indicated that a sizable portion of the respondents knew a good deal about PFMEs, and the majority of them primarily learned about them from medical professionals.

Table 4: Factors influencing the practice of pelvic floor muscle exercise (n = 95)

	SD	D	A	SA	M ± SD
Don't know so much about it	20	31	35	9	2.35 ± 0.92
Forgetfulness	9	18	50	18	2.81 ± 0.85*
Stress of pregnancy	6	27	53	10	2.70 ± 0.75*
Lack of time	9	50	29	7	2.37 ± 0.76
Don't know how to perform it despite being aware of it	21	54	19	1	2.00 ± 0.68
Don't understand the different types of pelvic muscle floor exercise	12	37	35	11	2.47 ± 0.87

Statistics were computed on 95 respondents (instead of 104) who had heard of pelvic floor muscle exercise; item with mean (M) > 2.5 was accepted by the respondents for a factor; *indicates item with M > 2.5; SD= Strongly disagree; D= Disagree, A = Agree; SA= Strongly agree; M=Mean.

Table 5: Association between knowledge of mothers and their practice of pelvic muscle exercises (n = 104)

	Practice of pelvic floor muscle exercise		Total	Chi-square	p-value
	Yes	No			
Knowledge of pelvic floor muscle exercise				25.749	P < 0.001
Good	72 (88.9)	9 (11.1)	81		
Poor	9 (39.1)	14 (60.9)	23		

This data on PFME knowledge contrasts with findings from a related study by Mbada *et al*., which found that only 37.0% of participants were aware of pelvic floor exercises.[11] One possible explanation for the relatively high percentage of PFME knowledge among the women in this study is that most of them had postsecondary education and may have valued health information. The support that medical professionals offer during prenatal sessions is another thing to think about.

Ironically, the majority of people who were aware of PFMEs were also proficient in their use. This is consistent with findings from an earlier research,[12,13] which found that knowledge of PFMEs was a significant factor in determining compliance. In contrast, Okeke *et al*.'s study found that although a relatively high percentage of participants (71.02%) knew about PFMEs, only 38.37% practised them.[10] The results show that while there might be additional factors that prevent or interfere with pregnant women following the advised exercise regimen, pregnant womens knowledge of PFMEs does guarantee that they will follow PFMEs. Therefore, it follows that educating women is essential to lowering pregnancy-related problems and expecting mothers should seriously consider attending weekly prenatal exercise classes.

Table 6: Association between socio-demographic characteristics of the mothers and their practice of pelvic muscle floor exercise

	Practice of pelvic floor muscle exercise		Total	Statistics	p-value
	Yes	No			
Age				2.869[f]	0.418
<25	25 (78.1)	7 (21.9)	32		
25–29	36 (83.7)	7 (16.3)	43		
30–34	6 (60.0)	4 (40.0)	10		
35+	10 (76.9)	3 (23.1)	13		
Educational status				-[f]	0.041
Lower (primary and secondary)	12 (60.0)	8 (40.0)	20		
Higher (tertiary)	69 (82.1)	15 (17.9)	84		
Marital status				3.300[c]	0.192
Single	26 (68.4)	12 (31.6)	38		
Married	48 (84.2)	9 (15.8)	57		
Divorced/ separated/ widowed	7 (77.8)	2 (22.2)	9		
Occupation				5.959[f]	0.188
Civil servant	15 (83.3)	3 (16.7)	18		
Housewife	8 (66.7)	4 (33.3)	12		
Trader/ farmer	19 (79.2)	5 (20.8)	24		
Professional	28 (90.3)	3 (9.7)	31		
Student	11 (64.7)	6 (35.3)	17		
Number of children				0.345[c]	0.842
1–2	42 (82.4)	9 (17.6)	51		
3–4	21 (77.8)	6 (22.2)	27		
5 and above	6 (85.7)	1 (14.3)	7		

Statistic used: c = Chi-square test; f = fisher's exact test; p < 0.05.

Forgetfulness and pregnancy-related stress were cited by the majority of study participants as the main factors influencing the use of PFMEs. This conclusion is supported by a related study,[14] which discovered that women's willingness to exercise is influenced by certain barriers. The results of a similar study carried out in Nigeria on a sample of 252 pregnant women support this. The study revealed that despite being enrolled in the education programme, only 38.3% of the sample completed the PFMEs. Additionally, it was determined that the primary obstacles to the exercises were fatigue, lack of time and forgetting about the exercises.[10]

Pregnant mothers' knowledge and practice of PFMEs were found to be significantly correlated in this study, suggesting that mothers who had better knowledge of the practice

were more likely to engage in it than those who had less knowledge. The greater knowledge may have resulted from the respondents' appreciation of health information due to their higher education; subsequently, this high knowledge was put into practice, as the majority of these women engaged in PFME. This contrasts with a study where the knowledge was high but did not translate into practice.[15]. Additionally, Alharbi *et al*. found that only 38.5% of their sample was performing the exercise adequately, even though over half of their sample had satisfactory knowledge of the exercise and over 70% had an attitude favouring the exercise.[16] These results diverge from ours, especially about the high degree of practice in our sample.

While the number of children, age, marital status and occupation did not appear to be associated with the practice of PFMEs, our investigation did reveal a significant relationship between practice and educational status. More mothers completed PFMEs with higher rather than with lower education levels. This is in line with a study that included 169 Pakistani women and discovered a positive relationship between educational attainment and awareness of PFMEs.[17] A study involving 349 pregnant women was also carried out in Ethiopia to assess antenatal exercise-related factors, such as PFMEs. According to the study, employment, education level and getting advice on exercising during prenatal care were all correlated with prenatal exercise knowledge, attitude and practice levels.[18]

Strengths and limitations of the study

Examining the instrument's high reliability score involved a test-retest process. There may be a study limitation because not all of the pregnant women in the study area are literate in English. To mitigate potential bias stemming from language barriers, the researcher allocated sufficient time to explain each questionnaire item to the respondents in the Igbo language. The small number of pregnant mothers who visit the centre makes the sample size of this study inadequate, and it is suggested that more tertiary establishments be included in future research.

CONCLUSION

Conclusively, this research demonstrated that expectant mothers possessed a strong understanding of pelvic floor exercises, particularly the Kegel exercise, which they primarily performed at home. The main factor influencing the practice of PFMEs was forgetfulness. More specifically, the application of PFMEs was linked to knowledge and educational attainment. Therefore, it is advised to give pregnant Nigerian women the necessary instruction or encouragement to emphasise the value of PFME practice. Weekly prenatal visit sessions should incorporate the PFME programme, in which a physiotherapist will instruct and motivate the women to engage in the practice. Since practice is impacted by educational attainment, the government could be a major player in fostering an environment that can enhance the education of girl children.

Authors' contributions

Almost all the authors actively participated in the development of this study: PCC, EOA, CI, and JCE contributed to the study's design, data collection, analysis, and interpretation; PCC, CI, and FSB also reviewed and edited the manuscript; PCC, CI, and EOA wrote the final report; and all authors approved the work's final draft after reading it.

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Ethical approval

The research/study approved by the Institutional Review Board at Enugu State University Teaching Hospital Ethical Committee Office, number ESUTH/REF/VOL 1/107, dated 01st January 2023.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of AI-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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