



Comparative Analysis of Kegel Exercise Knowledge, Application, and Recommendation Between Physical Therapy and Rehabilitation and Nursing Students

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Abstract

Introduction and Hypothesis Pelvic floor muscle exercises are widely recommended as an evidence-based, noninvasive, and cost-effective approach, particularly for the prevention and management of urinary incontinence. This study was conducted to compare the knowledge levels, application habits and recommendation behaviors of Physiotherapy and Rehabilitation and Nursing department students regarding Kegel exercises.

Methods This cross-sectional study included 250 undergraduate students (150 from Physiotherapy and Rehabilitation, 100 from Nursing) at a Turkish university. Data were collected via a structured questionnaire evaluating students' sociodemographic characteristics, knowledge, practice frequency, recommendation behaviors, and perceived effectiveness of Kegel exercises. Group comparisons were analyzed using independent *t*-tests and chi-square tests, with statistical significance set at $p < 0.05$.

Results Physiotherapy and Rehabilitation students showed significantly higher scores in knowledge ($p = 0.032$), more frequent application ($p = 0.008$), and greater likelihood of recommending Kegel exercises ($p = 0.001$). They also reported higher effectiveness and overall engagement ($p < 0.001$).

Conclusions The findings indicate that Physiotherapy and Rehabilitation students possess higher levels of knowledge, are more likely to apply Kegel exercises themselves, and more frequently recommend them to others compared to Nursing students. This disparity may be attributed to curriculum differences, particularly the greater emphasis on musculoskeletal and pelvic health training within physiotherapy education. Integrating structured pelvic floor muscle training modules into nursing curricula may enhance students' competence and confidence, ultimately contributing to improved pelvic health awareness and patient care outcomes.

Keywords Pelvic floor muscle training · Physical therapy · Nursing students · Health Education

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Physiotherapy students showed higher Kegel exercise knowledge, practice, and recommendation rates than nursing students; curricular differences appear to explain this disparity.

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Introduction

Kegel exercises, originally introduced by Dr. Arnold Kegel in 1948, involve the voluntary contraction and relaxation of pelvic floor muscles to improve urinary continence, sexual function, and pelvic organ support [1]. Pelvic floor muscle

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training (PFMT) is now widely recognized as the first-line, noninvasive intervention for women suffering from stress urinary incontinence and pelvic organ prolapse [2]. Despite strong evidence supporting its efficacy, many healthcare professionals lack adequate training in PFMT techniques and may be unable to effectively promote its use in clinical practice [3].

Pelvic floor dysfunction affects a considerable proportion of women, particularly during and after pregnancy. PFMT represents a cost-effective, low-risk behavioral intervention for managing urinary and fecal incontinence and is recommended across various stages of a woman's life [4, 5]. These exercises strengthen the pelvic muscles, improve urethral and anal sphincter control, and reduce incontinence episodes when performed consistently and correctly [6, 7].

The effectiveness of PFMT depends on patient selection, the type and frequency of exercises, and adherence to training regimens [8]. Programs typically last 6 weeks to 8 months and involve performing contraction sets three times per day [5]. Proper instruction and muscle awareness are critical, and healthcare professionals, especially nurses and physiotherapists, are expected to educate patients on the importance and techniques of these exercises [9, 10].

Students in health-related fields, particularly those studying nursing and physiotherapy, are future key implementers of pelvic health interventions. However, gaps in education and practical training on PFMT have been reported across curricula [11, 12]. With internet sources being the predominant means of health information, the role of formal education in enhancing evidence-based knowledge is more critical than ever [13].

This study aims to compare knowledge, practice habits, and recommendation behaviors regarding Kegel exercises among undergraduate students in the Physiotherapy and Rehabilitation and Nursing departments. Identifying discipline-specific educational gaps may inform curriculum development and support the integration of pelvic floor health modules in undergraduate training to promote early professional competency and improve long-term patient outcomes.

Materials and Methods

Study Design and Setting

This descriptive, comparative cross-sectional study was conducted between May and July 2024 at a foundation university in Türkiye. The study was designed to assess and compare Kegel exercise-related knowledge, application behavior, and recommendation practices between undergraduate students enrolled in the Physical Therapy and Rehabilitation and Nursing departments.

Participants and Sampling

The target population included third- and fourth-year students who had completed coursework relevant to musculoskeletal or urological systems. A total of 250 students participated in the study, comprising 150 Physiotherapy and Rehabilitation and Nursing students and 100 Nursing students. The imbalance between groups reflects the actual student distribution within the institution and the use of convenience sampling; this approach was chosen to maximize participation rates and feasibility within the study time-frame. The sample was selected using a non-probability convenience sampling technique. Eligibility criteria included voluntary participation, being aged 18 years or older, and enrollment in one of the two programs. Students who had previously received advanced training in pelvic floor therapy outside the formal curriculum were excluded to ensure homogeneity in educational exposure. An a priori power analysis was not performed owing to the exploratory nature of the study; however, post hoc analysis indicated that the achieved sample size provided sufficient statistical power ($>80\%$) to detect moderate between-group differences at a significance level of $p < 0.05$. The final sample size was primarily determined by the number of eligible and consenting students available during the data collection period.

In Türkiye, both the Physiotherapy and Rehabilitation and Nursing undergraduate programs are 4-year degree programs. In the Physiotherapy and Rehabilitation curriculum, courses related to musculoskeletal rehabilitation, urogenital system disorders, and pelvic floor muscle training are typically introduced during the second academic year and expanded through practical and clinical applications in the third and fourth years. In contrast, Nursing curricula primarily address pelvic floor health within broader courses such as women's health, obstetrics, and fundamentals of nursing, which are generally offered in the third or fourth academic year and are predominantly theoretical in nature.

For this reason, the present study focused on students in the second to fourth years of education, aiming to capture variations in exposure timing and depth of pelvic floor-related content between programs. Including these academic years allowed for comparison between students who may have encountered relevant content earlier in their training and those whose exposure occurred closer to the time of questionnaire administration, thereby reflecting real-world curricular differences rather than assuming uniform educational timelines.

Data Collection Instrument

Data were collected using a two-part structured questionnaire designed to evaluate participants' sociodemographic

characteristics, knowledge, application habits, and perceived self-efficacy regarding Kegel exercises.

Sociodemographic and Kegel-Related Knowledge Survey

This section included 14 items in multiple-choice and Likert-type formats, created by the researchers following a comprehensive literature review. The items collected core demographic information (age, gender, height, weight, marital status, department, and academic year) and evaluated participants' awareness, knowledge sources, perceived importance and benefits of Kegel exercises, as well as their self-reported practice and recommendation behaviors. Sample questions included: “Do you have any knowledge about Kegel exercises?”; “How would you rate your knowledge level?”; “Have you ever recommended Kegel exercises to others?”; and “What is the optimal age to begin Kegel exercises?”.

Broome Pelvic Muscle Self-Efficacy Scale (PMSES)

The Broome Pelvic Muscle Self-Efficacy Scale (PMSES) was developed by Broome (1999) to assess individuals' perceived self-efficacy in performing pelvic floor muscle exercises [14]. It consists of 23 items across two subscales: efficacy expectation (14 items) and outcome expectation (9 items). Items are rated on a visual analog scale (0–100), with higher scores indicating greater self-efficacy. The Turkish validity and reliability study was conducted by Zengin and Pinar (2008), reporting high internal consistency (Cronbach's $\alpha=0.97$ total). In this study, only the total PMSES score was used for analysis [15].

Data Collection Procedure

Participants were informed about the study objectives and confidentiality principles. After obtaining informed consent, students completed the questionnaire anonymously in a classroom setting, under supervision, to avoid discussion or peer influence. Each session lasted approximately 15–20 min.

Data Analysis

Statistical analysis was conducted using IBM SPSS Statistics version 26. Descriptive statistics (means, standard deviations, frequencies, and percentages) were calculated to summarize demographic characteristics and Kegel-related variables. Independent-samples *t*-tests were used to compare mean scores of knowledge, application frequency, and perceived effectiveness between the two groups. Chi-square

Table 1 Sociodemographic characteristics of participants ($N=250$)

Variables	x	SD
Age (min 18, max 30)	22.3	1.6
Gender	<i>n</i>	%
Male	113	45.2
Female	137	54.8
Department		
Physical therapy and rehabilitation	163	65.2
Nursing	87	34.8
Academic year		
2nd	58	23.2
3rd	77	30.8
4th	115	46.0
Marriage		
Single	246	98.4
Married	4	1.6

Table 2 Knowledge levels of kegel exercises among physical therapy and rehabilitation and nursing students

Knowledge level	Physical therapy and rehabilitation (%)	Nursing (%)	<i>p</i> value
Very good (5)	18.40	12.1	0.032
Good (4)	24.70	20.3	
Moderate (3)	22.10	18.9	
Little (2)	15.60	22.5	
Very little (1)	12.30	15.8	
No knowledge (0)	6.90	10.4	

tests were applied to evaluate categorical outcomes such as recommendation status. A significance level of $p < 0.05$ was used for all inferential statistics.

Ethical Approval

This study was approved by the Ethics Committee of Istanbul Gelisim University on May 10, 2024. All participants were informed about the purpose and procedures of the study, and written informed consent was obtained from those who voluntarily agreed to participate.

Results

Participants had a mean age of 22.3 ± 1.6 years (range 18–30). Most were enrolled in Physical Therapy and Rehabilitation (65.2%), and 34.8% in Nursing. More than half of the participants were female (54.8%). The majority were fourth-year (46.0%) and third-year (30.8%) students,

indicating greater clinical experience. Nearly all participants were single (98.4%), reflecting the typical demographic profile of undergraduate students (Table 1).

The findings revealed a statistically significant difference in knowledge levels between the two groups ($p=0.032$). A higher proportion of Physiotherapy and Rehabilitation students rated their knowledge as “very good” (18.4%) compared to Nursing students (12.1%), whereas more Nursing students reported “little” or “no knowledge” regarding Kegel exercises (Table 2).

Furthermore, Physiotherapy and Rehabilitation students were more proactive in practicing Kegel exercises; 28.6% reported practicing them “regularly” compared to only 15.2% of Nursing students, with Nursing students more likely to report practicing “rarely” or “never” ($p=0.008$) (Table 3).

In addition, Physical Therapy and Rehabilitation students were significantly more inclined to recommend Kegel exercises, with 76.5% affirming they would recommend them compared to 58.3% of Nursing students ($p=0.001$). They also rated the effectiveness of Kegel exercises and their overall experience considerably higher than Nursing students, scoring 78.2 ± 12.4 versus 62.7 ± 15.8 for effectiveness, and 84.5 ± 10.2 versus 70.3 ± 13.6 for overall scale scores ($p < 0.001$) (Table 4).

Discussion

The present study demonstrated significant differences in knowledge, practice, and recommendation behaviors related to Kegel exercises between Physiotherapy and Rehabilitation and Nursing students. Students enrolled in Physiotherapy

and Rehabilitation consistently reported higher levels of knowledge, more frequent personal practice, and greater confidence in recommending pelvic floor muscle exercises, suggesting that curricular structure and the extent of applied training play a critical role in shaping competence in pelvic floor health [11].

These findings are consistent with previous literature indicating that physiotherapy students typically receive earlier and more comprehensive exposure to pelvic floor muscle training through musculoskeletal rehabilitation-focused coursework [11]. Studies conducted in Europe and Türkiye similarly report that nursing students often demonstrate lower confidence and practical competence in pelvic floor health, largely due to the predominantly theoretical nature of related content within nursing curricula [11–13]. In contrast, curricula that integrate hands-on training and clinical reinforcement appear to enhance both theoretical understanding and practical self-efficacy among physiotherapy students [11].

The observed differences may also reflect professional role expectations embedded within undergraduate education. Physiotherapy programs emphasize physical assessment, exercise prescription, and functional rehabilitation, which naturally facilitate skill acquisition in pelvic floor muscle training [11]. Nursing education, while strong in holistic patient care and communication, may provide fewer structured opportunities for applied pelvic floor training. Previous studies suggest that incorporating experiential learning strategies—such as simulation-based education, case-based learning, and supervised clinical practice—can significantly improve nursing students’ knowledge and self-efficacy in pelvic floor muscle training techniques [12, 13].

Comparisons across healthcare disciplines have highlighted similar trends, with physiotherapy students outperforming nursing and medical students in pelvic floor-related knowledge and confidence [12]. These findings reinforce the importance of discipline-specific curricular content while also underscoring the need for interprofessional alignment in pelvic health education, particularly given the shared responsibility of healthcare professionals in patient education and conservative management of pelvic floor disorders [11, 12].

The generalizability of the present findings should be interpreted with caution. Undergraduate curricula, clinical exposure, and professional role expectations related to pelvic floor health vary considerably across countries and

Table 3 Application frequency of kegel exercises among physiotherapy and rehabilitation and nursing students

Application frequency	Physiotherapy and rehabilitation (%)	Nursing (%)	<i>p</i> value
Regularly (5)	28.60	15.2	0.008
Often (4)	22.40	18.7	
Occasionally (3)	20.10	21.3	
Rarely (2)	15.30	25.6	
Never (1)	13.60	19.2	

Table 4 Effectiveness ratings, overall scale scores, and recommendation practices among FTR and nursing students

Metric	Physical therapy and rehabilitation (mean $\pm$ SD)	Nursing (mean $\pm$ SD)	<i>p</i> value
Effectiveness	78.2 ± 12.4	62.7 ± 15.8	0.0001
Overall scale score	84.5 ± 10.2	70.3 ± 13.6	0.0001
Recommendation (yes, %)	76.5	58.3	0.001

institutions. As this study was conducted within a single Turkish university, the results primarily reflect the national educational context and may not be directly transferable to other healthcare education systems [10, 13].

Several limitations should be acknowledged. The cross-sectional design precludes causal inference, and reliance on self-reported data may introduce reporting bias. The sample was drawn from a single institution and included a higher proportion of female students, which may limit representativeness. Additionally, the absence of objective assessments of practical performance may restrict conclusions regarding actual clinical competence in pelvic floor muscle training [12].

Despite these limitations, the study provides meaningful insight into discipline-specific educational gaps in pelvic floor health. Addressing these gaps during undergraduate education may contribute to a future healthcare workforce better equipped to promote evidence-based pelvic floor muscle training and improve long-term patient outcomes [2, 15].

Conclusion

This study demonstrates significant differences in Kegel exercise-related knowledge, practice, and recommendation behaviors between Physiotherapy and Rehabilitation and Nursing students, likely reflecting curriculum structure and the extent of practical training. Integrating applied pelvic floor education into nursing curricula may enhance students' competence and confidence in this area. Future multicenter and longitudinal studies are needed to evaluate the long-term impact of curricular interventions on clinical practice and patient outcomes.

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Data Availability The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethical Approval This study was approved by the Ethics Committee of Istanbul Gelisim University on May 10, 2024, at 14:00. All participants were informed about the purpose and procedures of the study, and written informed consent was obtained from those who voluntarily agreed to participate.

Conflicts of interest None.

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