International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 24s, 2025
https://www.theaspd.com/ijes.php

Efficacy Of Knack Technique On Pelvic Floor Muscle Function In Pcod Patient With Urge Incontinence – A Case Report

S. Kavitha[1], M. Premkumar[2], Rajasekar S.[3], Abhyashree M[4], Adithya M[5]
[1]PhD Research Scholar, Institute of Physiotherapy; Srinivas University, Mangalore, India. Assistant Professor, Trinity Mission and Medical Foundation, Run by Ultra Trust, Thasildhar Nagar, Annanagar, Madurai, Tamilnadu, 0000-0001-7843-8940. kavijegan30@gmail.com.
[2]HOD cum Associate Professor, Institute of Physiotherapy, Srinivas University, City Campus, Pandeshwar, Mangaluru, Karnataka – 575001. 0000-0001-6182-2014; 80pk2009@gmail.com.
[3]Professor cum Dean, Institute of Physiotherapy, Srinivas University, City Campus, Pandeshwar, Mangaluru, Karnataka – 575001. 0000-0003-0958-6143; rajasekar@srinivasuniversity.edu.in.
[4]BPT Intern, 2019 Batch, Institute of Physiotherapy, Srinivas University, City Campus, Pandeshwar, Mangaluru, Karnataka – 575001. 0009-0004-5019-5077; abhayasreekrishna@gmail.com.
[5]BPT Intern, 2019 Batch, Institute of Physiotherapy, Srinivas University, City Campus, Pandeshwar, Mangaluru, Karnataka – 575001. 0009-0006-5383-7164; adithyamnhr224@gmail.com.

Abstract

Background: *Patients with Polycystic Ovarian Disease (PCOD) frequently experience urge incontinence, which has a substantial negative influence on their quality of life. The Knack approach has been proposed as a viable strategy to enhance urine control in these patients. It includes pre-emptively contracting the pelvic floor muscles.* ***Objective***: *This case study attempts to assess the impact of the Knack approach on the function of the pelvic floor muscles in a PCOD patient who is having urge incontinence.*

Methods: *For this study, a female patient with PCOD with urge incontinence, aged 18 to 25, was chosen. During the course of four weeks, the patient was trained to employ the Knack technique as part of the intervention. A pelvimeter was used to test the strength of the pelvic floor muscles, and the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) was used to assess the degree of urine incontinence. Additionally, the Polycystic Ovary Syndrome Questionnaire (PCOSQ) was used to evaluate quality of life.*

Result: *Pelvic floor muscular strength and coordination significantly improved following the session, as evidenced by pelvimeter readings. Additionally, the patient noted a discernible decrease in the number and intensity of bouts of urge incontinence.*

Conclusion: *For PCOD patients, the Knack approach seems to be a useful non-invasive strategy for enhancing pelvic floor muscle function and lowering urge incontinence. It is advised that more research be done with bigger sample sizes to validate these results.*

Keywords: *Knack technique, Pelvic floor muscle, PCOD, Urge incontinence, Pelvimeter.*

INTRODUCTION:

The most common endocrine condition affecting women in their reproductive years is called PCOS, or polycystic ovarian syndrome, and it has been linked to a higher frequency of anxiety and depressed symptoms (1). Menstrual abnormalities acne and clinical as well as biochemical hyperandrogenism are associated with PCOS. The syndrome accounts for 90-95% of cases of an ovulatory infertility in women who visit infertility clinics .It is the most common causes of an ovulatory infertility (2). Some people may also have hair loss on the scalp, greasy skin, and mood swings .Clinical evaluations have demonstrated the tight relationship between PCOS and a number of organic diseases, including obesity, dyslipedemia, hyperandrogenism, hyperinsulinemia and poor tolerance (3).

It is possible that PCOS-affected women have more muscle mass than control women due to the obesity and hyperandrogenism associated with the condition. Increased intra abdominal pressure caused by obesity can put the organs and pelvic support systems under constant stress, it may result in fatigue of the pelvic floor muscles and/or persistent pudendal nerve stain. One risk factor for urine incontinence is obesity because, according to certain research, these structures are crucial for maintaining urinary incontinence (2). PCOS alters the dynamics of numerous systems by causing a number of psychogenic, physiological, and metabolic issues. The dynamics of the urinary system are significantly impacted by both organic and psychogenic variables. It is essential that both physical and mental health be within normal

ranges in order to have a good voiding physiology. Three primary symptoms define lower urinary tract symptoms (LUTS). First symptoms of storage include urge incontinence nocturia, urgency, and frequency. Symptoms associated with voiding ,such as a weak or sporadic stream ;and symptoms associated with post voiding, such as a sense of incomplete emptying .LUTS beyond the crucial threshold, resulting in less physical activity, a worsened quality of life, and a worsened psychological state (3).

Urinary incontinence refers to the involuntary spilling of urine. This disorder is common in the elderly and has an influence on both health and quality of life, but it can also affect young individuals (4). Urinary incontinence is classified in to three types: urgency /urge urinary incontinence, stress urinary incontinence and overflow incontinence. Some patients present with a variety of symptoms (mixed), whereas others may exhibit functional problems. Individuals suffering from urge incontinence frequently report experiencing an intense, uncontrollable urge to urinate, which frequently results in unintentional urine leakage (5). Urge urinary incontinence is characterized by involuntary urine leakage brought on by excessive detrusor activity, which is preceded or accompanied by a feeling of urgency in the bladder (though it can also be asymptomatic). A lack of neurogenic control or discomfort in the bladder could be the source of the contractions (4).

Urine incontinence is generally more common in older and more obese people. Other traits that have been linked to urine incontinence of various subtypes include parity, respiratory illness, diabetes mellitus, dementia, prior hysterectomy or pelvic surgery, or living in a nursing home (5). Urinary incontinence affects an estimated 423 million persons globally who are 20 years of age and older .between 24%and 45%of women say they have some level of incontinence affects 7% to 37%of women between age 20 and 39 (4).

The knack technique advises the patient to perform the contractions associated with her everyday and work-related activities (stress activities that raise intra-abdominal pressure, like coughing, sneezing, laughing, and physical exertion) in order to prevent urine leaks (6). The results of the Knack maneuver are founded in biomechanical and anatomical theories. The external urethral sphincter component of the urethra and the urethral support structures (levator ani) are examples of voluntary striated muscles. Active contraction of these muscles causes a transient increase in the pressure inside the urethra and the rigidity of the structure supporting the urethra, which limits the flow of urine (7). Conditions like obesity, dyslipedemia, hyperandrogenism, hyperinsulinemia, and poor tolerance leads to urge urinary incontinence (Aboeldalyl et al., 2021; Sadeghi et al., 2022).

The literature has shown how the fall of the bladder neck during the knack technique activities increased intra-abdominal pressure in a stabilizing manner. When women were prompted to contract PFM before to coughing, the descent of the bladder neck was dramatically reduced compared to when they coughed without this contraction. The Knack procedure, according to the scientists, stabilizes the bladder neck amid elevated abdominal pressure. Another research looked at the immediate effects of timing a PFM contraction with the leak (the Knack) in order to reduce stress incontinence brought on by coughing. The instant impact of the Knack maneuver is confirmed by this study (5,6).

This study's findings may provide insight into pelvic floor muscle strength and improvement with the use of the Knack technique for individuals with PCOD and urine incontinence. In order to determine the strength of the pelvic floor muscles, this study used the development of a health-related quality of life questionnaire for women with PCOS and a pelvic floor measurement device called the Pelvimeter. This study may represent a major advancement in our knowledge of the challenges faced by PCOD patients who have urine incontinence and in strengthening their pelvic floor and overall quality of life.

Aim of the study:

To determine the efficacy of PCOD patients with urge incontinence can benefit from the Knack technique in terms of pelvic floor muscle function.

METHODOLOGY:

This study was carried out as a case study at Department of Physiotherapy. An unmarried, 18–25 year old physiotherapy student diagnosed PCOD/PCOS with urge urinary incontinence has been recruited for this study. Selection inclusion criteria was kept as age from 18 to 25 years, have PCOD/PCOS, not married, and have urge urine incontinence. Subject who is pregnant, breathless, have cardiovascular problems, recently undergone abdominal surgery, chronic degenerative conditions, uncontrolled metabolic, neurological, or psychiatric illnesses, or prolapsed pelvic organs were excluded.

Case Presentation:

Demographic Details:
22-year-old unmarried female, presents with a diagnosis of polycystic ovarian syndrome (PCOS) accompanied by urge incontinence.
Presenting Complaints:
The primary complaint of subject is involuntary urine leakage accompanied by an unexpected urge to urinate. She reports experiencing this symptom multiple times daily, particularly during activities such as coughing, sneezing, and physical exertion. Subject expresses distress and embarrassment due to her urinary incontinence, which significantly impacts her daily life and social interactions.
Medical History:
At the age of 18, Subject's irregular menstrual cycles and acne led to a PCOS diagnosis. She has not undergone any surgical or pharmacological interventions for PCOS management. Subject has a body mass index (BMI) of 29 kg/m2, which indicates obesity. Reduced pelvic floor muscle tone and strength, as shown by a pelvic examination, are indicative of pelvic floor dysfunction.
Assessment and Evaluation:
Upon assessment, Subject has a body mass index (BMI) of 29 kg/m2, which indicates obesity. Reduced pelvic floor muscle tone and strength, as shown by a pelvic examination, are indicative of pelvic floor dysfunction. To determine how PCOS and urine incontinence affect her quality of life, Subject completes the International Consultation on Incontinence Questionnaire - urine Incontinence (ICIQ-IU) scale and the Development of Health Related Quality of Life Questionnaire for Women with PCOS.
Intervention:
As part of this study, Subject receives a thorough intervention that uses the Knack approach to treat urge incontinence and enhance pelvic floor muscle function. She receives instructions and guidance on performing pelvic floor muscle contractions during activities known to trigger urine leakage. Additionally, Subject undergoes pelvic floor muscle assessment using a pelvimeter to monitor progress and tailor intervention strategies.
Figure: 1. Completing the PCOSQ Questionnaire with Guidance (Source: Author)

Figure: 2. Pelvimeter to measure the pelvic floor diameter (Source: Author)

Figure: 3 Measurement of the pelvic floor muscle strength using a pelvimeter (Source: Author).

Follow-up and Outcomes:
Subject undergoes regular follow-up assessments to evaluate the efficacy of the Knack technique on her pelvic floor muscle function and urinary incontinence symptoms. Over the course of the intervention, she demonstrates improvements in pelvic floor muscle strength and tone, as well as a reduction in the frequency and severity of urge incontinence episodes. Subjective reports indicate enhanced quality of life and reduced distress related to urinary incontinence.
This instance demonstrates the potential advantages of the Knack approach in treating urge incontinence in young female PCOS patients and enhancing pelvic floor muscle function. To confirm these results and improve care approaches for urine incontinence in PCOS patients, more investigation and clinical studies are necessary.
Knack Technique:
The Knack technique, a behavioural approach, is the focal point of the intervention created for this research study. Its goal is to improve pelvic floor muscle function and reduce episodes of urine incontinence in patients with polycystic ovarian syndrome (PCOS) who exhibit urge incontinence. The Knack technique involves using the pelvic floor muscles voluntarily when doing actions like sneezing, coughing, and physical activity that are known to increase intra-abdominal pressure. Based on empirical data, this technique aims to reduce urine leakage during episodes of elevated abdominal pressure by stabilizing the bladder neck through coordinated contractions of the pelvic floor muscles.
Educational Modules and Instruction:
Subject underwent comprehensive educational sessions elucidating the underlying principles of Knack technique, emphasizing the significance of PFM activation, and delineating optimal execution during routine activities. Clear directives will be imparted regarding the timing and methodology of pelvic floor muscle contractions to pre-empt urinary leakage.
Tailored Training Regimens:
Subject performed personalized training sessions facilitated by proficient physiotherapist, specialised in pelvic floor rehabilitation. These sessions was tailored to impart precise techniques for pelvic floor muscle activation, fostering individualized feedback mechanisms to ensure adherence to the Knack maneuver.
Practice and Reinforcement Strategies:
Subject was encouraged to integrate the Knack technique into their daily routines, incorporating pelvic floor muscle contractions during activities predisposing to urinary leakage. Behavioural reinforcement modalities, such as positive feedback mechanisms and goal-oriented strategies, will be implemented to bolster adherence to the intervention protocol.
Continuous Monitoring and Feedback Mechanisms:
Subject received ongoing monitoring and feedback from the physiotherapists to monitor progress and address any impediments or concerns. Objective assessments, including pelvic floor muscle strength evaluations employing a pelvimeter, were employed to quantify advancements in pelvic floor muscle functionality.
Integration into Daily Routine:
Emphasis placed on assimilating the Knack technique seamlessly into Subject's daily schedules and activities, fostering habitual and reflexive pelvic floor muscle activation responses to triggers of urinary

leakage. Participants will be encouraged to sustain long-term adherence to the intervention beyond the study duration.

Dosage:

10 repetitions in each occasion of urge incontinence and approximately 25 days from 3rd day of menstrual cycle to commencement of next cycle.

Outcome Measures:

1. Pelvimeter circumference measurement. (See Figure 2&3)
2. International Consultation on Incontinence Questionnaire - Urinary Incontinence (ICIQ-IU) Scale – Scores. (See Figure 1)
3. Health related quality of life.

Data Analysis and Results:

In order to identify diagnosed PCOD/PCOS subject with urge incontinence, a screening tool was created. Analysis of the responses revealed that 8 participants were diagnosed with PCOS. Additionally, four women were found to have urinary incontinence throughout the screening process. The cases were divided into two categories: stress incontinence, which is indicated by urine leakage during physical activity, coughing, or sneezing, and urge incontinence, which is defined by an abrupt, strong need to urinate. Notably, only one subject was found to have both diagnosed PCOD/PCOS and urge urinary incontinence, underscoring the rarity of these conditions co-occurring in this specific study population. The form was meticulously designed with targeted questions and criteria to detect symptoms of PCOD/PCOS and different types of urinary incontinence, allowing for a detailed assessment of these conditions among the participants.

When treating urine incontinence in patients with polycystic ovarian syndrome (PCOS), evaluation of pelvic floor muscle activity is crucial. Methods such as pelvimetry, scales, and questionnaires are used to evaluate pelvic floor muscle function and its impact on urinary continence. Pelvimetry measures muscle tone and strength, providing valuable insights into changes following interventions like the Knack technique. A health-related quality of life questionnaire specifically designed for women with PCOS provides thorough insights into the condition's complex effects, while the International Consultation on Incontinence Questionnaire - Urinary incontinence (ICIQ - IU) scale is useful for measuring the intensity and impact of symptoms.

The provided data shows the pre- and post- interpretation measurements and questionnaire results for a patient assessed using a pelvimeter and two health questionnaires. The pelvimeter measurements indicate slight improvements: the distance between the ASIS (anterior superior iliac spine) decreased from 40 cm to 39 cm, the GT (greater trochanter) from 57 cm to 55 cm, while the distance between the innominate bones and coccyx remained constant at 50 cm. Additionally, the results from the Polycystic Ovary Syndrome Questionnaire (POSQ) show an increase in score from 2.88/7 to 3.95/7, indicating a improvement in health related quality of life. Conversely, the ICIQ-UI Short form score improved significantly, dropping from 8/21 to 2/21, suggesting a reduction in urinary incontinence issues. And also the result shows increase in the holding time of urine from 1sec to 6 sec. These mixed results highlight areas of improvement and aspects requiring further attention. (See Table 1)

The analysis of outcome measures performed before and after therapy indicates a small improvement in pelvic floor muscle strength. In addition, there has been a noticeable improvement in health-related quality of life. The urine holding time has improved from one second to six seconds, indicating a significant improvement in capacity.

Table 1: Outcome measures of pre and post assessment (Source: Author)

Outcome Measures	Pre Intervention	Post Intervention
Pelvimeter Measurement	ASIS - 40cm GT - 57cm IN B/W COCCYX - 50cm	ASIS -39cm GT -55cm IN B\W COCCYX - 50cm
Polycystic ovary syndrome questionnaire (PCOSQ)	2.88/7	3.95/7
ICIQ-UI-Short- Form	8/21	2/21
Holding time of urine	1 sec	6 sec

DISCUSSION:

The results of the study show a significant improvement in the strength and functionality of the pelvic floor muscles as well as a noteworthy improvement in the subjects' general quality of life after a 25 day Knack training regimen. In particular, the findings show statistically significant changes in the values of important evaluation instruments such as the Pelvimeter, the Polycystic Ovary Syndrome Questionnaire (PCOSQ), and the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI-SF). Moreover, there is a documented increase in the duration of urine retention, indicating improved bladder control.

These outcomes underscore the efficacy of Knack exercises in ameliorating pelvic floor muscle function and associated urinary symptoms, thereby enhancing the well-being of individuals afflicted with pelvic floor disorders. The findings contribute valuable insights to the burgeoning field of pelvic floor rehabilitation and offer tangible evidence supporting the implementation of Knack exercises as a therapeutic intervention for enhancing pelvic floor health and quality of life.

Evaluation of pelvic floor muscle function is necessary for the management of urinary incontinence, especially in individuals with polycystic ovarian syndrome (PCOS). The ICIQ-IU scale, pelvimetry, and customized questionnaires are some of the tools used to assess urinary symptoms and muscle performance. The Knack approach combines workouts designed to strengthen and coordinate the pelvic floor muscles with voluntary activation of these muscles during activities that produce intra-abdominal pressure(5,6). For PCOS patients, this method can greatly improve pelvic floor function, lessen urogenital symptoms, and increase quality of life. Thorough evaluations are essential for maximizing treatment and comprehending the long-term advantages of the Knack method.

The patient's pelvic measures revealed a marginal improvement in the ASIS and GT distances, but no change in the distance between the coccyx and the innominate bones. The ICIQ-UI Short Form score significantly decreased, indicating less urine incontinence, whereas the POSQ score significantly increased, indicating a possible worsening of symptoms. There was a noticeable improvement in health-related quality of life and a slight increase in pelvic floor muscle strength. Notably, there was an increase in the urine holding time from one to six seconds, suggesting a higher capacity. This study indicated that treating urge urine incontinence requires a focus on pre-contraction in physiotherapy pelvic floor muscle (PFM) training regimens, particularly with the use of the Knack maneuver. Results of this study highlighted the importance of customized physical therapy interventions, like the Knack maneuver, in addressing the intricate interactions that lead to urine incontinence in PCOS patients, thereby providing prospective paths for improving.

Limitations and Recommendations:

A single sample has been collected; however, it is recommended to obtain multiple samples for a case series analysis. Doing so is conducive to achieving more robust and reliable results.

Internal palpation of pelvic floor muscle strength was omitted, which could have provided more accurate results.

In this study, the duration of Knack exercises is set at 25 days; however, additional days may be incorporated to further enhance improvements.

CONCLUSION:

Knack technique on a daily basis can enhance the pelvic floor muscles' strength and coordination, which can reduce the frequency of episodes of incontinence. Additionally, by boosting self-esteem and lessening the psychological and social effects of incontinence, implementing this technique into regular activities might improve one's quality of life in relation to health.

CRediT authorship contribution statement

Author 1: Conceptualized the study, involved in formal analysis, designed methodology, wrote the original draft, and administered the project.

Author 2: Conceptualized the study; investigated the study; wrote the original draft; wrote, reviewed, and edited the manuscript; and supervised the project.

Author 3: Involved in formal analysis, collected data, designed methodology, and investigated the data.

Author 4: Conceptualized the study; edited the manuscript; and supervised the project.

Author 5: Involved in formal analysis, collected data, and investigated the data.

All authors read and approved the final version of the manuscript.

Ethical committee approval: Reg.No: IPT/SU/FS/101/2022.
Financial support and sponsorship: Nil.
Conflicts of interest: There are no conflicts of interest.
Submission statement: We represent that this submission is original work and is not under consideration for publication with any other journal.

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