

## A REVIEW: UNDERSTANDING URINARY INCONTINENCE AND PELVIC FLOOR MUSCLE TRAINING AMONG CHILDBEARING WOMEN

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### ABSTRACT

*Urinary incontinence is one of the common conditions experienced by women all over the world. Although it is not considered a life-threatening situation, it could affect a woman's physical, physiological, social, and reduce the quality of their life. Knowing about the disease and getting early treatment has a significant impact on improving the problem. Pelvic floor muscle training, known as conservative therapy, is the first-line treatment for women suffering from urinary incontinence. Therefore, this review aims to identify the understanding of pelvic floor muscle training among childbearing women. Online literature search, including PubMed, ScienceDirect, Medline, SpringerLink, and Scopus, was conducted using Google Scholar and IIUM databases. A total of 20 eligible articles were reviewed. The review revealed that despite most childbearing women being aware of pelvic floor muscle training, it does not influence them to practice it as a routine. Thus, this review will impact Malaysia's healthcare professional to incorporate pelvic floor muscle training in antenatal class programs.*

Key words: pelvic floor, pelvic floor training, Kegel exercise, urinary incontinence, childbearing women

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### INTRODUCTION

Urinary incontinence (UI) is among the problems commonly experienced by women. Although it is not a disease and not a life-threatening condition, it can affect a woman's physical, physiological, and social life, as well as reducing their quality of life. According to the International Continence Society (ICS), UI was defined as "a condition in which unintentional, accidental involuntary loss of urine is a social or hygienic and is objectively demonstrable" (Sountoulidis, 2018). The World Health Organization (WHO) reported that UI commonly affects those women of childbearing age between 15 to 49 years old (World Health Organization, 2006) whereas the childbearing refers to a woman's age, where she can have babies (Dariah et al., 2019). Interestingly, UI can be prevented by doing pelvic floor muscle training which is recognized as first-line therapy for the problem (Abrams, 2017).

### SEARCH STRATEGY

The online literature search in PubMed, ScienceDirect, Medline, SpringerLink, and Scopus was conducted using Google Scholar and IIUM databases. The English version peer-reviewed articles were reviewed from 2015 until 2020. A comprehensive list of keywords and phrases was strictly applied to searching with synonymous terms and relevant subheadings. The keywords used were "urinary incontinence" AND "childbearing women" AND "pelvic floor" AND "pelvic floor training" OR "Kegel exercise". The title of the articles was identified, and the abstracts were screened for the inclusion criteria. A total of 20 articles were identified to be reviewed in this paper.

### PREVALENCE OF URINARY INCONTINENCE

UI is categorized into three types involving stress incontinence, urge incontinence, and mixed incontinence. The International Urogynecological Association (IUA) and ICS stated that stress incontinence is the leakage of urine associated with coughing, sneezing, or physical exertion (Bo et al., 2017). In contrast, urge incontinence is defined as the leakage of urine accompanied by a sudden compelling desire to void, difficult to differentiate (Aoki et al., 2017). Mixed incontinence is the combined symptoms of stress incontinence and urge incontinence (Dariah et al., 2017). The most common type of UI is stress urinary incontinence (Zalina

et al., 2016). The severity of UI can be divided into three levels, which is slight UI, moderate UI, and severe UI. The incontinence frequency for slight UI is a few times per year, moderate UI is a few months, and severe UI is a few times or more per week (Chen et al., 2019).

A study revealed that 15% of women have urinary incontinence problem, and showed simultaneous sedentary habits (Leirós-Rodríguez, Romo-Pérez, & García-Soidán, 2017). The overall prevalence of stress, urge, and mixed incontinence was 5.4%, 11.3%, and 7.0% among women (Islam, Bell, Hossain & Davis, 2018). In contrast, the stress urinary incontinence (SUI) type among pregnant women was prevalently high, which is 80%, followed by mixed urinary incontinence (MUI) with 16%, and the least was urge urinary incontinence (UII) with 4% (Dince, 2017). Another study reported that women tend to get UI in their childbearing years, either during pregnancy or postnatal and in menopause women (Dariah et al., 2019). In Malaysia, the prevalence of women considered to get UI during third trimester was 34.3% (Abdullah et al., 2016; Dhillon et al., 2019).

### **PELVIC FLOOR MUSCLE TRAINING**

A pelvic floor muscle is a connective tissue or a group of muscles underneath the pelvis, which support the organ that lies on it (Raizada & Mittal, 2008). The pelvic organs comprise the bladder and bowel in men and the bladder, bowel, and uterus in women. Two important muscles are involved, i.e., levator ani and the coccygeus (Herschorn, 2004). Women have a higher risk of having weak pelvic floor muscles than men, whereby the factors that contribute to this problem include pregnancy, childbirth, aging, being overweight, and abdominal surgery (Aoki et al., 2017). A study stated that women who have undergone pelvic surgery have a five times higher risk of having lower urinary tract symptoms, including urinary incontinence, than women who have not undergone surgery (Zalina et al., 2016).

Pelvic floor muscle training (PFMT) is an effective treatment for women with urinary incontinence, pelvic organ prolapses, or pelvic floor muscle dysfunction (Dumoulin et al., 2016). PFMT is also known as Kegel exercises, as it was introduced in 1948 by an American gynecologist, Arnold Kegel. He claimed an 84% cure rate after training with this exercise for women with different incontinence types. In addition, PFMT is also recommended for stage 1 stress urinary incontinence (Ptak et al., 2019).

PFMT refers to the performance of repeated voluntary contractions of the pelvic floor muscles that outlines the frequency, intensity, progression of exercises, and the duration of the training period (Dumoulin et al., 2018). A PFMT should include one or more sets of exercises per day, performed on at least several days per week, for at least eight weeks to see the positive results. Practicing in daily life can ensure the effect in the longer term. The exercises can be done at any time and any place, and the position most people prefer is lying down or sitting on a chair (Ahmed Ibrahim, 2015). There are several effects of PFMT in improving the symptoms of UI, such as decreased leakage, improved pelvic floor muscle strength and the quality of life.

There are benefits of PFMT including reduce the incidence of urine leakage, improved pelvic floor muscle strength and good quality of life.

### **DECREASED LEAKAGE**

Urine leakage is associated with UI in women. Women with the symptom of stress and mixed urinary incontinence practiced the treatment of PFMT and have shown improvement in their symptoms of UI (Celiker Tosun et al., 2015). However, follow-up should be done regularly to ensure the effectiveness of PFMT. There is a study revealed the improvement of UI symptoms after eight weeks of doing Kegel exercise at home was 68.4% for stress urinary incontinence and 41.2% for mixed urinary incontinence (Cavkaytar et al., 2015).

However, another cohort study that focused on the effect of PFMT in reducing the UI symptoms discovered no significant difference between the outpatient PFMT group and the home PFMT group based on the number of urine leakage episodes per week (Fitz et al., 2020). Meaning that the PFMT done by the patient at home can be an alternative treatment to the women as it has an equal benefit with supervised PFMT at the hospital or clinic. Thus, regular practice of PFMT at home may decrease urine leakage and reduce the symptoms of UI.

### **IMPROVED PELVIC FLOOR MUSCLE STRENGTH**

Pelvic floor muscle strength is the maximum ability of the pelvic floor muscle to hold the position of a woman's reproduction organ. According to the Oxford grading system, the pelvic floor muscle strength using vaginal palpation is graded from 0 to 5 (Ferreira et al., 2011). The pelvic floor muscle weakness can lead to several problems such as UI and pelvic organ prolapse. Evidence showed that doing the exercise will increase muscle mass and stabilize the urethra (Ptak et al., 2019). A study revealed that 36.2% (21 patients out of 58 patients) had increased muscle strength to grade 5 after 12 weeks of PFMT (Celiker Tosun et al., 2015). The duration in achieving grade 5 of pelvic floor muscle strength depends on the women's current pelvic floor muscle strength. Those who had weak pelvic floor muscle strength need longer time to practice daily PFMT than those with strong pelvic floor muscle. The other reason for doing PFMT is to maximize the urethral pressure and also to improve the voluntary contraction of the muscle, resulting in improved pelvic floor muscle strength (Malhotra & Chahal, 2018). So, most of the UI symptoms were almost completely reduced when the pelvic floor muscle strength of grade 5 was achieved.

## IMPROVED QUALITY OF LIFE

The UI affects 25%–40% quality of life in women with incontinence (Ostle, 2016). After 12 weeks of the training program, which combined the PFMT and the muscle transversus abdominis exercise, patients showed improved in their quality of life, such as performance of household chores (e.g., cleaning, shopping, etc.) and activities outside the home. (Ptak et al., 2019). Another study of quality of life in SUI subjects was assessed using the King's Health Questionnaire (KHQ). The results showed that the KHQ score was decreased, indicating that the quality of life was improved after four weeks of the PFMT course (Jebakani & Sameul, 2017). The higher the final score of the KHQ test, the poorer the quality of life and vice versa. The pelvic floor muscle strength decreased as the number of deliveries increased. This will influence in decreasing of quality of life. Thus, the quality of life was not improved among women with UI after normal delivery (Özdemir et al., 2015). Therefore, increasing the awareness of PFMT among women will reduce UI symptoms due to weak pelvic floor muscle and will increase the life quality.

## KNOWLEDGE, ATTITUDE, AND PRACTICE OF PELVIC FLOOR MUSCLE TRAINING

In the general married women or women during antenatal or postnatal have good basic knowledge of PFMT. A study revealed that women have a good knowledge as they know that PFMT may treat or prevent UI and that the exercise can be done any time (Muhammad et al., 2019; Jaffar et al., 2020). Similarly, two other studies identified that majority of postnatal women know the information regarding PFMT (Alharbi et al., 2019; Ahmed Ibrahim, 2015). However, some women thought it is normal to get incontinent during pregnancy (Anne-Marie et al., 2017). This reviewed identify most of the women got information regarding PFMT from books, website, and during health education session from healthcare professionals. It is congruent with the study that identified the most common mentioned about PFMT was from books and magazines (Muhammad et al., 2019). Although some women did not experience pelvic floor muscle disorder, most of them agreed that all women should practice PFMT. Women also aware that the practice of PFMT would help during the delivery of a baby (Temtanakitpaisan et al., 2020). They found women have a positive and good attitude towards PFMT; however, having good knowledge and attitude does not influence the good practice of PFMT. Others findings show the women were not interested in practicing PFMT due to the lack of information about PFMT or did not get the benefits of PFMT in the past and forgot to do the exercise (Alharbi et al., 2019; Anne et al., 2017; Temtanakitpaisan et al., 2020). Although social media is widely used in this era, direct information from healthcare professionals is an effective and easiest way to improve the knowledge about PFMT. Thus, healthcare professionals need to give more attention to providing knowledge and practice of PFMT, such as emphasizing and motivating women on PFMT during antenatal appointments.

## CONCLUSION

Based on this review, childbearing age women are prone to experience UI, as most cases began from the antenatal period. Pelvic floor muscle training is considered a treatment that can reduce UI symptoms. A review also revealed that despite having good knowledge and understanding of PFMT, the daily practice of PFMT is still needed. Moreover, greater attention from healthcare professionals is essential to ensure that childbearing women can apply PFMT as their routine. Future research should be recommended to the elderly women as the number among them with UI problems is increasing.

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## REFERENCES

- Abdullah, B., Ayub, S. H., Mohd Zahid, A. Z., Noorneza, A. R., Isa, M. R., & Ng, P. Y. (2016). Urinary incontinence in primigravida: The neglected pregnancy predicament. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, 198, 110–115.
- Abrams P, Cardozo L, Wein A. & Wagg A. (2017). Incontinence: 6th International Consultation on Incontinence, Tokyo, September 2016. 6th edition. Bristol, UK: *International Continence Society*.
- Ahmed Ibrahim, W. (2015). Assess Levels of Knowledge, Attitude and Practice of the Married Women about Pelvic Floor Muscles Exercise. *International Journal of Science and Research*, 6(10), 2319–7064.
- Alharbi, J., AwadAlrhiely, A., Abdulla Mufleh, F., Alharbi, N., Ali, K., Mohamed El-Sabagh, E. (2019). Knowledge, Attitude and Practices of Kegel Exercise among Postnatal Women, in Al Madinah Al Munawarah, Saudi Arabia. *International Journal of Nursing Didactics*, 09(06), 01–10.
- Anne-Marie, H., Steven, M.M.P., Judith, M.W. & Richard. G.B. (2017). Pregnant women's awareness, knowledge and beliefs about pelvic floor muscles: a cross-sectional survey. *The International Urogynaecological Association 2017*, 1-9.
- Aoki, Y., Brown, H. W., Brubaker, L., Cornu, J. N., Daly, J.O. & Cartwright, R. (2017). Urinary incontinence in women. *Nature Reviews Disease Primers*, 3, 1-20.
- Bo, K., Frawley, H. C., Haylen, B. T., Abramov, Y., Almeida, F. G., Berghmans, B., ... & Wells, A. (2017). An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for the conservative and nonpharmacological management of female pelvic floor dysfunction. *International urogynecology journal*, 28(2), 191-213.
- Cavkaytar, S., Kokanali, M.K., Topcu, H.O., Aksakal, O.S. & Doğanay, M. (2015). Effect of home-based Kegel exercises on quality of life in women with stress and mixed urinary incontinence. *Journal of Obstetrics and Gynaecology*, 35(4), 407-410.

- Celiker Tosun, O., Kaya Mutlu, E., Ergenoglu, A. M., Yenieli, A. O., Tosun, G., Malkoc, M., Askar, N., & Itil, I. M. (2015). Does pelvic floor muscle training abolish symptoms of urinary incontinence? A randomized controlled trial. *Clinical Rehabilitation*, 29(6), 525–537.
- Chen, C.C.G., Cox, J.T., Yuan, C., Thomaier, L. & Dutta, S. (2019). Knowledge of pelvic floor disorders in women seeking primary care: A cross-sectional study. *BMC Family Practice*, 20(1), 1-10.
- Dariah, M.Y., Kueh, Y.C., Hanis, I. & Naing, N.N. (2017). Validation of Malay version of incontinence praying ability among childbearing women who attended Hospital Universiti Sains Malaysia. *Education in Medicine Journal*, 9(1), 69–79.
- Dariah, M.Y., Sharizan, A. & Kueh, Y.C. (2019). Urinary incontinence among pregnant women attending an antenatal clinic at a tertiary teaching hospital in North-East Malaysia. *Journal of Taibah University Medical Sciences*, 14(1), 39-46.
- Dhillon, H.K., Fatt, Q.K., Singh, H.J., Kaur, G., Md Zain, A.Z. & Nordin, R.B. (2019). Urinary Incontinence Amongst Malaysian Women in Selangor: Prevalence, Types and Risk Factors. *World Journal of Public Health*, 4(1), 10.
- Dinc, A. (2017). Prevalence of urinary incontinence during pregnancy and associated risk factors. *Low Urinary Tract Symptoms*.
- Dumoulin, C., Cacciari, L.P. & Hay-Smith, E.J.C. (2018). Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. *Cochrane Database of Systematic Reviews*, (10), 1-283.
- Dumoulin, C., Hunter, K.F., Moore, K., Bradley, C.S., Burgio, K.L., Hagen, S., Imamura, M., Thakar, R., Williams, K. & Chambers T. (2016). Conservative management for female urinary incontinence and pelvic organ prolapse review 2013: Summary of the 5th International Consultation on Incontinence. *Neurourology and urodynamics*, 35(1), 15-20.
- Ferreira, C. H., Barbosa, P. B., de Oliveira Souza, F., Antônio, F. I., Franco, M. M., & Bø, K. (2011). Inter-rater reliability study of the modified Oxford Grading Scale and the Peritron manometer. *Physiotherapy*, 97(2), 132–138.
- Fitz, F. F., Gimenez, M. M., de Azevedo Ferreira, L., Matias, M., Bortolini, M., & Castro, R. A. (2020). Pelvic floor muscle training for female stress urinary incontinence: a randomised control trial comparing home and outpatient training. *International urogynecology journal*, 31(5), 989–998.
- Herschorn S. (2004). Female pelvic floor anatomy: the pelvic floor, supporting structures, and pelvic organs. *Reviews in urology*, 6 Suppl 5(Suppl 5), S2–S10.
- Islam, R. M., Bell, R. J., Hossain, M. B., & Davis, S. R. (2018). Types of urinary incontinence in Bangladeshi women at midlife: Prevalence and risk factors. *Maturitas*, 116, 18–23.
- Jaffar, A., Mohd-Sidik, S., Nien, F. C., Fu, G. Q., & Talib, N. H. (2020). Urinary incontinence and its association with pelvic floor muscle exercise among pregnant women attending a primary care clinic in Selangor, Malaysia. *PLoS ONE*, 15(7 July), 1–12.
- Jebakani, B., & Sameul, R. (2017). Effectiveness of Pelvic Floor Exercises for Stress Urinary Incontinence among the Postpartum Women. *Indian Journal of Physiotherapy and Occupational Therapy - An International Journal*, 11(3), 46.
- Leirós-Rodríguez, R., Romo-Pérez, V. & J.L.García-Soidán J.L. (2017). Prevalence of urinary incontinence and its relation with sedentarism in Spain. *Actas Urológicas Españolas (English Edition)*, 41(10), 624-630.
- Malhotra, N., & Chahal, A. (2018). The effectiveness of pelvic floor exercises on symptoms in females with stress urinary incontinence. *Bioscience Biotechnology Research Communications*, 11(4), 681–686.
- Muhammad, J., Muhamad, R., Husain, N. R. N., & Daud, N. (2019). Pelvic floor muscle exercise education and factors associated with implementation among antenatal women in Hospital Universiti Sains Malaysia. *Korean Journal of Family Medicine*, 40(1), 45–52.
- Ostle, Z. (2016). Assessment, diagnosis and treatment of urinary incontinence in women. *British Journal of Nursing*, 25(2), 84–91.
- Özdemir, Ö. Ç., Bakar, Y., Özengin, N., & Duran, B. (2015). The effect of parity on pelvic floor muscle strength and quality of life in women with urinary incontinence: A cross sectional study. *Journal of Physical Therapy Science*, 27(7), 2133–2137.
- Ptak, M., Ciećwicz, S., Brodowska, A., Starczewski, A., Nawrocka-Rutkowska, J., Diaz-Mohedo, E., Rotter, I. & Franic, D. (2019). The Effect of Pelvic Floor Muscles Exercise on Quality of Life in Women with Stress Urinary Incontinence and Its Relationship with Vaginal Deliveries: A Randomized Trial. *BioMed Research International*.
- Raizada, V., & Mittal, R. K. (2008). Pelvic floor anatomy and applied physiology. *Gastroenterology clinics of North America*, 37(3), 493–vii.
- Rozihan, I & Rohana, I. (2008). Pelvic organ prolapse in women attending menopause clinic: prevalence and risk factors. *Malaysian Journal Obstetrics Gynaecology*, 8, 86-92.
- Sountoulidis, P (2018). Stress urinary incontinence. *International Continence Society (ICS)* Accessed on 15th October 2020, from: <https://www.ics.org/committees/standardisation/terminologydiscussions>.
- Temtanakitpaisan, T., Bunyavejchevin, S., Buppasiri, P., & Chongsomchai, C. (2020). Knowledge, attitude, and practices (KAP) survey towards pelvic floor muscle training (PFMT) among pregnant women. *International Journal of Women's Health*, 12, 295–299.
- World Health Organization. (2006). *Reproductive health indicators: guidelines for their generation, interpretation and analysis for global monitoring*. World Health Organization.
- Zalina, N., Ruqaiyah, B. R., Htyke, M. P., Dalia, F. A., Hamizah, I., Roszaman, R., Rozihan, I. (2016) Lower Urinary Tract Symptoms (LUTS) among women attending gynaecology clinic and its effect on their social life. *International Medical Journal*, 15(1), 6.