



Change of Urinary Incontinence and Erectile Dysfunction with Kegel Exercises in Older Patients Post-TURP

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Abstract

Introduction: Urinary incontinence and erectile dysfunction are common complications following TURP. Older patients Post-TURP often complain of experiencing urinary incontinence and decreased erectile function. This study aims to analyze the effectiveness of kegel exercises on urinary incontinence and erectile dysfunction in older patients post-TURP.

Method: The research is quasi-experiment. The number of samples was 64 patients after TURP (32 interventions and 32 controls), using a systematic random sampling technique. The data collection technique used the ICIQ-UI-SF questionnaire for urinary incontinence and the IIEF-5 questionnaire for erectile dysfunction. Data analysis used Paired t-test, Independent t-test, and Manova test with a significance level of $\alpha < 0.05$.

Result: Kegel exercise decreased urinary incontinence ($p=0.000$), kegel exercise increased erectile function ($p=0.001$), and kegel exercise reduced urinary incontinence (44%) and increased erectile function (21%). The concluding study kegel exercise effectively reduces urinary incontinence and improves erectile function in older patients post-TURP.

Discussion: Kegel exercises can use as a companion therapy or non-pharmacological alternative therapy to treat urinary incontinence and erectile dysfunction in post-TURP patients.

Keywords: Urinary incontinence, erectile dysfunction, kegel exercise, post-TURP

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INTRODUCTION

Urinary incontinence (UI) is a disorder of fulfilling urinary elimination. UI can be in the form of very little, very large, or uncontrolled urinary excretion (Caljouw et al., 2011; Irwin, 2019). UI can occur due to cystitis, can be temporary, but can also be permanent if caused by neurological disorders (Jiang & Qian, 2019; Misseri, 2017). It often occurs when the urinary catheter is removed for the first time after Trans Urethral Prostate Resection (TURP) (Anderson et al., 2015). Erectile dysfunction is also a postoperative effect of TURP with symptoms of impotence (Wong et al., 2020).

Result in a preliminary survey at Urology Polyclinic dr. Soegiri Hospital
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Lamongan found that 30% of 10 patients had urinary incontinence, but the incidences of erectile dysfunction were not documented. Benign Prostatic Hyperplasia (BPH) often occurs in men aged around 50 years. The prevalence is 50% at 60 years and 80% at 80 years, and disorders of the lower urinary tract (LUTS) often occur (El Shorbagy et al., 2017). The condition has characterized the formation of large nodules in the prostate gland and compressed the urethra causing obstruction leading to LUTS. Symptoms of LUTS are obstruction and irrigation (Anan et al., 2020; Inzunza et al., 2018). In many patients over 50 years, the prostate gland enlarges, extends upward to the bladder, and blocks the flow of urine covering



the urethral orifice (Goonewardene et al., 2018).

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The interventional management of BPH depends on the severity of the obstruction caused and the patient's condition, and 10% of patients require surgery (Das, 2019; Türk et al., 2018). TURP is the gold standard management of BPH to reduce complication rates. TURP is the standard surgical treatment for BPH patients. TURP is the treatment of choice for the prostate but has a significant rate of postoperative morbidity (Chen et al., 2021; Uddin et al., 2017). TURP can cause bleeding complications, urethral stricture, urinary incontinence, retrograde ejaculation, TURP syndrome, and erectile dysfunction (Scott et al., 2020). TURP often causes strictures with an incidence of 2.2-9.8% and often requires repeated measures (Enikeev et al., 2018; Santa Mina et al., 2015). Post-TURP UI is causing urinary sphincter insufficiency (USI), and detrusor overactivity (Kusljic et al., 2017).

Early incontinence can occur in 30-40% of patients. Early incontinence occurs due to symptoms of bladder muscle irritation or instability due to prolonged BPH (Milios et al., 2019). The release of the catheter causes the detrusor muscle not to contract, the symptoms that occur are frequent urination due to the inability to control the bladder and a burning sensation (Das, 2019; Huang et al., 2020). Impaired sexual intercourse in post-TURP patients due to erectile dysfunction. Erectile dysfunction causes electrical currents to damage the neurovascular system during TURP. TURP is optimally possible to avoid resection of the distal verumontanum, the most proximal part of the distal urethral sphincter (Chen et al., 2021; Geraerts et al., 2016). Damage to the distal urethral sphincter during TURP is common in the anterior verumontanum. Trauma to the distal sphincter sensory fibers originates from the dorsal penile nerve as an afferent pathway, thus affecting the control of

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the external sphincter (Das, 2019; Kumar & Nehra, 2009).

UI and erectile dysfunction affect activity, sexuality, and self-esteem. UI raises hygiene and psychosocial issues such as shyness, social isolation, and withdrawal (McNicholas et al., 2013; Pan et al., 2019). UI reduces social interaction and activity and is associated with health, emotional status, psychological well-being, and impaired sexual relations. Erectile dysfunction can cause disharmony in a husband and wife relationship. Urinary incontinence and prolonged erectile dysfunction will cause a decrease in quality of life and low self-esteem, leading to depression (Mohamad Al-Ali et al., 2017; Pan et al., 2019).

Management of urinary incontinence and erectile dysfunction is pharmacological therapy and intermittent urinary catheter placement. Urinary tract spasmolytic drug therapy can cause side effects (Goonewardene et al., 2018; Jiang & Qian, 2019). Treatment management at dr. Soegiri Hospital is an intermittent insert urinary catheter for two weeks. The follow-up success rate was 75%, but 25% of patients still had a relapse after urinary catheter insertion. Urinary catheter insertion causes urethral swelling, urinary tract infection, and sepsis (Carrero-López et al., 2016; Zhang & Liao, 2018).

To reduce drug side effects, and prevent infection, kegel exercise is an alternative nursing intervention to treat urinary incontinence and improve erectile function in post-TURP patients. Kegel exercises can strengthen pelvic muscles and increase urethral resistance and urinary control (Hall et al., 2018; Wong et al., 2020). Kegel exercises aim to strengthen the pubococcygeal muscles and pelvic diaphragm muscles. Kegel exercises can help men achieve stronger erections, maintain hip health, and control ejaculation (Kirages & Johnson, 2016; Myers & Smith, 2019).

Early Kegel exercises after TURP increase the ability to urinate, decrease complaints of dribbling after urination and decrease urinary incontinence episodes post-TURP (Madjid et al., 2011; Milios et al., 2020). The effect of Kegel exercises before TURP showed an increase in pelvic floor muscle endurance, although there was no difference in

urodynamic status after TURP (Anan et al., 2020; Enikeev et al., 2018; Kirages & Johnson, 2016).

Many studies on Kegel exercises, but studies with male samples are still few, considering the differences in the characteristics and anatomical structures of the urogenital system between men and women. This study aims to analyze the effect of Kegel exercises on urinary incontinence and erectile dysfunction in older patients post-TURP.

METHOD

Studi design, setting, and sample

The study is a quasi-experiment with pretest-posttest with a control group research design, which compares the effectiveness of the kegel exercise intervention in the treatment group with the control group before and after the intervention. The study involved two groups, the intervention group, and the control group. The intervention and control groups received medical care according to hospital procedures, medication administration, and intermittent catheter insertion. The intervention group is giving additional kegel exercises. Both groups measured urinary incontinence and erectile dysfunction before and after the intervention.

Participants

The study population was older patients post-TURP Urology Polyclinic dr. Soegiri Hospital in 2019, as many 378 patients, and the average number of patients every month is 32 patients. The study sample was 64 patients (32 interventions, 32 controls). Sampling used systematic random sampling, recorded in a notebook and numbered. Odd numbers go to the intervention group, and even numbers go to the control group. Inclusion criteria: 1) Patients post-TURP 1 week after catheter removal (3 weeks post-TURP), 2) Understand verbal and written instructions, 3) Have a legal and sexually active partner, 4) Age less than 65 years, and 5) cooperative. Exclusion criteria: 1) had cognitive impairment, 2) received drug therapy for muscle dilation, 3) had erectile dysfunction before TURP, and 4) had urinary tract infection, constipation, chronic cough/chronic bronchitis, and asthma.



Outcome Measurement

The instrument for measuring incontinence is the International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) questionnaire (Machioka et al., 2019), consisting of 6 questions. The questionnaire assesses using a Likert scale, with the lowest score of 0 and the highest score 5. The scores of all questions total, then categorized: 0: no urinary incontinence, 1-6: mild urinary incontinence, 7-12: mild-moderate urinary incontinence, 13-18: moderate urinary incontinence, 19-24: severe urinary incontinence, 25-30: very severe urinary incontinence, while the tool to measure erectile dysfunction uses the International Index of Erectile Function-5 (IIEF-5) questionnaire, which consists of 5 questions. Scoring conditions: 0: no sexual activity, 1: most negative response, and 5: most positive response, with scoring criteria: 22-25: no erectile dysfunction, 17-21: mild erectile dysfunction, 12-16: mild-moderate erectile dysfunction, 8-11: moderate erectile dysfunction, 5-7: severe erectile dysfunction (Verze et al., 2019).

Intervention

Implementation in stages: 1) Giving a questionnaire characteristics patient and pre-test of urinary incontinence and erectile dysfunction. The intervention group was given training in Kegel exercises by the physiotherapy

team, dr. Soegiri Hospital. After being trained to try to be independent, 2) Provide a Kegel exercise manual book and exercise schedule to the intervention group, 3) Teach filling in the exercise schedule, 4) The control group gets hospital service standards, 5) Posttest 4 weeks after the Kegel exercise intervention, and 6) After the posttest the control group was given a Kegel exercise manual book.

Data Analysis

Descriptive analysis used the frequency distribution of demographic data of age, education, profession, and surgery history. Data are normally distributed. Data were analyzed using paired t-test, independent t-test, and multivariate Manova test with a significance level of <0.05.

Ethical Consideration

The research was obtained from the Health Research Ethics Committee, Faculty of Nursing, Airlangga University No. 712-KEPK. All participants signed informed consent before data collection.

RESULTS

The distribution of research results is present in the demographic data of respondents in tables based on age, education, profession, and surgical history.

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Table 1 Distribution based on characteristics of patients Post-TURP (n=64)

Characteristics	Intervention Group (n=33)		Control Group (n=33)		p
	Mean ± SD	Min-Max	Mean ± SD	Min-Max	
Age (Month)	65,25 ± 4,66	55-65	64,44 ± 3,80	55-65	0,95
	n	%	n	%	
Education					0,58
Basic education	22	68,7	24	75,0	
Middle education	10	31,3	8	25,0	
Profession					0,60
No	10	31,3	12	37,5	
Work	22	68,7	20	62,5	
Surgical history					0,49
No	26	81,2	28	87,5	
Yes	6	18,8	4	12,5	



The results show the mean age of respondents as 65,25 years (SD=4,66) in the intervention groups, and 64,44 years (SD=3,80) in the control groups, with an age maximum of 65 years. It found that 68,7% of the intervention group is basic education (SD), and

75% of the control group also are basic education (SD). In the intervention group, 68,7% worked, and in the control group, 62,5% worked, while in surgery history finding 81,2% never had surgery in the intervention group and 87,5% in the control group.

Table 2 Differences urinary incontinence and erectile dysfunction in post-TURP patients before and after kegel exercises in the intervention and control group (n=64)

Variable	Group	Pretest (n=32)		Posttest (n=32)		p	Partial Eta Square
		Mean	SD	Mean	SD		
Urinary incontinence	Intervention	14,22	1,89	11,88	2,08	0,000	0,440
	Control	13,94	1,74	13,69	1,79	0,143	
Erection dysfunction	Intervention	8,25	1,70	14,44	1,87	0,000	0,213
	Control	11,06	1,59	12,38	2,24	0,286	

**Independent t-test sig. <0,05

***Manova test sig. <0,05

The results show differences in urinary incontinence and erectile function scores in the intervention group after being given the Kegel exercise intervention with each p=0,000 (p<0,05), while in the control group there was no difference in urinary incontinence scores p=0,143 (p>0,05) and erectile function p=0,286 (p>0,05). The results also showed Kegel exercise heffected on urinary incontinence (p=0,440) and erectile dysfunction (p=0,213) in post-TURP patients, so can be said Kegel exercises contributed to urinary incontinence (44%) and erectile dysfunction (21%).

DISCUSSION

Effects of Kegel Exercises on Urinary Incontinence

Measurement of urinary incontinence scores in the intervention group after being given the Kegel exercise intervention showed a significant decrease. Before the Kegel exercise intervention, the patient experienced moderate urinary incontinence, and after the Kegel exercise intervention decreased to mild-moderate urinary incontinence. All parameters decreased scores. The lowest scores occurred in the ability to hold urine when removing clothes from the toilet, urine discharge when coughing or sneezing, and not needing to run to the bathroom because of the urge to urinate. Post-TURP patients who did Kegel exercises experienced a faster decrease in dribbling than patients who did not do gymnastics (Anan et

al., 2020; Madjid et al., 2011). The condition is due to an improvement in the urinary system. The surgical wound is in the healing process so that the bladder sphincter has begun to work optimally, and the pubococcygeus muscle is getting stronger(Geraerts et al., 2016; Milios et al., 2020).

Urinary incontinence after TURP causes irritation symptoms due to friction of the injured prostate. Early incontinence usually causes symptoms of irritation or instability of the bladder muscle due to prolonged BPH (Huang et al., 2020). The third-week wound healing process is in the proliferative phase and tissue formation. The shape of the tissue that is still stiff causes the external bladder sphincter to be stiff causing urinary disorders(Jiang & Qian, 2019; Stormont & Chargui, 2022). The external bladder is part of a group of muscles below the prostate called the pelvic floor muscles (Huang et al., 2020). This muscle is involved in bladder control if bladder sphincter injury due to surgery will cause symptoms of urinary disorders (Kusljic et al., 2017; Türk et al., 2018).

Besides being caused by the wound healing process, post-TURP urinary incontinence can also cause long-term bladder stretching due to BPH (Mukherjee et al., 2015). Post TURP, the patient was placed in a urinary catheter for approximately two weeks because the bladder muscle was not optimal for contraction. After one week of urinary catheter

removal, the bladder muscle is also not strong enough to allow urine to excrete. When inserting a urinary catheter, the bladder does not fill and does not contract, eventually experiencing atony (Carrero-López et al., 2016). Urinary incontinence after TURP often results in bladder dysfunction and decreased detrusor overactivity (Das, 2019). If the urinary catheter removes, the detrusor muscle cannot contract maximally, possibly being unable to urinate (Anderson et al., 2015; Goonewardene et al., 2018).

Age is also a factor in urinary incontinence. Urinary incontinence is an inevitable part of the aging process. The mean age of post-TURP patients was almost the same, 60.44 years (control group) and 60.25 years (intervention group). This condition causes no difference in urinary incontinence scores in post-TURP patients before Kegel exercises. The risk factors that cause post-TURP urinary incontinence are age, weakness, and nerve stiffness (Machioka et al., 2019; Scott et al., 2020).

The results showed that Kegel exercises could reduce urinary incontinence, proven to decrease urinary incontinence scores in the treatment group. Kegel exercises can improve early urinary incontinence in post-TURP patients (Hall et al., 2018; Milios et al., 2019). Early Kegel exercises greatly affected urinary incontinence post-TURP, especially Kegel exercises guided by physiotherapists, decreasing urinary incontinence scores more significantly (Carrero-López et al., 2016). Previous studies showed Kegel exercises in men can reduce the frequency of urinary incontinence by more than half the previous frequency (Anderson et al., 2015; Carrero-López et al., 2016).

Comparing the study effect of Kegel exercises on urinary incontinence in patients after radical prostate surgery and transurethral resection of the prostate found no significant difference between the intervention group and the control group. The intervention group was given Kegel exercises with a guide therapist, while the control group was only given leaflets as a guide. The results comparison effects of conventional kegel exercises and advanced kegel exercises on post-TURP patients showed

that the decrease in urinary incontinence scores was more significant in patients who did advanced kegel exercises (El Shorbagy et al., 2017).

Kegel exercises usefully to strengthen the pelvic floor muscles (Milios et al., 2019). The mechanism Kegel exercises on urinary incontinence are by performing movements to tighten and relax the pelvic floor muscles, thereby reducing discomfort in the pelvic floor area and can accelerate blood circulation to the prosthesis so that it will accelerate the wound healing phase (Mungovan et al., 2013). Kegel exercises will cause contraction and relaxation of the pelvic floor muscles, so reduce discomfort and increase circulation in the pelvic area, reduce edema and accelerate wound healing (Scott et al., 2020; Wong et al., 2020).

In addition to accelerating the wound healing process, Kegel exercises through the mechanism of contraction and increasing the smooth muscle tone of the bladder wall can stimulate and support the pelvic floor muscles limiting downward movement of the urethra and preventing urine leakage (Zhang & Liao, 2018). Intensive exercise can increase muscle mass pelvic floor structure will permanently lift the elevator muscles to a higher position in the pelvis (Uddin et al., 2017). Muscle hypertrophy due to exercise and decreased stiffness of the endopelvic fascia can prevent a decrease in the pelvic floor due to increased intra-abdominal pressure, thereby preventing urinary incontinence (Anan et al., 2020).

Effect of Kegel Exercise on Erection Dysfunction

The results analysis of the measurement of erectile function scores in the intervention group after Kegel exercises showed a significant increase ($p=0,001$). Post-TURP patients experiencing erectile dysfunction, after doing Kegel exercises for three months, showed better recovery of erectile function (Geraerts et al., 2016). Kegel exercises performed as many as 60 contractions per day with two sessions and performed every two weeks can improve erectile function (Kirages & Johnson, 2016).

TURP is a procedure by inserting a surgical instrument directly through the urethra into the prostate and using an electric current (Kumar & Nehra, 2009). The urethral



opening is also the opening of the sperm that extends the length of the penis, so this action directly affects the muscular, vascular, and nervous systems of the penis. Electric current and heat can affect the organs next to it (urethral epithelium, arteries, and sphincter muscles) (Goonewardene et al., 2018; Huang et al., 2020). The resulting electric current is high frequency can damage neurovascular erectile function after TURP. Although are reports of post-TURP erectile function improving if not given an early stimulus can decrease the function of nerves and muscles (El Shorbagy et al., 2017).

The erectile function of post-TURP patients before Kegel exercises in the intervention group and the control group showed no difference, with an average erectile function score of 8-11, because the nervous system, muscles, and blood circulation that regulates erections have not functioned optimally due to TURP surgery. This caused the patient to be still afraid to have sexual intercourse, so there were no stimulations for nerves, muscles, and blood circulation. The early orgasm in post-TURP patients causes shame and avoidance of sexual activity (Myers & Smith, 2019). The results of other studies report that if there are urinary disorders, there is also a decrease in erectile function in men over 40 years (Rival & Clapeau, 2017).

The increase in erectile function scores after Kegel exercises is due to increased blood circulation in the penis, increased stamina, and sexual satisfaction because Kegel exercises increase the bulbocavernosus muscle and the ischiocavernosus muscle, so can improve erectile function (Wong et al., 2020). The success of Kegel exercises is characterized by decreasing venous flow and higher pelvic floor muscle contractions at the base of the penis, especially the bulbocavernosus and ischiocavernosus muscles (Miliotis et al., 2020). In addition, Kegel exercises are an easy and painless therapy choice (Das, 2019; Huang et al., 2020).

Studies on the effect of pelvic floor exercises on climacteric incontinence and erectile dysfunction include climacteric finding the patients perform 90 contraction Kegel exercises performed at home in various supine,

sitting, and standing positions had an impact on reducing urinary and climacteric incontinence, as well as improving erectile function (Verze et al., 2019). Research comparing the effectiveness of pelvic floor muscle training and biofeedback with lifestyle changes in men with erectile dysfunction concludes that pelvic floor muscle training and biofeedback will be used as effective alternative treatments for erectile dysfunction (Prota et al., 2012).

The Kegel exercises in this study were ten contractions, six sessions, and the rest 30 seconds per session. Kegel exercises three times a day for 10 minutes have increased the strength and mass of the pelvic floor muscles and improved blood circulation and bulbocavernosus muscle. This exercise increased the strength of pubococcygeus, bulbocavernosus, and ischiocavernosus muscles. This condition causes hard penile erections due to increased blood circulation, sexual stamina, volume and intensity of ejaculation, and increased urine flow (Kirages & Johnson, 2016; Myers & Smith, 2019).

The results study Kegel exercises affected reduced urinary incontinence (44%) and improving erectile function (21%) in post-TURP patients. A decrease in urinary incontinence scores and an increase in erectile function due to Kegel exercises can improve the urinary system and improve erectile function. Early Kegel exercises effectively reduced urinary incontinence post-TURP and can able halve the frequency of urinary incontinence from before (Anderson et al., 2015; Uddin et al., 2017). Kegel exercises can also train the pelvic floor muscles and improve erectile function, making it an option to treat erectile dysfunction (Prota et al., 2012; Verze et al., 2019).

Pelvic floor exercises performed earlier can minimize complications in post-TURP patients (Anan et al., 2020; Hall et al., 2018). This exercise will strengthen the pelvic floor muscles will increase urethral resistance, urinary control, bowel problems, and difficulty maintaining an erection after TURP so that Kegel exercises can be a non-pharmacological nursing intervention to reduce drug side effects and prevent post-TURP infection (Huang et al., 2020; Rival & Clapeau, 2017). This study can use nursing intervention in providing education and



training as a complementary therapy alternative to treat urinary incontinence and erectile dysfunction in post-TURP patients.

The limitation of the study was that researchers were not always beside the patient when doing Kegel exercises, researchers only received reports, and the observation checklist filled out by patients and families. In addition, the design of this study still uses a quasi-experimental, not using a randomized controlled trial.

CONCLUSION

Kegel exercises effectively to reduce urinary incontinence and improve erectile function in older patients post-TURP. Kegel exercises can use as a complementary nursing intervention to treat post-TURP complications. Suggestions, use the services of a research assistant to monitor interventions and accuracy of patients in doing Kegel exercises using different respondents and locations.

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DECLARATION OF INTEREST

All authors declare that there was no conflict of interest in this study.

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