Research Article
(Araştırma Makalesi)

EGEHFD, 2024,40 (1): 11-22
Doi: 10.53490/egehemsire.1134716

Kevser İLÇİOĞLU[1]
Orcid: 0000-0002-4900-9095
Ayşe ÇEVİRME [2]
Orcid: 0000-0001-7116-2523

[1] Sakarya University, Faculty of Health Sciences, Department of Nursing, Sakarya, Türkiye.

[2] Sakarya University, Faculty of Health Sciences, Department of Nursing, Sakarya, Türkiye.

Sorumlu Yazar (Corresponding Author):
Kevser İLÇİOĞLU
kevserozdemir@sakarya.edu.tr

Keywords:
Women's health; Kegel exercise; scale development; urinary incontinence; quality of life.

Anahtar Sözcükler:
Kadın sağlığı; Kegel egzersizi; ölçek geliştirme; üriner inkontinans; yaşam kalitesi.

Effectiveness of Kegel Exercise Training in Women with Urinary Incontinence: A Methodological and Experimental

Üriner İnkontinansı Olan Kadınlarda Kegel Egzersiz Eğitiminin Etkililiği: Metodolojik ve Deneysel Bir Çalışma

Gönderilme Tarihi:23 Haziran 2022 **Kabul Tarihi:** 26 Nisan 2023

* This study was carried out as a thesis in Sakarya University Health Sciences Institute Nursing Doctorate Program in 2017. This study was presented at the 1st International and 2nd National Congress of Women's Health Nursing in 2018.

ABSTRACT

Objective: This study was carried out to evaluate the Kegel Exercise training efficacy given to women diagnosed with urinary incontinence and to develop the "Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale" and to test its validity reliability.

Methods: The study, which was planned methodologically and experimentally with pre-test and post-test, was carried out on 105 women with urinary incontinence between March and July 2017.

Results: The average age of women was 49.10 ± 8.99 years. According to the data before the Kegel Exercise training and 8 weeks after the Kegel Exercise application, the average scores of the scales changed over time ($p < 0.05$). The scale developed in the study was found to be a valid and reliable scale that can measure the effectiveness of Kegel Training

Conclusion: Kegel Exercise training positively affected the quality of life and it was determined that the Evaluation Scale of the Developed Kegel Exercise Training Activity is a valid and reliable measurement tool. Nurses are asked to work on issues related to urinary incontinence, to evaluate and transfer these studies to their applications, and thus, it is expected that evidence-based practices will be increased.

ÖZ

Amaç: Bu çalışma, üriner inkontinans tanısı almış kadınlara verilen Kegel Egzersizi eğitimi etkinliğinin değerlendirilmesi ve "Kegel Egzersizi Eğitimi Etkinliğinin Değerlendirme Ölçeği"nin geliştirilmesi, geçerlilik güvenirliğinin test edilmesi amacıyla gerçekleştirildi.

Yöntem: Ön test ve son test yapılarak metodolojik ve deneysel olarak planlanan çalışma, Mart-Temmuz 2017 tarihleri arasında 105 üriner inkontinans tanısı almış kadın üzerinde yapılmıştır.

Bulgular: Kadınların yaş ortalaması 49.10±8.99 yıl idi. Kegel Egzersizi eğitimi öncesi ile Kegel Egzersizi uygulamasından 8 hafta sonraki verilere göre ölçeklerin puan ortalamalarında zamana göre değişim tespit edildi ($p<0.05$). Çalışmada geliştirilen ölçeğin Kegel Egzersizi eğitimi etkinliğini ölçebilecek geçerli ve güvenilir bir ölçek olduğu görüldü.

Sonuç: Üriner inkontinansın yaşam kalitesi üzerindeki olumsuz etkisinin Kegel Egzersizi ile azaldığı tespit edilmiştir. Kadınlara öğretilen Kegel Egzersizine uyumun sağlanması, eğitimin kadınlar için anlaşılır ve uygulanabilir hale getirilebilmesi, eğitimin etkinliğinin ölçülmesi için önerilmektedir. Bu amaçla geliştirilen "Kegel Egzersiz Eğitimi Ölçeğinin Yararlılığı ve Uygulanabilirliğinin Değerlendirilmesi" geçerli ve güvenilir bir ölçek olarak literatüre eklenmiştir.

How to cite: : İlçioğlu, K., Çevirme, A. (2024). Effectiveness of Kegel exercise training in women with urinary ıncontinence: A methodological and experimental. *JEUNF*, *40*(1), 11-22. Doi: 10.53490/egehemsire.1134716
Kaynak Gösterimi: İlçioğlu, K., Çevirme, A. (2024). Üriner inkontinansı olan kadınlarda Kegel egzersiz eğitiminin etkililiği: Metodolojik ve deneysel bir çalışma. *EGEHFD*, 40(1), 11-22. Doi: 10.53490/egehemsire.1134716

INTRODUCTION

Urinary Incontinence (UI) has been defined by the International Continence Society (ICS) as involuntary urinary incontinence that causes social and hygienic problems and can be shown objectively (Abrams et al., 2002). Urinary incontinence symptoms are a common health problem not only in developing countries but also in developed countries. Risk factors for UI in women are the old age, cases of increased intra-abdominal pressure such as chronic constipation and obesity, high number of deliveries, obstetric factors such as difficult birth and birth trauma, chronic obstructive pulmonary disease, diabetes mellitus, systematic diseases like cerebro vascular disease and congestive heart failure, menopause due to systemic diseases and decreased estrogen level (Stothers and Friedman, 2011; Unsal, Tozun and Arslantaş, 2013). Many studies show urinary incontinence frequency between 54.8%- 9.4% in the world and in Turkey are reported to be between 16.4%- 49.5% (Unsal et al., 2013; Zhu, Li, Lang, Xu and Wong, 2013).

UI is a health problem that negatively affects the quality of life due to its effect on daily life (Chiaffarino, Parazzini, Lavezaari, Giamban and GISIU, 2003). Due to the constant feeling of wetness, irritation and odor, it can also cause emotional problems related to the feeling of inadequacy in women. Because women cannot control their urinary functions due to urinary incontinence, they feel imperfect and inadequate, voluntarily isolate themselves from social life, reducing the amount of fluid taken daily, and this can lead to impaired quality of life of women (Melville, Delaney, Newton and Katon, 2005; Ozdemir, Ozerdogan and Unsal, 2011).

Pelvic floor exercises, one of the most applied methods among UI treatment methods, was designed by Arnold Kegel in 1948 to strengthen the pelvic floor muscles and thereby improve urethral sphincter function (Bo, 2004). Kegel exercises are aimed at strengthening the muscle support in the pelvic floor, and training of these muscles is recommended as the first treatment in all types of UI. Kegel Exercise increases pelvic floor and anal sphincter muscle strength, urethral closure pressure and resistance. In addition to improving urethral sphincter function, it plays a role in increasing support in the pelvic organs, strengthening voluntary both periurethral and perivaginal muscles, and thus decreasing the frequency of UI (Herderschee, Hay- Smith, Herbison, Roovers and Heineman, 2011).

Nurse plays a role as a consultant in preventing UI and approaching women who have this problem, and constitutes an important part of the healthcare team in diagnosis, evaluation and especially conservative treatment (Ozkan, Bilgic and Beji, 2019).

This study was conducted to evaluate the Kegel Exercise training effectiveness given to women diagnosed with UI.

Research questions

• Does Kegel exercise improve the quality of life of women with UI?

• Is this “Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale” valid and reliable?

METHODS

Research Design

The research was conducted methodologically and experimentally with the aim of developing the “Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale”, testing the validity reliability and evaluating the effectiveness of the Kegel Exercise education of women diagnosed with urinary incontinence by applying pre-test and post-test. Research was held between March and July 2017 at the urology policlinic in the western part of Turkey.

Population and Sample

Women who admitted to the urology outpatient clinic in two state hospitals located in the western part of Turkey consist the population of the study. The sample size was planned to consist of 90 women, 30 women with stress incontinence, 30 women with urge incontinence, and 30 women with mixed incontinence, which are the types of urinary incontinence during the experimental phase of the study. In the first interview phase of the study, 120 women were reached, but 105 women were sampled because 15 of the women did not participate in other interviews. In the Power Analysis conducted as a result of the study, the power of the study was found to be 99.8%. Women with diabetes, diuretic and antihypertensive drugs, urinary tract infections, pelvic organ prolapse, lumbar disc herniation and previous incontinence operations were excluded from the study. In the scale development phase, it is recommended to use 5-10 times the number of scale items (Burn and Grove, 1997). This study, 60 people were calculated for sample size with a ratio of 10 times for the 6-item scale, 105 people were included in the scale development phase and are compatible with the literature.

Data Collection

"Data Collection Form for Women's Descriptive Features", which involves socio-demographic, General Health, Obstetric, Menopause and UI related information and were prepared in accordance with the purpose of the study, “Incontinence Impact Questionnaire - Short Form”, “Incontinence Quality of Life - I-QOL Scale” and “Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale” was used as a data collection tool. The data were collected by face-to-face interview method after the women were informed about the research, their questions about the research were answered and the 'Informed Volunteer Consent Form' was filled. This process took about 20-25 minutes. During the data collection phase, the rules in the Helsinki Declaration were followed. Data collection flow chart is given Figure 1.

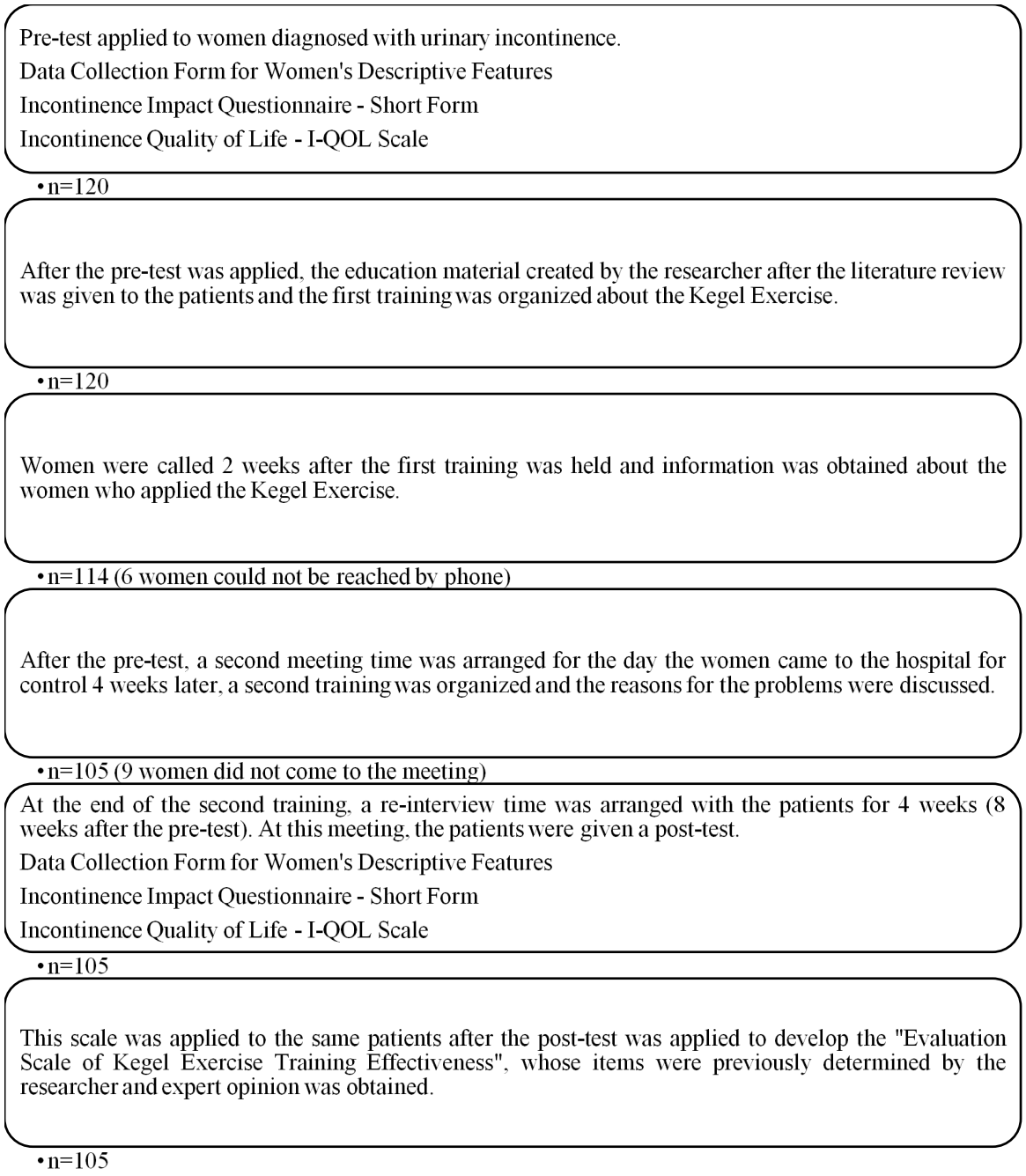

Figure 1. Data collection flow chart

This study, I-QOL Scale were used to evaluate the effect of urinary incontinence on quality of life. From the Incontinence Impact Questionnaire developed by Shumaker et al. In 1994, a 19-question long form, Incontinence Impact Questionnaire-7 (IIQ-7), was created in 1995 by Uebersax et al. (Uebersax, Wyman, Shumaker, McClish and Fantl, 1995). The Turkish validity and reliability study of the scale was conducted in 2007 (Cam, Sakallı, Ay, Cam and Karateke, 2007). The first form of the Incontinence Quality of Life Scale was created in the USA in 1996 (Wagner, Patrick, Bavendam, Martin and Buesching, 1996). After the validity and reliability of the scale in Turkish, this scale was used for the first time in 2004 by Ozerdoğan (Ozerdogan, Beji and Yalcin, 2004).

Developing the Scale

Content validity of the scale: By the literature review of the draft of the Evaluation Scale for the Usefulness and Applicability of Kegel Exercise Training, a 5-item Likert-type 16-item item pool was created. The developed scale draft were sent to the faculty members and the relevant specialists of various nursing departments and medical faculties in order to evaluate whether they cover the subject wanted to be scaled, the understandability of the directive and items in terms of language and expression. The scale draft prepared before the application was read to a faculty member from the Turkish language and literature department in terms of compliance with the Turkish language rules, and its accuracy was checked and named as the "Evaluation Scale for the Usefulness and Applicability of the Kegel Exercise Training". The experts were asked to evaluate each item on the scale using 1-4 points, using the degree of measurement (1 = not suitable, 2 = very corrected, 3 = less corrected, 4 = very suitable). Suggestions from 11 experts were evaluated. Finally, a 7 item scale was prepared and the items were corrected in terms of language and expression in line with the expert opinion. In the statistical analysis, another item was removed and the final version of the scale was given with 6 items. As a result of the Kendall W Compliance Test for the validity of the scale (number of experts: 11, Kendall's W: 0.255, $p > 0.05$), it was determined that the experts reached consensus and the items in the scale represent the area to be measured.

Validity and reliability analysis of the scale: Explanatory and confirmatory factor analysis after Kendall's W compliance analysis for scope validity at the validation stage of the Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale. In the reliability phase, test-retest analysis and Cronbach's alpha internal consistency analysis methods were applied.

Factor analysis: In order to determine the suitability of the data for factor analysis, Kaiser-Meyer-Olkin (KMO) Sample Suitability Test and Bartlett's Sphericity test showing the correlation of the items with each other were applied. In our study, Cashier Meyer Olkin (KMO) value was found to be 0.64. Thus, it is seen that the results of factor analysis to be applied to the data will be useful and usable. As a result of the Bartlett Sphericity test, it was concluded that there were significantly high relations between the variables and the data were suitable for applying factor analysis ($X2$: 310.556, sd:15, $p < 0.001$).

Exploratory factor analysis (EFA): Along with EFA, 6 items were observed to unite under two factors, and it was ensured that expressions with a factor load of over 0.400 were included in the scale. The variance level of the items that make up the two-dimensional structure produced from EFA is 75.709%.

Confirmatory factor analysis (CFA): The two-factor structure of the Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale was analyzed with DFA, and the data obtained for the fit index after analysis are RMSEA = 0.18, IFI = 0.91, CFI = 0.91and SRMR = 0.08. In addition, the path diagram showing the distribution of standard load values obtained with the single factor structure obtained with DFA is given in Figure 2.

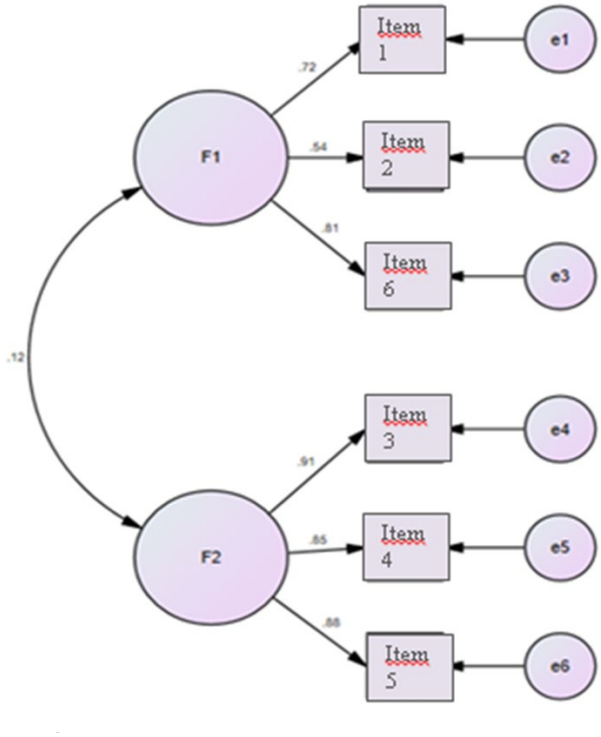

Figure 2. 1st Degree CFA model with two sub-dimensions

Test – retest analysis: In the repetitive measurements of the Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale, the test-retest method was used to determine the state of reaching similar measurement values. The scale was applied to all participants (n = 105) with an interval of two weeks. There is a statistically significant decrease in the mean of the scale and its sub-dimensions over time.

Internal consistency analysis (Cronbach alpha): Cronbach's alpha reliability coefficient, which is one of the most frequently used criteria as an internal consistency scale, was used for evaluating the reliability of the scale. These values are generally higher than the acceptable value of 0.70.

Education application stage of the research: The training program for women was created to learn about Kegel Exercise, how this exercise is done, its benefits, and what to consider during practice. The training booklet, which was created in line with the data collected as a result of national and international literature reviews, was given to women after the first training (Demirci and Cosar, 2009; Wyman, Burgio and Newman, 2009; Yildiz, Sarsan and Ardic, 2009; Kaplan and Demirci, 2010). The training was done after the women were examined at the gynecological table, by asking the researcher to make a vaginal touch and to squeeze the finger which is used for vaginal touch on the patient. Thus, the first Kegel Exercise was applied together with the researcher, and in this way, the patient was told which muscles to use, how many times and how often to apply his muscles. The first training was given immediately after the pretest, and the other training was given 4 weeks after the interview with the patient. In addition, during the 8-week period, women were questioned by the researcher every 2 weeks and whether there was a problem with the implementation of the exercises and it was stated that they could call the researcher whenever they needed.

Data Analysis

The data obtained were evaluated in the IBM SPSS (version 23.0) Statistics Package Program in computer environment. Pearson correlation test, ANOVA and Independent T-test were used for statistical analysis. In the scale development phase, exploratory factor analysis and then confirmatory factor analysis were applied and Cronbach's Alpha values were used for the reliability of the scale. In addition, as a result of re-negotiations with 105 people, the test repeat test was concluded with the independent t test. $p < 0.05$ level was accepted for statistical significance.

Ethical Considerations

Ethical approval of the study was obtained from Sakarya University Faculty of Medicine Clinical Research Ethics Committee (Decision Number: 16214662/050.01.04/14 on 25 January 2017). Necessary permissions were obtained from hospitals. In addition, the women to be included in the research were informed about the research and written approval was received.

RESULTS

This study, there was a statistically significant difference between the mean score changes in the IIQ-7 scale and the I-QOL scale with socio-demographic characteristics (Table 1). Accordingly, there was a statistically significant difference between women's ages, education level, marital status, employment status and family types with the mean score changes in the IIQ-7 and I-QOL scales ($p<0.05$)

Table 1. Distribution of Women's Mean Score Changes in IIQ-7 and I-QOL Scales According to the Socio-Demographic Characteristics

Variables			n	Mean	Standard Deviation	F/T	p	Multiple comparison
Age groups	**IIQ-7**	30-39	18	-17.40	12.24	5.756	**0.001****	1-2,4
		40-49	47	-26.61	7.98			
		50-59	13	-27.06	7.87			
		60 and above	27	-27.66	8.63			
	I-QOL	30-39	18	15.93	1.89	5.870	**0.001****	1-3,4 2-3
		40-49	47	19.61	9.58			
		50-59	13	25.78	4.42			
		60 and above	27	23.56	7.17			
Education status	**IIQ-7**	Literate	13	-28.91	5.96	6.707	**0.000*****	1,2,3-4
		Primary School	53	-26.74	11.09			
		Secondary School	16	-28.23	5.86			
		High school and higher	23	-18.17	5.32			
	I-QOL	Literate	13	20.30	7.17	3.241	**0.025***	3-4
		Primary School	53	20.73	9.29			
		Secondary School	16	25.66	6.92			
		High school and higher	23	17.68	4.52			
Employment status	**IIQ-7**	Employed	21	-16.05	5.11	7.816	**0.000*****	
		Unemployed	84	-27.68	9.02			
	I-QOL	Employed	21	14.58	3.65	-6.442	**0.000*****	
		Unemployed	84	22.31	8.22			
Family type	**IIQ-7**	Extended family	42	-21.73	9.25	3.317	**0.001****	
		Nuclear family	63	-27.78	9.09			
	I-QOL	Extended family	42	18.83	5.16	-2.251	**0.027***	
		Nuclear family	63	22.05	9.44			

*:$p<0.05$ **:$p<0.01$ ***:$p<0.001$

IIQ-7: Incontinence Impact Questionnaire-7
I-QOL: Incontinence Quality of Life
F:ANOVA
T: Independent T-test

There was a statistically significant difference between smoking status, medical history, regular drug use, and mean score changes in BMI and IIQ-7 and/or I-QOL scales of women diagnosed with UI ($p<0.05$). There was a statistically significant difference between the birth of a big baby, pregnancy and puerperal incontinence with the mean score changes in IIQ-7 and I-QOL scales ($p<0.05$). Furthermore, there was a statistically significant difference between women's menopausal status, menopause types and hormone replacement therapy status with the mean score changes in the IIQ-7 and I-QOL scales ($p<0.05$). The distribution of women's mean score changes in IIQ-7 and/or I-QOL scales according to some variables is shown in Table 2.

Table 2. Distribution of Women's Mean Score Changes in IIQ-7 and I-QOL Scales According to the Some Variables

Variables			n	Mean	Standard Deviation	F	p	Multiple comparison
Smoking status	**IIQ-7**	Non-smoker	82	-25.22	10.49	0.383	0.703	
		Smoker	23	-25.84	5.34			
	I-QOL	Non-smoker	82	19.76	8.78	-3.812	**0.000*****	
		Smoker	23	24.35	3.43			
Medical history	**IIQ-7**	None	64	-22.50	9.19	4.095	**0.000*****	
		Available	41	-29.82	8.50			
	I-QOL	None	64	17.85	7.63	-5.106	**0.000*****	
		Available	41	25.31	6.75			
Drug use status	**IIQ-7**	None	76	-23.36	9.32	4.868	**0.000*****	
		Available	29	-32.10	7.18			
	I-QOL	None	76	18.34	7.20	-7.808	**0.000*****	
		Available	29	28.93	5.36			
BMI	**IIQ-7**	Normal or overweight	49	-22.71	11.394	4.939	**0.009****	1-3
		Obese	43	-26.64	7.126			
		Morbid obese	13	-31.10	5.370			
	I-QOL	Normal or overweight	49	16.62	8.344	17.749	**0.000*****	1-2,3
		Obese	43	23.35	6.300			
		Morbid obese	13	27.82	2.817			
Big baby history	**IIQ-7**	No	76	-23.83	9.02	2.730	**0.007****	
		Yes (normal birth)	29	-29.37	10.00			
	I-QOL	No	76	19.15	7.74	-3.450	**0.001****	
		Yes (normal birth)	29	24.98	7.73			
UI history in birth and puerperality	**IIQ-7**	None	81	-26.89	8.78	-3.126	**0.002****	
		Available	24	-20.20	10.54			
	I-QOL	None	81	22.45	8.49	7.045	**0.000*****	
		Available	24	15.08	2.22			
Menopause status	**IIQ-7**	No	48	-21.39	9.34	4.195	**0.000*****	
		Yes	57	-28.70	8.52			
	I-QOL	No	48	17.33	6.27	-4.402	**0.000*****	
		Yes	57	23.66	8.44			
Menopause type	**IIQ-7**	Natural	42	-27.06	7.45	2.545	**0.014***	
		Surgical	15	-33.29	9.85			
	I-QOL	Natural	42	22.75	7.79	-1.364	0.178	
		Surgical	15	26.19	9.89			
Hormonal therapy history for menopause	**IIQ-7**	None	45	-26.21	7.48	5.171	**0.000*****	
		Available	12	-38.05	4.96			
	I-QOL	None	45	22.10	8.13	-2.870	**0.006****	
		Available	12	29.50	7.10			

*:$p<0.05$ **:$p<0.01$ ***:$p<0.001$

IIQ-7: Incontinence Impact Questionnaire-7
I-QOL: Incontinence Quality of Life
F:ANOVA
T: Independent T-test

While there was a statistically significant negative (r = -0.250) low correlation between the number of births and the mean score changes in the IIQ-7 scale (p <0.05), there was a statistically significant positive low (r=0.251) correlation between the number of births and the mean score changes in the I-QOL scale (p <0.05). The difference between the participants' obstetric history and IIQ-7 and I-QOL scales is shown in Table 3.

Table 3. The Correlation Between the Women's Mean Score Changes in IIQ-7 and I-QOL Scales and the Number of Births

		IIQ-7	**I-QOL**
Number of births	r	**-0.250**	**0.251**
	p	**0.010***	**0.010***
	n	105	105

*:p<0.05 **:p<0.01 ***:p<0.001
IIQ-7: Incontinence Impact Questionnaire-7
I-QOL: Incontinence Quality of Life

Before the Kegel Exercise training was given, the average score from the IIQ-7 was 50.15 ± 21.21 and the average score from the I-QOL was 48.28 ± 21.39. 8 weeks after the training, the average scores obtained from the scales: from Incontinence Impact Questionnaire (IIQ-7) was 24.29 ± 17.95 and from I-QOL was 69.04 ± 25.27 points. The effectiveness of Kegel Exercise training according to the incontinence types of women is given in Table 4.

Table 4. Average Scores from the Scales Before Kegel Training Education and 8 weeks after the Kegel Training Education

Scales	**Urinary Incontinence**			**Urge Incontinence**			**Stress Incontinence**			**Mix İncontinence**		
	X±Sd	**t**	**p**	**X±Sd**	**t**	**p**	**X±Sd**	**t**	**p**	**X±Sd**	**t**	**p**
IIQ-7												
Before Kegel Exercise Training	50.15±21.21			16.54±5.33			18.63±3.12			17.46±4.53		
8 Weeks After Kegel Exercise Training	24.79±17.95	27.111	**0.000*** **	11.11±3.69	16.915	**0.000*** **	12.83±2.33	31.795	**0.000*** **	12.69±4.76	10.621	**0.000*** **
IQOL												
Before Kegel Exercise Training	48.28±21.39			72.09±16.73			65.80±17.79			55.57±18.58		
8 Weeks After Kegel Exercise Training	69.04±15.27	-26.156	**0.000*** **	88.17±10.31	-13.699	**0.000*** **	5.80±12.35	-16.568	**0.000*** **	74.31±13.40	-15.687	**0.000*** **

*:p<0.05 **:p<0.01 ***:p<0.001
IIQ-7: Incontinence Impact Questionnaire-7 I-QOL: Incontinence Quality of Life

DISCUSSION

According to our study results, it was determined that kegel exercise improves the quality of life in women with urinary incontinence. In addition, it was determined that the scale developed to evaluate the effectiveness of kegel exercise is a valid and reliable scale.

As age increases, the severity of UI is expected to increase (Haslam and Laycock, 2008). Accordingly, it is thought that the quality of life of older women will be affected more than other age groups. Akgun et al. In their study on 435 women, a negative correlation was found between age and quality of life (Akgun, Sut and Balkanli Kaplan, 2010). In another study conducted by Bartoli et al., a decrease in quality of life was detected with age (Bartoli, Aguzzi and Tarricone, 2010). When the difference between age and quality of life is examined in this study, there is a statistically significant difference between the age groups in terms of the mean of the IIQ-7 scale and the change in the I-QOL scale ($p < 0.05$).

UI is more common in unemployed women with low education level and due to early birth, short birth intervals and high number of births (Akgun et al., 2010; Terzi, Terzi and Kale, 2013). Accordingly, it is expected to receive more effective response from Kegel Exercise because this issue is more intense in women with low education level and inoperative UI. This study, there is a statistically significant difference in terms of the working status and education levels of women and the mean changes in the IIQ-7 scale and I-QOL scale ($p < 0.05$).

One of the reasons why UI negatively affects the quality of life in women is social isolation. Women close themselves to the home due to UI and restrict their social relationships because of their feelings of shame (Velazquez, Bustos, Rojas, Ovedio, Neri Ruz and Castrillo, 2007). UI women with a large family type are more affected by this situation due to the high number of people living at home, and a higher increase in quality of life is expected as a result of decreasing UI complaints by applying Kegel Exercise. According to our study data, there is a statistically significant difference between the family types in terms of mean changes in IIQ-7 and I-QOL scale ($p < 0.05$).

This study, there is a statistically significant difference in terms of smoking averages and the mean change in I-QOL scale ($p < 0.05$). Similarly, in a study involving 1307 women in Northern Mexico, active smoking was found to have a serious relationship with UI (García-Pérez, Harlow, Sampselle and Denman, 2013). The fact that smoking causes anatomical and neurological damage on the sphincter, as it causes severe cough, constitutes a risk factor for all types of UI (Harai, Oura and Mori, 2014). It has been stated in the studies that smoking is not only a risk factor for UI but also decreases the quality of life for UI (Amaral, Coutinho, Nelas, Chaves and Duarte, 2015; Demir and Erbesler, 2017).

The fact that the number of births is high and the birth weight of the baby that causes the second stage of the birth to be extended is among the risk factors for UI. Because both the number of births and large baby births cause damage to the pelvic floor and pudental nerve (Biswas, Bhattacharyya, Dasgupta, Karmakar, Mallick and Sembiah, 2017). It was determined in the study of Demirel and Akin that these two obstetric stories negatively affect the quality of life in women with UI (Demirel and Akın, 2014). In our study, there is a statistically significant negative low level correlation ($r = -0.250$) between the number of births and the mean of the change in the IIQ-7 scale, while there was a statistically significant positive low level correlation ($r = 0.251$) between the number of births and the mean of the change in the I-QOL scale.

According to study data, there is a statistically significant difference between the status of pregnancy and postpartum incontinence in terms of the average of the IIQ-7 scale and the change in the I-QOL scale ($p < 0.05$). Accordingly, the average of the change in the IIQ-7 and I-QOL scale of patients without a history of pregnancy and postpartum incontinence is significantly higher than that of patients with a history of pregnancy and postpartum incontinence. We can explain this situation in the form that women who have had UI problems for a long time do not perform the Kegel Exercise effectively because they think that they see it as a part of their lives and lose their quest to solve the problem, and accordingly they do not see the benefit they should have.

The lowering of the level of ovarian hormones in the blood with menopause has a negative effect on the pelvic floor muscles, which poses a risk for UI (Oz and Altay, 2017). Since the quality of life is more affected in women in menopause, it is thought that Kegel Exercise will have collaterally more impact on the quality of life regarding the situation of menopause. In addition, in women who undergo surgical menopause, along with these, damage to the muscles, nerve support structures that occur during the surgical menopause, and subsequent deficiency of ovarian hormones lead to UI (Unsal et al., 2013). In this study, there is a statistically significant difference between menopause states in terms of mean changes in IIQ-7 scale and I-QOL scale ($p < 0.05$). In addition, patients with surgical menopause have significantly higher average changes on the IIQ-7 scale than patients with natural menopause ($p < 0.05$).

Although the cause cannot be fully explained, women who receive hormone therapy in menopause have a higher prevalence and severity of UI (Bresee, Dubina, Khan, Sevilla, Grant, Eilber and Anger, 2014). California Health Research also reported that hormone therapy in menopause increases the risk of UI (CHIS, 2003). In another study, it was found that women who received hormone therapy in menopause in women under the age of 80 had a higher prevalence and severity of UI (Grady, Brown, Vittinghoff, Applegate, Varner, Snyder and HERS, 2001). In our study, there is a statistically significant difference between the status of hormone therapy history in menopause in terms of the average of the IIQ-7 scale and the change in the I-QOL scale ($p < 0.05$). Accordingly, the average of

the change in the IIQ-7 and I-QOL scale of patients with a history of hormone therapy in menopause is significantly higher than those without a history of hormone therapy in menopause.

In this study, IIQ-7 and I-QOL quality of life scales, which are unique to UI, were used to evaluate the quality of life of women with UI, as suggested by ICS. According to the data before the Kegel Exercise training and 8 weeks after the Kegel Exercise application, the three types of UI, which were included in the study, were determined according to time ($p < 0.05$). Accordingly, while the mean scores of the IIQ-7 scale decreased statistically significantly after the Kegel Exercise, the mean score of the I-QOL scale showed a statistically significant increase after the Kegel Exercise.

This study started with a literature review on UI and Kegel exercise to develop a scale. Although there are many scales related to Kegel exercise, no validity and reliability scale for the evaluation of the given Kegel exercise training was found. The reliability coefficients of the Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale, which we developed in this direction, show that it is a scale that reliably measures the effectiveness of the Kegel Exercise training given to women with urinary incontinence complaints. The minimum score that can be obtained from the scale is 6, the maximum score is 30. A high score indicates that Kegel Training training is effective. The scale can easily filled by individuals who can read and write. Application time is on average 10 minutes.

CONCLUSIONS

UI has a negative effect on quality of life and this effect has been determined to decrease with Kegel Exercise. As in the literature, Kegel Exercise is recommended to be the first step in treatment, to ensure compliance with the Kegel Exercise taught to women, to be able to make education understandable and applicable for women, measure the effectivity of the education. The "Evaluation of the Usefulness and Applicability of Kegel Exercise Training Scale" developed for this purpose has been added to the literature as a valid and reliable scale.

Limitations

The limitations of the study performed only on women with UI who applied to the hospital.

Author Contributions

Concept and design:K.I., A.C., Data Collection: K.I., Data analysis and interpretation: K.I., Writing manuscript: K.I., A.C., Critical review: A.C.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: It was supported by Sakarya University Scientific Research Projects Coordination with project number 2017-40-02-001

REFERENCES

Abrams, P., Cardozo, L., Fall, M., Griffiths, D., Rosier, P., Ulmsten, U., … Wein, A. (2002). Standardisation sub-committee of the International Continence Society. The Standardization of terminology in lower urinary tract function: Report from, the standardization sub-committee of the International Continence Society. *Neurourology and Urodynamics*, *21*, 167-178.

Akgun, G., Sut, N., Balkanli Kaplan, P. (2010). Prevalance of the urinary incontinence in women older than 40 years and influence of their QoL. *Turkiye Klinikleri Gynecology Obstetrics, 20*(6), 378-386. (in Turkish)

Amaral, M.O., Coutinho, E.C., Nelas, P.A., Chaves, C.M., Duarte, J.C.(2015). Risk factors associated with urinary incontinence in Portugal and the quality of life of affected women. *International Journal of Gynecology & Obstetrics, 131*, 82-86. doi: 10.1016/j.ijgo.2015.03.041.

Bartoli, S., Aguzzi, G., Tarricone, R. (2010). Impact on quality of life of urinary incontinence and overactive bladder: A systematic literature review. *Urology, 75*(3), 491-500. doi: 10.1016/j.urology.2009.07.1325

Biswas, B., Bhattacharyya, A., Dasgupta, A., Karmakar, A., Mallick, N., Sembiah, S. (2017). Urinary incontinence, its risk factors, and quality of life: A study among women aged 50 years and above in a rural health facility of West Bengal. *Journal of Mid-life Health, 8*(3), 130-136. doi: 10.4103/jmh.JMH_62_17.

Bo, K. (2004). Pelvic floor muscle training is effective in treatment of female stress urinary incontinence, but how does it work? *International Urogynecology Journal*, *15*, 76-84.

Bresee, C., Dubina, E.D., Khan, A.A., Sevilla, C., Grant, D., Eilber, K.S., Anger, J.T. (2014). Prevalence and correlates of urinary incontinence among older, community-dwelling women. *Female Pelvic Medicine & Reconstructive Surgery, 20*(6), 328-333. doi: 10.1097/SPV.0000000000000093.

Burns, N., Grove, S.K. (1997). *The practice of nursing research conduct, critique and utilization* (3rd ed.). Philadelphia, W.B. Saunders Company.

California Health Interview Survey. (2010). *CHIS 2003 adult public use file release 3 [computer file]: UCLA*. Center for Health Policy Research, Los Angeles, Computer File.

Chiaffarino, F., Parazzini, F., Lavezzari, M., Giamban, V., Gruppo Inter disciplinaredi Studio Incontinenza Urinaria (GISIU). (2003). Impact of urinary incontinence and over active bladder on quality of life. *European Urology, 43*, 535-538.

Cam, C., Sakalli, M., Ay, P., Cam, M., Karateke, A. (2007). Validation of the Shortforms of the Distress Inventory (UDI-6) in a Turkish Population. *Neurourology and Urodynamics,* 26,129-133.

Demir, G., Erbesler, Z.A. (2017). Quality of life and factors associated with it in elderly women with urinary incontinence. *Turkish Journal of Geriatrics, 20*, 213-222.

Demirci, N., Cosar, F. (2009). Behavioural therapy techniques for urinary incontinence. *SDU Medical Faculty Journal*, *16*, 35-40.

Demirel, T., Akin, B. (2014). Prevalence and risk factors of urinary incontinence and its impact on quality of life among 65 years and over women who lived in rural area. *Turkish Journal of Geriatrics, 17*, 379-388.

García-Pérez, H., Harlow, S.D., Sampselle, C.M., Denman, C. (2013). Measuring urinary incontinence in a population of women in northern Mexico: Prevalence and severity. *International Urogynecology Journal, 24*, 847-854. doi: 10.1007/s00192-012-1949-y.

Grady, D., Brown, J.S., Vittinghoff, E., Applegate, W., Varner, E., Snyder, T., HERS Research Group. (2001). Postmenopausal hormones and incontinence: The heart and estrogen/progestin replacement Study. *Obstetrics & Gynecology, 97*(1), 116-120.

Harai, M., Oura, A., Mori, M. (2014). Risk factors for urinary incontinence in Japanese elderly women. *Lower Urinary Tract Symptoms, 6*(2), 94–97. doi: 10.1111/luts.12026.

Haslam, J., Laycock, J. (2008). *Therapeutic management of incontinence and pelvic pain* (2nd ed). Springer.

Herderschee, R., Hay-Smith, E.J.C., Herbison, G.P., Roovers, J.P., Heineman, M.J. (2011). Feedback or biofeedback to augment pelvic floor muscle training for urinary incontinence in women. *The Cochrane Collaboration, 6*(7), CD009252. doi: 10.1002/14651858.CD009252.

Kaplan, S., Demirci, N. (2010). Conservative treatment methods for urinary incontinence. *Journal of Firat Health Services, 5*, 1-14. (in Turkish)

Melville, JL., Delaney, K., Newton, K., Katon, W. (2005). Incontinence severity and major depression in ıncontinent women. *Obstetrics & Gynecology, 106*, 585-592. doi: 10.1097/01.AOG.0000173985.39533.37.

Ozerdogan, N., Beji, N.K., Yalcin, O. (2004). Urinary incontinence: Its prevalence, risk factors and effects on the quality of life of women living in a region of Turkey. *Gynecologic and Obstetric Investigation, 58*, 145-150.

Öz, Ö., Altay, B. (2017). Risk factors of urinary incontinence and nursing approach. *Annals of Health Science Research,* 6, 34-37.

Ozdemir, E., Ozerdogan, N., Unsal, A. (2011). Urinary incontinence, sexual dysfunction and quality of life among married women older than 20, in Ankara Gulveren Health Clinic Region. *Turkiye Klinikleri Gynecology Obstetrics, 21*(4), 266-276.

Ozkan, S.A., Bilgic, D., Beji, N.K. (2019). The examination of nursing postgraduate theses related to urinary incontinence in Turkey. *Acibadem University Health Sciences Journal*, *10,* 201-210. doi:10.31067/0.2019.142

Stothers, L., Friedman, B. (2011). Risk factors for the development of stress urinary incontinence in women. *Current Urology Reports, 12*, 363-369. doi: 10.1007/s11934-011-0215-z.

Terzi, H., Terzi, R., Kale, A. (2013). Urinary incontinence frequency and affecting factors in women aged over 18. *Ege Journal of Medicine, 52*, 15-19.

Uebersax, J.S., Wyman, J.F., Shumaker, A., McClish DK, Fantl, J.A. (1995). Short forms to assess life quality and symptom distress for urinary incontinence in women: The Incontinence Impact Questionnaire and The Urogenital Distress İnventory. Continence Program for Women Research Group. *Neurourology and Urodynamics*, *14,* 131- 139.

Unsal, A., Tozun, M., Arslantas, D. (2013). Urinary ıncontinence, related factors and depression among 20 aged and over women in beylikova district centre in Eskişehir. *TAF Preventive Medicine Bulletin, 12*, 231-242. doi: 10.5455/pmb.1-1328538128.

Velázquez, M.M., Bustos, L.H.H., Rojas, P.G., Oviedo, O.G., Neri Ruz, E.S., Castrillo C.S. (2007). Prevalence and quality of life in women with urinary incontinence. A population base study. *Revista de Ginecología y Obstetricia de México*, *75*(6), 347-356.

Wagner, T.H., Patrick, D.L., Bavendam, T.G., Martin, M.L., Buesching, D.P. (1996). Quality of life of persons with urinary incontinence: Development of a new measure. *Urology, 47*, 67–72.

Wyman, J.F., Burgio, K.L., Newman, D.K. (2009). Practical aspects of lifestyle modifications and behavioural interventions in the treatment of overactive bladder and urgency urinary incontinence. *International Journal of Clinical Practice, 63,* 1177-1191. doi: 10.1111/j.1742-1241.2009.02078.x.

Yildiz, N., Sarsan, A., Ardic, F. (2009). Conservative treatment of stress urinary incontinence in women. *Turkish Journal of Physical Medicine and Rehabilitation, 12*, 42-50.

Zhu, L., Li, L., Lang, J., Xu, T., Wong, F. (2010). Epidemiology of mixed urinary incontinence in China. *International Journal of Gynecology & Obstetrics,* 1*09*(1), 55-58. doi: 10.1016/j.ijgo.2009.10.017.