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Original Research Article

Efficacy of pelvic floor muscle exercise on urinary incontinence in elderly patients

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Abstract

Background: Urinary incontinence is associated with weakened pelvic floor muscle support due to aging process. Pelvic floor muscle exercise is non pharmacological and non-surgical treatment to reduce severity of urinary incontinence. It helps to strengthening the pelvic floor muscle. This will be helpful to prevent fecal and urine leakage and improve the quality of life in elderly people.
Aim: to evaluate the efficacy of pelvic floor muscle exercise on urinary incontinence in elderly patients.
Materials and Methods: A quantitative approach was used to conduct study among 90 elderly patients which were selected by non-probability convenience sampling technique according to inclusion criteria of the sample from Krishna Hospital, Karad. Quasi-experimental one group pre-test, post-test research design was used. The data were collected by self-structured scale on level of urinary incontinence. Informed consent was obtained. The data was analyzed by using descriptive and inferential statistics. Statistics that include both descriptive and inferential were used to analyze the data.
Result: The pre-interventional means score was 16.311 where as post-intervention mean score was 0.6111 and the values revealed that there was a statistically significant difference in level of urinary incontinence between pre-test and post-test with corresponding p value <0.0001.
Conclusion: The researcher concludes that pelvic floor muscle exercise was effective to reduce the level of urinary incontinence in elderly patients. Pelvic floor exercise is cost-effective and should be first choice of treatment for urinary incontinence.

Keywords: Elderly, pelvic floor muscle exercise, urinary incontinence

Introduction

Physical changes occur in every elderly. This change occurs in a variety of systems, namely changes in cells, nervous system, auditory system, visual system, cardiovascular system,

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system of regulating body temperature, respiratory system, endocrine system, integumentary system, urinary system and musculoskeletal system. One of the physical changes that occur in the elderly is a change in the urinary system that has the potential for urinary incontinence (UI) problems. UI is an uncontrolled amount of urinary discharge. This is due to changes in the structure of the bladder and pelvic floor muscles which results in the elderly being unable to hold urine while urinating [1].

Overall, the prevalence of urinary incontinence was 24.7% (20.9% in men, 27.5% in women) [2]. UI has a high prevalence rate amongst elderly individuals and significantly affects all aspects of quality of life, especially physical performance [3].

Pelvic floor muscle exercises (PFME) are effective in the treatment of UI, strengthen muscle strength and improve patients' quality of life [4]. PFME is a non-pharmacological and nonsurgical treatment to reduce UI by strengthening the pelvic floor muscle, because UI is associated with weakened pelvic floor support due to aging [5]. PFME can help strengthen the muscles under the uterus, bladder, and bowel (large intestine). They can help both men and women who have problems with urine leakage or bowel control [6].

The present study is more effective for betterment of elderly patients those having UI. When pelvic floor muscles are strong, can automatically squeeze and relax. The negative effects of having weak pelvic floor muscles can be mitigated by exercising them. It also benefits to maintain daily living activity, mental health, physical health and improves quality of life in older adults.

Objectives

1. To assess level of urinary incontinence before the implementation of pelvic floor muscle exercise.
2. To assess the level of urinary incontinence after implementation of pelvic floor muscle exercise.
3. To find the association between pre-intervention level of urinary incontinence and socio demographic variables.

Materials and Methods

Quasi-experimental approach one group pre-test post-test design was adopted for the present study. Independent and dependent variable were Pelvic Floor Muscle Exercise and level of Urinary Incontinence respectively. Pilot study was conducted at Krishna Hospital, Karad. Self-structured scale was developed to assess the level of Urinary Incontinence. The reliability was measured by using test–retest method on 10 samples in Krishna Hospital, Karad. By using Karl Pearson Correlation Coefficient formula, $r = 0.9510$ ($r>0.7$), hence tool found to be reliable. The validity was established by experts from different specialties i.e., from Medical Surgical Nursing, Urologist and Statistician. Experts had given back the tool with their valuable suggestions. The tool was found to be relevant. Totally 90 elderly patients were selected by non-probability convenience sampling technique. The samples included in this study were who fulfilled the inclusion criteria with 51-70 years of age can speak Marathi or English language and those are willing to participate. Elderly patients having urinary catheter, benign prostatic hyperplasia, surgery for incontinence and handicapped were excluded from the study.

Ethical consideration: Research Ethics Committee of the Krishna Institute of Medical Science Deemed To Be University, Karad had given permission to the data collection. After obtaining permission from the setting, the patients were asked their willingness to participate in the study and informed consent was obtained.

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Procedure: After collecting the demographic data, the pre-test level of urinary incontinence in elderly patients was assessed using self-structured scale. After the pre-test, participants received pelvic floor muscle exercise three times in a day for fifteen days and each session lasted for approximately 10 minutes. Booklets on pelvic floor muscle exercise attached with log table for monitoring pelvic floor muscle exercise was provided to each participant on first day of visit. At the end of the 15th day, the post-test level of urinary incontinence was assessed by the same tool.

Results

Section I

Table 1: Frequency and percentage distribution of demographic variable of urinary incontinence in elderly patients. n=90

Sr. No.	Demographic variables	Categories	Respondent	
			Frequency	Percentage
1.	Age	51-55	28	31.11%
		56-60	18	20.00%
		61-65	21	23.33%
		66-70	23	25.56%
2.	Gender	Male	50	55.56%
		Female	40	44.44%
3.	Body build	Under Weight	8	8.89%
		Normal Weight	44	48.89%
		Over Weight	29	32.22%
		Obese	9	10.00%
4.	History of surgery	No history	45	50.00%
		Abdominal	13	14.44%
		Genitourinary	9	10.00%
		Other	16	17.78%
		Abdominal, Genitourinary	1	1.11%
		Abdominal, Genitourinary, other	3	3.33%
		Abdominal, other	2	2.22%
		Genitourinary, other	1	1.11%
5.	Occupation	Legislators, senior officials & managers	1	1.11%
		Professionals	12	13.33%
		Technicians and associate professionals	6	6.67%
		Clerks	3	3.33%
		Skilled workers and shop & market sales workers	11	12.22%
		Skilled agricultural & fishery workers	34	37.78%
		Craft & related trade workers	11	12.22%
		Plant & machine Operators and assemblers	3	3.33%
		Elementary occupation	8	8.89%
		Unemployed	1	1.11%
6.	Education	Profession or Honours	0	0.00%
		Graduate	5	5.56%
		Intermediate or diploma	4	4.44%
		High school certificate	18	20.00%
		Middle school certificate	39	43.33%
		Primary school certificate	10	11.11%
		Illiterate	14	15.56%
7.	Family income	≥1,23,322	8	8.89%
		61,663-1,23,321	2	2.22%

		46,129-61,662	22	24.44%

		30,831-46,128	37	41.11%
		18,497-30,830	11	12.22%
		6,175-18,496	8	8.89%
		≤6,174	2	2.22%
8.	Socio-economic class	Upper (I)	4	4.44%
		Upper middle (II)	16	17.78%
		Lower middle (III)	46	51.11%
		Upper lower (IV)	21	23.33%
		Lower (V)	3	3.33%

In this study, the majority of elderly patients 28(31.11%) belongs to age group of 51-55 years, majority of sample 50(55.56%) were male in terms of body build majority of samples 44(48.89) belongs to normal weight. Majority of sample 45(50%) were no history of surgery. Near about 34(37.78%) samples were skilled agricultural and fishery workers. The 39(43.33%) samples were having middle school certificate. Concerning to family income majority of 37(41.11%) samples were within the group of 30,831-46,128 rupees/month. Regarding the socioeconomic class the majority of samples 46(51.11%) are from lower middle (III) class.

Section II

Table 2: A table describing the level of urinary incontinence before implementation of pelvic floor muscle exercise. n=90

	Level of Urinary Incontinence	**Frequency (F)**	**Percentage (%)**	**Mean**	**Standard deviation (SD)**
Pre-intervention	Normal (0)	0	0%	16.311	7.649
	Mild (01-10)	23	25.56%		
	Moderate (11-20)	41	45.56%		
	Severe (21-30)	26	28.88%		

In this study with regards to pre-intervention, 41 (45.56%) of the patient had moderate level of UI. 26 (28.89%) had sever and 23 (25.56%) had mild level of urinary incontinence.

Table 3: A table describing the level of Urinary Incontinence after the Implementation of Pelvic Floor Muscle Exercise. n=90

	Level of Urinary Incontinence	**Frequency (F)**	**Percentage (%)**	**Mean**	**Standard deviation (SD)**
Post-intervention	Normal (0)	57	63.34%	0.6111	0.9795
	Mild (01-10)	33	36.66%		
	Moderate (11-20)	0	0%		
	Severe (21-30)	0	0%		

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With regards to post-intervention, 57 (63.33%) of the patient had normal level, 33 (36.37%) had mild level and none of had moderate and severe level of urinary incontinence.

Section III

Table 4: A table describing the comparison of mean and standard deviation of pre-intervention and post-intervention of Pelvic Floor Muscle Exercise on level of Urinary Incontinence

	Pre-intervention	Post intervention	Mean Difference	Paired 't" test
Mean	16.311	0.6111	15.667	t value = 21.081
Standard Deviation	7.649	0.9795		p value <0.0001

The pre-intervention level of urinary incontinence mean score was 16.311 with the standard deviation of 7.649 and the post-intervention level of urinary incontinence mean score was 0.6111 with the standard deviation of 0.9795. The mean difference was 15.667. The researcher applied paired t-test to assess the efficacy of pelvic floor muscle exercise on urinary incontinence. The paired t-value was 21.081. The one tail p-value is < 0.0001, considered extremely significant.

Section IV

Table 5: A table describing the association between the pre-intervention level of Urinary Incontinence & selected demographic variables. n=90

Sr. No.	Demographic variables		Mild	Moderate	Severe	chi square value	p Value	Result
1.	Age	51-55	7	15	6	9.318	0.1565	Not Significant
		56-60	5	8	5			
		61-65	7	11	3			
		66-70	4	7	12			
2.	Gender	Male	14	24	12	1.341	0.5114	Not Significant
		Female	9	17	14			
3.	Body build	Under Weight	3	3	2	20.992	0.0018	Significant
		Normal Weight	18	19	7			
		Over Weight	1	17	11			
		Obese	1	2	6			
4.	History of surgery	No history	11	25	9	16.854	0.264	Not Significant
		Abdominal	4	4	5			
		Genitourinary	2	5	2			
		Other	5	7	4			
		Abdominal, Genitourinary	0	0	1			
		Abdominal, Genitourinary, other	1	0	2			
		Abdominal, other	0	0	2			
		Genitourinary, other	0	0	1			
5.	Occupation	Legislators, senior officials & managers	0	0	1	23.677	0.1659	Not Significant
		Professionals	0	4	8			
		Technicians and associate professionals	1	3	2			
		Clerks	1	1	1			
		Skilled workers and shop & market sales workers	2	8	1			
		Skilled agricultural & fishery	12	16	6			

		workers						
		Craft & related trade workers	3	5	3			
		Plant & machine Operators and assemblers	1	2	0			
		Elementary occupation	3	2	3			
		Unemployed	0	0	1			
6.	Education	Profession or Honours	0	0	0	14.015	0.1723	Not Significant
		Graduate	0	2	3			
		Intermediate or diploma	3	1	0			
		High school certificate	5	9	4			
		Middle school certificate	7	22	10			
		Primary school certificate	4	2	4			
		Illiterate	4	5	5			
7.	Family income	≥1,23,322	0	3	5	32.517	0.0011	Significant
		61,663-1,23,321	0	0	2			
		46,129-61,662	4	8	10			
		30,831-46,128	11	22	4			
		18,497-30,830	4	7	0			
		6,175-18,496	4	1	3			
		≤6,174	0	0	2			
8.	Socio-economic class	Upper (I)	0	2	2	23.812	0.0025	Significant
		Upper middle (II)	1	5	10			
		Lower middle (III)	15	23	8			
		Upper lower (IV)	7	11	3			
		Lower (V)	0	0	3			

The above table shows the association between the pre-intervention level of urinary incontinence with selected demographic variables using Chi square test. Since p-values are less than 0.05 corresponding to a demographic variable of body built was 0.0018, family income was 0.0011 and socio-economic class 0.0025, so it is found to have significant association with the pelvic floor exercise among elderly patient with Urinary Incontinence.

We reject the null hypothesis. Hence, there is statistically significant association between the pre-intervention level of Urinary Incontinence among elderly patient and selected demographic variables (body built, family income, socio-economic class) at 0.05 level of significance.

Discussion

The findings of the study have been discussed with the references of the objectives and hypothesis.

In present study, the level of urinary incontinence before implementing pelvic floor muscle exercise, 25.56% of the patient had mild, 45.56% had moderate, 28.89% patient had severe and level of urinary incontinence.

This is supported by another study conducted by Swati D. on 30 women with urinary incontinence, 26.67% of the patient had mild, 43.33% had moderate and 20% had severe and 10% had very severe level of urinary incontinence [7].

The present study compared to similar study done by Wilda L.O. on elderly patients. Level of urinary incontinence before Kegal exercise was 20% had mild, 70% had moderate and 10% had heavy urinary incontinence [8].

The findings of the study shows that pelvic floor muscle exercise was significantly effective on the urinary incontinence.

In the present study, p value was less than 0.001 (less than 0.05) this proved that pelvic floor

muscle exercise was found to be significantly effective on urinary incontinence in elderly patients.

Similar findings were reported by Bo Ae Lee conducted study on 150 women. They found that pelvic floor muscle exercise can be good therapeutic option for improving urinary incontinence in elderly women with cognitive impairment after 12 weeks of exercise. The P-value is <0.001 [9].

This is supported by another study conducted by Wilda L.O, were they implement of Kegal exercise on urinary incontinence among elderly patients. The p value was 0.008≤0.05, so that there is influence of Kegal exercise on elderly patients with urinary incontinence [8].

The finding of the study shows that there is an association between level of urinary incontinence and selected variables.

In present study it was observed that body build, family income and socio-economic class was found to have an association with the level of urinary incontinence among elderly patient Since p-values are less than 0.05 corresponding to a demographic variable of body built was 0.0018, family income was 0.0011 and socio-economic class 0.0025, so it is found to have significant association with the pelvic floor muscle exercise among elderly patient with urinary incontinence.

Conclusion

Elderly performing pelvic floor muscle exercise to cure urinary incontinence had positive influence on the outcomes. During the last five decades, a pelvic floor muscle exercise is in practice in the western countries. But then Indian people are not aware of importance of performing pelvic floor muscle exercise. The health care professionals have the responsibility of reaching out towards the people about pelvic floor muscle exercise. The was concluded with the objective to assess the efficacy of pelvic floor muscle exercise on the level of urinary incontinence.

The findings of the study revealed that pelvic floor muscle exercise was effective on the level of urinary incontinence in elderly patients.

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