

## RESEARCH ARTICLE

## ASSOCIATION BETWEEN URINARY INCONTINENCE AND DIFFERENT LEVEL OF PHYSICAL ACTIVITIES

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## ABSTRACT

**Objective:** This research study aimed to find out the association between physical activity and urinary incontinence in elderly population. **Methods:** A cross-sectional correlation study design was conducted with n=161 elderly male and female subjects with age  $\geq 55$  years. Non-probability convenience sampling was used in order to collect data from the respondents. Rapid Assessment of Physical Activity (RAPA) and MESA questionnaire was used to evaluate level of physical activity and presence of urinary incontinence. The association between physical activity and urinary incontinence was measured through Chi-square test. SPSS 21 was used to analyze the data. **Results:** The mean $\pm$ SD age of subjects was 64.03 $\pm$  9.56 years. Level of physical activity found to be significantly associated with urinary incontinence ( $p \leq 0.05$ ). A significant association can be seen in participants who are sedentary ( $p=0.02$ ), who perform moderate physical activity for 30 minutes/day for 5 days/week ( $p=0.04$ ) and who perform strength activities ( $p < 0.001$ ). **Conclusion:** Moderate level of regular physical activity at-least 5 days in week and/or activities to increase muscle strength such as weight lifting, calisthenics once a week or more are prevent urinary incontinence in elderly people.

**Keywords:** elderly, incontinence, physical activity, stress incontinence, urinary incontinence, urge incontinence.

## INTRODUCTION

The body movement produced by skeletal muscles results in energy expenditure is called physical activity. The activities in daily life considered as physical activity are sports, conditioning, household, and other occupational activities.<sup>1</sup> Planned, structured, and repetitive physical activity has a final or an intermediate objective the improvement or maintenance of physical fitness. To sustain life every individual performs physical activity but the amount of physical activity they perform depends on their personal choice.<sup>2</sup> Increased level of physical activity leads to lower self-reported prevalence of urinary incontinence in the community.<sup>3</sup> Severe incontinence leads to the reduced activity and socially isolated person.<sup>4</sup>

Urinary incontinence is the complaint of any involuntary leakage of urine.<sup>5</sup> According to a research, the prevalence of urinary incontinence in women was found to be 17% in women and 11% in men aged 55 years or older.<sup>6</sup> Urinary incontinence leads to social isolation, poor hygiene, skin disorders and other psychological problems in elderly population.<sup>7</sup> Urinary incontinence increases the risk of falls and fractures in elderly population as they rush to the toilet.<sup>3</sup> Elderly population with urinary incontinence had significant negative impact on

quality of life.<sup>4</sup> A study showed that 58.3% of men and 65.7% of women quality of life was affected their degree of incontinence.<sup>8</sup>

Urinary incontinence is further divided into different types among that stress; urge and mixed urinary incontinence are the most common.<sup>9</sup> Stress incontinence occurs as involuntary leakage of urine. Exertion and pressure on the abdomen provoked the symptoms because of which the bladder losses urine. Mostly this occurs during coughing or sneezing. Weak pelvic floor muscles, intrinsic sphincter deficiency and aging leads to urethral hyper mobility which is the common cause of stress urinary incontinence whereas the cause of urge incontinence is inappropriate contractions of urinary bladder. The prevalence of incontinence symptoms is because of overactive bladder, detrusor over activity, spontaneous contraction, bladder infections, and nerve damage from stroke, dementia and multiple sclerosis.<sup>5</sup>

Urinary incontinence has an insidious way of affecting quality of life. UI may cause social isolation, loss of sexual function, and other psychological problems in elderly population. Urinary incontinence increases the risk of falls in elderly population as they rush to the toilet. With increasing age, the muscles of the bladder and the urethra loses some

of their strength which can be maintained by doing pelvic floor muscle exercises. There are several methods to treat urinary incontinence including behavioral, pharmacological and surgical intervention. In the literature, there is less evidence available on the treatment of urinary incontinence with physical activity. Additionally there are many side effects of incontinence medication including dry mouth, upset stomach, dry eyes and constipation. Physical activity helps to make the elderly population free from the medication, the surgical procedures like bladder neck suspension and promote quality of life of the elderly population. The purpose of this study is to explore association between level of physical activity and urinary incontinence.

#### MATERIAL & METHODS

A cross-sectional correlation study design was conducted. A total of n=400 elderly people were evaluated for inclusion criteria, n=161 fulfilled the criteria and included in the study. The male and female elderly subjects with age  $\geq 55$  years of old were included in the study. The participants with other than stress incontinence, prostate problem, history of stroke, kidney problems, and low back pain sciatica, apparent symptoms of hip and knee osteoarthritis were excluded from the study. Non-probability convenience sampling technique was used to recruit the sample. Prior to data collection written informed consent was obtained from each participant.

For any given participant, data was collected through general demographic questionnaire included age, gender, BMI, and urinary incontinence. Rapid Assessment of Physical Activity (RAPA) questionnaire was used to evaluate level of physical activity also muscle strength and flexibility of elderly population. The distinction between levels was made on the basis of physical activity weekly and use of weights or calisthenics. MESA Urinary incontinence questionnaire was used to diagnose urinary incontinence.

The results of study are presented as frequency, percentages, mean $\pm$ SD, and p-values. The association between physical activity and urinary incontinence was measured through Chi-square test.

SPSS 21 was used to analyse the data. The level of significance was set at a p value less than 0.05

#### RESULTS

The minimum age of subjects was 55 and maximum age was 86 years. The mean $\pm$ SD age of subjects was 64.03 $\pm$  9.56 years. A total number of male and female participants were n=91(56.5) and n=70(43.5%) respectively. A total of n=4(2.5%) were underweight, n=75(46.6%) healthy weight, n=65(40.4%) were overweight and n=17(10.6%) were obese. A total of n=54(33.5%) of participant was found to have Urinary incontinence and remaining n=107(66.5%) were normal. Regarding the type of urinary incontinence, n=126(78.26%) never experienced urinary incontinence, n=16(9.93%) experienced urge incontinence rarely, n=16(9.93%) sometimes and 3(1.86%) often. A total of n=21(13.04%) experienced stress incontinence rarely, n=10(6.21%) sometimes and n=1(0.06%) often.

The results showed that n=27(16.8%) participants were sedentary and rarely perform any kind of physical activity, n=19(11.8%) were irregularly underactive and perform some kind of light to moderate physical activities, n=58(36.02%) were underactive and perform some kind of light activity /week, n=31(19.3%) were also underactive and perform moderate physical activity <30minutes a day or 5 days a week, n=4(2.5%) were also underactive but perform vigorous physical activity less than 20minutes/day or 3 days/week, n=21(13.04%) were underactive but perform moderate activities for  $\geq 30$  minutes a day or  $\geq 5$  days /week, n=2(1.24%) were also underactive but perform  $\geq 20$  minutes/day of vigorous activities  $\geq 3$ days/week, n=17(10.6%) were active and perform activities to increase muscle strength  $\geq 1$ /week more, n=16(9.9%) were also active and perform activities to improve flexibility such as stretching or yoga  $\geq 1$ week.

Level of physical activity found to be significantly associated with urinary incontinence ( $p \leq 0.05$ ). A significant association can be seen in participants who rarely or never do any physical activity ( $p=0.02$ ), who do physical activity 30 minutes a day moderate

activity 5 days a week ( $p=0.04$ ) and who do strength

activities ( $p<0.001$ ). (Table 1)

Table 1: Association between physical activity and Urinary Incontinence

		Urinary Incontinence		X <sup>2</sup>	p-value																																																																						
		Yes	No																																																																								
		I rarely or never do any physical activity	Yes			14	13	4.88	0.02																																																																		
	No	40	94	I do some light or moderate physical activities but not every week	Yes	8	11			0.70	0.40	No	46	96	I do some light activity every week	Yes	22	36	0.78	0.37	No	32	71	I do moderate physical activity every week but less than 30minutes a day or 5 days a week	Yes	6	25	3.4	0.63	No	48	82	I do vigorous physical activity every week but less than 20minutes a day or 3 days a week	Yes	1	3	0.13	0.71	No	53	104	I do 30 minutes or more a day of moderate activities 5 or more days a week	Yes	3	18	4.0	0.04*	No	51	89	I do 20 minutes or more a day of vigorous activities 3 or more days a week	Yes	0	2	1.0	0.31	No	54	105	I do activities to increase muscle strength such as weight lifting, calisthenics once a week or more	Yes	0	17	8.86	<0.001 ***	No	56	102	I do activities to improve flexibility such as stretching or yoga once a week or more	Yes	4	12	0.417	0.51	No
I do some light or moderate physical activities but not every week	Yes	8	11		0.70	0.40																																																																					
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## DISCUSSION

The Aim of study was to determine the association of physical activity and urinary incontinence in elderly population. One of the hypotheses was that there was significant association between level of physical activity and urinary incontinence in elderly population and on the basis of result it was accepted.

There was strong association found between moderate physical activities for 30 minutes and never or rare physical activity with urinary incontinence. A study by J. Med Liban reported in 2012 that moderate physical activity reduces the prevalence of urinary incontinence and also declared that level of physical activity is inversely proportional to urinary incontinence. Although current study was cross-sectional study, It cannot demonstrate a cause and effect relationship between physical activity and beginning of Urinary Incontinence, results suggest that a helpful and beneficial effect of physical activity is found on the prevention of UI. To clarify the causality a prospective study or RCT (randomized control trials) are required.<sup>10</sup>

In the prospective analysis from The Nurses Health there were 2355 cases of incident urinary incontinence in their population. They involved supplementary questionnaire and questions on physical activity. Their results show the inverse association between low impact activity and urinary incontinence.<sup>11</sup> Reduced risk of UI was significantly associated with increased levels of total physical activity. There were found associations between walking and low impact physical activity in the incidence of urinary incontinence. Walking and low level physical activity had a significant reduction in Stress incontinence.<sup>12</sup>

The study done on Spanish population which objective was to determine the prevalence of UI in relation with sedentary include n=8146 population in which n=4745 were women and n=3401 were men. Data from n=8,146 people over 60 years of age (age range of 60-94 years) were used .The population with the urinary incontinence shows more sedentary habits as compared with the healthy participants. The findings of this study shows sedentary lifestyle are significantly associated with urinary incontinence in older age, which can explain the present study

that also shows, rare or never physical activity was associated with urinary incontinence among elders.<sup>14</sup> One of the cross sectional study that involved 471 non-institutionalized population. The International Consultation on Incontinence Questionnaire Short-Form and a specific severity UI item was used to assess urinary incontinence. Physical fitness was determined by 8 tests and also by fitness index (F.I). Standard questionnaires recorded the active as well as sedentary behaviours. The study reported UI in 28.5% of the participants were associated with the lower fitness level and low flexibility especially of the upper body. Higher body mass index was observed in women who had UI. There were positive effects of increased fitness level to reduce UI.<sup>15</sup> The major cause of obesity is low physical activity and urinary incontinence was more common in obese people. The weight loss intervention reduced the frequency of stress incontinence episodes through 12 months.<sup>16</sup> It was clear that 20 -70% risk of urinary incontinence was associated with each 5-unit increase in BMI.<sup>17</sup> But current study did not see any relation of BMI with urinary incontinence.

The current study shows association between activities to increase muscle strength and who do 30 minutes or more a day of moderate activities 5 or more days a week have low chance of developing urinary incontinence. Prolong provocative physical activities like jumping and running improve muscle pelvic floor muscle mass and strength that in turn prevent leakage of urine.<sup>18,19</sup> Increased level of physical activity contributes in decreasing urinary incontinence by increasing generalized muscle strength as well as by regularly engaging muscles of the pelvic floor.<sup>14,20</sup> A study reported that mild to moderate intensity of physical activity reduces the risk of developing urinary incontinence.<sup>21</sup> A cohort was conducted on Latino older adults to find the incidence of urinary incontinence and results showed that improved physical performance lowered the incidence of urinary incontinence among study participants.<sup>22</sup>

## CONCLUSION

Moderate level of regular physical activity at-least 5 days/week and/or activities to increase muscle

strength such as weight lifting, calisthenics  $\geq 1$  prevents urinary incontinence in elderly people. The sample size of study is limited and only association was found so cause and effect relationship could not be established. To generalize the result of study on elderly population it is recommended to conduct a study on larger scale. It is also suggested that different level of physical activity can be used as a intervention to find actual cause and effect relationship with urinary incontinence.

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