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Effect of Age, Educational Status, Parity and BMI on Development of Urinary Incontinence - a Cross Sectional Study in Saudi Population

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ABSTRACT

Background: The research article looks at the background of women with urinary incontinence and exposed to different demographic factors. Women who had urinary incontinence and women without urinary incontinence were compared with regards to their demographic features and risk of development of urinary problems. These risk factors can either cause short term or temporary urinary incontinence or they can cause long term or permanent urinary incontinence. This article explores the association of age, educational status, body mass index (BMI) and parity on the development of urinary incontinence. **Aim of Study:** This study aimed at conducting an analysis into the risk factors that are related to urinary incontinence. **Results and Analysis:** Z-tests were conducted for every demographic factor and the results are then discussed comprehensively citing various studies that have been conducted before. Analysis shows that age and BMI increase chances of urinary infection and consequently urinary incontinence. Women of lower educational levels record more cases of urinary incontinence due to lack of general information about the condition. Women with higher parity levels also record more cases of urinary infections and subsequently urinary incontinence. **Conclusion:** From the analysis above, it can be seen that these factors usually play great roles in the existence and absence of urinary incontinence especially in women in Saudi Arabia. Most important is that, its prevention is mostly by use of the risk factors mentioned here in the research. This will usually involve observing a given risk factor to a state that makes it unfavorable for urinary incontinence to occur.

Key words: Urinary incontinence, Saudi Arabia, Parity, BMI.

1. INTRODUCTION

Urinary Incontinence is a chronic and costly to treat condition that is defined as a disorder that can be basically explained as inability to control urine or loss of bladder control. According to Danford *et al,* there exist risk factors that cause increased chances of urinary incontinence, especially among women of child bearing age (1, 2). These risk factors can either cause short term or temporary urinary incontinence or they can cause long term or permanent urinary incontinence. This article is about some of these risk factors that may lead to urinary incontinence.

The risk factors covered in this article are age, education levels, parity and BMI. According to Rogers, age is a significant risk factor especially for women who have given birth through vaginal method. Stress incontinence is more common in these women as it may result in destroyed pelvic muscles (3). Body weight is also a significant risk factor which weakens the detrusor muscles. According to Subak *et al*, urinary incontinence is more common among women who are overweight (4). A study from Turkey has reported BMI, UTI and constipation to be the risk factors for urinary incontinence in women above 65 years of age (5). Education level in women is highly related to hygiene and urinary tract infections. These risk factors were chosen for analysis as they are the most significant and most common and they form the basis for diagnosis for urinary incontinence.

2. PATIENTS AND METHODS

The study was conducted from Jan-May 2015 as a descriptive cross sectional study at Qassim University Clinic, Buraidah. Convenient sampling was used including all women who presented to the Qassim University Clinic for gynecological consultations. Women who were having any medical disorder

as well as those who did not consent were excluded from the study. A self-structured questionnaire was used to collect the data. Qassim University Clinic is a major facility in the region. Data was kept anonymous for privacy.

2.1. Statistical analysis

The Statistical Package for the Social Sciences 22 (SPSS 22) was used to conduct proportion z-tests to determine what factors are more likely to be responsible for urinary incontinence. The demographic factors examined included participants age, level of education, body mass index (BMI) and parity. Urinary complaints explored were whether or not participants had experienced any of the following problems; stress incontinence (SI), urgency, nocturia, frequency, urge incontinence and urinary tract infection (UTI). In order to test the hypothesis, differences between two groups on the aforementioned factors were examined. The groups included participants that reported having urinary problems (n = 111) and those who do not have urinary problems (n = 100). However, for participants that do not have any urinary problems none stated that they experienced the following factors SI, urgency, nocturia, frequency, urge incontinence and UTI. Thus, participants that did not have urinary problems were not assessed on those factors and frequency statistics for those with urinary problems were presented.

3. RESULTS

During the study interval there were 111 patients with urinary complaints and 100 women having no urinary problem were taken as controls.

Clinical characteristics of study subjects are presented in Table 1.

Variable	Level	Frequency Group-1 With urinary problem N=111	Frequency Group-2 Without a urinary problem N=100
Age	21-30	22	48
	31-40	39	35
	41-50	22	17
	51 and above	28	0
Education	Illiterate	41	03
	Primary or below	62	80
	Secondary	08	17
	Higher	0	0
BMI	20 and below	04	0
	21-25	37	97
	26-30	58	03
	31 and above	12	0
Parity	Less than 4	12	84
	4-7	39	16
	8 and above	60	0

Table 1. Count and Percent Statistics for Demographic Variables

Age

Proportion z-tests were conducted to determine if any significant differences in the frequency of participants having urinary problems and those who do not have urinary problems exist between age groups (21-30 years old, 31-40 years old, 41-50 years old, 51 years and above). The distribution of age groups was fairly evenly distributed for participants with a urinary problem; however, for those without a urinary problem, 83.0% of the participants were 40 years old or younger (n = 83) and none were older than 50. Displayed in Table 1 is a cross tabulation of urinary problem groups (with and without by age group).

Results from the proportion tests revealed that there were significant differences in the frequency of urinary problems between 21-30 year old (p < 0.001) and participants' 51 years and older (p <0 .001). That is, there was more than double the amount of 21-30 year old participants without a urinary problem (48 of 100 = 48.00%) as compared to 21-30 year old with a urinary problem (22 of 111 = 19.82%). And for participants' 51 years and older, all had a urinary problem. A summary of the proportion z-tests is displayed in Table 2.

Age	Proportions (%)			Z	Probability (2-tailed)
	With urinary problem (I)	Without a urinary problem (J)	Difference (I-J)		
21-30	19.82	48.00	-28.18	-4.341	<0 .001
31-40	35.14	35.00	0.14	0.021	0.984
41-50	19.82	17.00	2.82	0.527	0.596
51 and above	25.23	0.00	25.23	5.393	<0.001

Table 2. Summary of Proportion z-Tests between Urinary Problem Groups and Age

Levels of Education

Proportion z-tests were conducted to determine if any significant differences in the frequency of urinary problems existed between levels of education (illiterate, primary or below, secondary, and higher education). For participants with a urinary problem, the majority (55.86%) were at the primary, or below, level of education (n = 62) and 36.94% were illiterate (n = 41). The vast majority of participants without a urinary problem (80.00%) were at the primary, or below, level of education (n = 80). There were no participants that were at the higher education level within either group. Displayed in Table 1 is a cross tabulation of urinary problem groups (with and without) by levels of education.

Results from the proportion z-tests revealed that significant differences in the frequency of urinary problems existed between levels of education. That is, there was a significantly (p <0 .001) larger number of illiterate participants with urinary problems (n = 41, 36.94%) than participants without a urinary problem (n = 3, 3.00%). However, for participants with primary and secondary levels of education, there were significantly (p < 0.001 and 0 .028 respectively) larger amounts of participants without urinary problems (primary n = 80, 80.0% and secondary n = 17, 17.0%) than those with urinary problems (primary n = 62, 55.86% and secondary n = 8, 7.21%). There were no participants in the sample at the higher education level. A summary of the proportion z-tests is displayed in Table 3.

Education	Proportions (%)			Z	Probability (2-tailed)
	With urinary problem (I)	Without any urinary problem (J)	Difference (I-J)		
Illiterate	36.94	3.00	33.94	6.059	<0 .001
Primary or below	55.86	80.00	-24.14	-3.733	<0 .001
Secondary	7.21	17.00	-9.79	-2.198	0.028

Table 3. Summary of Proportion z-Tests between Urinary Problem Groups and Level of Education

BMI

Proportion z-tests were conducted to determine if any significant differences in the frequency of urinary problems existed between levels of BMI (20 and below, 21-25, 26-30, and 31 and above). For participants with a urinary problem, the majority (52.25%) had a BMI level between 26 and 30 (n = 62), 3.60% had a BMI level of 20 and below (n = 4), 33.33% had a BMI level between 21 and 25 (n = 37), and 10.81% had a BMI level of 31 and above (n = 12). For participants without a urinary problem, nearly all had a BMI level between 21 and 25 (n = 97, 97.0%). Displayed in Table 1 is a cross tabulation of urinary problem groups (with and without) by levels of BMI. Results from the proportion z-tests revealed that significant differences in the frequency of urinary problems did exist between levels of BMI. That is, for BMI levels between 21 and 25, there was a significantly (p <0.001) larger amount of participants without urinary problems (n = 97, 97.0%) than those with urinary problems (n = 37, 33.3%). However, for BMI levels between 26 and 30, there was a significantly (p <0 .001) larger amount of participants with urinary problems (n = 58, 52.25%) than those without urinary problems (n = 3, 3.0%). And, for BMI levels of 31 and above, there was a significantly (p =0 .001) larger amount of participants with urinary problems (n = 12, 10.81%) than those without urinary problems (n = 0, 0.0%). A summary of the proportion z-tests is displayed in Table 4.

	Proportions (%)				
BMI	With urinary problem (I)	Without any urinary problem (J)	Difference (I-J)	Z	Probability (2-tailed)
20 and below	3.60	0.00	3.60	1.917	0.055
21-25	33.33	97.00	-63.67	-9.592	<0 .001
26-30	52.25	3.00	49.25	7.880	<0 .001
31 and above	10.81	0.00	10.81	3.386	0.001

Table 4. Summary of Proportion z-Tests between Urinary Problem Groups and Levels of BMI

Parity

Proportion z-tests were conducted to determine if any significant differences in the frequency of urinary problems existed between levels of parity (less than 4, 4-7, and 8 and above). For participants with a urinary problem, the majority (54.05%) had a parity level of 8 and above (n = 60), 35.14% had a parity level between 4 and 7 (n = 39), and 10.81% had a parity level less than 4 (n = 12). For participants without a urinary problem, 84.0% had a parity level less than 4 (n = 84) and the remaining participants had a parity level between 4 and 7 (n = 16). Displayed in Table 1 is a cross tabulation of urinary problem groups (with and without) by levels of parity.

Results from the proportion z-tests indicated that significant differences in the frequency of urinary problems did exist between levels of parity (less than 4, 4-7, and 8 and above). That is, for parity levels less than 4, there was a significantly (p <0 .001) larger amount of participants without urinary problems (n = 84, 84.0%) than those with urinary problems (n = 12, 10.81%). However, for parity levels between 4 and 7, there was a significantly (p =0 .002) larger amount of participants with urinary problems (n = 39, 35.14%) than those without urinary problems (n = 16, 16.0%). And for parity levels of 8 and above, there was a significantly large difference (p <0 .001) in the amount of participants with urinary problems (n = 60, 54.05%) and those without (n = 0). A summary of the proportion z-tests is displayed in Table 5.

	Proportions (%)				
Parity	With urinary problem (I)	Without any urinary problem (J)	Difference (I-J)	Z	Probability (2-tailed)
Less than 4	10.81	84.00	-73.19	-10.660	<0 .001
4-7	35.14	16.00	19.14	3.162	0.002
8 and above	54.05	0.00	54.05	8.691	<0 .001

Table 5. Summary of Proportion z-Tests between Urinary Problem Groups and Parity

4. DISCUSSION

According to Danford et al, the risk of urinary incontinence increases with age and thus the reason why there was a larger number of women who were over forty years who were likely to be suffering from urinary incontinence (2). Age in women has the effect of bringing hormonal change especially after childbirth. This heightens the risk of urinary infections and subsequently urinary incontinence. The fact that there were a larger number of illiterate women with urinary incontinence can be attributed to hygiene according to studies by Jennifer et al (6). Weight increases chances of urinary infection and thus the results which indicate that all women who had normal BMI had no urinary infection but most women with BMIs higher than 26 had urinary infection that was a risk factor for urinary continence (7). The higher the parity recorded in women, the higher is the number of women with urinary infection and the lesser the number of women without urinary infection. This means that parity levels increase the chances of women getting urinary incontinence (8). This can be explained by the fact that older women are at a higher risk of urinary infections than their younger counterparts. Urinary incontinence adversely effects the quality of life and loss of self-esteem therefore it is necessary to find out the risk factors for its development so that timely preventive measures can be taken (9,10)

5. CONCLUSION

Urinary incontinence usually presents itself in a variety of ways. These ways are representational of some of the risk factors that bring about its occurrence. From the analysis above, it can be seen that these factors usually play great roles in the existence and absence of urinary incontinence especially in women in Saudi Arabia. Most important is that, its prevention is mostly by use of the risk factors mentioned here in the research. This will usually involve observing a given risk factor to a state that makes it unfavorable for urinary incontinence to occur.

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