Assiut Scientific Nursing Journal
http://asnj.journals.ekb.eg
http://www.arabimpactfactor.com
http://olddrji.lbp.world/indexedJournals.aspx
DOI: 10.21608/ASNJ.2022.126562.1339

Effect of Health Teaching sessions on Pregnant Women's Knowledge and Health Behaviour Regarding Urinary Tract Infection

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Abstract:
Background: The increased prevalence of urinary tract infections (UTIs) among pregnant women because they do not have the potential education about self-care behaviour during pregnancy along with the useful interventions that are helpful for treating urinary tract infections (UTI). **Aim of study:** the aim of this quasi-experimental study was to evaluate the effect of developing and implementing health teaching sessions on pregnant women's knowledge and health behaviour regarding urinary tract infection S**etting:** This study was conducted on the outpatient ante-natal clinic at Prince Sultan Military Medical City. **Sample:** Purposive sample with a total of 377 pregnant women were recruited, divided into two groups (control and study). **Results:** a highly significant difference between the routine and designed teaching sessions about knowledge and healthy behaviour related to urinary tract infection . These findings revealed that the women knowledge and behaviour improved in intervention group when compared with control group (p-values < 0.001) which appeared in increase percentage of women with fair (61.54%) and good (35.90%) knowledge, 35.9% their health behaviours improved compared to 23.68% before intervention. A highly significant positive correlation was illustrated between studied women's total knowledge and total practice scores at pre (p=0.04) and post-intervention (p=0.000) phases. **Conclusion:** The research hypothesis is supported, and pregnant women with UTI exhibited better knowledge and health care behaviour after implementing health teaching sessions than before. **Recommendations:** Clearly written management protocol, should be developed and used in clinical practice.

Keywords: Health behaviours, Health teaching sessions, Knowledge & Urinary Tract Infections

Introduction
Urogenital infections are one of the most common causes of 150 million deaths each year, where 50% of women are affected by the disease. Urinary Tract Infection (UTI) is also regarded as the second common problem that takes place among pregnant women **(Abd El Aziz et al., 2016).** The prevalence of the problem is common in both Western and the Eastern Region. As for instance; in US alone almost 7.9 million patients suffering from UTI visits general practitioners **(Hassan et al., 2015).** Whereas, in Saudi Arabia the prevalence rate of the UTI among pregnant women is 14.2% specifically in the eastern region, while in the southern region the rate of growth of UTI is 12.7% **(Alsohaim, 2019). Entesar & Abdelhafez (2018)** mentioned that the prevalence of UTI among pregnant women is high, as more than half of the pregnant women i.e., 58% of them were suffering from UTI. Among 29% of such women, major cause of the problem was the development of fungus. In Egypt, the frequency of UTI during pregnancy was 32%, with 63.3% of them having moderate infection. UTIs were more significant among women with an intermediate socioeconomic score (37.9%). The most important risk factors associated with UTI in the studied group were unsatisfied personal hygiene, positive history of diabetes mellitus, anaemia, and past history of UTI **(Shaheen ., et al (2016).**

Most of the women during their pregnancy, develop the increasing risks of the uterovesical reflux and urinary stasis, due to the development of ureteral dilation, with increased bladder tone and decreased ureteral tone. More than 70% of pregnant women are exposed towards high level risks of developing the glycosuria leading towards the increased growth of bacteria in urine. The factors are important as they are the contributors of UTI during pregnancy,the pathogenesis of preterm labor patterns is also caused by different infections. **(Santoso., 2017)**

Studies suggested that UTI is also associated to the premature labor, hypertensive disorders during pregnancy, amnionitis and anemia. Similarly, neonatal outcomes that are related to UTI includes pneumonia. UTI is also responsible in increasing the risks of infants with lo`w birth weights, and prematurity. The factors are important and contributes towards the increasing risks of perinatal and serious maternal morbidity.

These types of risks can only be controlled through appropriate treatment and screening **(Baer et al., 2019, Khresheh & Ahmed., 2018).** Obstetri and Indonesia., 2015 indicated the prevalence of other health risks, as for instance; the prevalence rate of UTI is (2% - 10%), asymptomatic bacteria (20% - 40%) bacteria, pyelonephritis (0.5% - 2%) and cases of acute cystitis (1% - 4%). UTI that is not treated on timely basis lead towards different complications including; preeclampsia, renal failure, preterm labor, intrauterine fetal death, and low birth weight.

Hassan et al., (2015) indicated some of the major symptoms of UTI. Among them, the most common symptoms are pain in urination and burning, low grade fever followed by supra pubic pain. Another common sign of UTI is the foul-smelling urine. **Entesar, Abdelhafez (2018)** reported most common symptoms of UTI found among Saudi pregnant women. These symptoms include dysuria and pain (35%), rigors (12%), and fever (23%). UTI is highly responsive to treatments, however the follow up during the clinical evaluation and culture is important to retain the effectiveness of treatment. The prevention of UTI can only be held by exercising some useful precaution measures such as; drinking 6-8glassesofwater,developingaproper habit of urinating, maintain good hygiene, empty bladder completely etc. are critical to refrain the development of UTI .

The maintenance of an individual health is a practice that must be initiated at personal level to manage the wellbeing of mother as well as the infant. Self-care is further referred as an individual contribution towards personal health care. Most of the pregnant women lack the ability to cope with different problems that may ultimately affect their wellbeing. A study reported that most of the health problems are managed at home **(Tolulope & Deborah, 2015)** The seriousness of the problem and its impact on health can only be understood when patients are provided with the relevant knowledge in relation to their health. This will help in initiating the habits of self-care among pregnant women. **Mohamed et al (2017)** identified that lack of patient's knowledge is one of the significant causes of the increased prevalence of the problem. As most of the affected patients do not have the potential education regarding self-care during pregnancy along with the useful interventions that are helpful for treating UTI among pregnant women **(Ali & Sajem, 2018)** So, the study was aimed to evaluate the effect of Developing and implementing health teaching sessions on pregnant women's knowledge and health behaviour regarding urinary tract infection .

Theoretical Approach

According to social Cognitive Theory: Self-efficacy has been defined as belief of an individual in the competence or ability for succeeding in particular conditions or achieving a task. An individual's sense of self-efficacy can play an essential role in how an individual approaches tasks, challenges, and goals **(Bandura, 1999).** The theory of self-efficacy falls at the center of social cognitive theory proposed by Bandura, which highlights the role of observational learning and social experience in the growth of personality **(Bandura, 2005)**.

Significance of study:

Since urinary tract infection during pregnancy is considered as one of the most prevailing health problems during gestation with 17% - 20% incidence rate in pregnancies, its reoccurrence is another major concern especially in third trimester. Timely awareness to preventive measures can significantly improve patient health status and exposure to UTI through teaching and education programs and lifestyle maintenance. **(Szweda & Jóźwik 2016).**

Aim of study:

This study aimed to evaluate the effect of Developing and implementing health teaching sessions on pregnant women's knowledge and health behaviour regarding urinary tract infection

Research hypothesis:

Pregnant women who received health teaching sessions will exhibit better knowledge and health behaviour regarding (UTI) during pregnancy than before applying for the teaching guidelines.

Subjects and Methods.

Study Design

This quasi-experimental study was carried out on gestational women visiting the ante-natal clinic or admitted at Prince Sultan Military Medical City, with complains of urinary tract infection to to fulfil this study's aim. Quasi experimental research is research that resembles experimental research but is not true experimental research. Although the independent variable is manipulated, conditions, or terms of conditions are not randomly allocated to participants **(Cook & Campbell, 1979)**.

Sample Size

A total of 377 gestational women were recruited in the study through purposive sampling technique. The sample size was calculated using "Raosoft calculator" (Raosoft, Inc., USA) with 5% margin of error, 95% confidence interval, population size (n = 20000) and 50% response distribution. Based on the sample size, the recruited pregnant women were divided into two groups (i) the intervention group (ii) control group. Out of 377 participants, 180 patients were enrolled in intervention group and 197 patients were enrolled in control group. Before gestational women recruitment in the study, the researchers explained the objective

of the study to each participant and after approval informed consent was signed by all participants.

Inclusion and Exclusion Criteria

The study included pregnant women who fulfill the following inclusion criteria: All pregnant women who complained of (UTI) on the basis of urine culture (≥ 100,000 CFU/mL), and those who were free from any medical and obstetrical complications.

Tools of data collection:

The study Data were collected through the following:

1. A Structured Interviewing Questionnaire Researchers developed it to gather necessary data after reviewing relevant literature (Tehrani andNikpour,2014).It was written in the Arabic language and consisted of three parts: The first part was concerned with women's sociodemographic data such as age, and education and social status… etc.). Part II included eight questions to assess knowledge about UTI, It was adapted from **Emiru et al. (2013).** It included 14 questions in the form of closed-end questions (Signs & symptoms, causes, risk factors, treatment, prevention and complications).
2. Health Behaviour Checklist: For evaluating the health behaviours, the researchers using checklist, It was adopted from study done by **((Tehrani & Nikpour, 2014)** which included 24 health behaviours about treatment adherence, diet, self-hygiene, clothes health, sexual health and urination, the answer with four points likert scale (always, sometime, often and never).

Scoring system

For knowledge score. For each question, score (zero) for incorrect answer and (one) for the correct answer. Accordingly, the overall summed up of knowledge score varied between (zero) and (eight). The overall knowledge score, for each case, summed up and calculated as a percentage to the total corrected knowledge, to determine the knowledge score percent. Accordingly, total knowledge score percent has been divided into three categories namely; Good, Fair and Poor, as follows:

- Good knowledge: score summation was ranged between 66.7 and 100%.
- Fair knowledge: score summation was ranged between 33.4% and 66.6%.
- Poor knowledge: score summation was ranged between 0 and 33.3%
- For Behavior score : To measure Behavior score level, answers of the 24 questions allotted a score according to a 4 point Likert-scale ranged between 0 and 3 according to the negative or positive impression of the answer. The degrees were as follows: Never (0), Often (1), Sometimes (2), and Always (3). Thereafter, the scores for each index have been summed up and expressed as a percentage of the maximum sum. Accordingly, the overall summed up of behavior score varied between zero and seventy two. The behavior score, for each case, summed up and calculated as a percentage to the total behavior, to determine the behavior score percent. Accordingly, total behavior score percent has been divided into four categories as follows:

Fair Behavior: score summation was ranged between 0 and 70%.

Good Behavior: score summation was ranged between 71% and 80%.

Very-Good Behavior: score summation was ranged between 81 and 90%.

Excellent Behavior: score summation was ranged between 91 and 100%.

Procedure

The following phases were adopted to fulfil the aim of the study. First phase was interviewing and assessing the women's socio-demographic characteristics, baseline data about women and their urinary tract infection knowledge. It was used two times (pre and post-test). The interviewing questionnaire (pre-test) was administered to each woman individually using the personal interview method and asked to respond to the interview questionnaire. The researcher first greeting the woman and introduced herself to every woman agreed to participate in the study , explained the study's aim. The average time for each woman to complete the interview was about (20-25 minutes). This period of pre-tests took about two months.

The Pregnant women were 377 diagnosed with urinary tract infection (UTI) and they assigned randomly in two groups (180 intervention group and 197 control group). In pre- test for intervention group (180) which assigned randomly from clinic number (1) and (2) after finishing from doctor appointment, for a period of two weeks.

Pre-test for control group (197) patients , also, the patient assigned randomly from clinic number (3)and (4)according availability of patient after doctor finished for period of two weeks. Patients enrolled in the control group received regular care. The intervention group patients received interventions guidelines through health teaching session to address complaints related to UTI during gestation. Pre and post intervention questionnaire was provided to all participants of intervention and control group. Each participant was questioned individually by researcher in the ante-natal clinic. After receiving the hospital approval to collect the necessary data and to implement the teaching sessions, these process were started to carry out by the researchers from the beginning of July 202*1* till February 2022 , covering a period of eight months, five days a week, the

researchers visited the previously described setting from 8.00 am to 1.00 pm.

Planning: Based on the results obtained during the assessment process, the researchers produced the UTIs instructional guidelines which include the following items definition or of UTI causes, signs and symptoms, risk factors of UTI, problems associated with UTI, complications of UTI, prevention and Health care behaviour regarding UTI symptoms. An instruction guideline was developed after extensive review of literature. **Hassan,(2015),Nwambo et al, 2016**

Implementation of teaching sessions, were implemented in individual teaching (consist of 4women per day) for period of 3 months conducted (60) sessions each sessions ranged from 1to 2 hours' the content of sessions covered the definition or of UTI causes, signs and symptoms, risk factors of UTI, problems associated with UTI, complications of UTI, prevention and Health care behaviour regarding UTI symptoms. Different methods of teaching were used such as printed instructional guideline booklet, PowerPoint presentation, individual discussion, and demonstration.

In Evaluation phase , after 3 month of completion of teaching sessions, post-test was complete for intervention group by using the same tool to evaluate the effect of the health teaching sessions on women knowledge and health–care behaviours. Patients informed by researchers to be in contact with researchers by phone for any guidance. The pregnant women were so interested to attain because researcher was informed them about the importance of follow up to prevent the complications for the mother and foetus, and contacted them by phone one day before their appointment to encouraged them to attend. The control group leaved to routine hospital care, after 3 months used same tool to post test .

Pilot study:

The study tools were pre-tested on a random sample of 10 % of women to check the clarity, applicability, any difficulties with their application, and to determine the time needed for completion of the tools. Modification of the tools was done according to the pilot study results. Subjects who shared in the pilot study were excluded from the study subjects. As regard the instructional guidelines for teaching sessions were tested for its content validity by a panel of expert in medical and obstetric faculty member staff to ascertain its relevance and completeness and required modification was carried out accordingly.

The reliability of the questionnaire was assessed by Cronbach's alpha coefficient, the value for UTI knowledge was found 0.71 and health behaviour was 0.80. For face validity , the data collection tools were reviewed in details by the team including researcher, gynecologist, urology specialists, gynecological and obstetric nursing head for its applicability and comprehensiveness.

Ethical consideration :

Prior to the study, the researcher obtained ethical approval from the Institutional Review Board (IRB) NO. 846 (23 June 2016) The researcher also communicated the anonymous and confidential handling of the data, whereas oral consent was obtained from women who were participated in the study, after explaining the nature and purpose of the study. There was no any risk for the women during conduction of the study. The study was followed common ethical principles in clinical research. Confidentiality and anonymity would be assured and the participating women had the right to refuse participation or withdraw from the study without any rational.

Statistical Analysis

Data was analysed by using SPSS version 19 software. Mean and standard deviation were computed for numerical, whereas, frequency and percentages were used to assess the categorical variable. Association between variables factors was computed by applying inferential statistics. Group differences were analyzed through Chi-square $\chi 2$, t-test and two-way ANOVA. *P*-value < 0.05 was taken as significance.

Results

Table (1): Baseline Characteristics of enrolled participants

Variables	Intervention Group N (%)	Control Group N (%)
Age Distribution, n (%)		
18- 25 years	45 (25)	49 (25)
26-32 years	92 (51)	112 (57)
33-35 years	29 (16)	20 (10)
> 35 years	14 (8)	16 (8)
Age (Mean ± SD)	Mean ± S. D = 28.7 ± 4.8	Mean ± S. D = 28.53 ± 4.66
Education Level		
Elementary	30 (17)	40 (20)
Intermediate	45 (25)	20 (10)
Secondary	60 (33)	68 (35)
Diploma	20 (11)	20 (10)
University	25 (14)	49 (25)

Variables	Intervention Group N (%)	Control Group N (%)
Socio Economic Status, n (%)		
< 3000 SAR	61 (34)	47 (24)
3000 – 8000 SAR	75 (42)	86 (44)
> 8000 SAR	44 (24)	64 (32)
Gestational Age, n (%)		
1st trimester	49 (27)	45 (23)
2nd trimester	61 (34)	62 (31)
3rd trimester	70 (39)	90 (46)
Lifestyle, n (%)		
Employed	77 (43)	86 (44)
Unemployed	103 (57)	111 (56)
Number of UTI diagnosis, n (%)		
1	51 (28)	58 (29)
2	71 (39)	82 (42)
3 or more	58 (32)	57 (29)
UTI pathogens, n (%)		
Escherichia Coli	75 (42)	71 (36)
Staphylococcus saprophyticus	39 (22)	44 (22)
Klebsiella pneumonia	21 (12)	26 (13)
Staphylococcus aurous	20 (11)	25 (13)
Staphylococcus epidermidis	15 (8)	19 (10)
Enterococcus faecalis	10 (6)	12 (6)

UTI= Urinary tract infection

Table (2): UTI Knowledge Score of intervention and control group before implementing teaching sessions

Scoring Scale	Intervention Group, n (%)	Control Group, n (%)	P-value
Good (66.7% -100%)	36 (20)	44 (22)	0.2366
Fair (33.4% – 66.6%)	92 (51)	98 950)	
Poor (0% – 33.3%)	52 (29)	55 (28)	
*Significant when p value < 0.05			

Table (3): UTI Knowledge Score of intervention and control group after implementing teaching sessions

Scoring Scale	Intervention Group, n (%)	Control Group, n (%)	P-value
Good (66.7% -100%)	58 (32)	68 (35)	<0.05
Fair (33.4% – 66.6%)	110 (61)	115 (58)	
Poor (0% – 33.3%)	12 (7)	14 (7)	
*Significant when p value < 0.05			

Table (4): Behavior Score Percentage of Participants Regarding UTI Before implementing teaching sessions

Scoring Scale	Intervention Group (%)	Control Group (%)	P-value
Excellent Behavior	31 (17)	36 (18)	0.9756
Very Good Behavior	60 (33)	65 (33)	
Good Behavior	38 (21)	43 (22)	
Fair Behavior	51 (28)	53 (27)	
*Significant when p value < 0.05			

Table (5): Percent distribution of pregnant sampled women with UTI regarding behavior (n = 77) after teaching sessions

ITEM	Control								Study Case								χ^2	P-value
	Never		Often		Sometimes		Always		Never		Often		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
Refer to a physician onset of irritation and frequent urination		0.00	6	15.79	19	50.00	13	34.21		0.00	2	5.13	15	38.46	22	56.41	3.1799*	0.0746
Continue taking the antibiotics according to physician orders	2	5.26	3	7.89	13	34.21	20	52.63		0.00	3	7.69	8	20.51	28	71.79	2.3849*	0.1225
Refer to the physician after the end of the medication again.	8	21.05	8	21.05	7	18.42	15	39.47	5	12.82	7	17.95	16	41.03	11	28.21	3.3721*	0.0663
Drink 8 glasses of water daily	3	7.89	7	18.42	19	50.00	9	23.68		0.00	8	20.51	21	53.85	10	25.64	1.3975*	0.2371
Drink less than 3 cups of tea daily	16	42.11	7	18.42	7	18.42	8	21.05	8	20.51	15	38.46	8	20.51	8	20.51	4.3192*	0.0377**
Eat yogurt at least once two days.	6	15.79	11	28.95	10	26.32	11	28.95	2	5.13	8	20.51	10	25.64	19	48.72	2.9544*	0.0856
Eat citrus fruits, orange, sweet lime, lemon and tomato daily	6	15.79	8	21.05	15	39.47	9	23.68	3	7.69	9	23.08	15	38.46	12	30.77	0.6554*	0.4182
Take a shower in a standing position & don't sit on the wet and cold surfaces	2	5.26	3	7.89	12	31.58	21	55.26		0.00	3	7.69	3	7.69	33	84.62	7.1103*	0.0077**
Wash my genital area from fore to back after each bowel movement.		0.00	4	10.53	8	21.05	26	68.42		0.00		0.00	1	2.56	38	97.44	8.1030*	0.0044**
Change my sanitary pads every 4 to 6 hours during menstruation		0.00	2	5.26	7	18.42	29	76.32		0.00	1	2.56	3	7.69	35	89.74	1.2519*	0.2632
wash my genital area with warm water during menstruation		0.00	3	7.89	12	31.58	23	60.53		0.00	4	10.26	7	17.95	28	71.79	1.1690*	0.2796
Dry my genital area with paper towel after washing	2	5.26	1	2.63	7	18.42	28	73.68		0.00		0.00	6	15.38	33	84.62	0.6975*	0.4036
Change my underwear daily.		0.00	3	7.89	3	7.89	32	84.21		0.00		0.00	4	10.26	35	89.74	1.4063*	0.2357

ITEM	Control								Study Case								χ^2	P-value
	Never		Often		Sometimes		Always		Never		Often		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
Wear loose and cotton underwear's		0.00	3	7.89	13	34.21	22	57.89		0.00	2	5.13	13	33.33	24	61.54	0.0212*	0.8841
Wash my underwear's with hand and apart from other cloths	8	21.05	4	10.53	10	26.32	16	42.11	6	15.38	6	15.38	6	15.38	21	53.85	1.1536*	0.2828
After washing, put my underwear in the sun or iron it	7	18.42	6	15.79	11	28.95	14	36.84	14	35.90	2	5.13	11	28.21	12	30.77	2.8587*	0.0909
Wash my underwear's after purchase	11	28.95	4	10.53	6	15.79	17	44.74	2	5.13	3	7.69	6	15.38	28	71.79	7.1649*	0.0074**
Wear loose pants and pantyhose	11	28.95	6	15.79	15	39.47	6	15.79	2	5.13	7	17.95	15	38.46	15	38.46	7.9924*	0.0047**
Avoid coitus two weeks during treatment of UTI.	3	7.89	6	15.79	11	28.95	18	47.37	2	5.13	5	12.82	10	25.64	22	56.41	0.1601*	0.6891
Urinate and wash my genital area before and after coitus	1	2.63	3	7.89	4	10.53	30	78.95		0.00	2	5.13	4	10.26	33	84.62	0.1236*	0.7252
Ask my husband to wash his genital area before coitus	16	42.11	3	7.89	4	10.53	15	39.47	10	25.64	8	20.51	2	5.13	19	48.72	2.8349*	0.0922
Avoid aromatic lotion in genital area during sex	7	18.42	4	10.53	9	23.68	18	47.37	5	12.82	5	12.82	11	28.21	18	46.15	0.1481*	0.7003
Urinate every 4 hours and avoid holding urine	2	5.26	3	7.89	15	39.47	18	47.37		0.00	3	7.69	8	20.51	28	71.79	3.9285*	0.0475**
Urinate every night before bed		0.00	3	7.89	6	15.79	29	76.32		0.00		0.00	5	12.82	34	87.18	1.5486	0.2133
Overall	111	12.17	111	12.17	243	26.64	447	49.01	59	6.31	103	11.02	208	22.25	566	60.53	32.5942	3.92x10-7**

Significant when p value* *< 0.05***

Table (6): level of knowledge about UTI before and after implementation of teaching sessions for the intervention and control group

Variables	Knowledge Level					
	Intervention Group, n (%)		P-value*	Control Group, n (%)		P-value
	Pre-Intervention	Post-Intervention		Pre-Intervention	Post-Intervention	
Normal changes in urinary tract during pregnancy	0.29±0.48	2.58±0.98	<0.001	0.45±0.69	0.49±0.75	0.638
Awareness of urinary tract infection basic concept	0.59±0.61	1.78±0.51	<0.001	0.71±0.69	0.64±0.72	0.463
Urinary tract infection risk factors	0.63±0.74	2.11±0.73	0.013	0.78±0.93	0.79±0.86	0.347
Influence of water intake in UTI	0.53±0.75	2.05±0.69	0.036	0.65±0.90	0.71±0.51	0.489
Influence of caffeine intake in UTI	0.57±0.71	2.49±0.75	0.021	0.69±0.80	0.69±0.64	0.129
Urinary tract infection types and diagnosis	0.65±0.68	2.25±0.85	0.005	0.55±0.96	0.60±0.81	0.749
Signs and symptoms of lower & upper UTI	0.63±0.78	2.15±0.45	0.019	0.43±0.75	0.58±0.78	0.133
UTI complications to pregnant women	0.69±0.80	2.36±0.78	0.002	0.88±0.55	0.61±0.65	0.784
UTI complications to fetus	0.72±0.69	2.70±0.65	<0.001	0.68±0.66	0.51±0.57	0.595
Management of UTI in pregnancy	0.75±0.77	2.20±0.80	<0.001	0.85±0.48	0.65±0.51	0.617
Role of personal hygiene in UTI management	0.79±0.82	2.29±0.61	<0.001	0.77±0.57	0.53±0.55	0.321

P-value = P value for intervention group*

Table (1): Baseline characterstics of enrolled patients are demonstrated in. The mean ± SD age of enrolled gesttaional women was 28.7 ± 4.8 in intervention group with maximum participants aged between 26-32 year 92 (51%). More than one third of the enrolled preganant women completed secondary education 60 (33%) and the history of recruited subject's socio-economic status represented that most of the recruited pregnant women were from middle earner category of 3000-8000 SAR 75(42%) mainly. The distribution of participants in each trimester showed 70 (39%) gestational women enrollment in third trimester as highest, followed by 61 (34%) in second trimester and 49 (27%) in first trimester with UTI complaint. Lifestyle history represented 103 (57%) enrolled participants were unemployed and majority was diagnosed atleast two times with UTI infection 71 (39%) during primigravida or multigravida. The diagnostic history showed Escherichia Coli 75 (42%) as most frequently reported UTI pathogen followed by Staphylococcus saprophyticus 39 (22%) and Klebsiella pneumonia 21 (12%) in intervention group.

In **Table (2):** This table shows that, the association between enrolled gestational women knowledge related to UTI infection before implementation of teaching sessions and found no difference in level of knowledge in both intervention and control group and found statistically non-significant (P-value:0.23).

Table (3): Reveals the association between enrolled gestational women knowledge related to UTI infection after implementation of health teaching sessions ,there is a significant difference in level of knowledge in both intervention and control group (P-value:<0.05).

Table (4): The behavioural score percentage of participants to adopt to healthcare practices related to UTI before implementation of health teaching session showed insignificant correlation between both intervention and control group on Likert scale (P-value: 0.97).

Table (5): The comparison between the behavior practices regarding UTI prevention among sampled women after teaching sessions, there was statistical significant difference in practice between the control and study group in 6 question out of the 24 questions. In overall, The percent of "Always" answers among study group outnumber that among control group; 60.47 % and 49.01 %, respectively. On contrary, the percentage of "Never" answers among control group outnumber that of study group; 12.17 % and 6.30 % respectively. Accordingly, there was highly significant difference between the two groups, where p-value less than 0.05.

Table (6): The results demonstrated the relationship between mean level of knowledge related to UTI among pregnant women in both the intervention and control group before and after implementing teaching sessions. The results showed significantly improved

levels of awareness and knowledge in all areas among the intervention group where (p=0.05). However, there was no significant difference observed in both pre and post intervention health teaching sessions in control group

Discussion

The data from our study estimated the impact of training and education program and implementation of intervention guidelines in pregnant women with UTI to improve their level of knowledge and reduce UTI outcome during gestation. The results from our study showed UTI knowledge score of participants significantly improved after health teaching and training in intervention group. Similarly, results from our study showed the behavioural score percentage of participants to adapt to healthcare practices related to UTI after implementation of health teaching sessions showed statistically significant correlation between both groups. Another study by **Hassan et al., 2015,** also studied implementation of intervention guidelines and its impact on pregnant women which significantly improved quality of life through increase in UTI knowledge among pregnant women. Our study reported most prevalent UTI pathogen for infection in pregnant women was Escherichia Coli 75 (42%) followed by Staphylococcus saprophyticus 39 (22%). A study by **Minassian et al.,2013**, also studied impact of urinary infection during pregnancy association with increased risk of pre-eclampsia.

The behavioural score percentage score in our study of participants to adapt to healthcare practices related to UTI after implementation of health teaching sessions showed statistically significant correlation between both groups. A study by Tehran and Nikpour., 2014 also studied significant improvement in health behaviours (P-value< 0.001) in intervention group to improve knowledge and self-efficacy in reducing UTI. Our study analysed level of knowledge through evaluation of various variables in both groups before and after implementation of teaching and significant improvement was observed in intervention group participants in terms of knowledge related to basic UTI signs and symptoms, complications and management.

However, **Gessese et al.,2017** reported high uropathogens prevalence and anti-microbial resistance data incorporation in pregnant women study to reduce asymptomatic and symptomatic bacteriuria infections. **Navarro et al. 2019** in their study also indicated that the intervention of the health teaching sessions resulted in the development of positive health care habits. For instance; most of the participants provided an improved intake of water after the intervention. Also, teaching served as a significant variable in improving the hygiene practices among participants. **Tehrani et al 2014**, also supported the idea of health intervention guidlines in improving the preventive measures of UTI among pregnant women. Cheng et al 2011, on the other hand observed contradicted findings, according to which women with UTI were at increased risks of low birth weight of babies, small for gestational age, and preterm. **(Gessese., 2017).** Our study showed weak level of UTI knowledge in pregnant women before intervention, **Al-Kotb et al 2016,** also supported the findings by indicating that most of the pregnant women specified a significantly weak level of knowledge. Our study has a limitation that this study was conducted only in Riyadh and antibiotic profile of pregnant women was not considered, therefore future studies are required on large scale to evaluate the impact of intervention health programs in reducing the medication intake countrywide along with sanitation habits to reduce UTI during pregnancy. With the limitation of the study, it was concluded that implementation of health teaching sessions and training programs among pregnant women can significantly help improving their health, hygiene and lifestyle routine during pregnancy to reduced risk of exposure to UTI pathogens and decrease associated complications to fetus. Hence the null hypothesis is rejected and we conclude that gestational women with UTI complain who received health education programs are expected to improve the level of UTI knowledge and health behavior through preventive measures implementation.

Our study also recommended pro-active healthcare professionals' involvement in gestational women training and education in all trimester to avoid UTI associated complications in pregnancy. The ante-natal education must be delivered in the form of local language booklet, counselling, teaching material etc.

Conclusion and Recommendations:

The study has concluded that health teaching sessions had effects on the knowledge, and health behaviours in the women with UTI. Therefore, it is suggested that health sessions about UTI prevention should be accessible to everyone, especially married women with UTI. The study recommends that screening test (urine dipstick, microscopy and culture) must performed for all pregnant women at different health settings and Nurses should increase pregnant women awareness about UTIs and healthy life style specially fluid intake, sexual relation care and genital area care and good nutrition.

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