



The Effect of Instructional Guidelines on Pregnant Women's Perception Regarding Urinary Tract Infection

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Article History	Abstract
Received: 06 June 2023 Revised: 25 Sept 2023 Accepted: 08 Oct 2023	<p>Background: Urinary tract diseases (UTIs) are the foremost predominant diseases in pregnancy, counting for about 20% of all pregnancies. Moreover, they are responsible for 10% of all hospitalizations during pregnancy. Aim: The study aimed to evaluate effect of instructional guidelines on pregnant women's perception regarding urinary tract infection. Design: A quasi-experimental research design was used at this study. Setting: The study was conducted in Obstetric and Gynecological clinic in El Hussein Hospital Al-azar University. Sample: A purposive sample of ninety-six pregnant women with urinary tract infection. Tools: The study utilized two assessment tools: a Structured Interviewing Questionnaire and Likert scale of women attitudes for pregnant women regarding urinary tract infection (UTI). Results: The findings of the study indicated that prior to the application of instructional guidelines, more than two-thirds of the pregnant women had an unsatisfactory level of knowledge about UTI. However, after the application of the guidelines, more than three-thirds of them demonstrated satisfactory knowledge. Similarly, nearly three-quarters of the participants held a negative attitude towards UTI before the guidelines, whereas after the guideline's application, more than three-thirds of them displayed a positive attitude. Conclusion: Based on these results, it can be concluded that the instructional guidelines effectively improved both the knowledge and attitude of the pregnant women towards UTI, thereby supporting the research hypothesis. Recommendations: The study recommends the implementation of routine screening for UTIs in all pregnant women during each trimester of pregnancy, including bacteriuria examination and urine culture, to ensure early diagnosis and appropriate treatment.</p>
CC License CC-BY-NC-SA 4.0	Keywords: Instructional guidelines, Perception, Pregnant women, Urinary tract infection.

1. Introduction

Pregnancy is a critical time for women. There is an increased risk that pregnant women will develop urinary tract infections (UTIs). The hormonal changes that occur during pregnancy further increase the risk for both pregnancy and non-pregnancy related infections due to the physiological immune suppression associated with the action of human chorionic gonadotropin and prolactin. UTIs account for up to 10% of pregnant women. They are also known, after anemia, as the second most common pregnancy disorder. More than 50% of women suffer at least one UTI incidence during their lifetime (Hassan et al., 2022).

Urinary tract infection is one of the most prevalent health problems worldwide during pregnancy, especially in developing countries. In a recent review, the global prevalence of UTIs in pregnancy ranged from 3 to 35% across five continents, with preterm birth rates >10%. There are three distinct clinical

forms of UTI related to pregnancy: Asymptomatic bacteriuria (ASB), cystitis, and pyelonephritis, which are the cause of approximately 5% of hospital admissions of such patients (Eslami et al., 2022).

Urinary tract infections should be treated effectively with the appropriate therapy by improving pregnant women's knowledge and healthy lifestyle activities (self-care practices) to prevent complications such as premature labor. These include an understanding of genitourinary tract physiology, reasons for genitourinary infection, complications, and proper health habits. Good personal hygiene, drinking plenty of water that flushes out the bacteria from the urinary tract, completely emptying the bladder as soon the urge is felt or at least once in three hours, helps to keep bacteria down, and wearing cotton underwear which does not trap moisture and proper hygiene (Kandula et al, 2022).

Proper health habits (self-care) referred to the development and use of personal health habits and coping strategies to improve their health, avoid or mitigate disease and preserve well-being. Such practices are generally carried out without clinical assistance. However, it can be detrimental if founded on inaccurate understanding harmful behaviours, considering the great value of self-care activities for health maintenance (WHO., 2022).

Nursing consultations during the pregnancy is the ideal time to educate women regarding their health to prevent urinary infection. At this stage a woman has constant contact with various health professionals and is encouraged to improve her physical condition during the pregnancy (Bezerra, et al., 2016). The nurse should investigate urinary symptoms and guide pregnant women about maintain a healthy weight by good care and keeping weight under control, may be able to decrease risk of urinary infections (Sayed et al., 2020). The nurse is a key person to educate the women to meet the self-care needs, request, facilitate, and increase their self-care abilities to perform self-care activities. Women's treatment now receives full nurse evaluation, preparation, rehabilitation, education, counselling, and assistance. Nurse encourages relaxation, provides sufficient hydration, teaches patients, and provides women with the expertise to recognize early signs and symptoms of urinary tract infection to encourage prevention, early detection, and treatment of possible infections (WHO. , 2022).

Significance of the study

Urinary tract infection (UTI) is a significant health issue that affects many individuals each year and is particularly common among pregnant women. The incidence of UTI during pregnancy is higher due to physiological and anatomical changes, such as urethral dilatation, decreased urethral tone, and increased bladder tone, which can lead to increased uterovesical reflux and urinary stasis. Globally, up to 70% of pregnant women experience UTI, with approximately 8.3 million cases per year (Abdullah et al., 2019). In Egypt, the prevalence of urinary tract infection is approximately 29%, with rates varying across different cities. For instance, in Ismailia city, the prevalence is around 30%, while in Suez, it ranges from 20% to 25%. Generally, the rate of UTI decreases with higher levels of academic qualification, as a significant proportion of affected women tend to have low education levels and may be illiterate (Mohamed et al., 2018). Considering the aforementioned factors, the current study aims to assess the impact of instructional guidelines on the perception of pregnant women regarding urinary tract infection.

Aim of the study

The aim of this study was to evaluate the effect of instructional guidelines on pregnant. Women 's perception regarding urinary tract infection.

2. Materials And Methods

Research design:

Quasi-experimental (pretest and post-test) design was utilized to evaluate the effectiveness of instructional guidelines on pregnant women's perception regarding urinary tract infection.

Study setting:

The study was carried out in obstetric and gynecological clinic in El-Hussein Hospital Al-ahzar University in Egypt.

Study sample:

A purposive sample of (96) pregnant women with urinary tract infection.

Sample Size:

All Pregnant women at third trimester of pregnancy (96 woman) who accept to participate in the study and meet the inclusion criteria for the period of three months were enrolled in this study.

Sample criteria:

Pregnant women at third trimester of pregnancy. Free from medical disorder e.g., Diabetes mellitus, Hypertension, Spinal cord injury

Tools for data collection:

To collect data for this study two tools were used:

-Tool I: Structured interviewing Questionnaire: This tool was constructed by the researchers after reviewing a related literature (Samanta, 2016; Ngxongo, 2018). And consisted of three parts: Part (I) Personal data demographic such as (age, educational level, residence, occupational telephone number and economic status). Part (II) Obstetric and maternal history as: number of pregnancies, number of labours, number of abortions, previous contraceptive methods, mode of deliver and previous vaginal infection. Part (III) knowledge assessment tool (pre/post-test): This tool was designed by the researcher in Arabic language mainly to collect data. It was used to assess the pregnant women's' knowledge regarding urinary tract infection as: definition, causes, sign and symptoms, risk factor, complication, duration of the current complaint, treatment of urinary tract infection (Flavia et al., 2018).

Knowledge Scoring system:

The knowledge scoring system used in this study consisted of 15 items, with a total possible score of 30. Each item was assigned a grade based on the correctness and completeness of the response. Two grades were given for answers that were both correct and complete, one grade for answers that were correct but incomplete, and zero grade for wrong answers or when the participant responded with "I do not know." The subject's responses were then calculated within this scoring system. The total knowledge was categorized as the following:

-Satisfactory knowledge: $\geq 60\%$ 18 points.

-Unsatisfactory knowledge: $< 60\%$ 18 points.

-Tool (II): Likert scale of women attitudes: The Likert scale used to measure pregnant women's attitudes toward urinary tract infection was adapted by (Samanta., 2016), which modified by the researcher based on a review of relevant literature. The purpose of the sheet was to assess the participants' attitudes towards urinary tract infection, its prevention, management, and associated factors. The specific questions or statements on the attitude assessment sheet would depend on the objectives and research focus of the study. The sheet may have included Likert scale items, where respondents could rate their agreement or disagreement with statements on a scale (e.g., agree, neutral, disagree). This tool is 3-point liker scale that consisted of (18 items) with a total grade (36). Two grades were given for (agree), one grade given for (neutral) response and zero grade given for (disagree). Its subject responses were calculated in the scoring system. It likely consisted of a set of questions or statements related to various aspects of urinary tract infection, such as knowledge, beliefs, perceptions, and behaviours. It was classified to:

-Positive attitude: $\geq 60\%$.

-Negative attitude: $< 60\%$.

Tool validity:

In the study, a jury consisting of three nursing experts specializing in the Maternal and Newborn department was involved. The involvement of experts in the assessment process adds credibility and validity to the study. Their expertise in the field of maternal and newborn care ensures that the tool aligns with the relevant aspects of women's health and well-being in that specific context and the recommended any necessary modifications was done.

Tool reliability:

Tools were tested for reliability using Cronbach's alpha test which the observational checklist. was = 0.920. The tools were proved to be valid and reliable with Cronbach's alpha test.

Ethical considerations:

The study protocol was submitted to the Scientific Research Ethics Committee at the Faculty of Nursing, Helwan University, for approval. Additionally, an official permission was obtained from the director of the study setting to conduct the research. Before participating in the study, pregnant women were provided with a detailed explanation of the study's objectives and gave their oral consent to participate. They were assured that all information collected would be treated confidentially and solely used for the study's purposes, with anonymity guaranteed. The participants were also informed that their involvement was entirely voluntary, and they had the right to withdraw from the study at any time.

Operational item:

The operational design included preparatory phase, content validity, reliability, pilot study and field work.

Preparation phase:

After reviewing the relevant literature to the study, the tools were designed, the educational sessions and the supportive material (an Arabic booklet) were developed and finally the pilot study was conducted to assess applicability of the study tools after confirming the content validity of the developed tool and the educational sessions and material by a panel of 3 experts in maternity nursing.

Pilot study:

The pilot study was conducted on 10% of the study subjects which represent 9 pregnant women who were excluded from the study sample. The purposes of the pilot study were to test the applicability and clarity and feasibility of the study tools, and it served to estimate the time needed to complete the tools. It also helped to find out any obstacles and problems that might interfere with data collection process. Based on findings of the pilot study, certain modifications on the tools were done.

Field work:

After official permission obtained from previously mentioned settings. The study was conducted at AL Hussein Hospital, Al Azhar University in Egypt. Data collection took place over a period of three months, starting from October 2022 and concluding in December 2022. To collect the data, the researcher attended the antenatal clinic two days per week, from 9:00 am to 2:00 pm, until the desired sample size was achieved. The current study was achieved through four phases: Preparatory phase, assessment phase, Implementation, and evaluation phase.

The Preparatory Phase: A reviewing of past and current literature covering the various aspects of the problem was done using books, articles, magazines, and network about studies related to pregnant women's perception regarding urinary tract infection.

Assessment phase: Assessment was done by the researcher through interviewing every woman individually in the antenatal clinic, either before or after their obstetrician's examination. At the beginning of each interview, the researcher introduced herself to the pregnant women and provided a brief explanation of the study's nature and purpose. It was emphasized that the collected data would be treated confidentially and used solely for research purposes. The interviews were conducted individually by the researcher in the antenatal clinic. The first part of the interview involved collecting demographic data and obstetrical and maternal history using tool (I). The second part of the interview consisted of Obstetric and maternal history. the third part about a knowledge assessment regarding urinary tract infection, and tool (II), Likert scale of women attitudes regarding urinary tract infection. The completion of the questionnaire sheet by each participant took approximately 20-25 minutes. The researcher aimed to interview four pregnant women per day until reaching the predetermined sample size over the course of three months.

Implementation: After the completion of the pretest questionnaire, a guideline was developed and submitted to the study group. This guideline contained information on the definition of urinary tract infection, risk factors, causes, signs, symptoms, treatment, and prevention. The guideline was designed in simple Arabic language to enhance the knowledge and attitude of the pregnant women regarding urinary tract infection. Following the development of the guideline and supportive material, the post-test was conducted immediately after the final session. The same tool used in the pre-test was utilized for the post-test. Various teaching methods were employed, including lectures, group discussions,

demonstrations, and re-demonstrations. Instructional media were also utilized during the teaching sessions.

Evaluation phase: The evaluation started immediately after intervention, aimed to assess the effect of instructional guidelines on pregnant women's knowledge and attitude regarding urinary tract infections (UTIs). To evaluate this, the researchers used the same questionnaire that was administered before the implementation of the instructional guidelines. This approach allows for a direct comparison between the pre-implementation and post-implementation results, providing insights into the impact of the instructional guidelines. By administering the questionnaire post-implementation of the instructional guidelines, the researchers could assess any changes in the participants' knowledge and attitude. A comparison of pre- and post-implementation questionnaire responses would help determine the effectiveness of the guidelines in improving these aspects. The evaluation phase plays a crucial role in determining the success of the instructional guidelines and their impact on pregnant women's knowledge and attitude regarding UTIs. The findings obtained from this phase would provide valuable insights for future interventions and strategies aimed at improving women's understanding and attitudes towards UTIs during pregnancy.

Administrative design:

Before initiating the study, an important step was taken to obtain permission and cooperation from the relevant authorities. An official letter was issued from the Dean of the Faculty of Nursing to the director of each study setting, specifically the antenatal clinic at Al Hussein Hospital. The letter explained the aim of the study and requested their permission to conduct the research within their facility. This official letter serves several purposes. Firstly, it establishes a formal communication channel between the researchers and the hospital administration. It ensures that the study is conducted with proper authorization and in accordance with the policies and regulations of the hospital. Secondly, the letter provides a clear explanation of the study's objectives, enabling the hospital director to understand the purpose and significance of the research. This helps in gaining their support and cooperation for the smooth execution of the study.

Statistical design:

Data entry and statistical analysis was done using SPSS 11.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, in addition to means and standard deviations for quantitative variables. Qualitative variables were compared using chi-square test. Statistical significance was considered at p-value <0.05 and highly statistical significance was considered at p-value <0.01.

3. Results and Discussion

Table (1) shows that more than half (55.2%) of the age of the studied pregnant women was ranged $30 \leq 40$ years old, while only (16.7%) of the age of them was > 40 years old with a mean age of $32.56 + 5.45$. Considering education, nearly to two-third (58.3%) of the studied pregnant women held a secondary school certificate. Regarding to residence, more than three quarters (77.1%) of them being from urban. Considering occupation, more than four fifths (87.5%) being housewife. In relation to economic status, more than two-thirds (61.5%) of the studied pregnant women had a low income.

Table (2) shows about on three quarters (74%) majority of studies (87.5%) of pregnant women had a frequency of pregnancies and deliveries ≤ 3 times with Mean + SD= $2.95 + 0.99$ & $1.95 + 0.99$ respectively. Regarding abortion, nearly to one quarter of them had once time of abortion. Considering contraceptive methods, (55.2%) of them using IUD as contraceptive methods followed by (27.1%) using tablet and (9.4%) using injection methods. Additionally, the mean score of gestational age is $35.47 + 1.60$. Moreover, (94.8%, 95.8%, 94.8%, 94.8% & 100%) had not Present complication, have a history of vaginal infection, UTI and previous treatment of urinary tract infection and have previous visit doctor for follow-up, respectively.

Figure (1) illustrates that more than two thirds (64.9%) of the studied pregnant women have unsatisfactory level knowledge regarding UTI at a pre-application of instruction guidelines. While more than three thirds (95.8%) of them have satisfactory knowledge regarding UTI at a post-application of instruction guidelines. In addition to, presence of a highly statistically significant difference at $P = 0.000$.

Table (3) shows that at pre- application instruction of guideline, more than two-thirds (67.7%) of the studied pregnant women disagreed that frequency of tea & cola reduce UTI. Additionally, more than half (52.1%, 59.4%, 52.1%, 58.3% & 56.3%) of them disagreed that using feminine hygiene prevent UTI, frequency of weekly intercourse cause UTI and voluntary delay in voiding cause UTI, urinate less than 30-minute pre coitus and dinking a plenty water & Vit. C reduce it respectively. Moreover, more than two-fifths (49%, 43.8%, 46.9%, 43.8%,49%, 40.6%, 44.8%) of the studied pregnant women disagreed that using wear cotton underwear, change wear cotton underwear daily, wear loose cotton underwear daily, washing genitals pre-coitus reduce UTI, washing genital post-coitus reduces UTI, wash genital husband pre-coitus reduce UTI, wash genital husband post-coitus reduce respectively. While at a post application instruction guideline, more than three-thirds (90.6%, 91.7% & 91.7%) of the studied pregnant women agreed that wash genital husband post-coitus reduce, Urinate less than 30-minute pre coitus and water & Vit. C reduce it. Additionally, there was a highly statistically significant difference between pre and post application instruction guidelines.

Figure (2) illustrates that nearly to three-quarters (72.9%) of the studied pregnant women have negative attitude regarding UTI at a pre-application of instruction guidelines. While the majortiy (91.7%) of them have positive attitude regarding UTI at a post-application of instruction guidelines. In addition to, presence of a highly statistically significant difference at $P = 0.000$.

Table (4): represents that, there was a highly statistically significant relation between personal data. (Age, education, occupation, and economic status) and total level knowledge regarding urinary tract infection among the studied pregnant women during pre-application of instruction guideline, at $P < 0.05$. While there was a highly statistically significant relation between personal data (age, education, and residence) and total level knowledge regarding urinary tract infection among the studied pregnant women during post application of instruction guideline at $P < 0.05$.

Table (5): represents that, there was a highly statistically significant relation between personal data. (Age, education, residence, occupation and economic status) and total level attitude regarding urinary tract infection among the studied pregnant women during pre-application of instruction guideline, at $P < 0.05$. While there was a highly statistically significant relation between personal data (Age, education, and residence) and total level knowledge regarding urinary tract infection among the studied pregnant women during post application of instruction guideline at $P < 0.05$...

Table (6): represents that there was a highly statistically significant positive strong correlation between total score of knowledge and attitude during pre and post application of instruction guideline among the studied pregnant women, at $r = (0.984, 0.919)$ & $P = 0.000$ respectively.

Table (1): Distribution demographic characteristic among the studied pregnant women (n=96).

Personal date	No	%
Age		
< 30 years	27	28.1
30 - 40 years	53	55.2
> 40 years	16	16.7
Mean + S D	32.56 + 5.45	
Educational level:		
Illiteracy	14	14.6
Primary	18	18.8
Secondary	56	58.3
University	8	8.3
Occupation:		
Working	12	12.5
Housewife	84	87.5
Economic status:		
Low	59	61.5
Moderate	37	38.5

Table (2): Obstetric and maternal history among the studied pregnant women (n=96)

Obstetric and Maternal History		No	%
Number of pregnancies	≤ 3	71	74.0
	>3	25	26.0
Mean + SD		2.95 + 0.99	
Number of deliveries	≤ 3	84	87.5
	>3	6	6.3
	None	6	6.3
Mean + SD		1.95 + 0.99	
Mode of delivery:	Normal vaginal	27	28.1
	Caesarean section	61	63.5
	None	8	8.3
Abortion	Twice	2	2.1
	Once	23	24.0
	None	71	74.0
Previous of urinary tract infection	Yes	2	2.1
	No	94	97.9
Contraceptive methods	IUD	53	55.2
	Tablets	26	27.1
	Injection	9	9.4
	None	8	8.3
Gestational age	Mean + SD	35.47 + 1.60	
Present complication	Yes	5	5.2
	No	91	94.8
History of vaginal infection	Yes	92	95.8
	No	4	4.2
Previous history of UTI	Yes	92	94.8
	No	4	4.2
Previous treatment of urinary tract infection	Yes	92	94.8
	No	4	4.2
Previous visit doctor for follow-up	Yes	96	100.0
	No	0	0.0

Figure (1): Distribution of total knowledge regarding UTI during pre and posttest application instruction-guideline among the studied pregnant women (n=96)

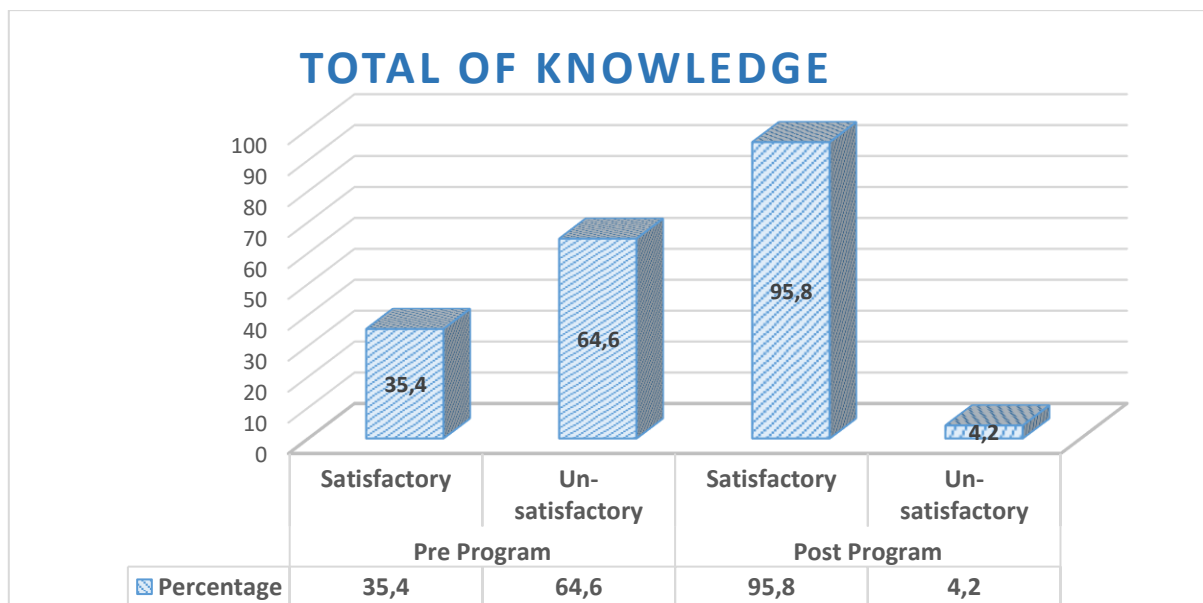


Table (3): Distribution Comparison between attitude regarding UTI during pre and post application instruction of guideline among the studied pregnant women(n=96)

Items	Pre- Test						Post-Test						T test	P value
	Agree		Neutral		Dis-agree		Agree		neutral		Dis-agree			
	N o	%	N o	%	N o	%	N o	%	N o	%	N o	%		
UTI can be prevented.	23	24.0	27	28.1	46	47.9	84	87.5	11	11.5	1	1.0	13.9	0.000*
Using feminine hygiene prevent UTI	15	15.6	31	32.3	50	52.1	79	82.3	13	13.5	4	4.2	15.4	0.000*
Hand hygiene reduce UTI	28	29.2	32	33.3	36	37.5	81	84.4	12	12.5	3	3.1	11.9	0.000*
Perineal care reduces UTI	18	18.8	48	50.0	30	31.3	76	79.2	15	15.6	5	5.2	14.7	0.000*
Drying perineum reduced UTI	32	33.3	29	30.2	35	36.5	84	87.5	10	10.4	2	2.1	11.3	0.000*
Using wear cotton underwear	19	19.8	30	31.3	47	49.0	81	84.4	12	12.5	3	3.1	14.4	0.000*
Change wear cotton underwear daily.	15	15.6	39	40.6	42	43.8	84	87.5	10	10.4	2	2.1	16.1	0.000*
Wear loose cotton underwear daily.	20	20.8	31	32.3	45	46.9	78	81.3	10	10.4	8	8.3	12.7	0.000*
Voluntary delay in voiding cause UTI	14	14.6	32	33.3	50	52.1	79	82.3	12	12.5	5	5.2	15.4	0.000*
Washing genitals pre-coitus reduce UTI	27	28.1	27	28.1	42	43.8	83	86.5	10	10.4	3	3.1	12.3	0.000*
Washing genitals post-coitus	23	24	26	27.1	47	49.0	85	88.5	9	9.4	2	2.1	13.7	0.000*

reduce UTI															
Wash genital husband pre-coitus reduce UTI	19	19.8	38	39.6	39	40.6	84	87.5	9	9.4	3	3.1	14.3	0.000*	
Wash genital husband post-coitus reduce UTI	27	28.1	26	27.1	43	44.8	87	90.6	5	5.2	4	4.2	12.2	0.000*	
Frequency of weekly intercourse cause UTI.	16	16.7	23	24.0	57	59.4	75	78.1	13	13.5	8	8.3	14.0	0.000*	
Urinate less than 30-minute pre coitus	26	27.1	14	14.6	56	58.3	88	91.7	4	4.2	4	4.2	13.1	0.000*	
Water & Vit. C reduce UTI	26	27.1	16	16.7	54	56.3	88	91.7	6	6.3	2	2.1	13.4	0.000*	
Frequency of tea & cola reduce UTI	15	15.6	16	16.7	65	67.7	74	77.1	14	14.6	8	8.3	14.6	0.000*	
Eating healthy reduce UTI	52	54.2	24	25.0	20	20.8	85	88.5	9	9.4	2	2.1	7.1	0.000*	

*Significant $p \leq 0.05$ **Highly significant $p \leq 0.0$

Figure (2): Percentage distribution of total attitude regarding UTI during pre and post application instruction of guideline among the studied pregnant women (n=96)

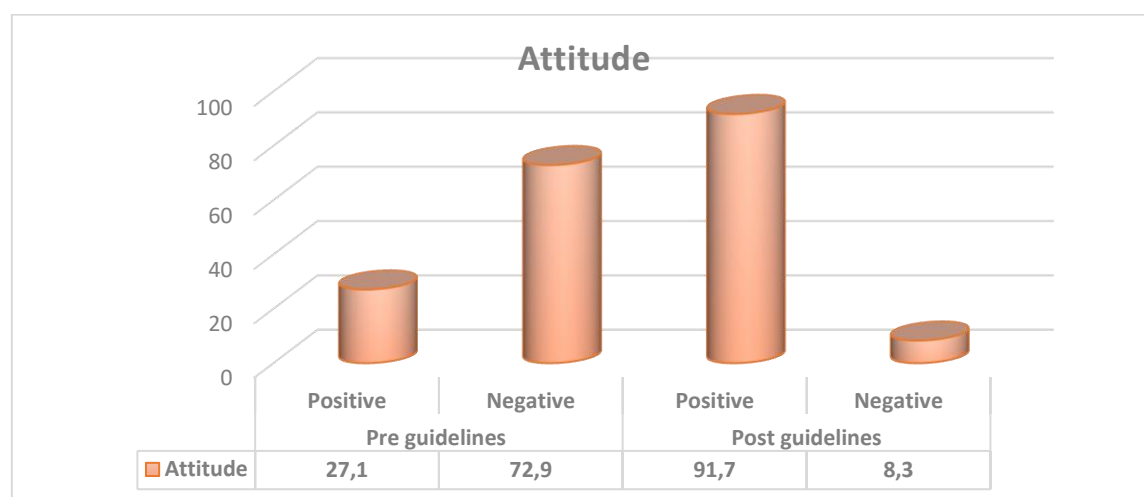


Table (4): Relation between demographic and total level knowledge regarding urinary tract infection during pre and post application of instruction guideline among the studied pregnant women (n=96)

Values were expressed as Means ± SE.

Personal date	Pre-guideline				Post-guideline			
	Level of knowledge							
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory	
	No	%	No	%	No	%	No	%
Age								
< 30 years	3	3.1	24	25.0	26	27.1	1	1.0
30-40 years	18	18.8	35	36.5	53	55.2	0	0.0
> 40 years	13	13.5	3	3.1	13	13.5	3	3.1
χ^2 & P Value	21.7 & 0.000**				10.8 & 0.004**			
Educational level:								
Illiteracy	1	1.0	13	13.5	10	10.4	4	4.2
Primary	0	0.0	18	18.8	18	18.8	0	0.0
Secondary	26	27.1	30	31.3	56	58.3	0	0.0
University	7	7.3	1	1.0	8	8.3	0	0.0
χ^2 & P Value	27.2 & 0.000**				24.4 & 0.000**			
Residence:								
Rural	10	10.4	12	12.5	19	19.8	3	3.1
Urban	24	25.0	50	52.1	73	76.0	1	1.0
χ^2 & P Value	1.25 & 0.313F				6.41 & 0.037* F			
Occupation:								
Working	10	10.4	2	2.1	11	11.5	1	1.0
Housewife	24	25.0	60	62.5	81	84.4	3	3.1
χ^2 & P Value	13.7 & 0.000** F				0.596 & 0.419 F			
Economic status:								
Low	3	3.1	56	58.3	56	58.3	3	3.1
Moderate	31	32.3	6	6.3	36	37.5	1	1.0
χ^2 & P Value	61.5 & 0.000** F				0.323 & 0.499 F			

Table (5): Relation between personal date and total level attitude regarding urinary tract infection during pre and post application of instruction guideline among the studied pregnant women (n=96)

Values at the same column with different letters are significantly different at P<0.05.

Personal date	Pre-guideline				Post-guideline			
	Level of attitude							
	Positive		Negative		Positive		Negative	
	N	%	N	%	N	%	N	%
Age								
< 30 years	3	3.1	24	25.0	22	22.9	5	5.2
30-40 years	10	10.4	43	44.8	53	55.2	0	0.0
> 40 years	13	13.5	3	3.1	13	13.5	3	3.1
χ^2 & P Value	29.0 & 0.000**				10.7 & 0.005**			
Educational level:								
Illiteracy	1	1.0	13	13.5	7	7.3	7	7.3
Primary	0	0.0	18	18.8	18	18.8	0	0.0
Secondary	18	18.8	38	39.6	56	58.3	0	0.0
University	7	7.3	1	1.0	7	7.3	1	1.0
χ^2 & P Value	25.0 & 0.000**				38.7 & 0.000**			
Residence:								
Rural	10	10.4	12	12.5	16	16.7	6	6.3
Urban	16	16.7	58	60.4	72	75.0	2	2.1
χ^2 & P Value	4.87 & 0.053*F				13.4 & 0.002** F			

Occupational:								
Working	10	10.4	2	2.1	10	10.4	2	2.1
Housewife	16	16.7	68	70.8	78	81.3	6	6.3
χ^2 & P Value	21.9 & 0.000** F				1.24 & 0.261 F			
Economic status:								
Low	3	3.1	56	58.3	54	56.3	5	5.2
Moderate	23	24.0	14	14.6	34	35.4	3	3.1
χ^2 & P Value	37.5 & 0.000** F				0.004 & 0.632 F			

*Significant $p < 0.05$ **Highly significant $p < 0.01$ F: Fisher Exact Test

Table (6): Correlation between total score of knowledge and total attitude during pre and post application of instruction guideline among the studied pregnant women (n=96)

Total Attitude	Knowledge (Pre-test)		Knowledge (Posttest)	
	r	P value	R	P value
Attitude (Pre-guidelines)	0.984	0.000**		
Attitude (post guidelines)			0.919	0.000**

*Significant $p < 0.05$, **Highly significant $p < 0.01$

Regarding demographic characteristic among the studied pregnant women, the results of the present study revealed that more than half (of the age of the studied pregnant women was ranged 30- ≤ 40 years' old, while only of the age of them was > 40 years old with a mean age of 32.56 + 5.45. Considering education, nearly to two-third of the studied pregnant women held a secondary school certificate. Regarding to residence, more than three quarters of them being from urban. Considering occupation, more than four fifths being housewife. In relation to economic status, more than two-thirds of the studied pregnant women had a low income. The findings suggest that the women studied who live in rural regions, have a low educational level, and report insufficient income, likely have a poor socioeconomic status. This poor socioeconomic status can have implications for various aspects of their lives, including their self-care practices. Living in rural regions often presents challenges in terms of access to healthcare services, transportation, and resources. Limited educational opportunities can also contribute to a lack of awareness and knowledge about proper self-care practices. Additionally, reporting insufficient income indicates financial constraints, which can limit the ability to afford necessary healthcare services, medications, and self-care products.

These results are similar with the results of study performed in Egypt by El-bana & Ali (2020) which entitled " Effect of an educational intervention on pregnant women's knowledge and self-care practices regarding urinary tract infection " who stated more than half of the studied women were in the age group of 30-<40 years old and had secondary education. Also, three quarters of them lived in an urban area, and were not working women, while most of them were living in a nuclear family and had not enough income.

Regarding obstetric and maternal history among the studied pregnant women, the current study revealed that three quarters and most studies of pregnant women had a frequency of pregnancies and deliveries ≤ 3 times. Regarding abortion, nearly to one quarter of them had once time of abortion. Considering contraceptive methods, more than half of them using IUD as contraceptive methods followed by more than one quarter of them using tablet and the minority of them using injection methods. Additionally, the mean score of gestational age is 35.47 + 1.60. Moreover, the majority and all the studied women hadn't present complication, have a history of vaginal infection, UTI and previous treatment of urinary tract infection and have previous visit doctor for follow-up respectively.

From the researcher point of view, these results are considered a predisposing factor for developing UTI among the studied women and the risk increase with physiological changes that occur during pregnancy. This finding is like the results of Parida et al., (2018) which entitled "Prevalence of urinary tract infection in pregnant women in a Tertiary Care Hospital of Odisha" in Odisha and found that most pregnant women in the study were multigravida and multipara because of sexual activity, pelvic floor stress during birth, and weakening of supportive structure. But these results are in difference with Ranjan et al., (2018) at a study entitled "Prevalence of UTI among pregnant women and its

complications in newborns" in India which clarified that most studied pregnant women in the study were nulliparous. In addition to another study done by Elshobary et al., (2022) who studied in "Effect of Applying Self-Efficacy Nursing Guidelines on Pregnant Women's Performance regarding Urinary Tract Infections" in Egypt and found that before applying the guidelines, more than forty percent of the pregnant women had unsatisfactory attitude and performance related to self-care of urinary tract infections. In addition to two weeks and three months after the intervention, the study group had a statistically significant increase in total performance and attitude score to relieve urinary tract infection symptoms in contrast to before. However, the difference was not noticeable in the control group.

In relation to women attitude regarding UTI, the study revealed that, three-quarters of the studied pregnant women have negative. attitude regarding UTI at a pre-application of instruction guidelines, while most of them have positive attitude regarding UTI at a post-application of instruction guidelines. In addition to, presence of a highly statistically significant difference at $P = 0.000$. The study conducted by Yazdi et al. (2020) in Iran, titled "Effect of integrated health promotion intervention and follow-up on health issues related to urinary tract infection among pregnant women," supports the finding that implementing an educational intervention for women regarding healthy self-care practices can lead to a highly statistically significant difference in total attitudes related to urinary tract infection. The study's results suggest that the educational intervention had a positive impact on the attitudes of pregnant women towards urinary tract infection. By providing comprehensive health promotion interventions and follow-up, the study aimed to improve various health-related behaviors, including clothing choices, food habits, urinary habits, and sexual behavior habits, all of which are factors potentially related to urinary tract infection.

It's worth noting that randomized controlled trials, like the study conducted by Yazdi et al., provide robust evidence due to their rigorous design and ability to control for confounding variables. The results of this study contribute to the growing body of research supporting the effectiveness of educational interventions in improving attitudes and self-care practices related to urinary tract infection among pregnant women.

Additionally, this finding is supported with Mohamed et al., (2020) who illustrated that there was. a highly statistically significant difference between total attitudes related to urinary tract infection and healthy performance self-care practices at pre-and after implementing the health beliefs model based. education for women.

Regarding to relation between demographic and total level knowledge regarding urinary tract infection during pre and post application of instruction guideline among the studied pregnant women, the current study clarified that there was a highly statistically significant relation between personal data. (Age, education, occupation, and economic status) and total level knowledge regarding urinary tract infection among the studied pregnant women

during pre-application of instruction guideline. While there was a highly statistically significant relation between personal data (age, education, and residence) and total level knowledge regarding urinary tract infection among the studied pregnant women during post application of instruction guideline. This result may be due to age group, education and social status of the women are important factors that determine their level of information of them and their facilities to obtain health services and education programs.

This finding is in a harmony with Yakout (2020) at a study entitled "Effect of health teaching sessions. on pregnant women's knowledge and health behavior regarding urinary tract infection" in Egypt who demonstrated a statistically significant relationship between the studied pregnant women' total mean knowledge scores and their personal data as age, education, and occupation pre and post health teaching sessions.

According to relation between personal date and total level attitude regarding urinary tract infection during pre and post application of instruction guideline among the studied pregnant women, the present study revealed that there was a highly statistically significant relation between personal data (age, education, residence, occupation and economic status) and total level attitude regarding urinary tract infection among the studied pregnant women during pre-application of instruction guideline, while

there was a highly statistically significant relation between personal data (age, education, and residence) and total level knowledge regarding urinary tract infection among the studied pregnant women during post application of instruction guideline.

This result could be related to the personal attitude may be influenced by the personal characteristics. That control the perception and practices toward any matter. This result is congruent with the study achieved by Ahmadi et al., (2020) who found that, before implementation of instructional guidelines, it had found highly statistically significant correlation between age, education, residence and three phases of performance and after implementation of instructional guidelines. It seems that there is a discrepancy between the results of the study mentioned by Yazdi et al. (2020) and the information provided earlier. The study conducted by Yazdi et al. found no significant difference in terms of demographic variables and different dimensions of the Health Belief Model (HBM) regarding attitude and practice in the two study groups during the pre-post intervention stage. It's important to note that research findings can vary due to various factors, including differences in study design, sample size, intervention methods, and population characteristics. It's not uncommon for different studies to yield different results, particularly when investigating complex topics such as attitudes and practices related to urinary tract infection.

Regarding the correlation between the overall knowledge score and attitude score before and after implementing the instruction guideline among pregnant women in the study, the results revealed a significant and strong positive correlation. The researchers believe that this association can be attributed to the improvement in knowledge observed, which subsequently led to improvements in practice and attitude. As a result, this indicates the success of the instructional guidelines and their beneficial impact. This result is supported with a study performed by El-bana et al., (2020) who concluded that there is a statistically positive correlation between total knowledge and self-practice scores before and after the intervention. This finding suggests that an improvement in knowledge can lead to improved practices.

4. Conclusion

Prior to the implementation of instruction guidelines, over two-thirds of the pregnant women in the study had an unsatisfactory level of knowledge regarding urinary tract infections (UTI). However, after the application of instructional guidelines, more than three-quarters of them demonstrated satisfactory knowledge about UTI. Additionally, nearly three-quarters of the participants held a negative attitude towards UTI before the guidelines, whereas after the guidelines, over three-thirds of them displayed a positive attitude. The implementation of instructional guidelines resulted in a significant and highly statistically different improvement in both knowledge and attitude towards UTI among the studied women. Consequently, the instructional guidelines successfully achieved their objective of positively influencing knowledge and attitude regarding UTI in the participants. These findings provide support for the research hypothesis.

Recommendations

Routine screening of all pregnant women for early diagnosis and proper treatment of UTIs during the three trimesters of pregnancy, including bacteriuria examination and urine culture. The importance of raising women's awareness about physiological changes during pregnancy and warning signs, particularly regarding infections. The need for health education on self-care practices, which should be continuously reinforced, modified, or eliminated based on their benefits and potential risks. Furthermore, the concept of self-care should be integrated into all levels and strategies of women's healthcare. The significance of empowering women with knowledge and skills to take care of their own health during pregnancy. Replication of the current study on a larger probability sample is recommended for the generalizability of the results.

Further studies

Indeed, further research is necessary to explore the factors and barriers that influence the utilization of self-care practices throughout women's reproductive years. Understanding these factors can provide valuable insights into promoting and enhancing self-care behaviors among women. Investigating the utilization of self-care practices for managing various gynecological problems can contribute to the development of effective interventions and strategies in women's healthcare.

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