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Genital Tract Infection among Women in Reproductive Age: Educational Program

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Abstract: **Genital tract infections (GTIs) have been identified as a greater public and genital health challenge worldwide. They present a vast burden of disease and adversely influence genital health of women causing great mortality and morbidity in both adults and newborn infants and many of them intensify the risk for HIV transmission.** ***Aim:*** **To evaluate the effectiveness of an educational program on women with genital tract infection in reproductive age.** ***Methods:*** **A quasi-experimental study design was used at Bab El-sharia University Hospital, Al-Azhar University (Out-patient Gynecological Clinic).** ***Sample:*** **A purposive sample was used to recruit 170 women suffering from GTIs according to certain criteria: Having at least two of the signs and symptoms of GTIs, at reproductive age group (19- <45 years).** ***Tools:*** **1) Semi-structured questionnaire, and 2) Self–administered assessment sheet.** ***Results:*** **Findings of the present study showed that the majority of the studied women had inadequate practice preprogram compared with most of them had adequate practice post program intervention with highly statistically significant difference. Furthermore, minority of them correctly followed-up healthy habits regarding prevention of GTIs preprogram compared with most of them correctly followed-up healthy habits regarding prevention of GTIs post program intervention with highly statistically significant difference. Moreover, all of them are not seeking for medical assistance. Finally, there was a positive correlation between total women's knowledge and their total reported practice regarding GTIs post program intervention.** ***Conclusion:*** **The implementation of educational program was effective as a method in improving the practice and knowledge of women in reproductive age as regards genital tract infection and its preventive measures.** ***Recommendations:*** **1) The GTI preventive programs should be integrated into other reproductive health care programs such as family planning, maternal and child health services to provide broad-based reproductive health care. 2) Replication of the study on a larger sample and in different geographical areas in Egypt for generalization of findings.**

Keywords: **Educational program, Genital tract infection, reported practices and knowledge regarding GTIs.**

I. INTRODUCTION

Reproductive health known as a condition in which reproduction is completed in a state of complete physical, mental and social well-being and not just absence of disease or disorder of the reproductive process. The poor health of Egyptian women is a concern on both national and individual level ***(Simarjeet et al., 2017).***

Being a healthy woman is essential to have good genital health and to have a healthy baby. Genital health problems comprise the master cause of ill health in women of reproductive age group worldwide especially in developing countries. Neglecting these preventable and treatable conditions can lead to distressful situations among many women ***(UNPF, 2014).***

Genital tract infections generally seen as a silent epidemic and is one of the main public health problems and standing second after maternal morbidity and mortality- as the cause of healthy life loss among sexually active women of reproductive age in developing countries, the extent of GTIs has increased dramatically throughout the world. The WHO

appreciated that each year there are over 340 million new cases of sexually transmitted infection and genital tract infection (STI/GTI) in which 75 to 85% occur in developing countries ***(Sreelatha, 2017).***

Genital tract infections can be a threat to women's health and lead to severe consequences such as pelvic inflammatory disease (PID), infertility in women and men, ectopic pregnancy, and adverse pregnancy outcomes involving miscarriage, stillbirth, preterm birth, congenital infection, neonatal and infant morbidity and mortality. The GTIs are also known to increase the susceptibility of HIV transmission and acquisition. It is rated that about one-third of the 500,000 maternal deaths occurring each year have been due to infectious pregnancy complications, e.g. post- abortion and postpartum infections ***(Ebrahimi et al., 2015 & UNPF, 2017).***

The pattern and the frequency of genital tract infections depend mainly on the sociocultural setting in which the women live and has shown an increasing prevalence among the lower socioeconomic class ***(Balamurugan & Bendigeri, 2018).*** In contrast, women with higher standards of living show considerably lower levels of prevalence of genital health problems due to better nutrition, sanitation and hygienic conditions. Further, women living in rural areas have a higher chance of getting diseases associated with genital tract infection due to lack of knowledge on diseases related to genital tract and their symptoms ***(Dibelli et al., 2014).***

Furthermore, these infections may be due to lack of hygiene or adoption of risky behaviors such as not using condoms or having several sexual partners. Women from low educational backgrounds appear to be silent regarding their genital and sexual health issues than women from urban communities ***(Karou et al., 2012).*** Generally, women's in reproductive age with self-reported symptoms of GTIs do not seek treatment because of existing taboos and restraint as regards sexual and reproductive health. They hesitate to discuss the reproductive problem, especially due to shame and embarrassment ***(Petrova et al., 2015).***

Preventing GTIs is the most effective way of decreasing the unfavorable consequences. Preventing the spread of GTIs demands that women's in reproductive age at risk of gaining infection must change their hygienic practices and behaviors. It includes the following: improving knowledge on reproductive physiology, improving menstrual and personal hygiene, reducing the use of harmful substances, improving nutrition, providing proper help-seeking behavior, improving health services, and changing sexual behaviors and practices ***(Salhan, 2018).***

Finally, as women in reproductive age are often victims of various gynecological morbidities, nurses can take an active part in empowering and educating them to avoid and combat GTIs through improving their awareness and clearing the misconceptions as regards GTIs ***(Ching, 2014 and Rabieipoor et al., 2015).***

SIGNIFICANCE OF THE STUDY

In developing countries, women in reproductive age are at high risk for various genital health problems especially GTIs diagnosis because of a culture of silence regarding GTIs, misunderstanding of the women about the causes and adequate health behavior and self-prevention. All of these lead to increasing the incidence of GTIs and its complications. Education of performance skills and helping patients to gain knowledge, to make them follow self-care behaviors, accept and collaborate inadequate health behavior, will result in disease recovery and complications control ***(Sevil et al., 2015)***. So educational program are developed to increase practice and knowledge of women in reproductive age about genital tract infection and its preventive measures.

AIM OF THE STUDY

This study aims to evaluate the effectiveness of an educational program on women with genital tract infection in reproductive age through the following:

1- Assessment of studied women knowledge about genital tract infection pre/post program.

2- Assessment of studied women practice and preventive measures about genital tract infection pre/post prgram.

3- Implementation and evaluation of the educational program.

Research hypothesis

Reproductive women age who received educational program would have improved practices and knowledge regarding genital tract infection and its preventive measures than before educational program.

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II. SUBJECTS AND METHODS

Design:

A quasi-experimental study design was used to evaluate the effectiveness of an educational program on women with genital tract infection in reproductive Age in Bab El-sharia University Hospital, Al-Azhar University (Out-patient Gynecological Clinic).

Sample Type:

A purposive sample was used.

Setting:

The study was conducted at the Out-patient Gynecological Clinic, in Bab El-sharia University Hospital, Al-Azhar University, Egypt.

Subjects:

The actual sample size (170) that was selected from the total number (200) after filling in questionnaires (of those who are suffering from different symptoms of genital tract infections). Criteria of selection: women suffering from GTIs who will attend Out-patient Gynecological Clinic for checkup and follow up according to the following criteria: Having at least two of the signs and symptoms of GTIs as abnormal vaginal discharge, burning, itching, backache, abdominal pain, dyspareunia etc., and at reproductive age group (19- < 45 years).

Tools of Data Collection:

Two tools of data collection were used:

1- **A semi-structured questionnaire:** (1): To assess women's characteristic. (2): To assess women's families' characteristics. (2): To assess self-reported symptoms of women regarding prevention of GTIs.

2- **Self–administered assessment tool:** (1): To assess women's personal practices regarding prevention of genital tract infection. Total personal practices score was classified as: Adequate: 60% or more, and inadequate: Less than 60%. (2): To assess if the women correctly follow up healthy habits regarding prevention of GTIs. (3): To assess women's knowledge regarding genital tract infection and sexually transmitted disease. Total knowledge score was classified as: Satisfactory: 60% or more, and unsatisfactory: less than 60%.

Methods of data collection:

The study was conducted according to the following steps:

An official approval letter clarifying the purpose of the present study was issued from the Dean of the Faculty of Nursing at Ain Shams University, to the General Director Bab El-sharia University Hospital, Out-patient Gynecological Clinic Director, and Scientific Research Ethical Committee in the Faculty of Nursing as an approval to conduct this study. The tool used in the study was developed by the researcher after reviewing the relevant and related literature. All studied women (n= 170) were invited to participate in the study. This study started from beginning of May 2018, till the end of February 2019 for data collection. Data were collected through three phases: Assessment phase (pre-test), implementation phase (conducting education program), and follow up and evaluation phase (post-test):

Phase I. Assessment phase (pre-test):

a. During assessment phase, the researcher held the first meeting with each woman after doctor examination to introduce herself and briefly explained the nature and the purpose of the study. They were informed that participation in this study was voluntary and they had the right to withdraw at any time without giving any reason. Oral approval of women to share in this study was achieved.

b. After obtaining the acceptance from each woman to participate in the current study, the researcher provided an overview and clarification about the assessment tools questions to the women. Then, the semi-structured questionnaire was distributed to each woman to assess women's general characteristics & women's families' characteristics and their

reported symptoms and treatment seeking behavior regarding prevention of GTIs. The questionnaire took about 15-20 minutes to be completed.

c. The second meeting was conducted after analysis of the first semi-structured questionnaire that was distributed in the first meeting to select only the women who suffer from GTI symptoms. The researcher distributed the semi-structured questionnaire to assess women's personal practices & women's healthy habits & women's sources of reported practices and knowledge regarding prevention of genital tract infection. It was filled in by the women in a time ranged from 20 to 30 minutes to be completed.. The assessed numbers of women who participated per week ranged from 1-2 groups each from 17 women (the phase of assessment took the first 2 months).

Phase II. Implementation phase (conducting education program):

After assessing the women's' personal practices & healthy habits and knowledge regarding prevention of genital tract infection using the pretest semi-structured questionnaire, the total sample (170) was divided into small groups 10 groups each group consisted of 17 women. The total number of educational program sessions was 8 sessions, two to three sessions for each group (3 days/week), each session was conducted for one to two hours in the time they are free, by organization with the women and with the Director of the Technical Institute for Nursing, which belongs to Bab El-sharia University Hospital, Al-Azhar University.

Health education sessions were given to the women in the form of lectures and group discussions by using audio-visual aids, they emphasized on improving women's practices and knowledge. An additional 15 minutes were assigned at the end of the lecture for an open discussion with the women about this session topic and feedback from the women was obtained to ensure that they got the maximum benefits.

An illustrated booklet containing information about genital tract infection was distributed to the studied women who are able to read and write in the first session of the educational program. As well, the researcher communicated with women via telephone calls for instructions and reinforcement.

Phase III. Evaluation phase (post-test)

The effectiveness of the program was evaluated immediately after the pretest and after one month from the education program implementation using the same self-administered questionnaire.

Two evaluations were done for each woman. The first one was at the beginning of the study as a baseline data (pre-test). The second evaluation was conducted after one month from the education program implementation in order to detect the effect of education program on practices and knowledge of reproductive women age regarding genital tract infections (post-test).

Ethical considerations:

All official permissions to carry out the study were secured from pertinent authorities. All women were informed about the importance and aim of this study. Oral consents were obtained from all the studied women. All women were informed that their participation is voluntary and their rights to withdraw at any time without giving any reason, and confidentiality of the information were assured. As well, the women were informed that the collected data would be used only for the purpose of the present research, as well as for their benefits.

Statistical analysis:

Data was collected, coded and entered to a personal computer (P.C) IBM compatible 2.6 GHZ. They were analyzed using Statistical Package for Social Science (SPSS), under windows version 18. The collected data were organized, revised, analyzed, tabulated using number and percent distribution. Proper statistical tests were used to determine whether there were statistically significant differences between variables of the study. The statistical tests used in this study were: Chi-square test (X^2) for qualitative variables, Correlation coefficients (r) to find correlations between quantitative data, Spearman rank correlation to find correlations between categorized data. Statistical insignificant difference was considered when $P>0.05$, while it was a statistical significant difference when $P<0.05$, and statistical highly significant difference was considered when $P<0.00$.

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III. RESULT

Table (1a) shows that, two fifths of the studied women were in the age group less than 20 years, with a mean age of 25.05 ± 8.67 and less than half had secondary education (40% & 45.3% respectively). The same table reveals that almost three fifths of them were married, while slightly more than three quarters were housewives, and around two thirds reside urban areas (60.6%, 75.9% & 65.3% respectively).

Table (1b) indicates that, the great majority (86.5%) of the studied women had a nuclear family and less than half of them are from middle and low class (44.7% & 42.9% respectively). Besides, most (91.2%) of the studied women had healthy housing conditions.

Table (2a) reveals that the majority of the studied women complained from presence of vaginal discharge which is abnormal (80% & 78% respectively). In addition, slightly more than three fifths (61%) of them described it as thick white vaginal discharge as small pieces like white cheesy. The same table reveals that relatively high percentage of the studied women complained from lower back pain (63.5% & 79% respectively).

Table (2b) presents that, more than half of the studied women had problem with the menstruation and the most prominent one comes with severe pain, followed by not coming in time, then by blood clotting (45.3%, 32.3%, 27.4% & 24.5% respectively). The same table reveals that more than half of them complained from continuous lower abdominal pain and less than half of them described it as severe pain without anyone touches their abdomen (81.8% & 53.1% & 47.6% respectively).

Table (2c) displays that, almost one quarter (25.9%) of the studied women sometimes felt burning sensation during urination and less than one fifth (19.4%) of them felt straining sensation during urination. The same table clears that, more than one quarter of the studied women didn't have any sexual problems during relation with husband, while more than two thirds of women's husbands were free from any sexual problems (28.1% & 68.9% respectively).

Table (3) shows that, the majority (84.3%) of the studied women were not seeking physician's consultation pre program as they perceive them as simple things that disappear alone as compared with 90.2% of them who changed post-program intervention, with highly statistically significant difference ($P < 0.000$).

Table (4a) indicates that, a minority (12.4%) of the studied women had correctly followed-up healthy habits regarding prevention of GTIs preprogram as wearing cotton underwear and changing it frequently, compared with 89.4% of them who correctly followed-up healthy habits regarding prevention of GTIs post-program intervention, with highly statistically significant difference ($P < 0.000$).

Table (4b) reveals that, minorities of the studied women had correctly followed-up healthy habits regarding menstruation hygiene preprogram as using sanitary pads made from cotton, changing them often each bath and taking shower during menses (65.3%, 17.6% & 11.8% respectively) compared with majority of them who correctly followed-up healthy habits regarding menstruation post-program intervention (89.4% & 82.3% & 64.7% respectively) with highly statistically significant difference ($P < 0.000$).

Table (4c) shows that, a minority (6.7%) of the studied women had correctly followed-up healthy habits regarding sexual relation hygiene preprogram as washing well before and after sexual intercourse with warm water and antiseptic solution externally according to doctors' order compared with 81.1% of them who correctly followed-up healthy habits regarding sexual relation hygiene post-program intervention, with highly statistically significant difference ($P < 0.000$).

Figure (1) illustrates that, the majority (84.1%) of the studied women had inadequate total reported practices pre-program compared with 92.9% of them had adequate total reported practices post-program intervention, with highly statistically significant difference ($P <0.000$).

Table (5a) indicates that more than one quarter of the studied women had lack of knowledge related to the concept, sign and symptoms, and predisposing factors of GTIs preprogram (36.5%, 28.2% & 34.7% respectively) compared with more than half of them had adequate knowledge post-program intervention (52.9%, 76.5% & 71.2% respectively) with highly statistically significant difference ($P < 0.000$).

Table (5b) reveals that more than one quarter of the studied women had lack of knowledge related to complication and the types of GTIs preprogram (29.4% & 56.2% respectively) compared with majority of them had satisfactory knowledge post-program intervention (64.7% &73.5% respectively) with highly statistically significant difference (P < 0.000).

Table (5c) shows that, a minority (1.8%) of the studied women identified all names of STDs preprogram, and almost three quarters (74.1%) of them believed that women who complain from GTIs didn't need help from professional person compared with 69.4% of them identified all names of STDs and all (100%) of them believed in help from professional person post-program intervention with highly statistically significant difference (P <0.000).

Figure (2) presents that, the majority (84.7%) of the studied women had unsatisfacory total knowledge pre-program about GTIs and STDs, compared with 89.4% of them had satisfactory total knowledge post-program intervention with highly statistically significant difference (P<0.000).

Table (6) reveals that, there were no correlations (P>0.05) between total women's knowledge and their total reported practice regarding GTIs pre-program intervention. Meanwhile, there were positive correlations (P<0.05) between total women's knowledge and their total reported practice regarding GTIs post program intervention.

Table (1a): Distribution of the studied women according to their characteristics (n=170)

Items	Total number (170)	
	No	%
Age (in years)		
< 20	68	40
20 - < 30	52	30.6
30 - < 40	37	21.8
40 +	13	7.6
Mean ± SD	25.05 ± 8.67	
Range	15 – 48	
Religion		
Muslim	170	100
Marital status		
Married	103	60.6
Single	67	39.4
Level of education		
Illiterate	36	21.2
Read and write	6	3.5
Primary/preparatory	23	13.5
Secondary	77	45.3
University	28	16.5
Job		
Housewife	129	75.9
Working	41	24.1
Residence		
Rural	59	34.7
Urban	111	65.3

Table (1b): Distribution of the studied women according to their families' characteristics (n= 170).

Items	Total number (170)	
	No	%
Family type		
Nuclear	147	86.5
Joint	23	13.5
Socio-economic status		
High	21	12.3
Low	73	42.9
Middle	76	44.7

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Housing condition (according to women's description)		
Healthy	155	91.2
Unhealthy	15	8.8

Table (2a): Distribution of the studied women according to their reported symptoms of GTIs.

Items	Total number (170)	
	No	%
There is vaginal discharge		
No	29	17.1
Yes	136	80
Sometimes	5	2.9
The vaginal discharge is:	**N = 141**	
Normal	8	5.7
Not normal	110	78
I don't know	23	16.3
Description of vaginal discharge	**N = 141**	
Thick white vaginal discharge as small pieces like white cheesy	86	61
Yellow thick secretion sometimes tending to green with fishy odor	45	31.9
Sometimes is thin colorless, other time is white creamy	1	0.7
White creamy secretion	2	1.4
Thin colorless secretion	7	5
Feeling any pain in the back	**N = 170**	
No	32	18.8
Yes	108	63.5
Sometimes	30	17.6
Site of pain	**N = 138**	
Lower back	109	79
Mid back	20	14.5
All the back	9	6.5

Table (2b): Distribution of the studied women according to their reported symptoms of GTIs.

Items	Total number (170)	
	No	%
Menstruation is regular or there is problem with it		
Regular	68	40
There is problem	102	60
In the case of the presence of problem, it is	**N = 102**	
Not coming in time	28	27.4
Staying long time	16	15.7
Blood clotting	25	24.5
Coming with severe pain	33	32.3
Did you feel any pain in the lower abdomen?	**N = 170**	
No	25	14.7
Yes	139	81.8
Sometimes	6	3.5
The pain is:	**N = 145**	
Continuous	77	53.1
Not continuous	68	46.9
Description of this pain	**N = 145**	
Severe pain without anyone touches my abdomen	69	47.6
Severe pain when someone touches my abdomen	3	2.1
Present in the two sides of my lower abdomen	27	18.6
Severe pain extended to my legs	22	15.2
All the previous	24	16.5

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Table (2c): Distribution of the studied women according to their reported symptoms of GTIs.

Items	Total number (170)	
	No	%
Feeling burning sensation during urination		
No	92	54.1
Yes	34	20
Sometimes	44	25.9
Feeling straining sensation during urination		
No	111	65.3
Yes	33	19.4
Sometimes	26	15.3
Descending urine spots especially during straining or coughing		
No	95	55.9
Yes	50	29.4
Sometimes	25	14.7
Did you feel any signs or symptoms from the following during sexual intercourse?	**N = 103**	
Internal pain or friction	22	21.3
Itching or burning sensation	27	26.2
Back pain	25	24.3
Nothing	29	28.1
Did your husband complain from any sexual problems?	**N = 103**	
Yes	32	31.1
No	71	68.9
This problem is	**N = 32**	
Secretion or pus from urethra	29	90.6
Tumor and swelling of the testis	3	9.4

Table (3): Distribution of the studied women according to their reported knowledge of practices regarding symptoms of genital tract infection pre/post educational program.

Women's personal practices	Total number (170)				X^2 & P value	
	Pre		Post			
	No	%	No	%		
Vaginal secretion	**N = 141**		**N = 141**		X^2	**P value**
Nothing	54	38.3	4	2.8	54.26	0.000**
Vaginal douche prescribed by the pharmacist	40	28.4	10	7.1	21.88	0.000**
Washing with water and soap internally	10	7.1	5	3.5	1.76	0.185
Washing with water and soap externally	11	7.8	20	14.2	2.94	0.087
Staying in warm water	20	14.2	12	8.5	2.26	0.133
Seeking for the physician's consultation	6	4.2	90	63.8	111.44	0.000**
Problems with menstruation	**N = 102**		**N = 102**			
Nothing	86	84.3	10	9.8	113.85	0.000**
Seeking for the physician's consultation	16	15.7	92	90.2	113.85	0.000**
Abdominal pain (pelvic pain)	**N = 145**		**N = 145**			
Nothing	71	49.0	2	1.4	87.16	0.000**
Analgesics without prescription	40	27.6	27	18.6	3.28	0.070
Seeking for the physician's consultation	34	23.4	116	80	92.86	0.000**
Sexual intercourse problems	**No = 74**		**No = 74**			
Nothing	49	66.2	30	40.5	9.80	0.002*
Prevent sexual intercourse	25	33.8	20	27.0	0.798	0.372
Seeking for the physician's consultation	0	0	24	32.4	28.65	0.000**
Burning sensation with urination	**N = 78**		**N = 78**			
Nothing	19	24.3	0	0	21.64	0.000**
Drinking a lot of water	36	46.1	34	43.6	0.104	0.747
Staying in warm water	14	17.9	1	1.3	12.47	0.000**

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Women's personal practices	Total number (170)				X^2 & P value	
	Pre		Post			
	No	%	No	%		
Seeking for the physician's consultation	9	11.5	43	55.1	33.35	0.000**
Back pain	**No = 138**		**No = 138**			
Nothing	67	48.5	6	4.3	69.30	0.000**
Sleeping on my back	46	33.3	20	14.5	13.46	0.000**
Using ointment without prescription	10	7.2	25	18.1	7.36	0.007*
Seeking for the physician's consultation	15	10.9	87	63.0	80.62	0.000**

**Highly statistically significant

Table (4a): Distribution of the studied women according to their correctly follow up healthy habits regarding the prevention of GTI pre/post educational program.

Women's healthy habits regarding prevention of GTIs	Total number (170)				X^2 & P-value
	Pre		Post		
	No	%	No	%	
Follow a healthy diet, enough rest and sleep	23	13.5	160	94.1	X^2 =222.11 P =0.000**
Wear cotton/wide underwear and change it frequently.	21	12.4	152	89.4	X^2 =201.96 P =0.000**
Consult the physician before taking any antibiotics	18	10.6	150	88.2	X^2 =205.02 P =0.000**
Avoid using perfumed sprays for the genital area.	22	12.9	110	64.7	X^2 =95.89 P =0.000**
Stop using bad things such as vaginal douche continuously, enter fingers into the vagina, air compressors, cotton with honey/vinegar/carbonate without consultation	22	12.9	110	64.7	X^2 =95.89 P =0.000**
Cut your nails/wash your hands continuously in case of itching	33	19.4	145	85.3	X^2 =147.90 P =0.000**
Boiling internal clothes & spreading it on the sun and ironing it before using it.	18	10.6	165	97.1	X^2 =255.72 P =0.000**

****Highly statistically significant**

Table (4b): Distribution of the studied women according to their correctly follow up healthy habits regarding prevention of GTIs pre/post educational program.

Women's healthy habits regarding menstruation hygiene	Total number (170)				X^2 & P value
	Pre		Post		
	No	%	No	%	
Following personal hygiene especially during menstruation which includes:	111	65.3	152	89.4	X^2 = 28.22 P =0.000**
Taking shower during menses	20	11.8	110	64.7	X^2 = 100.88 P =0.000**
Disinfecting toilet before and after use	10	5.9	70	41.2	X^2 = 58.85 P =0.000**
Using sanitary pads made from cotton	111	65.3	152	89.4	X^2 = 28.22 P =0.000**
Changing pad every 4 hours especially in 1st day	12	7.0	100	58.8	X^2 = 103.11 P =0.000**
Changing pads after each bath	30	17.6	140	82.3	X^2 = 142.35 P =0.000**
Frequently washing hands before and after toilet	100	58.8	120	70.6	X^2 = 5.15 P =0.023*

****Highly statistically significant**

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Table (4c): Distribution of the married women according to their correctly follow up healthy habits regarding prevention of GTIs pre/post educational program.

Women's healthy habits regarding sexual relation	Total number (74)				X^2 & P-value
	Pre		Post		
	No	%	No	%	
Following safe sexual practices	40	54.0	50	67.6	X^2 = 2.84 P =0.092
Preventing sexual intercourse during treatment	30	40.5	45	60.8	X^2 =6.08 P =0.014*
Washing well before and after sexual intercourse with warm water and antiseptic solution externally according to doctor's order.	5	6.7	60	81.1	X^2 = 82.98 P =0.000**

****Highly statistically significant**

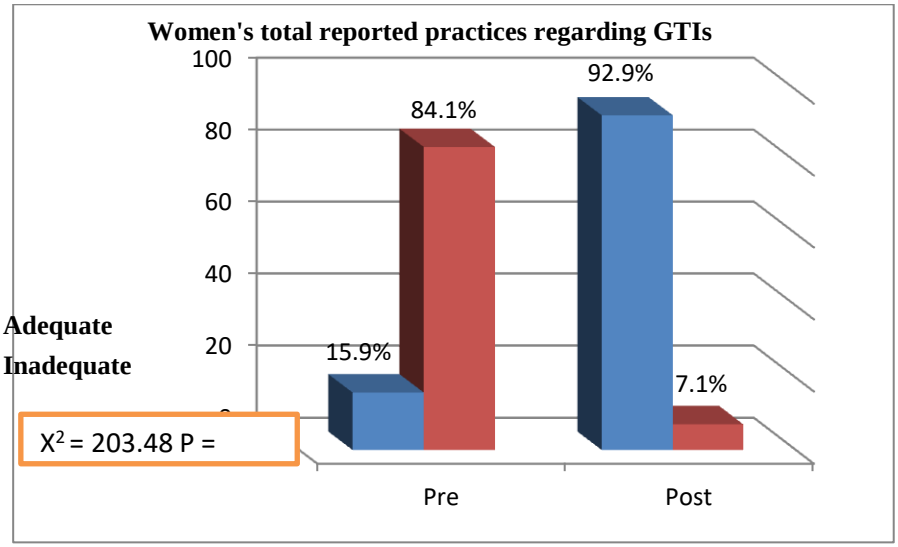

Figure (1): Distribution of the studied women according to their total reported practices regarding symptoms of genital tract infection pre/post educational program.

Table (5a): Distribution of the studied women according to their knowledge regarding genital tract infection pre/post educational program.

Women's knowledge	Total number (170)				X^2 & P value
	Pre		Post		
	No	%	No	%	
Concept of genital tract infection					
Secretion comes to the women from the under	56	32.9	18	10.6	X^2 =118.65 P =0.000**
Microorganisms attack the genital tract system because of cleanless and weakness in the health.	46	27.0	51	30	
All the previous	6	3.5	90	52.9	
Unknown	62	36.5	11	6.5	
Signs and symptoms of genital tract infections					
Abnormal vaginal secretion	31	18.2	12	0.7	X^2 =101.74 P =0.000**
Itching, burning , redness	36	21.2	8	4.7	
Pain during sexual intercourse	9	5.3	5	2.9	
Pain in the lower abdomen, during menses	7	4.1	6	3.5	
All the previous	39	22.9	130	76.5	
Unknown	48	28.2	9	5.3	

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Predisposing factors of genital tract infections					
Social/financial status of the family	11	6.5	16	9.4	
Bad health habits and pregnancy	7	4.1	4	2.3	
Nutritional /health status for women	20	11.8	3	1.8	X^2 =192.15
Habits/sexual behavior for couple	11	6.5	3	1.8	P =0.000**
Lack of quality of health services	20	11.8	11	6.5	
All the previous	42	24.7	121	71.2	
Unknown	59	34.7	12	7.0	

****Highly statistically significant**

Table (5b): Distribution of the studied women according to their knowledge regarding genital tract infection pre/post educational program.

Women's knowledge	Total number (170)				X^2 & P value
	Pre		Post		
	No	%	No	%	
The effect of genital tract infections on the women's health					
Delayed pregnancy/infertility	25	14.7	4	2.3	
Abscess in the pelvic	46	27.0	10	5.9	X^2 = 161.86
Increase incidence of sexually transmitted disease	37	21.8	18	10.6	P =0.000**
Infant death	7	4.1	13	7.6	
All the previous	5	2.9	110	64.7	
Unknown	50	29.4	15	8.8	
Types of genital tract infections					
Sexually transmitted disease	37	21.8	13	7.6	
Lower genital tract infection	25	14.7	18	10.6	X^2 = 161.86
Upper genital tract infection	7	4.1	10	5.9	P =0.000**
All the previous	5	2.9	125	73.5	
Unknown	96	56.2	4	2.3	
Genital tract infections can cause problem between couple					X^2 = 30.68
No	90	52.9	32	18.8	P =0.000**
Yes	80	47.0	138	81.2	
In the answer yes, how?	**N = 80**		**N = 138**		
Husband leaves his wife	64	80	10	7.2	X^2 = 140.71
Divorces/disintegration of the family	4	5	3	2.2	P =0.000**
Hits and insults his wife	5	6.2	15	10.9	
All the previous	7	8.7	110	79.7	

****Highly statistically significant**

Table (5c): Distribution of studied women according to their knowledge regarding sexually transmitted disease pre/post educational program.

Women's knowledge	Total number (170)				X^2 & P value
	Pre		Post		
	No	%	No	%	
You heard about sexually transmitted diseases					
No	114	67.0	26	15.3	X^2 =14.46
Yes	56	32.9	144	84.7	P =0.000**
The disease is	**N = 56**		**N = 144**		
Syphilis	5	8.9	10	6.9	
Chlamydia	10	17.8	5	3.5	X^2 =147.51
AIDS	30	53.6	24	16.6	P =0.000**
Gonorrhea	10	17.8	5	3.5	
All the previous	1	1.8	100	69.4	
Husband and wife should be treated in the same time					
No	100	58.8	0	0	X^2 = 141.67

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Yes	70	41.2	170	100	P =0.000**
In the answer yes, why?	**N = 70**		**N = 170**		--
If someone is treated alone, he/she will transmit infection to the other	70	100	170	100	
Did you believe that the women who complain from genital tract infections need help from professional person					
No	126	74.1	0	0	X^2 = 50.54 P =0.000**
Yes	44	25.9	170	100	

****Highly statistically significant**

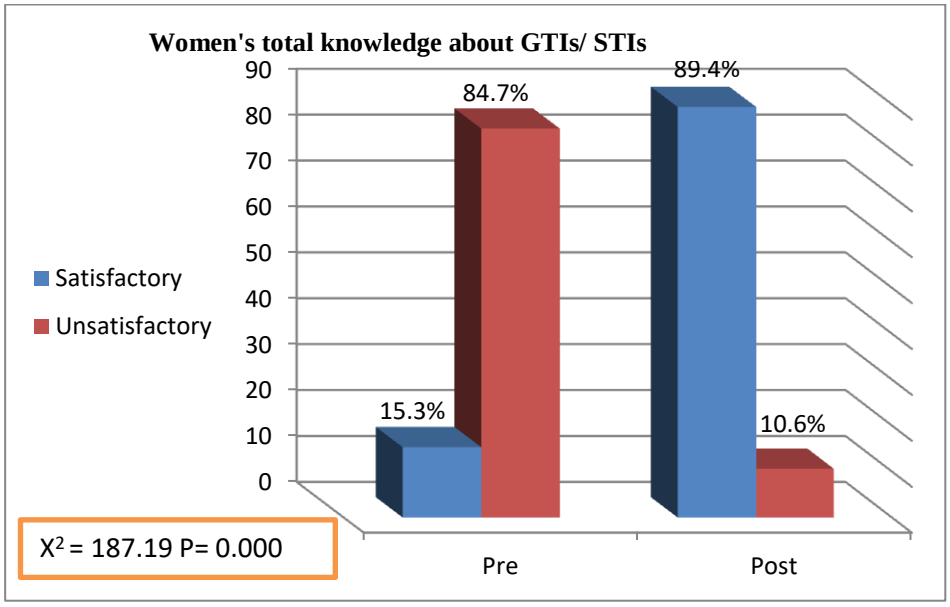

Figure (2): Distribution of the studied women according to their total knowledge about genital tract infection and sexually transmitted disease pre/post educational program.

Table (6): Correlations between the studied women's total knowledge and their total reported knowledge of practices regarding genital tract infection pre/post program.

Total women' reported knowledge of practices	Total women' knowledge			
	Pre program		Post program	
	R	P	R	P
Pre program	0.021	0.328	-	-
Post program	-	-	0.674	0.010*

*Correlation is significant at p< 0.05

IV. DISCUSSION

The aim of the present study was to evaluate the effectiveness of an educational program on women with genital tract infection in reproductive Age. Regarding to characteristics of the studied women, result of the present study revealed that, two fifths of them were in the age group less than 20 years, with a mean age of 25.05 ± 8.67. This result was consistent with ***Ebrahimi et al. (2015)***, who considered this age as a risk factor to infection and mentioned that, women in reproductive age were vulnerable to significantly high rates of infections and infection complications **(*Ebrahimi, 2015*).**

Concerning residence and education, results of this present study showed that, almost two thirds of them were living in urban areas and less than half of them had secondary education. These results were in partial agreement with those of ***Anitha et al. (2016)***, who found that, among women of reproductive age group (15-49 years), in a Chennai based study, 67.5% had secondary education or above and more than three quarters of girls were from rural areas**.**

Regarding marital status and job, results of the current study indicated that, slightly more than three fifths of the studied women were married and slightly more than three quarters were housewives. These results were in line with those of ***Alka et al. (2014)***, and ***Ebrahimi et al. (2015)***, who found that, the majority of women in reproductive age with common genital tract infections were married and housewives.

Concerning women's families' characteristics, the finding of the present study showed that the great majority of the studied women had a nuclear family. This result disagreed with that of ***Alka et al. (2014),*** who revealed that the majority of the sample has belonged to the joint family. While less than half of them belonged to the middle and low class. This result was in agreement with that of ***Eckert, (2015)***, who found that most of the studied women belonged to the middle socioeconomic class and cleared that, socioeconomic factors and insufficient resources increase the risk of having genital tract infection**.**

Regarding other women's families' characteristics, the finding of the present study indicated that most of the studied women reported that they had a healthy housing condition. This result was consistent with that of a very recent study carried out by ***Abd El-Salam et al. (2018)***, who found among female university students, 82.2% live in healthy house according to their description.

Regarding women's self-reported symptoms of genital tract infections, result of the present displayed that most commonly self-reported symptoms of GTIs were continuous lower abdominal pain, then abnormal thick white cheesy, then continuous lower back pain, then severe pain with menstruation, then burning sensation with urination, then itching or internal pain with sexual relation as reported by majority of them respectively. This result disagreed with ***Verma et al. (2015)***, and ***Sreelatha et al. (2017)***, who found that, the most commonly reported symptoms among women in urban and rural areas of Delhi were lower backache (63%), followed by lower abdominal pain (49%), and vaginal discharge (36%)**.**

Regarding women's reported knowledge of practices regarding symptoms of genital tract infections pre/post educational program, finding of the present study revealed that, the majority of the studied women had personal practices regarding symptoms of GTIs that was nothing pre program as they perceive it as a simple things that will disappear alone compared with most of them their personal practices changed post-program intervention as seeking for consulting the physician with highly statistically significant difference. This may be due to the insufficient knowledge and lack of awareness about healthy practices that negatively affect their practices. According to ***Petrova et al. (2015),*** and ***Mudey et al. (2019)***, who pointed out to the insufficient knowledge and lack of awareness about hygienic practices that negatively effect on knowledge and practice level**.**

The current study cleared that, a minority of the studied women had correctly followed-up healthy habits regarding the prevention of GTIs preprogram as wearing cotton underwear and changing it frequently, compared with most of them who correctly followed-up healthy habits regarding prevention of GTIs post-program intervention, with highly statistically significant difference. This result was consistent with those of ***Petrova et al. (2015),*** and ***Glenville, (2019),*** which revealed that type and cleanliness of the underwear as well as the frequency of changing it were important factors regarding the risk of getting an infection. Nylon and synthetic underwear don't absorb perspiration as much as the cotton underwear, causing the perineum to remain humid and leading to increased risk of genital tract infections with a highly statistically significant difference after educational program clarifying that underwear should be made from cotton and frequently changed.

The present study revealed that minorities of the studied women had correctly followed-up healthy habits regarding menstruation hygiene preprogram as using sanitary pads made from cotton, changing them often each bath and taking shower during menses**,** compared with the majority of them who correctly followed-up healthy habits regarding menstruation hygiene post-program intervention with highly statistically significant difference. This may be due to increased awareness about the health education program. This result was in agreement with ***Abd EL-Menim et al. (2018)***, who found that the majority of studied girls take shower during menstruation after educational programs compared with preprogramming, with a highly statistically significant difference. This may be attributed to the traditionally forbidden bathing during menstruation in rural cultures in Egypt**.**

Avery recent study carried out by ***Unni, (2019)***, who showed that 30.5% of women did not consider bathing during menstruation healthy, they have a persistent belief that bathing during the menstruation is dangerous. The menstruation is

a period of uncleanliness and the individuals are at the highest risk of infection which requires regular bathing and reported that a significantly higher proportion was found to bathe during menstruation after they had received health education.

Results of the current study presents that, a minority of the studied women had correctly followed-up healthy habits regarding sexual relation hygiene preprogram as washing well before and after sexual intercourse with warm water and antiseptic solution externally according to doctors' order compared with most of them who correctly followed-up healthy habits regarding sexual relation hygiene post-program intervention, with highly statistically significant difference. This might be explained that married women have a higher level of knowledge about genital hygiene practices especially after health education program which is needed to maintain reproductive health. This result was in disagreement with those of ***Bobhate and Shrivastava, (2018),*** who reported that, for coital hygiene practices the infected woman was a person who was less likely to practice pre or post-coital care. The woman who cleans perineum externally before coitus this one helps to prevent vaginal infection and manage undesirable vaginal odor.

This result was argued with ***Abd El-Salam et al. (2018)***, who found that most married students in their study have done pre and post-coital care post-intervention. This might be explained that married students have a higher level of knowledge about genital hygiene practices especially after health education program which is needed to maintain reproductive health**.**

Considering total women's reported practices regarding prevention of genital tract infection pre/post educational program, in the current study the majority of the studied women had inadequate total reported practices pre-program compared with most of them had adequate total reported practices post-program intervention, with a highly statistically significant difference. The previous result was supported by those of ***Soudabeh et al. (2015),*** and ***Abd El-Salam et al. (2018)***, who found similar results.

Concerning women's knowledge regarding genital tract infection pre/post educational program, result of the present study cleared that , more than one quarter of the studied women had lack of knowledge related to the concept, signs and symptoms and predisposing factors of GTIs preprogram compared with more than half of them had adequate knowledge post-program intervention, with highly statistically significant difference. This result was in accordance with that of ***Renju (2018)***, who revealed that majority of the adolescent girls had inadequate knowledge regarding vaginitis and its prevention in the pre-test compared to all of them had adequate knowledge regarding vaginitis and its prevention in the post-test. This result was also in agreement with those of ***Abd El-Salam et al. (2018)***, who noticed that a highly statistically significant difference regarding all items related to genital tract infections in pre and post-intervention.

Finding of the present study showed that more than half of the studied women had lack of knowledge related to the types of GTIs and less than half reported can cause problems between couple preprogram compared with around three quarters and majority of them had adequate knowledge post-program intervention respectively with highly statistically significant differences. This finding reflects the importance of reproductive health education that should be considered as part of the reproductive health services, for improving knowledge and reducing reproductive health problems among women in reproductive age. In a similar study, ***Chauhan et al. (2014)***, indicated that planned teaching program regarding genital tract infections was effective in increasing the knowledge of women.

Concerning women's knowledge regarding sexually transmitted diseases pre/post educational program, the present study cleared that, a minority of the studied women identified all names of STDs preprogram and almost three quarters of them believed that the women who complained from GTIs didn’t need help from professional person compared with more than two thirds of them identified all names of STDs and all of them believed in help from professional person post-program intervention, with highly statistically significant differences. These results were in line with those of ***Dawn and Biswas, (2018),*** who conducted a study in rural west Bengal and revealed that knowledge of the names of STDs was poor as only 23.4% mentioned gonorrhea as a cause of STD while 16.0% mentioned syphilis respectively**.**

In relation to total women's knowledge about GTIs and sexually transmitted diseases, result of the present study showed that, the majority of the studied women had unsatisfacory total knowledge pre-program compared with most of them had satisfactory total knowledge post-program intervention, with highly statistically significant difference. Hence, the finding of present study interpreted that, implementing an educational program regarding GTIs and its preventive strategies was effective in increasing the level of women's knowledge. This result was in agreement with those of ***Abd El-Menim et al.***

(2018) and Abd El-Salam et al. (2018), who found that, more than half of females had a poor knowledge in pre-intervention compared to about two thirds had good knowledge in post-intervention. This may be attributed to insufficient education related to reproductive health, which improved post intervention.

As regards the relation between women's total knowledge and their total reported practices, the present study noticed that there were positive correlations between total womens knowledge and their total reported practice regarding GTIs post program intervention. This might be explained that, when knowledge improves the practice tend to be healthier. So, implementation of educational program regarding genital infection was effective as a method to improve the knowledge, practices of women's in reproductive age as regards genital infection. This result was in agreement with ***Salhan, (2018)***, who also found that, there were positive correlations between having satisfactory knowledge and healthy practices post intervention.

V. CONCLUSION

On the basis of the findings of the current study, it is concluded that the implementation of planned educational program is effective as a method to improve the practices and knowledge of women in reproductive age as regards GTIs and its preventive measures.

VI. RECOMMENDATION

The researchers further recommended that the study can be replicated on larger sample and in different geographical areas for generalizations of the findings and to assess and compare the knowledge and practices regarding reproductive tract infections among rural and urban women. The GTI preventive programs should be integrated into other reproductive health care programs such as family planning, maternal and child health services to provide broad-based reproductive health care.

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