

Evaluating Pregnant Women's Knowledge Regarding Genital Tract Infections



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1. ABSTRACT

Background: genital tract infections during pregnancy are global health problems that cause complications for mothers and infants. **Aim:** This study aimed to evaluate pregnant women's knowledge regarding genital tract infections. **Study design:** A descriptive study design was utilized. **Setting:** The study was carried out in the outpatient Antenatal Clinic of the New Obstetric and Gynecological Hospital at Mansoura University. **Study subjects:** The study subjects included 231 pregnant women according to inclusion criteria. **Tools:** A structured interview questionnaire was used consisting of three parts including an assessment sheet of personal characteristics, obstetric history of, and knowledge of pregnant women, regarding GTIs. **Results:** The results found that more than one-third of pregnant women had correct knowledge about the definition of GTIs, more than half of studied women had incorrect knowledge about causes and treatment of GTIs, more than one-quarter of them had correct knowledge about risk factors of GTIs while, more than half of them had correct knowledge about signs and symptoms of GTIs, less than half of them had incorrect knowledge about prevention of GTIs and less than two-thirds of them had incorrect knowledge about the mode of transmission, complication and diagnostic tests of GTIs. **Conclusion:** the present study concluded that there were less than two-thirds of pregnant women had poor knowledge, more than one-quarter of them had good knowledge and only (13.4%) had fair knowledge regarding genital tract infections. **Recommendations:** Designs and implementing necessary educational program about the proper genital hygiene practice to improve knowledge of pregnant women through different media.

Keywords: Evaluation, Genital tract infection, Knowledge, Pregnant women.

2. Introduction:

Pregnancy is an extremely essential event in every female's life cycle. Pregnancy usually accompanied by certain physiologic, immunological and hormonal changes that may make pregnant women more prone to certain infections (Khadawardi, 2020). Genital tract infections (GTIs) refers to a set of illnesses that pose a threat to the health of women and are brought on by an invasion of any section of the upper or lower reproductive tract by bacteria, viruses, fungi or protozoa causing serious consequences to women (Xu et al., 2019).

In addition, there are personal factors like low education, lack of knowledge about genital hygiene, vaginal douching, using cloth padding in underwear, not washing hands, young age, low socioeconomic level, previous vaginal discharge, depression, anemia, potential for early labour, urinary infection,

and hospitalization during the present pregnancy (Ghaddar et al., 2020)

The biggest cause of women's morbidity during the reproductive cycle is genital tract infections. It has a significant negative social and economic impact on the community and can cause serious health issues for both the mother and the unborn child. GTIs can generate ectopic pregnancy, low birth weight, chronic pelvic inflammatory illness, abortion, stillbirth, and preterm labour, premature rupture of membranes, maternal sepsis, intrauterine growth restriction, congenital infection to fetus, cervical or genital cancer and other long-term consequences such as postpartum infections, infertility and toxic shock syndrome (Leeper & Lutzkanin, 2018).

The attitudes and behaviors of women regarding any reproductive health have a direct impact on their awareness of genital tract infections The lack of knowledge among

women regarding the causes, recommended practices for maintaining health, self-prevention, the culture of silence regarding genital tract infections and unusual uterine discharge all contribute to an increase in the occurrence of genital tract infections and their complications (Xu et al,2019).

Teaching, preventative counselling, and medication explanation are all aspects of nursing interventions for genital tract infections. Explaining the risks of self-diagnosing GTIs and using over the counter or natural remedies rather than pursuing early detection and therapeutic intervention as soon as GTIs are present are examples of educational nursing interventions (Bulut, 2020).

Significance of the study

Worldwide, GTIs during pregnancy being a major reproductive health problem, on top of being a burden in the health system. Annually, over 500 million newly discovered cases of the commonest curable Sexual Transmitted Infections (STIs) occurring globally. Millions of viral STIs occur worldwide. Women are fragile to the effects of Sexual Transmitted Infections (Jolly et al., 2016).

Reproductive health issues were estimated by the World Health Organization (WHO) to be 18% of the overall global burden of diseases in 2001. representing 32% of the world's population of childbearing women's health burden (Konadu et al., 2019).

According to the World Health Organization, sexually transmitted diseases cause about 200 million genital tract infections in women each year in developing countries. Reproductive tract infections (RTIs) rank as the second leading cause of maternal morbidity and mortality among women of reproductive age and are extremely common in). In developing countries (Youness & Omar, 2017).

Shaaban et al., (2013) added that they are a lot of women do not seek medical examination due to hesitation and shyness to discuss this issue, absence of female doctors in the nearest health care center, lack of privacy

and lack of knowledge, also due to the perception that their symptoms are normal and it is not the problem for which they should seek medical examination. Many women engage in harmful behaviors that are detrimental to their reproductive health.

2.1 Aim of the study

This research was aimed to evaluate pregnant women's knowledge regarding genital tract infections.

2.2 Research question

What is the pregnant women's knowledge regarding genital tract infections?

3. Method

3.1 Study design

A descriptive study was utilized

3.2 Study setting

Research was carried out in Outpatient Antenatal Clinic of New Obstetric and Gynecological Hospital at Mansoura University

3.3 Study Sample:

A purposive sample of 231 pregnant women

3.4 Study size calculation

Based on data from literature Mengistie et al., (2014), the calculation of the sample size with precision/absolute error of 5% and type 1 error of 5% the following formula is used: Sample size = $[(Z_{1-\alpha/2})^2 * P(1-P)]/d^2$

Where, $Z_{1-\alpha/2}$ = is the standard normal variate, at 5% type 1 error ($p < 0.05$) it is 1.96.

P = the expected proportion in population based on previous studies.

d = absolute error or precision.

So, Sample size = $[(1.96)^2 * (0.316) * (1 - 0.316)] / (0.06)^2 = 230.6$

Based on the above formula, the sample size required for the study was 231 pregnant women.

3.5 Data collection tool:

A structure interview questionnaire was used for data collection. It was developed by the researcher based on literature review: The questionnaire consisted of (3) parts: **Part (1)** General Characteristics such as age, level of

education, occupation, residence, period of marriage and economic.

Part (2): Obstetrical and gynecological history such as gestational age, gravidity, previous abortions, number of abortions, cause of abortion, number of living children, mode of last delivery, previous pregnancy complications, types of complications, number of antenatal visits during current pregnancy, weight, height, body mass index, onset of initial prenatal visits, current pregnancy complications, vaginal discharge, type of vaginal discharge, other women complain, type of genital tract infection, previous genital tract infection, treated genital tract infections

Part (3): Pregnant women's knowledge about GTIs to assess pregnant women's knowledge regarding genital tract infections: It includes 9 questions related to concept of genital tract infections, causes of genital tract infections, risk factors of genital tract infections, sign and symptoms of GTIs, mode of transmission of GTIs, complications of GTIs, diagnostic tests of GTIs, prevention of GTIs and treatment of GTIs.

Scoring system: Each question had three alternative answers: correct, partial correct and not correct. The respondent scored 3:1 point for every response respectively. Total knowledge score=27 the minimum score=9, maximum score=27.

3.6 Validity of the study tools: Three expert juries from Mansoura University's faculty of nursing's women's health and midwifery nursing department evaluated the tools. These professionals evaluated the tools' clarity, applicability, comprehensiveness, and understanding. As some sentences were shortened to make them easier for the women to understand, validity according to the modification of their feedback was taken into consideration.

3.7 Reliability of the tool:

The reliability of tool used in this study done using the Cronbach's alpha value (internal consistency) of the knowledge tool was 0.902 so the tool was reliable.

3.8 Pilot study:

A pilot study was done to evaluate the tools' viability, clarity, objectivity, and application on 10% (23 pregnant women) of the sample. It didn't include the study's sample. Additionally, to calculate the time needed to finish the tool, it required 15 minutes.

3.9 Ethical consideration

The Ethics Committee of the Faculty of Nursing, Mansoura University granted official permission. An official letter from the Faculty of Nursing, Mansoura University was sent to the head of Outpatient Antenatal Clinic of New Obstetric and Gynecological Hospital at Mansoura University to obtain formal approval before doing the research after outlining its purpose.

The pregnant women were informed of the goals of the study and given the opportunity to sign consent forms before the study could begin. All participants were able to leave at any time and involvement in the study was completely voluntary. Anonymity, privacy, security, and maintaining privacy was upheld at all times during the study. The findings will be used for publishing, education, and research processes, as well as for the required research for the participants' master's degrees, it was disclosed to the study participants.

3.10 Field work

- After taking written consent from Antenatal clinics at Mansoura University Hospital, data collection lasted 6 months (from beginning of September 2021 to end of February 2022).
- The researcher introduced herself to the pregnant women and explained the purpose and methodology of the study to gain their consent, cooperation and relief fear as well as their informal consent and the researcher guaranteed the privacy of the information gathered. Each pregnant woman was personally questioned by the researcher to gather information on their general features, obstetric and gynecologic history, knowledge about genital tract infections and data by using structured

interviewing questionnaire and take 15 minutes to complete questionnaire.

3.11 Statistical Analysis

SPSS for Windows version 20.0 was used to conduct all statistical analyses (SPSS, Chicago, IL). Continuous data were reported as mean standard deviation and had a normally distributed distribution (SD). Numbers and percentages were used to express categorical data. For the comparison of variables using categorical data, the chi-square test was employed. The study's questionnaires' reliability (internal consistency) test results were computed. The cutoff for statistical significance was $p < 0.05$.

4. Results

Table (1) Shows that (35.1%) of studied women were 23<27 years old, with Mean \pm SD (26.1 \pm 3.8). Regarding their educational level, data reveals that (48.9%) of pregnant women were secondary education. Also, (70.6%) of studied women were housewife and (65.8%) of pregnant women were from rural area, (46.3%) of them were married since more than 4 years and (58.0%) of studied women had sufficient income.

Table (2): Shows that 42.0% & 46.3% of pregnant woman were more than 29 weeks of gestation with Mean \pm SD (25.8 \pm 5.8) and 2-3 gravida respectively, 90.5% of them had no previous abortion, 75,6% of pregnant women had 1-2 living children and 62.6% of them were cesarean section. While 68.3% of pregnant women had no previous pregnancy complications and 31.8% of multigravida women had previous pregnancy complications were gestational hypertension.

Table (3): Shows that 41.1% of pregnant women were attended antenatal clinic for 1-5 visits during current pregnancy, 69.3% of pregnant women onset of initial antenatal visits were in first trimester, 37.4% of pregnant women had complication in current pregnancy were gestational hypertension, 77,9% of pregnant women had vaginal discharge and 47.2% of them were excessive vaginal discharge cured like cheese (cottage cheese). While 54.1% of pregnant women

were complain from bad odor and 47.6%, 47.6%, 43.3% & 39.0 % of pregnant women were complain from irritation, itching, dyspareunia and erythema respectively. Regarding to types of GTIs, 47.6 % of pregnant woman diagnosed with vulvovaginal candidiasis.

Table (4): Shows that 34.3% of pregnant women had correct knowledge about definition of GTIs ,26.4% of studied women had correct knowledge about risk factors of GTIs, 51.1% & 55% of studied women had incorrect knowledge about causes and treatment of GTIs respectively, 51.9% of studied women had correct knowledge about signs and symptoms of GTIs and (59.3%, 61.9% & 63.2%) of studied women had incorrect knowledge about mode of transmission, complication and diagnostic tests of GTIs respectively.

Table (5): Shows that there was a highly statistically significant relation between pregnant women total knowledge level of pregnant women and educational level, occupation and income ($p < 0.001$). While there was no statistically significant relation between total knowledge of pregnant women and age, residence & marriage ($p = 0.104$, $p = 0.794$ & $p = 0.113$) respectively.

Figure (1): Clarify that more than one third of studied women had previous GTIs and less than two thirds of them had no previous GTIs.

Figure (2): Clarify that less than two thirds of studied women with GTIs treated from GTIs and more than one third of them wasn't treated from GTIs.

Figure (3): Clarify that less than two thirds of studied women had poor knowledge regarding GTIs and more than one quarter of them had good knowledge.

Figure (4): Clarify that one third of pregnant women had information about GTIs from the experience of family, relatives and neighbors and less than one quarter of them had information from television and reading and perusal.

Table (1): Distribution of pregnant women according to their socio demographic characteristics N=231

Age (Years)		
20 < 23	64	27.7
23 < 27	81	35.1
27 < 31	64	27.7
31 ≤ 35	22	9.5
Mean ±SD	26.1 ±3.8	
Level of Educational		
Illiterate	10	4.3
Basic education	28	12.2
Secondary education	113	48.9
University education	16	6.9
Postgraduate education	64	27.7
Occupation		
House wife	163	70.6
Manual worker	17	7.3
Trades /business	18	7.8
Professional work	33	14.3
Residence		
Rural	152	65.8
Urban	79	34.2
Period of Marriage (Years)		
< 2	64	27.7
2 – 3	60	26.0
> 4	107	46.3
Income		
Insufficient (<4000 pounds)	39	16.9
Sufficient (4000-6000 pounds)	134	58.0
Sufficient and save (>6000 pounds)	58	25.1

Table (2): Distribution of pregnant women according to their obstetric history N=231

Gestational age (Weeks)		
12 <20	42	18.2
20 < 29	92	39.8
≥29	97	42.0
Mean ±SD	25.8 ±5.8	
Gravidity		
Primigravida	92	39.8
2 – 3	107	46.3
More than 3	32	13.9
Mean ±SD	2.0 ±0.9	
Previous abortion		
Yes	22	9.5
No	209	90.5
Number of abortions (N=22)		
1 – 2	17	77.3
3 – 4	5	22.7

Causes of abortion (N = 22)		
Traumatic causes	4	18.2
Cervical problems	5	22.7
Genital tract infections	13	59.1
Number of living children (N=123)		
1 – 2	93	75.6
3 – 4	22	17.9
More than 4	8	6.5
Mode of last delivery (n=139)		
S.V. D	22	15.8
S.V.D with episiotomy	30	21.6
C.S	87	62.6
Previous pregnancy complications (n=139)		
Yes	44	31.7
No	95	68.3
Types of complications (n=44)		
Pre-eclampsia	12	27.3
Placenta previa	9	20.5
Gestational hypertension	14	31.8
Gestational diabetes	9	20.4

Table (3): Distribution of pregnant women according to their current pregnancy history N=231

Variables	No	%
Number of antenatal visits during current pregnancy		
1 – 5 visits	95	41.1
6 – 11 visits	84	36.4
>11 visits	52	22.5
BMI (kg/m²)		
18 – 24.9	31	13.4
25 – 29.9	70	30.3
30 and above	130	56.3
BMI (Mean ±SD)	31.5 ±5.8	
Onset of initial antenatal visit		
First trimester	160	69.3
Second trimester	69	29.8
Third trimester	2	0.9
Current pregnancy complications (99)		
Pre-eclampsia	26	26.3
Placenta previa	12	12.1
Gestational hypertension	37	37.4
Gestational diabetes	24	24.2
Vaginal discharge (231)		
Yes	180	77.9
No	51	22.1
Types of vaginal discharge (n=180)		
Excessive discharge cured like cheese (cottage cheese)	85	47.2
Green yellow frothy discharge	40	22.2
Grayish – white discharge	55	30.6
Other women complaint		
Bad odor	125	54.1
Irritation	110	47.6
Itching	110	47.6
Dyspareunia	100	43.3
Erythema	90	39.0
Erosion /ulcer /vesicular lesion	7	3.0

Type of genital tract infection (231)		
Herps	7	3.0
Bacterial vaginosis	65	28.1
Vulvovaginal candidiasis	110	47.6
Trichomonas vaginalis	49	21.2

Table (4): Knowledge of pregnant women regarding genital tract infection (N=231).

Definition	102	44.2	49	21.2	80	34.6
Causes	118	51.1	56	24.2	57	24.7
Risk factors	109	47.2	61	26.4	61	26.4
Signs and Symptoms	57	24.7	54	23.4	120	51.9
Mode of transmissions	137	59.3	45	19.5	49	21.2
Complications	143	61.9	63	27.3	25	10.8
Diagnostic tests	146	63.2	66	28.6	19	8.2
Prevention	93	40.3	62	26.8	76	32.9
Treatment	127	55.0	53	22.9	51	22.1

Table (5): Relationship between total knowledge level and sociodemographic data of pregnant women (N=231)

Variables	Poor (n=139)		Fair (n=31)		Good (n=61)		Chi-Square	
	No	%	No	%	No	%	X ²	P
Age (Years)								
20 < 23	47	33.8	8	25.8	9	14.8		
23 < 27	42	30.2	12	38.7	27	44.3		
27 < 31	37	26.6	10	32.3	17	27.9		
31 ≤ 35	13	9.4	1	3.2	8	13	10.539	0.104
Educational level								
Illiterate	9	6.5	1	3.2	0	0.0		
Basic education	26	18.7	1	3.2	1	1.6		
Secondary education	81	58.3	16	51.6	16	26.2		
University education	11	7.9	1	3.3	4	6.6		
Postgraduate education	12	8.6	12	38.7	40	65.6	77.680	<0.001**
Occupation								
House wife	109	78.4	18	58.1	36	59.0		
Manual worker	10	7.2	5	16.1	2	3.4		
Trades /business	9	6.5	3	9.7	6	9.8		
Professional work	11	7.9	5	16.1	17	27.9	20.360	<0.001**
Residence								
Rural	93	66.9	21	67.7	38	62.3		
Urban	46	33.1	10	32.3	23	37.7	0.461	0.794
Period of Marriage (Years)								
< 2	45	32.4	3	9.7	16	26.2		
2 – 3	32	23.0	12	38.7	16	26.2		
> 4	62	44.6	16	51.6	29	47.5	7.477	0.113
Income								
Insufficient (<4000 pounds)	32	23.0	3	9.7	4	6.6		
Sufficient(4000-6000pounds)	89	64.0	16	51.6	29	47.5		
Sufficient and save(>6000pounds)	18	12.9	12	38.7	28	45.9	31.120	<0.001**

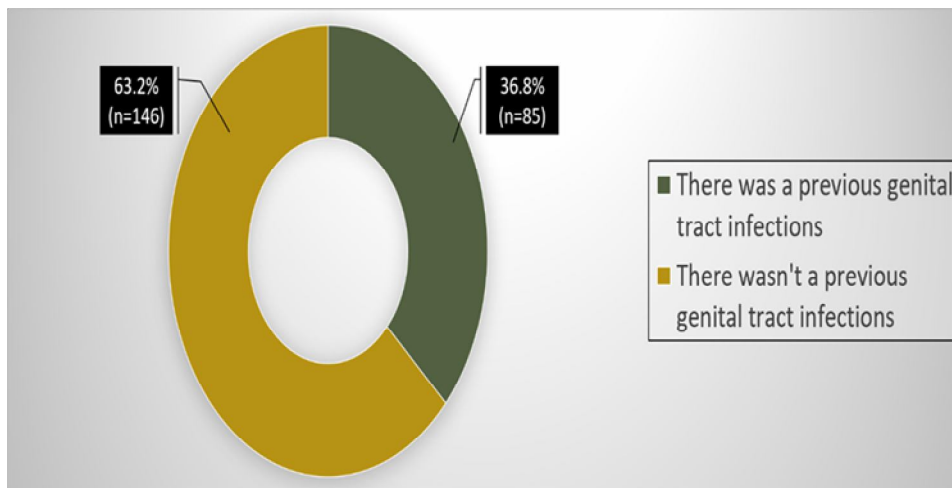


Figure (1): Distribution of previous history of GTIs among studied women N=231

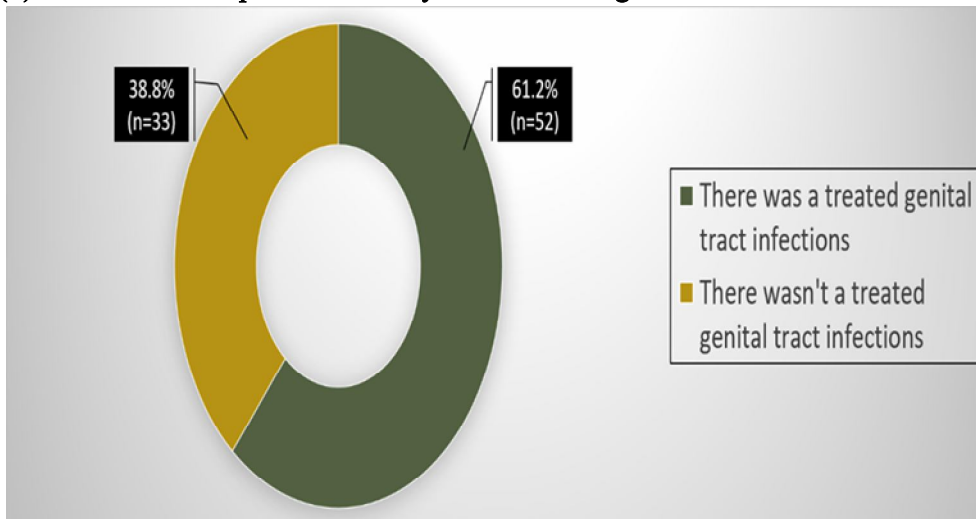


Figure (2): Distribution of GTIs among study sample (N=85)

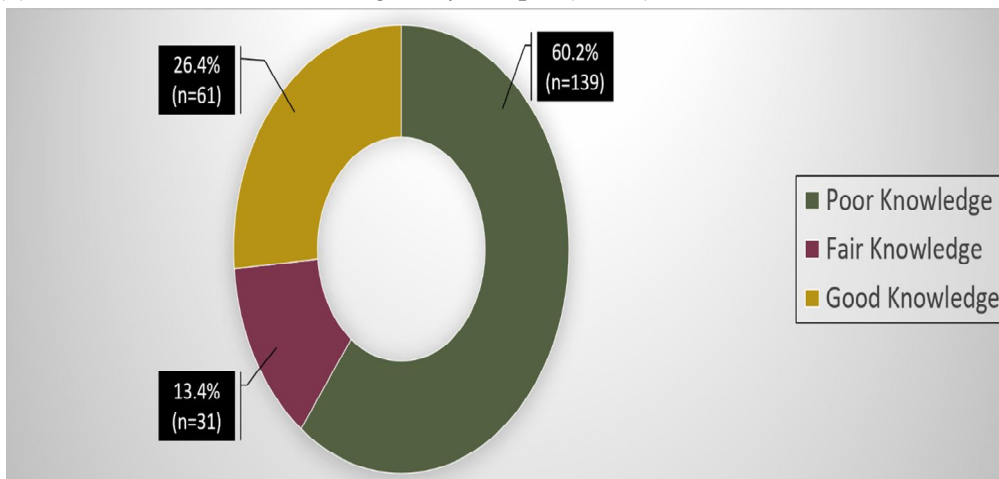


Figure (3): Total knowledge of the pregnant women regarding genital tract infections N=231

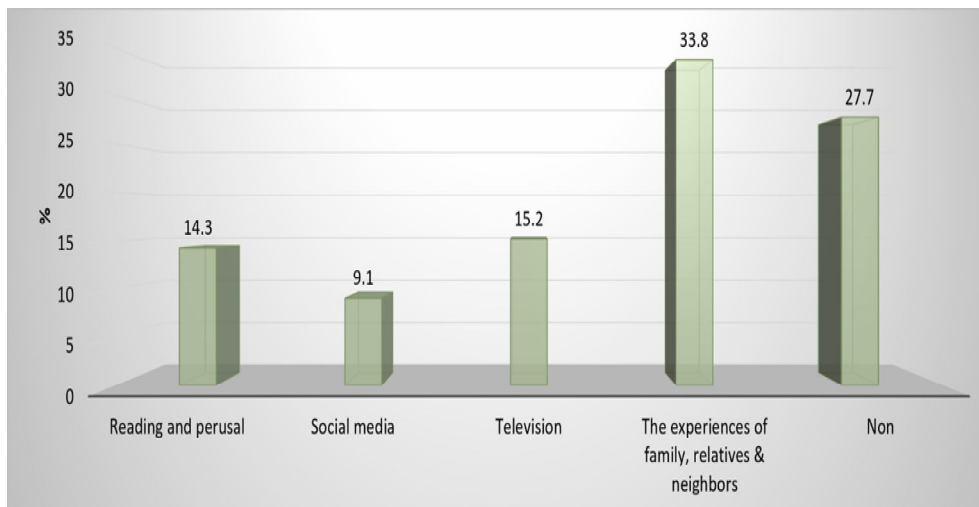


Figure (4): Frequency of source of pregnant women information about genital tract infection N=231

5. Discussion

The current study aimed to evaluate pregnant women's knowledge regarding genital tract infections. This aim was achieved through the results of this study, which revealed that less than Two - thirds of studied women had poor knowledge about GTIs.

Considering pregnant women's knowledge regarding genital tract infections, the findings showed that less than half of studied women had incorrect knowledge about definition, risk factors and prevention of GTIs. More than half of them had incorrect knowledge about causes and treatment of GTIs. More than half of them had correct knowledge about signs and symptoms of GTIs. Less than two thirds of them had incorrect knowledge about mode of transmission, complication and diagnostic tests of GTIs. The previous findings were in the same line with research conducted by **Mohammed et al., (2018)** who studied "knowledge and practice of women with lower genital tract infections in the patient gynecological clinic at Benha university hospital" reported that more than half of pregnant women had incorrect knowledge about causes and treatment of GTIs, less than half of them had incorrect knowledge about prevention of GTIs, less than two thirds of them had incorrect knowledge about mode of transmission and diagnostic tests of GTIs

Moreover, the results were supported by **Rabiu et al., (2010)** who studied "female reproductive tract infections: understandings and care seeking behavior among women of reproductive age in Lagos, Nigeria" and reported that less than two thirds of pregnant women had incorrect knowledge about complication of GTIs. These results maybe because of low level of studied women's awareness about genital tract infections.

While the findings of the current study were contradicted with **Mohammed et al., (2018)** who reported that less than three quarters of sample study had incorrect knowledge about definition of GTIs and more than half of them had incorrect knowledge about risk factors of GTIs. This difference could be attributed to the variation in sample size and its selection criteria.

Also, the present study disagrees with **Rabiu et al., (2010)** who reported that more than half of pregnant women had incorrect knowledge about sign and symptoms of GTIs. These findings may be due to educational variations.

The results of the current study showed that less than two thirds of them had poor knowledge and more than one quarter of them had good knowledge regarding genital tract infections. These results may be due to nature of living in rural areas with traditional beliefs that affect their awareness and education about genital tract infections. This study findings were in consistent with **Li et al., (2010)** who

conducted a descriptive study among rural women in China aimed to assess "knowledge, practice, and prevalence of reproductive tract infection" reported that less than two thirds of women had poor knowledge and more than one quarter of them had good knowledge regarding GTIs.

Regarding body mass index, more than half of pregnant women were obese with Mean \pm SD (31.5 \pm 5.8). obesity is one of the predisposing factors of genital tract infections. These study findings were in agreement with the study by **Sayed, Aboud, & Ali, (2019)** who reported that more than half of studied women were obese.

In addition, more than three quarters of pregnant women had vaginal discharge and less than half of them had white discharge like cheese, more than half had bad odor and less than half had irritation, itching, dyspareunia, erythema.

The previous findings were in agreement with **Rashad et al., (2022)** who studied "quality of life among women diagnosed with vaginal infection. In Zagazig University" who reported, more than three quarters of women had vaginal discharge and less than half of them had white discharge like cheese, more than half had bad odor and less than half had irritation, itching, dyspareunia, erythema.

Concerning type of genital tract infection, the present study findings revealed that less than half of pregnant women diagnosed with vulvovaginal candidiasis. It is thought that higher levels of oestrogen and more glycogen in vaginal secretions during pregnancy increase a woman's risk of developing VVC. Additionally, during pregnancy, changing hormone levels alter the pH balance in the vagina, which creates an environment more conducive to the growth of yeast infections.

These study findings were in agreement with **Waikhom et al., (2020)** who studied "prevalence of vulvovaginal candidiasis among pregnant women in the Ho municipality, Ghana: species identification and antifungal susceptibility of Candida isolates"

reported that less than half of studied women diagnosed with vulvovaginal candidiasis.

Regarding the relationship between total knowledge level of pregnant women and socio-demographic characteristics, the current study findings revealed that a highly statistically significant relation between women total knowledge level of pregnant women with educational level, occupation and income. it may be due to pregnant women with less education, they were less awareness about genital tract infections and their consequences on pregnancy and working pregnant women reach knowledge about genital healthy life style and health services more easily due to their economic freedom. This findings in agreement with a study conducted by **Elbialy, El-Shafie & El-Gamelen, (2019)** who studied "effect of preventive program about reproductive tract infections on knowledge, beliefs and practices among rural women based on health belief model" who reported, there was a highly statistically significant relation between women total knowledge score level with educational level, occupation and income.

Also, these results in agreement with **Mohammed et al., (2018)** who reported, there was a highly statistically significant relation between total knowledge level and women academic level.

6. Conclusion

The present research concluded that there were less than Two- thirds of pregnant women had poor knowledge regarding genital tract infections, and more than One- quarter of them had good knowledge and there was highly statically relation between total knowledge score and sociodemographic (educational level, occupation and income).

7. Recommendations:

Based on the study finding, the current study recommended the following:

- Designs and implementing necessary educational program about the proper genital hygienic practices to improve knowledge of pregnant women through different media.

- Designs and distribute Simple brochures to increase awareness regarding genital tract infections among pregnant women

Further study

- Stress on increasing awareness through introducing of GTIs education in schools and universities to provide appropriate evidence to youth
- Apply another study regarding knowledge about GTIs and behaviors among postpartum women

8. Acknowledgment

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9. Declaration of conflicting interests

The researchers reported that they had no possible conflicts of interest.

10. Funding

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11. References

- Bulut, A. (2020).** Genital hygiene behaviors of midwives and nurses working in primary healthcare services and the associated factors. *Acıbadem Üniversitesi Sağlık Bilimleri Dergisi*, (1), 72-77. <https://doi.org/10.31067/0.2019.199>
- Calik, K. Y., Erkaya, R., Gülnur, İ. N. C. E., & Yildiz, N. K. (2020).** Genital hygiene behaviors of women and their effect on vaginal infections. *Clinical and Experimental Health Sciences*, 10(3), 210-216. DOI:10.33808/clinexphealthsci.565845
- El bialy, A. A. A., El-Shafie, I. F., & El-Gamelen, H. A. (2019).** Effect of preventive program about reproductive tract infections on knowledge, beliefs and practices among rural women based on Health Belief Model. *International Journal of Novel Research in Healthcare and Nursing*, 6(1), 748-764. Available at: www.noveltyjournals.com
- Ghaddar, N., Anastasiadis, E., Halimeh, R., Ghaddar, A., Dhar, R., AlFouzan, W., ... & El Chaar, M. (2020).** Prevalence and antifungal susceptibility of *Candida albicans* causing vaginal discharge among pregnant women in Lebanon. *BMC infectious diseases*, 20(1), 1-9. <https://doi.org/10.1186/s12879-019-4736-2>
- Jolly, D., Mueller, M., Chen, M., Alston, L., Hawley, M., Okumu, E., Eley, N., Stancil, T. & MacQueen, K. (2016).** Concurrency and Other Sexual Risk Behaviors Among Black Young Adults in a Southeastern City. *AIDS Education and Prevention*, 28(1), pp.59-76.
- Kafle, P. & Bhattarai, S. (2016).** Prevalence and Factors Associated with Reproductive Tract Infections in Gongolia Village, Rupandehi District, Nepal. *Advances in Public Health*, pp.1-5. <https://doi.org/10.1155/2016/8063843>
- Khadawardi, K. (2020).** Prevalence of Abnormal Vaginal Discharge among Pregnant Women. *Medical Journal of Cairo University [The]*, 88(2), 677-683. DOI: 10.21608/mjcu.2020.104625
- Konadu, D. G., Owusu-Ofori, A., Yidana, Z., Boadu, F., Iddrisu, L. F., Adu-Gyasi, D., ... & Asante, K. P. (2019).** Prevalence of vulvovaginal candidiasis, bacterial vaginosis and trichomoniasis in pregnant women attending antenatal clinic in the middle belt of Ghana. *BMC pregnancy and childbirth*, 19(1), 341.
- Leeper, C., & Lutzkanin, A. (2018).** Infections during pregnancy. *Primary Care: Clinics in Office Practice*, 45(3), 567-586. DOI:<https://doi.org/10.1016/j.pop.2018.05.013>
- Li, C., Han, H. R., Lee, J. E., Lee, M., Lee, Y., & Kim, M. T. (2010).** Knowledge, behaviors and prevalence of reproductive tract infections: a descriptive study on rural women in Hunchun, China. *Asian Nursing Research*, 4(3), 122-129.

- [https://doi.org/10.1016/S1976-1317\(10\)60012-6](https://doi.org/10.1016/S1976-1317(10)60012-6)
- Mengistie, Z., Woldeamanuel, Y., Asrat, D., & Adera, A. (2014).** Prevalence of bacterial vaginosis among pregnant women attending antenatal care in Tikur Anbessa University Hospital, Addis Ababa, Ethiopia. *BMC research notes*, 7(1), 1-5. <http://www.biomedcentral.com/1756-0500/7/822>
- Mohammed F.F., Galal Ahmed El Kholy; Soad Abd-Elsalam Ramadan; Amira Refaat Said (2018).** Knowledge and practice of women with lower genital tract infections. M.S. Banha university *Egyptian Journal of Health Care*, 9(4), 254-270. DOI: 10.21608/EJHC.2018.26766
- Rabiu, K. A., Adewunmi, A. A., Akinlusi, F. M., & Akinola, O. I. (2010).** Female reproductive tract infections: understandings and care seeking behaviour among women of reproductive age in Lagos, Nigeria. *BMC women's health*, 10(1), 1-7. <http://www.biomedcentral.com/1472-6874/10/8>
- Rashad, M. R., Mohamed, H. S. E., Emar, H. A., Elsabiey, F. I., & Salim, H. M. (2022).** Quality Of Life among Women Diagnosed with Vaginal Infection. *Zagazig Nursing Journal*, 18(1), 52-69.
- Sayed, H. A. E., Aboud, S. A. H. H., & Ali, F. K. (2019).** Effect of implementing nursing intervention guidelines on recurrent vaginitis among reproductive-age women. *Journal of Nursing and Health Science*, 8(6), 59-74. DOI: 10.9790/1959-0806035974
- Seker, S., Canbay, F. C., Firouz, N., & Cesur, C. (2020).** Identifying genital hygiene behaviours of pregnant women in rural and urban regions: a cross-sectional study. *Clinical and Experimental Health Sciences*, 10(4), 375-381.
- Shaaban, O. M., Youssef, A. E. A., Khodry, M. M., & Mostafa, S. A. (2013).** Vaginal douching by women with vulvovaginitis and relation to reproductive health hazards. *BMC women's health*, 13(1), 1-6. <http://www.biomedcentral.com/1472-6874/13/23>
- Waikhom, S. D., Afeke, I., Kwawu, G. S., Mbroh, H. K., Osei, G. Y., Louis, B., ... & Opintan, J. A. (2020).** Prevalence of vulvovaginal candidiasis among pregnant women in the Ho municipality, Ghana: species identification and antifungal susceptibility of *Candida* isolates. *BMC pregnancy and childbirth*, 20(1), 1-14. <https://doi.org/10.1186/s12884-020-02963-3>
- Xu, S., Yu, C., Zhou, Y., Wu, J., Bai, T., Zhang, J., & Li, Y. (2019).** The prevalence of reproductive tract infections in a Chinese internal migrant population, and its correlation with knowledge, attitude, and practices: a cross-sectional study. *International journal of environmental research and public health*, 16(4), 655. <https://doi.org/10.3390/ijerph16040655>
- Youness, E. M., & Omar, A. M. (2017).** Effectiveness of planned educational program on vaginitis and its preventive measures on adolescent female nursing student's knowledge. *Egyptian Nursing Journal| Published by Wolters Kluwer-Medknow*, 14(1)Zaher, E. H., Khedr, N. F. H., & Elmashad, H. A. M. (2017). Awareness of women regarding vaginal discharge. *IOSR J Nurs Heal Sci*, 6, 01-12. www.iosrjournals.org