

# Biographic Factors Influences Health Practices Related to Prevention of Reproductive Tract Infections among Females Students: A Mixed Methods

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**Abstract:** *Abstract: Reproductive Tract Infections (RTIs) is defined as an infection of the reproductive or genital tract which causes health problem affecting adolescent females of reproductive age. Aim: The study aimed to assess health practices among female university students regarding the prevention of RTIs in Hafr Al Batin University. Methods: A mixed-methods study was conducted with 500 female students recruited at Hafr Albatien University using a purposive sample. A semi-structured interview sheet was used followed by fifty students were used for face-to-face interviews. Results: Mixed methods study proven the importance of in-depth data discovered by qualitative approaches, which revealed that there is a highly statistically significant relation among studied students' marital status, maternal education & profession, and their total echo levels regarding prevention of RTI, (P<0.001). Around 68% of them reported having symptoms of RTIs. Conclusion: The majority of female students had unsatisfactory knowledge about RTIs, their prevention, and unhealthy hygienic practices Recommendations: Further researches are needed to investigate the incidence if there are cultural contributory factors leading to RTIs and the adequate preventive interventions. Lastly, there is a needs to develop strategies towards improving adolescent students' health awareness and provision of appropriate reproductive health services.*

**Keywords:** *Adolescent, Female Students, Hygiene, Reproductive Tract Infection.*

## INTRODUCTION

Reproductive Tract Infections are defined as any infections of the reproductive system that result from the overgrowth of the bacteria or other organisms that normally live in the vagina, in addition to inadequate infection prevention practices. One cause of maternal morbidity and mortality, as the cause of loss of healthy life among women of reproductive age, is reproductive tract infections (RTI). Globally, reproductive tract infections cause serious health problems (RTI, 2020).

According to the body of literature, health reproductive systems and functions are essential components of the overall health of females. Many internal and external aspects, however, may challenge the capacity of individuals to maintain reproductive health; other factors related to the maintenance of reproductive health may be behavioral and involve the participation of an individual in risky practices (WHO, 2011).

RTIs are usually seen as a 'silent epidemic and are one of the major public health issues. In addition, females with self-reported reproductive morbidity symptoms do not seek treatment due to existing reproductive health harms and inhibitions. Not only can untreated infections lead to health consequences, but in terms of emotional distress related to gynecological morbidity and consequences (Prusty and Unisa, 2012).

University study is a critical time in which students face a number of challenges, including changes in the social and environments, the development of new social networks, greater autonomy of behavior, and adjustment to new schedules. College students are more likely to engage in risky health behaviors known to have a negative effect on well-being during this period of life, such as physical inactivity, stress, and poor dietary habits, in addition to gaining weight, changing sleep behaviors, these unhealthy behaviors may have a sustained effect on health and psychological well-being throughout later life (Almutairi et al., 2018; Musaiger et al., 2015, Pettay, 2008).

The effects of RTIs on reproductive health can be severe, and women are likely to be more life-threatening than men. These include pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and adverse outcomes of pregnancy, including miscarriage, stillbirth, preterm birth, and congenital infection, as well as serious or fatal consequences of other RTIs (WHO, 2020).

Studies conducted by Lowdermilk et al. (2006); Salhan (2011) conclude that the most effective way of reducing the adverse consequences is to prevent RTIs. To prevent the risk and spread of RTIs, women must alter their hygienic practices and behaviors. As well; improving knowledge of reproductive physiology, improving menstrual and personal hygiene, reducing the use of intravaginal substances, improving nutrition, providing appropriate help-seeking behavior, practice and improving health services, and changing sexual behaviors & practices.

Investment in keeping Adolescence healthy fuels economic growth by reducing health expenditure and reducing inequalities across generations by contributing to increased productivity (Youth Programs, 2011). Adolescence has gained increasing global attention, a time of opportunity. During this period, many physical, cognitive, emotional, and social development changes occur (AlBuhairan et al, 2015). A study by Khalil et al. (2003) explained the strategy covers general areas of adolescent health, which were including access to services, nutrition, and development as well as reproductive health. It was concluding that it is important to educate female adolescents in all matters of RH issues, needs, guidance, and service provision for reproduction.

The nurse as one of health care professions plays an important role especially in maternity, community health services and settings and university-affiliated health clinics and or services such as providing the adolescent with confidential, private, respectful, and culturally competent services, complete information, and communicated effectively with adolescents and counseling services about RTIs and their prevention (Ebrahim et al., 2017). More ever provide health promotion and give appropriate care when needed, they also need firm advice about what to do and what not to do, and they need practical examples of how to carry out this advice (El-Beih et al., 2018).

Using biographical research requires both rigorous and general lenses to produce knowledge about human lives, well researchers work with a variety of different types of data including documents such as written autobiographies, letters, and diaries (Nelson and Branen 2010) Mixed methods require understanding and interpretation of human experience across time and space while explaining individual action and add an additional layer of complexity to the reading of society

### **Significance of the study**

Adolescence is a transition period between childhood and adulthood. Although we may think of teenagers as a healthy group, many die prematurely and unnecessarily due to accidents, complications related to pregnancy, etc. (Adolescence, 2020). Reproductive health issues accounted for 18% of the total global disease burden and 32% of the global health burden among women in the childbearing age group. (IDSK, 2011). Over a quarter of the world's population is between 10 and 24 years of age, with 86% living in less developed countries. While adolescents make up a significant portion of the population of Saudi Arabia, and little is known about their health status. Improving health now, improving over the course of life, and contributing to the health of future generations. These young people, the parents of tomorrow, are in need of awareness about their health and reproductive care.

**Aim of the study:**

To assess the sociodemographic factors and health practices among the female university students regarding the prevention of Reproductive Tract Infections.

**Research questions:**

1. What are the level of knowledge and health practice among female university students regarding the prevention of RTIs?
2. Did there is a relation between the Biographic factors and level of knowledge & practice of female university students regarding the prevention of RTIs?

**SUBJECTS AND METHODS**

**Design:**

A mixed research design was used to achieve the aim of this study. A mixed-method blend helped the researcher to obtain more complete answers and raised overall robustness. Using such type of research approach deepened a researcher's understanding of individual situations, and enabled them to broaden their scope of the study.

**Setting:**

The study was carried out in three colleges in Hafr El Batin governorate, which includes female students, namely College of Applied Medical Science, College of Science, and College of literature, affiliated to the University of Hafr Albatin.

**Sampling and Population Criteria**

A purposive sample for a total of 500 female students, in the academic year 2019/2020. Who was available at that time of data collection at previously mentioned settings and agreed to participate in the study. The selected colleges were distributed as clusters, and it was like the following, 150 students from the College of literature, 150 students from the College of Applied Medical Science, and 200 from the College of science were included in the study. Sample criteria, Saudi students, their age ranging from 18-24 years, all of them from the second academic year, and agree to participate in the study. Sample technique was selected from each collage according to (17) (Abd-Ella, 2010) using the following equation:

Female students number to be selected from each collage =

$$\frac{\text{No of female students at third academic year/each faculty} \times \text{Number of the calculated sample size (500)}}{\text{Total number of female students at third year in the (7) collages}}$$

The sample size recommendations for a logistic regression analysis to investigate predictors with a 95 % confidence interval.

**Data Collection Tools:**

Semi-structured interviews are particularly appropriate to the study of knowledge, attitude, and behavior, furthermore exploring lifestyle and contextual concerns. The researchers used a sequential explanatory model while quantitative and qualitative research techniques were given equal priority; A semi-structured interviews questionnaire was used and composed of two main parts. The first part was a structured question (quantitative part) and has a combination of open-ended and closed questions. The second part is composed of four open-questions (qualitative data). Subsequently, of those 450 students, we randomly followed up by 50 students for one to three interviews. All the questions were developed in the English language based on recent and related literature, as well as translated to the Arabic Language to fit the sample criteria. The questionnaire was validated by a panel of experts from the College of Applied Medical Sciences. The time consumed for data collection was 6 months, starting from September 2019 to April 2020, and the researcher set with each student 30 minutes.

*The following are the parts of the semi-Structure Interview Questionnaire*

**Part I – Structured Interview questionnaire covers the following categories:**

**a. Sociodemographic data:**

Which including age, marital status, and family size.

**b. Health Assessment:**

This part includes questions about A- Medical history; it includes medical problems e.g. Underweight, Obesity, Respiratory diseases, Bone and joint disease. B- Menstrual history: Menstrual flow that is much heavier or lighter than usual, Dysmenorrhea, Periods occur (<21 or > 35 days apart irregularity, RTIs related complaints; including experiencing symptoms, such as abnormal vaginal discharge, lower back pain, lower abdominal pain, Vulva itching or burning and burning sensation with urination.

**c. Level of Knowledge about Reproductive system:**

It was covered questions relating to biological health aspect, such as anatomical construction, physiological aspects, and questions about reproductive tract infection, which includes definition of RTI, causes, signs& symptoms, stages, predisposing factors, complications, consequences of RTI on marital relation and effect on pregnancy/ outcome.

**d. Health practices on prevention of RTI:**

It was covered questions relating to healthy practices include perineal hygiene, includes perineal area cleaning, cleaning techniques, cleaning direction, perineal area dryness, antiseptic solution, or powder use. Menstrual hygiene includes questions about towels type that used during menstruation, towels altering, bath during menses, route of the bath, perineal hygiene during menstruation. Health behaviors, this part covered questions about, sources of health information when having symptoms of RTI, type and using of underwear, and ways of cleaning underwear.

**Scoring system for students' knowledge:**

For each item, the knowledge of female students was calculated as follows: complete or / correct response was scored (2 points), the correct response was scored incomplete (1 point), while no knowledge or wrong response was scored (zero points). For all knowledge-related issues, the total score was 59 points, representing 100%, and categorized into two levels as follows: satisfactory  $\geq 60\%$  of the total score and unsatisfactory  $< 60\%$  of the total score.

**Scoring system for health practices as stated by students:**

It counted as (1) point for healthy practice and (0) point for unhealthy practice. Response "yes" scored as one for the practice and if response "no" scored as zero. The RTI prevention score was between zero and two, never = 0, sometimes = 1, always = 2 points. The total

practice score was 43 points, representing 100% of the total. The assessment score for final practice was 75% for healthy practice and 75% for unhealthy practice.

### **Part II: Open-Ended Questions:**

The use of open-ended questions allows the respondent students to elaborate on their experiences or attitudes. The structure and sequencing of questions are encoded, as well the authors encouraged to use inquiries. The questions particularized on the questionnaire and discussed penetrating issues, the open-ended question was worded as; 'Can you tell me about your perception about reproductive tract infection? How many times did you have an infection in your reproductive tract? Can you indicate the factors leading to reproductive tract infection? What is the adequate intervention from the point of view to avoid reproductive tract infection?' The researchers used techniques to encourage discussions and make students comfortable to speak their minds; such as poster presentations.

### **Analysis**

Qualitative content analysis was used to evaluate the students' replies to the open-ended question. The participant's identification code was noted at the beginning of the interview and start time. The first author re-read the students' answers repeatedly to get a sense of complete information. The second author reread word-by-word to originate correspondences and variances. Then the collected information was arranged into categories and subcategories by third and fourth authors. The final data were discussed among four of the authors till the agreement was grasped.

### **Validity and Reliability**

The validity for the current study was established by a panel of seven experts in the field of Pediatric, Maternity, and Gynecological nursing, and Community nursing specialty who reviewed the tools for clarity, relevance, comprehensiveness, applicability, and according to their opinions researcher-made modifications. Before data collection, the pilot study was conducted on 10 percent of the total student sample size (50), to evaluate the efficiency, content validity of the questions, testing clarity, and arrangement of the items. As well as to test the applicability of the data collection tools and time-consuming for each tool. In the pilot sample recruited were excluded from the current subjects of the study. Regarding qualitative data, reliability, and trustworthiness of the findings, were accomplished through the process by which the authors analyzed and reviewed data for validation of the analysis.

### **Ethical Consideration**

To ensure the privacy and confidentiality of the data collected from female students, the researchers organized all relevant ethical aspects as; obtaining oral consent for participation in the study, explaining the purpose of the study, inform the participant that they have the right to withdraw or refuse to continue participation. A written letter was taken before starting data collection from the college administrative authority of Applied Medical Science to conduct the study. Then, a copy of the approval letter was directed to the previously selected college dean to gain approval to meet the students. After a full explanation of the purpose of the study from those who agree to participate in the study, oral informed consent was obtained from each participating student and they ensured confidentiality, and privacy.

### **Data Analysis:**

Quantitative data collected were analyzed using the program Statistical Package for Social Science (SPSS version 23), number, percentage distribution, mean and standard deviation were used. The collected data, coded, analyzed, and tabulated. Proper statistical tests have been used to determine whether statistically significant differences have been found between the study variables. The Chi-square test was the statistical test used in this paper. Significance of the findings  $P < 0.05$  significant differences,  $P < 0.01$  highly significant differences, and  $P > 0.05$  no significance. For the qualitative part, the transcribed interviews were analyzed

qualitatively by the researchers. Coding units and data analyses were summarized and paraphrased as well it represented relevance to the study.

**Results**

**Table (1)** Reveal that; the mean age of the learners studied was  $21 \pm 0.5$  years. Regarding the Marital Status, 90% of the studied students were single. Concerning, father education 26% were University or more and 84% of them were working. Also, it was found that only their basic education was completed by 36% of their mothers & 58% of their mothers were housewives. 56% of the students studied were from five to nine in family size.

**Table (1):** Socio-Demographic data of the Study Sample (no=500).

Items	No	%
<b>Age groups (in years)</b>		
18- <20	90	18.00
20-<22	300	60.00
22- 24	110	22.00
<b>Mean <math>\pm</math>SD</b>	<b>21<math>\pm</math>0.5</b>	
<b>Marital Status</b>		
Single	450	90.00
Divorced &Widow	50	10.00
<b>Father data:</b>		
<b>Level of education:</b>	70	14.00
- Illiterate or just read and write	100	20.00
- Primary	200	40.00
- Secondary	130	26.00
- University		
<b>Occupation:</b>		
Retired	80	16.00
Working	420	84.00
<b>Mother's education</b>		
- Illiterate or just read and write	94	18.80
- Primary	180	36.00
- Secondary	100	20.00
- University	126	25.20
<b>Mother's occupation</b>		
Working	210	42.00
Housewife	290	58.00

**Table (2):** Displays that, 60% of the studied students had a history of health problems; Anemia was of the highest percentage among 24% of them. 28% of them had an irregular duration between each menstrual cycle, while an equal percentage of 26% had dysmenorrhea. Also, this table displays that 68% of the studied students stated having symptoms of RTI.

**Table (3):** Describes, that the majority of students had unsatisfactory levels of knowledge in relation to RTIs-related items, which includes, definition, causes, signs& symptoms, stages, predisposing factors, complication, and consequences of RTI on marital relation. A highly statistically significant difference was found regarding all items related to RTIs, where  $p=0.001$ .

**Figure (1)** Demonstrates their knowledge score level in relation to items of RTIs, anatomy, physiology of the female reproductive system.

**Table (2):** Health assessment for study sample (n=500).

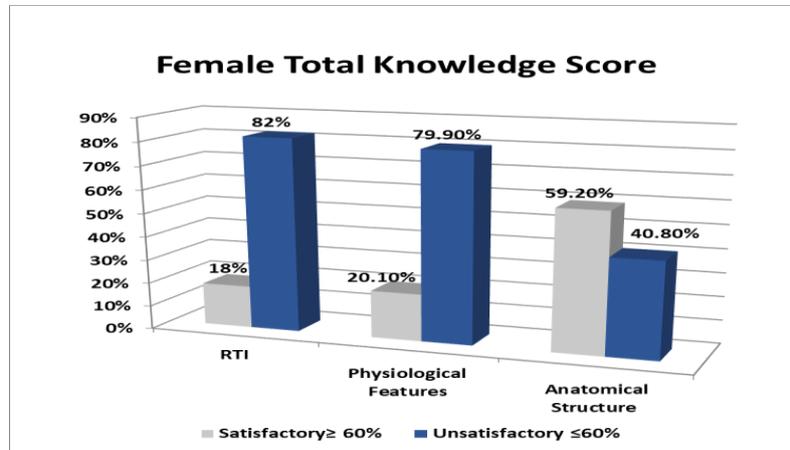
Items	No	%
<b>Health problems</b>		
Yes	300	60.00
No	200	40.00
<b>* Type of health problem:(n= 300)</b>		
Metabolic syndrome	36	12.00
Obesity	12	4.00
Underweight	70	23.34
Breathing problems/ Respiratory diseases	21	7.00
Heart diseases/ Hypertension	12	4.00
Allergies	19	6.33
Anemia	72	24.00
Diabetes Mellitus	48	16.00
Bone and joint disease	10	3.33
<b>Menstrual disturbances</b>		
Yes	300	60.00
No	200	40.00
<b>* Menstrual disorder:(n=300)</b>		
• Menstrual flow that is much heavier or lighter than usual	120	24.00
• Dysmenorrhea	130	26.00
• Periods occur (<21 or > 35 days apart	142	28.40
• Missing three or more periods in a row	68	13.60
• Periods that last longer than seven days	40	8.00
<b>Experiencing symptoms of RTI</b>		
Yes	340	68.00
No	90	18.00
Didn't remember	70	14.00
<b>RTI symptoms of (n= 340)</b>		
Abnormal vaginal discharge	238	100.0
Lower back pain	238	100.0
lower abdominal pain	120	50.4
Vulva itching or burning	49	20.6
Burning sensation with urination	29	12.2

**Table 3:** Knowledge Score Level about RTIs among young female n= (500).

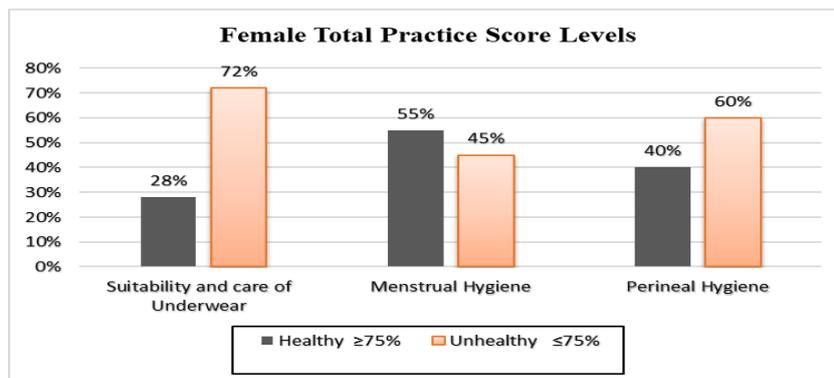
Items	Satisfactory $\geq$ 60%		Unsatisfactor y<60%		Z test
	No	%	No	%	
Definition	100	20.00	400	80.00	<b>Z=35.6, P = 0.001*</b>
Causes	120	24.00	380	76.00	<b>Z= 34.1, P = 0.001*</b>
Signs& Symptoms	150	30.00	350	70.00	<b>Z= 16.194, P = 0.001*</b>
Stages	60	12.00	340	68.00	<b>Z= 17.811, P = 0.001*</b>
Predisposing factors	100	20.00	400	80.00	<b>Z= 20.579, P = 0.001*</b>
Complications	70	14.00	330	66.00	<b>Z=25.194, P = 0.001*</b>
Effect on pregnancy/ outcome	50	10.00	350	70.00	<b>Z=28.194, P = 0.001*</b>
Consequences of RTI on marital relation	40	8.00	360	72.00	<b>Z= 18.194, P = 0.001*</b>

RTIs: Reproductive Tract Infections

**Figure (2):** Clarifies that student' unhealthy hygienic practices score levels were the main pattern in relation to items related to acceptability of underwear care, perineal and menstrual hygiene.

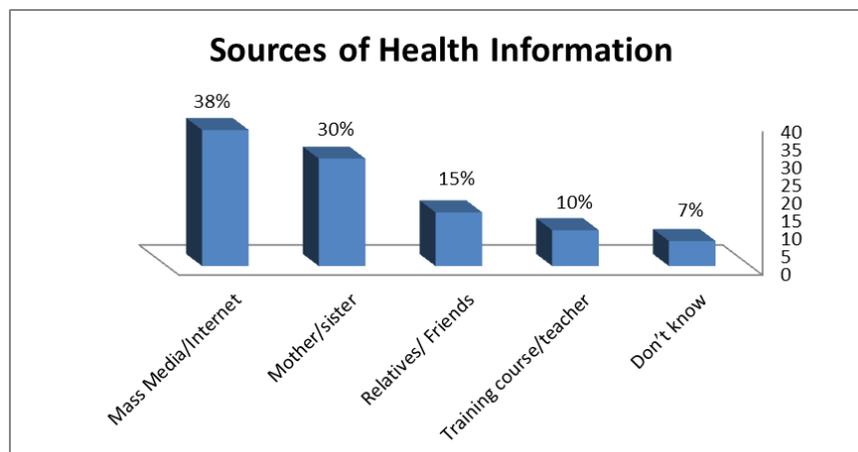


**Figure (1)** Female Total Knowledge Score levels n= (500).



**Figure (2)** Female Total Practice Score Levels about Prevention of RTI n= (500)

**Figure (3):** Explains that 38% of the studied students seek advice regarding symptoms of RTI from mass media and internet, while 30% of them mentioned mother and sister as a source of their health advice. Only 7% of studied students mentioned don't know.



**Figure (3):** Young Female Sources of Health Information concerning to RTI symptoms n= (500).

**Table (4)** This shows that the relationship between the age of students studied, marital status, mother occupation, and their overall level of knowledge score is highly statistically significant ( $P < 0.001$ ). While no statistically significant difference between the relationship between maternal education and the overall level of knowledge score ( $P > 0.05$ ).

**Table (5)** Describes that there are no statistically significant relationship between the age, marital status, and overall RTI prevention practice levels of the studied students ( $P < 0.05$ ). There is also a highly statistically significant relationship between the mother education & occupation of studied students and their overall levels of practice in RTI prevention, ( $P < 0.001$ ).

**Table (6)** Shows that the relationship between maternal education and family size of studied students and the incidence of RTI symptoms is highly statistically significant ( $P < 0.003$ ). There is also a statistically significant relationship between the marital status of the study students and the incidence of RTI symptoms ( $P < 0.05$ ).

**Table 4:** Association between Students' Total Knowledge Score Level and their Bio-Demographic data.

Items	Satisfactory $\geq 60$ N=200		Unsatisfactory < 60 % N=300		Total (n=500)		Z test
	No	%	No	%	NO	%	
<b>Age groups (in years)</b>							
18- <20	40	20.00	50	16.67	90	18.00	<b>Z=30.6</b> <b>P = 0.001*</b>
20-<22	90	45.00	210	70.00	30	60.00	
22- 24	70	35.00	40	13.33	0	22.00	
					11		
					0		
<b>Marital Status</b>							
Single	170	85.00	280	93.33	45	90.00	<b>Z=28.6</b> <b>P = 0.001*</b>
Divorced &Widow	30	15.00	20	6.67	0	10.00	
					50		
<b>Mother's education</b>							
-Illiterate or just read and write	29	14.50	65	21.67	94	18.80	<b>Z=9.6</b> <b>P = 0.059</b>
- Primary	50	25.00	130	43.33	18	36.00	
- Secondary	40	20.00	60	20.00	0	20.00	
- University	81	40.50	45	15.00	10	25.20	
					0		
					12		
					6		
<b>Mother's occupation</b>							
Working	110	55.00	100	33.33	21	42.00	<b>Z=17.6</b> <b>P = 0.001*</b>
Housewife	90	45.00	200	66.67	0	58.00	
					29		
					0		

**Table 5:** Association between Students' total practice score Level and their Demographic data.

Items	Healthy ≥75 N=210		Unhealthy <75 % N=290		Total (n=500)		$\chi^2$ P
	No	%	No	%	N0	%	
<b>Age groups (in years)</b>							$\chi^2=2.05$ P = 0.306
18- <20	50	23.81	40	13.80	90	18.00	
20-<22	70	33.33	230	79.31	300	60.00	
22- 24	90	42.86	20	6.89	110	22.00	
<b>Marital Status</b>							$\chi^2=5.61$ P = 0.028
Single	180	85.71	270	93.10	450	90.00	
Divorced &Widow	30	14.29	20	6.90	50	10.00	
<b>Mother's education</b>							$\chi^2=13.29$ P = 0.001
- Illiterate or just read and write	25	11.91	69	23.80	94	18.80	
- Primary	45	21.42	135	46.55	180	36.00	
- Secondary	50	23.81	50	17.24	100	20.00	
- University	90	42.86	36	12.41	126	25.20	
<b>Mother's occupation</b>							$\chi^2=9.79$ P = 0.002
Working	120	57.14	90	31.03	210	42.00	
Housewife	90	42.86	200	68.97	290	58.00	

**Table.6:** Association between Demographic data and Rate of RTI Symptoms among Students Female University.

Items	Present (340)		Absent (160)		Total (n=500)		$\chi^2$ P
	No	%	No	%	No	%	
<b>Age groups (in years)</b>							$\chi^2=0.185$ P = 0.67
18- <20	60	17.64	30	18.75	90	18.00	
20-<22	190	55.88	110	68.75	300	60.00	
22- 24	90	26.47	20	56.25	110	22.00	
<b>Marital Status</b>							$\chi^2= 6.233$ P = 0.021
Single	300	88.23	150	93.75	450	90.00	
Divorced &Widow	40	11.77	10	6.25	50	10.00	
<b>Mother's education</b>							$\chi^2= 12.26$ P = 0.003
- Illiterate or just read and write	70	20.60	24	15.00	94	18.80	
- Primary	150	44.12	30	18.75	180	36.00	
- Secondary	60	17.64	40	25.00	100	20.00	
- University	60	17.64	66	41.25	126	25.20	
<b>Mother's occupation</b>							$\chi^2= 2.26$ P = 0.11
Working	72	30.3	48	38.7	210	42.00	
Housewife	166	69.7	76	61.3	290	58.00	

RTIs: Reproductive Tract Infections

## DISCUSSION

All infections of the reproductive system are recognized by reproductive tract infections (RTI) and are also one cause of maternal morbidity and mortality, as the cause of loss of healthy life among women of reproductive age. Globally, reproductive tract infections cause serious health problems.

### **According to the results from the Quantitative data, the current study revealed that:**

The current study revealed that around 60 % of female students had a past history of health problems; 68 % of the female students reported having RTI symptoms. A highly statistically significant difference was found regarding all items related to RTIs. In addition that a highly statistically significant relation between studied students' age, marital status, mother occupation, and their total knowledge score level. While there is no statistically significant difference between the relationship between maternal education and the level of total knowledge score.

Regarding prevention of RTI and their total practice levels, it was found that no statistically significant relation between studied students' age, marital status. There is also a very important statistical relationship between the mother education & occupation of studied students and their overall levels of practice in RTI prevention. Also, a highly statistically significant relation between studied students' mother education & family size and the incidence of RTI symptoms. There is also a significant statistical relationship between the marital status of students studied and the incidence of symptoms of RTI. The current finding is also relatively consistent with the Balamurugan and Bendigeri (2012) study, which found that the prevalence of RTIs was 40.4 percent among women in the reproductive age group. The effect of socio-demographic factors on the occurrence of RTI has a direct effect. In addition, the study showed that (43.9 percent) women currently have symptoms of RTIs, which is relatively consistent with the study of Bhilwar et al (2015). Abdominal pain (68.2 percent), back pain (69.6 percent), and vaginal discharge (59.3 percent) were the most often reported symptoms.

In addition, it relatively matches with the study of Xu Sh et al, (2019). They found that, respectively, 3.2% and 22.6% of all subjects lacked knowledge about the identification and prevention of RTIs. Over 80 percent of the participants agreed to develop RTI and take courses related to RTI. Although every 2-3 days, 45.1% of respondents changed their underwear, relatively half of them cleaned their genitals daily, and one-third and more reported taking a bath daily. Moreover, the present finding is relatively in accordance with the study of Kerubo et al 2016. They found that one or more symptoms were reported by a quarter of them; vaginal discharge most commonly (11 percent), pain (9 percent), or itching (4 percent)

Furthermore, the current finding is in harmony with the findings reported by Kafle and Bhattarai (2016). The prevalence of suggestive RTI symptoms was found to be 39.9 percent. Common symptoms reported in the study were low back pain, vaginal discharge and low abdominal pain, and an irregular menstrual cycle. This could be due to changing lifestyle trends, dietary habits, stress, hormone imbalance, or some medical reasons that require gynecological evaluation at the earliest. In addition, the present finding falls in line with the study of Yassin (2012) Almost all of the study subjects who revealed a high prevalence of menstrual disorders had one or more menstrual disorders.

The present finding is relatively concordant with the studies of Ibrahim et al (2007) which revealed that most students had an unsatisfactory level of knowledge score on RTIs. Only very few of the learners had a satisfactory level of knowledge score. This may be due to inadequate understanding and lack of awareness of hygienic practices that have a negative impact on their level of practice. The current finding is partly in line with Ahmed (2009), who stated that most adolescent girls had inappropriate perineal hygiene practices. It also agrees with Busari (2012), who found that there was a statistically significant relationship between the hygienic practices of students and their mother's level of education.

As well the study exposed that, more than two-thirds of the female students have symptoms of RTIs. Temporarily, the majority of them didn't search for any health advice for their stated symptoms of RTIs. The factors which hinder them from seeking advice were due to shame of using obstetrical services and the absence of health services for female students in the university regarding reproductive health problems which might affect their health and future fertility negatively. The current finding also doesn't match with that of Sarhan (2008) revealed that more than two-thirds of girls preferred to consult their mothers when having any genital symptoms. In addition, the current findings contradict the study of Abd-Ella (2010) showed that the major source of information among adolescent girls was mothers.

***According to the results from the qualitative dimension for open ended questions, the current study revealed that:***

He interview was conducted with a total of fifty students, and they agreed to participate in the qualitative study. Their mean age was  $21 \pm 0.5$  years old, and all of them were female students.

### **Can you tell me about your perception about reproductive tract infection?**

The analyzed data indicated that; infections are perceived to be common for most of them and it causes much discomfort especially during study time, but there was a little evenness in the inscription of symptoms, causes, and values of infection. The common perception from their point of view was that infection is one of the causes of serious disease and leads to side effects like itching, burning sensation, and serious inflammation.

### **How many times did you have an infection in your reproductive tract?**

Regarding the extracted analysis, around one-third of students mentioned that they had an experience of one or two times of reproductive tract infections. As well they recognized the importance of early detection and management for infections. Some students, especially those who had previous experience of reproductive tract infection, acknowledge that better personal and quality of care could decrease the risk of infections. Lately, they relay the importance of periodic female community awareness regarding personal hygiene.

### **Can you indicate the factors leading to reproductive tract infection?**

Participant students indicated their openness to engaging in discussions about the factors and stated that it is not connected with the underlining cultural, traditional, and socio-economic factors. The majority of the students indicated that the toilets especially lack cleanliness of the bathroom, as one of the most causes and mode of acquiring RTI's. Several participants answered, reproductive tract infections are harmful and cause parasites or germs in the reproductive tract. I expect it hurts a lot, and the infection may be direct or indirect. Several

participants cited these infections that affect the reproductive tract could be due to Bacteria or viruses. While most participants were comments that untreated infections will lead to pelvic Inflammatory Diseases, ectopic pregnancy, infertility, and general health problems for the newborn. In addition, few of participants, relay health concerns, women experience, social consequences, and emotional distress could be one of gynecological morbidity.

### ***What is the adequate intervention point of view to avoid reproductive tract infection?***

From the settled data, students revealed their perception to avoid such infection to the immediate treatment in general. From their point of view, the immediate treatment could be through washing using more water and frequent personal hygienic or showers at home. There was a concern that married women only she has to go for consulting from the health care provider, especially if symptoms persist or aggravate. The participants highlight the need for young girls and university students to understand the reproductive system and the disease-related. One of their answers was; I do not feel comfortable when you ask me about the reproductive tract, because I'm not sure my information is correct or not. Most of the students were aware of their own limitations, due to their lack of knowledge and they requested to have learning sessions from specialists in a form of 'deep conversations' about the physiology of the reproductive system, symptoms, treatment, and how to avoid the related infections.

### **Limitations**

The studied sample involved students from only a few colleges, and the majority of respondents were from rural districts. Therefore, the data should be construed with attentiveness. Written responses to open-ended questions existing no opportunity to develop the answers through follow-up questions. Such an opportunity could have been valued if there is a sensitive or complex answer they could not script it in written text.

### **Conclusion**

The current study concludes that a great number of the studied students had a history of health problems, in relation to RTIs, the majority of students also had unsatisfactory knowledge score levels. In additional unhealthy hygienic practices score levels were the main pattern in relation to items related to acceptability of underwear care, perineal and menstrual hygiene, and around one-third of the studied students seek advice regarding symptoms of RTI from mass media and the internet.

### **Recommendations**

The study recommends that there is a need for periodic health assessment & health education requests assessment for female university students. Based on identified needs, designing and implementing relevant educational classes/programs for female university students to identify the early symptoms of RTI. Also based on the socio-demographic relation, there is a need to use appropriate educational strategies to increase the awareness of the health of students and the importance of healthy lifestyles, nutrition & hygiene. Further study is needed to investigate the incidence of and factors leading to RTIs and the adequate intervention. In addition to developing a strategy to increase adolescent's awareness about reproductive health services.

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### Conflict of Interest

The authors declare that they have no conflicts of interest

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