An Empirical Study On Awareness And Perception Of Female Tea Pluckers Regarding Symptomatic Urinary Tract Infections

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Abstract

Aim: The present paper purpose is to explore the perceptions and awareness of tea garden pluckers regarding the symptoms of urinary tract infections (UTIs), with a focus on various factors of demography such as religion, age, education, marital status, etc.

Objective: To assess the awareness and perceptions of female tea pluckers about symptomatic urinary tract infections among themselves.

Methodology: The methodology surrounded about descriptive research design in which a structured questionnaire a survey method is being implemented. This questionnaire gathered data on key demographic variables—age, marital status, religion, and educational qualifications—which served as independent variables. It also included items designed to measure the dependent variables, specifically the 'awareness' and 'perception' of symptomatic urinary tract infections, rated on a 5-point Likert scale. 617 tea pluckers were selected using stratified random sampling. To analyze the data and test the hypotheses, the study applied various statistical analysis techniques such as T-test, ANOVA, and post hoc analysis.

Findings: The outcome of the study indicate a significant difference among socio demographic factors when analyzing tea pluckers awareness of symptomatic urinary tract infections. Conversely, while examining perceptual differences regarding symptomatic urinary tract infections, significant differences were observed based on age and marital status. However, no significant differences were identified concerning religion and educational

qualifications in relation to tea pluckers perception of symptomatic urinary tract infections.

Research Limitations/Future Implications: Time and budget constraints, resulting in a small sample size, are among the study's limitations. Another limitation pertains to the measurement of tea pluckers' awareness and perception, as only a limited number of statements were considered. Future research could modify these measurement statements or incorporate alternative ones. Additionally, future studies may explore other socio-economic factors beyond those examined in this study. Furthermore, the study area is limited to a single district in the southern region of Assam.

Keywords: *Awareness, Perception, Tea pluckers, Urinary Tract Infections Symptoms*

1. Introduction

The early 1908s seen the tea cultivation on a large scale that was initiated by the colonial rule of East India Company in Assam during the early 1820s. The history recognizes Chabua, Dibrugarh, Assam as the first tea garden, set up in the year 1837. In 1840, the Assam Tea Company launched commercial tea production in the area. By the year 1850s, tea plantations had proliferated across other regions of India, leading to the widespread conversion of land for tea agriculture (Deka, 2008). India stands as a major global producer of tea, with the majority—around 80%—of its production being used for internal consumption (Caro, 2020). By the early 1900s, Assam had established itself as the world's foremost tea-producing region. Nevertheless, because tea cultivation depends on specific soil and climatic conditions, its production has remained confined to select areas of India. Currently, tea is grown across many states in India, out of which Kerela,Tamil Nadu, West Bengal and Assam accounts to approx 96% of India's total tea cultivation. The Northeast region alone comprises nearly 78% of India's total tea plantation area. Teas from regions such as Darjeeling, Assam, and the Nilgiris are internationally acclaimed for their unique quality. Tea exports significantly contribute to India's foreign exchange earnings. Moreover, several states including Karnataka, Bihar, Tripura, Uttarakhand, Odisha ,Himachal Pradesh, Arunachal Pradesh, Manipur, Sikkim, Nagaland, Meghalaya and Mizoram are involved in small-scale enterprises associated with the tea industry. (Arya, 2013). India's tea sector has seen substantial structural changes over the last twenty years. Despite this evolution, the sector has grappled with numerous challenges such as industry downturns, the closure of tea estates, low yield levels, shrinking profit margins, and a decline in export volumes. Assam holds a distinctive place as the only region globally that cultivates its own unique tea variety, Camellia assamica. Known for its rich, malty sweetness and earthy taste, Assam tea contrasts with the floral notes commonly associated with highland teas like those from Darjeeling and Taiwan (Gupta, 2018). The tea industry, founded during British colonial rule, relied on the migration of workers from Bihar and Odisha, and their descendants have since become an important demographic within the state (Kurmi, 1981). Tea is cultivated in over 60 countries, with the majority of production

happens to be in China followed by India (FAO, 2022). The tea industry is regarded as a crucial national resource, with plantation agriculture playing a key role in the overall agricultural sector. Urinary tract infections are seen to be the most common bacterial body infections in women, often aggravated by factors related to their occupation and environment (Bharara & P. Sandhu, 2017) and with an estimate of 150 million individuals affected worldwide every year (Vietinghof, et al., 2023). Female tea pluckers, who endure strenuous labor in challenging conditions, are particularly susceptible to health issues due to their limited access to proper sanitation and long working hours (Saikia, 2017), (Nahar, 2014).According, to the literature (Deshwara & Hasan Meer, 2021), at Deondi Tea Garden in, Habiganj, Bangladesh highlighted that a large number of female tea workers seeking treatment at his clinic are affected by urinary tract infections. Tea production remains a crucial contributor to Assam's economic development and is among India's most significant foreign exchange earners. The tea pluckers on tea estates plays an indispensable role in this sector (Choudhury, 2018). Their involvement and contributions are vital to the social and economic fabric of the region. This research paper motive is to shed light on the awareness and perception of female tea pluckers with regard to symptomatic urinary tract infections.

2. Review of Literature

2.1 Awareness and Perceptions towards Symptomatic Urinary Tract Infections

The goal of this review is to extract the variables or factors that measure awareness and perception, specifically those related to the causes of urinary tract infections (UTIs). We examined various studies to identify the factors contributing to UTIs across different populations and industries.

The study by (Almaghlouth, et al., 2023) explored the awareness, knowledge, and attitudes of individuals living in Al-Ahsa, Saudi Arabia, towards UTIs. The survey assessed several variables, including understanding what a UTI is, identifying risk factors, recognizing the seriousness of UTIs, methods for treatment, awareness of UTI prevalence, and knowledge of the higher susceptibility of females to UTIs.

Similarly, the research by (Alshahrani, *et al*., 2022) focuses on assessing the practices, knowledge and attitudes of females in the Aseer region of Saudi Arabia regarding urinary tract infections (UTIs). It identified common UTI symptoms, such as painful urination, urgency, and the presence of red urine. The key factors examined included familiarity with UTIs, defining a UTI, understanding the most common causes and symptoms, recognizing risk factors, identifying effective prevention and management methods, assessing the commonality of UTIs, and evaluating perceptions of UTIs as a serious health concern. The study also explored complications associated with UTIs, individuals' personal experiences with infections and their frequency, symptoms encountered during infections, daily water intake habits, the consumption of bladder-irritating fluids (like coffee or tea), and common

reactions to UTI symptoms.

Another study by (Selamat, et al., 2020) investigates the secondary school teenagers' general understanding and awareness, and prevailing attitudes towards UTIs. This study examined whether participants had encountered information about UTIs through reading or discussions, attended seminars or classroom sessions, or were aware of the causes, risk factors, and treatment options for UTIs. Further research by (Safwan, Bhavantha Dias, & Ayomi Dilhari, 2024) analyzed the awareness and perception of Sri Lankan teachers regarding their attitudes, practices and knowledge related to UTIs. The study assessed determinants such as prior exposure to information about UTIs, awareness of the most common causes, recognition of women's higher susceptibility due to their shorter urethra, acknowledgment of the increased risk among sexually active women, understanding the preventive benefits of drinking 3–4 liters of water daily, and identifying the burning sensation during urination as a common symptom of UTIs.

Additionally, research by (Sundas, et al., 2024) focused on pregnant women's attitude, knowledge and practicesconcerning UTIs in Pakistan. The study highlighted that UTIs are common infections affecting the bladder, kidneys, ureters, and urethra. Several factors contribute to UTIs, including poor hygiene, holding in urine for too long, dehydration, and bacteria entering the urinary tract during sexual activity. It is important to identify symptoms like burning sensation during urination, cloudy urine, frequent urination or has a strong odor in urine. To prevent and manage UTIs, individuals are advised to seek medical help, stay hydrated, and practice good hygiene.

The study (Tabassum, *et-al.*, 2021) intent to measure the awareness and knowledge of UTIs among students of university in Bangladesh by examining several key factors. It explored the common misconception that UTIs exclusively affect women, emphasizing the need for accurate information on the condition. The research also emphasized the importance of proper hygiene during urination as a key preventive step against UTIs. Additionally, it explored the role of hydration in managing infections, highlighting that drinking more water can help the body eliminate UTIs more efficiently.

This literature review provides insight into the key variables influencing awareness and perception of UTIs, which can contribute to future studies and awareness campaigns aimed at improving UTI prevention and management.

2.2 The Relationship Between Demographic Characteristics and Awareness and Perceptions.

This literature review aims to investigate research that links demographic characteristics with variables related to awareness and perception, specifically concerning the causes of urinary tract infections (UTIs). We reviewed various studies to identify the factors contributing to UTIs across different populations and industries.

The study (Tabassum, Most. Nazma Parvin, & Md. Imran Nur Manik, 2021) employs

descriptive data to analyses the respondents based on their prior knowledge and awareness of UTIs in relation to demographic characteristics such as marital status ,gender, age groups, & education (independent value). The research was conducted among university students in Bangladesh to measure the level of awareness and knowledge on urinary tract infections.

The article (Sundas, et al., 2024) sought to examine the connection between factors of knowledge, practices, attitude and socio-demography related to UTIs in pregnant women in Pakistan. This descriptive, cross-sectional study identified age and educational qualifications (independent variables) as the main socio-demographic factors explored.

The research (Selamat, et al., 2020) aimed to investigate the link between knowledge, practices, attitude and socio-demography in relation to UTIs among school students in Malaysia. This descriptive, cross-sectional study highlighted age and race (independent variables) as the main socio-demographic factors examined.

The study (Alshahrani, et al., 2022) in the Aseer region , aimed to investigate the relationship between attitudes, practices and knowledge concerning UTI among females. This cross sectional research tried to emphasize on age, marital status, and educational qualifications (independent variables) as the primary socio-demographic factors analyzed. Additionally, the study sought to assess awareness, attitude and knowledge toward UTIs in Saudi Arabia, examining marital status and education (independent variables) as key socio-demographic factors in measuring these aspects.

The study (Majumder, 2014) explored health-seeking behavior and the various factors influencing it. These factors may include (i) the nature of the disorder and how it is perceived, such as its type, stage, severity, frequency, duration, and identification; and (ii) individual characteristics, including family-related aspects (age, marital status, gender, household size, education, employment, ethnicity, and religion).

The study (Jaroliya, Jaroliya, & Modi, 2021) concentrated on examining the awareness and perception of employees (dependent variables) of those organizations that consider Corporate Social Entrepreneurship (CSE) and how these factors relate to employees' demographics (independent variables), which include gender, age, educational attainment, experience, designation, and number of employees. The study's conclusions showed that employees' awareness of CSE is not affected by their age, gender, amount of education, or position; but, when their views are taken into account, awareness levels do change.

2.3 Research Gap

The tea-garden communities in Assam constitute nearly 20% of the state's total population. Unlike their counterparts in other Indian states, who are recognized as Scheduled Tribes (STs) and Scheduled Castes (SCs), these communities in Assam are classified as Other Backward Class (OBC) or More Other Backward Class (MOBC). Unfortunately, the living conditions in tea garden settlements continue to be significantly subpar, primarily due to the meager

wages earned by workers. Their living conditions are further worsened by the lack of essential services in many tea plantations, including electricity, clean drinking water, sanitation, and healthcare facilities. The exploitative system within the tea industry today bears a strong resemblance to the colonial-era labor structure (Jumi, Borah, & Das, 2021), (Saha, Chitrasen Bhue, & Rajdeep Singha, 2019). The condition of women in tea garden of Assam is a pressing issue that has been the focus of continuous research and analysis. Studies indicate that women in these tea estates hold a considerably lower status compared to men (Sutradhar, 2015). This disparity is further aggravated by widespread health challenges, including micronutrient deficiencies like anemia, as well as infectious diseases and respiratory disorders (Medhi, N., B., & J., 2006). Lack of education and awareness about menstruation, along with the use of unhygienic practices, can result in severe issues in such as UTI & reproductive tract infections (Saikia, 2017), (Nahar, 2014). These challenges not only affect women's and girls' health but also limit their social and economic opportunities. Insufficient knowledge about proper menstrual management has contributed to absenteeism from work and school, as well as avoidance of public spaces (Das, et al., 2015). Urinary tract infections (UTIs) are common among tea garden workers, as highlighted by (Kabir, 2007). According to (Datta, 2017), UTIs are one of the most prevalent health problems that these workers deal with. Specifically, poor sanitation, unhygienic living circumstances, and hunger make female workers more vulnerable to disease. The population in tea garden communities is particularly at risk for various infectious diseases and malnutrition, driven by factors such as low socioeconomic status, lack of education and awareness, overcrowding, and poor living conditions (Purkayastha & Kalita, 2016), .The study of awareness and perception of female tea pluckers towards symptomatic urinary tract infections (UTIs) is crucial for the tea industry as it directly impacts workforce productivity, health, and overall industry sustainability. According to (Nahar, 2014) the main cause of UTIs for many tea garden workers is inadequate consumption of clean or unfiltered water. Female tea pluckers form a significant portion of the labor force, and frequent UTIs can lead to absenteeism, reduced efficiency, and lower productivity, ultimately affecting tea harvesting schedules and production output. Poor awareness and management of UTIs can also result in severe health complications, increasing medical expenses and decreasing workers' quality of life. Additionally, a workforce struggling with untreated health issues may experience lower morale and job dissatisfaction, leading to high employee turnover and recruitment challenges. There is limited literature specifically focusing on the awareness and perception of symptomatic urinary tract infections (UTIs) among female tea pluckers in the tea industry. While several studies have examined general menstrual health, hygiene practices, and reproductive health issues among women in rural and occupational settings, none explicitly address this topic among tea pluckers working in tea gardens. Research in related fields has highlighted the impact of poor hygiene and limited healthcare access on female workers' health, productivity, and well-being in agricultural sectors.

However, a study specifically targeting UTI awareness and perception among female tea pluckers would provide valuable insights into their unique challenges and contribute to both public health and industry-specific improvements. Insights from such studies can help policymakers and tea estate managers implement better workplace health programs, including improved sanitation, access to healthcare, and awareness campaigns. By prioritizing the health of female tea pluckers, the tea industry can maintain a stable and productive workforce, ensuring smooth operations and promoting the social and economic well-being of its workers.

3. Research Objectives and Hypotheses Formulated

3.1. Objective

To assess the awareness and perception of the female tea puckers with regard to symptomatic urinary tract infections existing among themselves.

3.2 Hypothesis

H_1: The awareness of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different demographic groups.

H_2: The perception of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different demographic groups.

4. METHODOLOGY

4.1 Research Area

This research was carried out in the Cachar district of Assam., located in northeastern India. Spanning over 3,786 square kilometers, the district lies in the southern region of Assam. Cachar is home to 56 tea estates, employing a total of 43,790 tea pluckers (Source: Assistant Labour Commissioner). For the study, the ten largest tea estates based on the number of workers—Koomber, Doloo, Ruttonpore, Dewan, Pollarbond, Burtoll, Binnakandy, Chandighat, Rosekandy, and Derby—were selected from the total 56 estates in the district.

4.2 Research Design

This research adopts a descriptive design and utilizes a survey method with a structured questionnaire to assess tea pluckers' awareness and perceptions of urinary tract infection symptoms.

4.3 Sample Size

The sample size of 367 was calculated through Cochran's (1963) formula. considering the sample unit as female tea pluckers with UTI symptoms. Although the final sample size for this study is 367, not all female tea plucker respondents approached may exhibit symptoms (occurrence rate) or may choose not to respond (completion rate) when contacted. To address this, a larger pool of respondents was approached to achieve the desired sample size. Consequently, 617 respondents were contacted to obtain the initial sample of 367 female tea pluckers with UTI symptoms. Additionally, 250 respondents were identified as female tea

pluckers without UTI symptoms.

4.4 Measurement tools:

The questionnaire included questions specifically designed to assess their awareness and perceptions regarding urinary tract infections. The statement for measuring the awareness and perception has been adopted from the questionnaire (Almaghlouth, et al., 2023), (Alshahrani, et al., 2022) (Safwan, Bhavantha Dias, & Ayomi Dilhari, 2024) (Selamat, et al., 2020) (Tabassum, et-al., 2021). The approach employed in previously published research has been followed for the measuring of the statements on the awareness of female tea pluckers towards symptomatic UTIs. The five measuring statements that make up workers' knowledge of symptomatic UTIs are as follows:

i.   I heard about what UTIs

ii.   I have experienced symptoms of burning sensations while urinating

iii.   I am aware delay in urination can cause UTI

iv.   I am aware that drinking less water can cause UTI

v.   I know maintenance of proper hygiene can prevent UTI

The approach employed in previously published research has been followed for the measuring of the statements on the perception of female tea pluckers towards symptomatic UTIs. The five measuring statements that make up workers' perception of symptomatic UTIs are as follows:

i.   I feel UTI is serious

ii.   I feel symptoms of a burning sensation/pain in urination, then I visit hospital

iii.   I feel symptoms of a burning sensation/pain in urination, I drink more water

iv.   I feel the symptoms of UTI is common

v.   I think female are more prone to UTI than male

The awareness and perception of tea pluckers regarding symptomatic UTIs are assessed using a series of statements measured on a 5-point Likert scale (Minejima, et al., 2018). The dependent variables of the study are: symptomatic urinary tract infections and the independent variables are: age, marital status, religion and educational qualifications.

4.5 Statistical analysis:

To achieve the objective of assessing the awareness and perception of female tea pluckers regarding symptomatic urinary tract infections (UTIs), several statistical steps were employed. Initially, scores for both awareness and perception were calculated based on a set of questions related to urinary tract infections (UTIs). These scores were then grouped into three categories: low, moderate, and high, determined by the 33rd and 66th percentiles of the total scores. After categorizing, cross-tabulation was used to examine the relationship between

the presence of UTI symptoms and the categorized levels of awareness and perception. This analysis provided insights into how awareness and perception varied between individuals who had experienced UTI symptoms and those who had not. To understand significant differences in awareness scores anova was applied to the data across different age groups and marital statuses. Post hoc using Tukey's HSD test was employed to pinpoint certain group differences. Lastly, the mean awareness scores between groups of religion (Hindu vs. Muslim) and educational levels (Illiterate vs. Primary) were investigated through T-tests. These tests helped determine whether differences in awareness were statistically significant based on these categorical variables.

5. Results and analysis

5.1 Data Description

The table below presents the summary statistics of tea pluckers' awareness and perception in relation to the demographic profiling of the 617 sample units, as shown in Table 1.

Table 1: Profile of Tea Pluckers Based on Demographic Traits

Demographic Factor		Frequency	Percentage	Mean (Awareness)	S.D (Awareness)	Mean (Perception)	S.D (Perception)
Age	18-30	115	18.6	11.76	2.53	14.11	2.32
	31-40	268	43.4	12.62	2.15	15.91	2.16
	41-50	193	31.3	11.99	2.08	15.33	2.10
	50+	41	6.6	12.85	2.24	15.27	2.27
Marital Status	Married	394	63.9	12.50	2.26	15.26	2.46
	Unmarried	190	30.8	12.09	2.18	15.66	1.89
	Divorced	20	3.2	10.30	0.46	14.95	1.53
	Widow	13	2.1	11.15	2.35	14.23	1.76
Religion	Hindu	540	87.5	12.41	2.25	15.34	2.35
	Muslim	77	12.5	11.32	1.92	15.44	1.69
Educational Qualification	Illiterate	303	49.1	12.66	2.12	14.95	2.56
	Primary Level	314	50.9	11.91	2.30	15.12	2.41

Table 1 shows that variables with lower means indicate stronger agreement with the measurement statements, while higher means suggest greater disagreement. This trend is consistent for both awareness and perception of symptomatic urinary tract infections. Furthermore, the overall Cronbach's alpha reliability score, which measures the reliability of the instrument, is 0.729. This value demonstrates good internal consistency for the survey. As a Cronbach's alpha value of 0.7 or above is typically regarded as acceptable in social science studies, the result indicates that the 10 items in the scale effectively assess the same underlying construct—awareness and perception of urinary tract infections (UTIs).

5.2 Hypothesis testing

Table 2: Cross tabulation of Awareness and Existence of symptoms.

Crosstab					
Count					
		Awareness category			Total
		Lowest awareness	moderate	high	
Existence of symptoms	No	133	73	44	250
	yes	47	153	167	367
Total		180	227	210	617

This table shows the relationship between awareness levels (low, moderate, high) and the existence of UTI symptoms. Out of the 617 respondents, 367 (59%) reported experiencing UTI symptoms, with the majority of them falling in the high awareness category (167 respondents). This suggests that respondents with higher awareness , the reporting of experiencing symptoms is more likely. Conversely, 250 respondents reported no symptoms, with a larger portion being in the lowest awareness category (133 respondents), indicating that low awareness might be associated with a lack of symptom recognition.

Table 3: Cross Tabulation of Perception and Existence of symptoms

Crosstab					
Count					
		Perception category			Total
		Low	Moderate	High	
Existence of symptoms	No	112	56	82	250
	yes	176	75	116	367
Total		288	130	199	617

Similarly, this table illustrates the relationship between perception levels (low, moderate, high) and UTI symptoms. Of those who reported symptoms, the majority fell into the low perception category (176 respondents). This suggests that, despite experiencing symptoms, many respondents do not perceive UTIs as serious, which may impact their health-seeking behavior. The table highlights a notable relationship between low perception levels and the existence of symptoms, suggesting a potential gap between awareness and health perceptions.

5.2.1. Awareness on symptomatic urinary tract infections and age

H1$_a$: The awareness of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different age groups.

Table 4: ANOVA Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Age

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.895	3	2.965	4.787	.003
Within Groups	379.646	613	.619		
Total	388.541	616			

Table 5: Tukey HSD Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Age

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	31-40	-.219	.088	.062	-.44	.01
18-30	41-50	-.002	.093	1.000	-.24	.24
	50+	-.338	.143	.086	-.71	.03
	18-30	.219	.088	.062	-.01	.44
31-40	41-50	.217*	.074	.019	.03	.41
	50+	-.119	.132	.804	-.46	.22
	18-30	.002	.093	1.000	-.24	.24
41-50	31-40	-.217*	.074	.019	-.41	-.03
	50+	-.336	.135	.064	-.68	.01
	18-30	.338	.143	.086	-.03	.71
50+	31-40	.119	.132	.804	-.22	.46
	41-50	.336	.135	.064	-.01	.68

*. The mean difference is statistically significant at the 0.05 level.

Interpretation

The ANOVA table shows a statistically significant difference in awareness levels across different age groups (F = 4.787, p =0.003). The post -hoc analysis (Tukey HSD) reveals that respondents aged 31-40 have significantly higher awareness than those aged 41-50 (p = 0.019). There is also a near-significant difference between those aged 50+ and younger age groups, indicating that younger respondents may have higher awareness levels than older respondents.

5.2.2. Awareness on symptomatic urinary tract infections and marital status

H1$_b$: The awareness of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different marital status.

Table 6: ANOVA Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Marital Status

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	15.701	3	5.234	8.605	.000
Within groups	372.840	613	.608		
Total	388.541	616			

Table 7: Tukey HSD Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Marital Status

(I) Marital Status	(J) Marital Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Unmarried	.164	.069	.083	-.01	.34
Married	Divorced	.832*	.179	.000	.37	1.29
	Widow	.286	.220	.563	-.28	.85
	Married	-.164	.069	.083	-.34	.01
Unmarried	Divorced	.668*	.183	.002	.20	1.14
	Widow	.122	.224	.947	-.45	.70
	Married	-.832*	.179	.000	-1.29	-.37
Divorced	Unmarried	-.668*	.183	.002	-1.14	-.20

	Widow	-.546	.278	.202	-1.26	.17
Widow	Married	-.286	.220	.563	-.85	.28
	Unmarried	-.122	.224	.947	-.70	.45
	Divorced	.546	.278	.202	-.17	1.26

The mean difference is significant at the 0.05 level.

Interpretation

The ANOVA results show significant differences in awareness based on marital status (F = 8.605, p = 0.000). The post-hoc comparisons indicate that divorced women have significantly higher awareness levels than both married and unmarried women (p = 0.000 and p = 0.002, respectively), suggesting that marital status has an influence on UTI awareness.

5.2.3. Awareness on symptomatic urinary tract infections and religion

H1$_c$: The awareness of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different religious groups.

Table 8: T-test Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Religious Affiliation

Group Statistics					
	Religion	N	Mean	Std. Deviation	Std. Error Mean
Awareness categorize	Hindu	540	2.09	.801	.034
	Muslim	77	1.73	.662	.075

The group statistics show that Hindu respondents have a higher mean awareness score (2.09) compared to Muslim respondents (1.73), indicating that awareness of UTIs is higher among Hindu respondents. The independent samples t-test confirms that this difference is statistically significant (t = 3.837, p = 0.000), suggesting a notable disparity in awareness based on religious background.

5.2.4. Awareness on symptomatic urinary tract infections and educational qualification

H1$_d$: The awareness of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different education levels.

Table 9: **T-Test Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Educational Qualifications**

Group Statistics					
	Education	N	Mean	Std. Deviation	Std. Error Mean
Awareness categorizes	Illiterate	303	2.17	.771	.044
	Primary level	314	1.93	.798	.045

The descriptive statistics for educational qualifications show that illiterate respondents have a higher mean awareness score (2.17) compared to those with primary education (1.93). The t-test shows that the difference in awareness between illiterate and primary-level educated respondents is statistically significant (t = 3.925, p = 0.000). This suggests that illiteracy may be associated with greater awareness, possibly due to alternative information sources or dependence on traditional knowledge.

Table 10: Table of Independent Sample T Test for Awareness

	F	sig	t	df	Sig (2-tailed)
Religion	4.375	0.037	3.837	615	0.000
Educational Qualification	0.004	0.950	3.925	615	0.000

Interpretation

1. Religion:

Levene's Test for Equality of Variances (F = 4.375, p = 0.037): The premise of equal variances is broken, as evidenced by the p-value of 0.037, which is below the typical cutoff of 0.05. Consequently, care should be taken when interpreting t-test results that assume unequal variances.

t-test (df = 615, p < 0.001, t = 3.837): There is a statistically significant difference in the awareness levels of the two religious groups (Muslim and Hindu), as indicated by the two-tailed significance (p-value) of 0.000. This suggests that these groups' awareness of UTIs varies greatly.

2. Educational Qualification:

Levene's Equality of Variances Test (p = 0.950, F = 0.004) The assumption of equal variances is supported by a p-value of 0.950, which is significantly higher than 0.05. As a result, the t-

test findings that assume equal variances can be interpreted.

The two-tailed p-value of 0.000 indicates a statistically significant difference in awareness between the two educational groups (primary level vs. illiterate) (t-test ($t = 3.925$, df = 615, $p < 0.001$). This implies that awareness of UTIs is influenced by educational background.

5.2.5. Perception on symptomatic urinary tract infections and age

H2$_a$: The perception of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different age groups.

Table 11: ANOVA Results: Perception of Tea Pluckers Towards Symptomatic Urinary Tract Infections Across Different Age Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	30.062	3	10.021	13.832	.000
Within Groups	444.100	613	.724		
Total	474.162	616			

Table 12: Tukey HSD Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections Across Different Age Groups

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	31-40	-.610*	.095	.000	-.85	-.37
18-30	41-50	-.420*	.100	.000	-.68	-.16
	50+	-.370	.155	.080	-.77	.03
	18-30	.610*	.095	.000	.37	.85
31-40	41-50	.190	.080	.085	-.02	.40
	50+	.240	.143	.335	-.13	.61
	18-30	.420*	.100	.000	.16	.68
41-50	31-40	-.190	.080	.085	-.40	.02
	50+	.050	.146	.986	-.33	.43
	18-30	.370	.155	.080	-.03	.77
50+	31-40	-.240	.143	.335	-.61	.13

41-50	-.050	.146	.986	-.43	.33

*. The mean difference is significant at the 0.05 level.

Between Groups (Sum of Squares = 30.062, F = 13.832, p = 0.000): The p-value of 0.000 indicates a highly significant variation in UTI perception among the different age groups (18–30, 31–40, 41–50, and 50+).

Tukey HSD Multiple Comparisons:

18-30 vs. 31-40: Significant difference (p = 0.000), with the younger age group (18-30) having a lower perception score than 31-40.

18-30 vs. 41-50: Significant difference (p = 0.000), with 18-30 again showing a lower perception score compared to 41-50.

18-30 vs. 50+: Borderline significant (p = 0.080), with 18-30 having a lower perception score compared to those 50+.

31-40 vs. 41-50: No significant difference (p = 0.085).

Other comparisons (31-40 vs. 50+, 41-50 vs. 50+): No significant differences.

Interpretation: Age significantly influences UTI perception, with younger individuals (18-30) having lower perception scores compared to older groups. The perception increases with age, particularly between the 18-30 group and the older age groups (31-40 and 41-50).

5.2.6. Perception on symptomatic urinary tract infections and marital status

H2b: The perception of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different marital status.

Table 13: ANOVA Results: Perception of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Marital Status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.311	3	2.437	3.200	.023
Within Groups	466.851	613	.762		
Total	474.162	616			

Table 14: Results: Tukey HSD Results: Perception of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Marital Status

(I) Marital Status	(J) Marital Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Unmarried	.064	.077	.839	-.13	.26
Married	Divorced	.401	.200	.187	-.11	.92
	Widow	.593	.246	.076	-.04	1.23
	Married	-.064	.077	.839	-.26	.13
Unmarried	Divorced	.337	.205	.356	-.19	.87
	Widow	.529	.250	.149	-.12	1.17
	Married	-.401	.200	.187	-.92	.11
Divorced	Unmarried	-.337	.205	.356	-.87	.19
	Widow	.192	.311	.926	-.61	.99
	Married	-.593	.246	.076	-1.23	.04
Widow	Unmarried	-.529	.250	.149	-1.17	.12
	Divorced	-.192	.311	.926	-.99	.61

Between Groups (Sum of Squares = 7.311, F = 3.200, p = 0.023): The p- value (**0.023**) is less than 0.05, indicating a statistically significant difference in UTI perception between different marital status groups (Married, Unmarried, Divorced, Widow).

Tukey HSD Multiple Comparisons:

Married vs. Unmarried: No significant difference (p = 0.839).

Married vs. Divorced: No significant difference (p = 0.187).

Married vs. Widow: Borderline significant difference (p = 0.076), with Widows showing a higher mean perception score compared to Married individuals.

Other comparisons (Unmarried, Divorced, Widow): No significant differences between these groups.

Interpretation: There is an overall significant effect of marital status on perception of UTI, with the greatest potential difference between Widows and Married individuals, though this

result is not conclusive (p = 0.076). Other group differences are not statistically significant.

5.2.7. Perception on symptomatic urinary tract infections and religion

H2$_c$: The perception of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different religious groups.

Table 16: T-Test Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by Religion

	Religion	N	Mean	Std. Deviation	Std. Error Mean
perception_ categorize	Hindu	540	1.84	.865	.037
	Muslim	77	1.94	.964	.110

Hindu (Mean = 1.84) vs. Muslim (Mean = 1.94): The perception scores are slightly higher for Muslim individuals compared to Hindus, but the difference is minimal.

t-test (F = 10.583, p = 0.001, t = -0.848, p = 0.397): Although Levene's test indicates a significant difference in variances (p = 0.001), the t-test shows no statistically significant difference in perception between Hindus and Muslims (p= 0.397).

Interpretation: While there is a slight difference in perception scores between the two religious groups, it is not statistically significant. Therefore, religion does not have a significant influence on UTI perception in this sample.

5.2.8. Perception on symptomatic urinary tract infections and educational qualifications

H2d: The perception of female tea pluckers with regard to symptomatic urinary tract infection differ significantly among different education levels.

Table 15: Results: Awareness of Tea Pluckers Towards Symptomatic Urinary Tract Infections by education

	Level of Education	N	Mean	Std. Deviation		Std. Error Mean
Perception categorize	Illiterate	303	1.86	.886		.051
	Primary level	314	1.85	.871		.049

Illiterate (Mean = 1.86) vs. Primary Level (Mean = 1.85): The mean perception scores for both groups are almost identical, indicating that educational qualification (Illiterate vs. Primary level)

does not show a meaningful difference in UTI perception.

t-test (F = 0.555, p = 0.457, t = 0.065, p = 0.948): The t-test shows no significant difference in UTI perception between individuals who are illiterate and those with a primary education (p = 0.948).

Interpretation: Educational qualification (Illiterate vs. Primary level) does not have a statistically significant impact on UTI perception.

Table 17: Table of Independent Sample Test for Perception

	F	sig	t	df	Sig (2- tailed)
Religion	10.583	0.001	-.848	615	.397
Educational Qualification	0.555	0.457	0.065	615	.948

Summary –

I. Marital status has a modest impact on UTI perception, with Widows potentially having higher perception scores.

II. Age is a significant factor, with younger individuals (18-30) showing lower UTI perception compared to older individuals.

III. Educational qualification (Illiterate vs. Primary level) does not influence perception significantly.

IV. Religion does not significantly affect perception of UTI between Hindus and Muslims

7. Conclusion

The primary intention of this study was to scrutinize how female tea puckers perceive and understand the presence of symptomatic UTIs among themselves. The study's empirical data reveal that 367 (59%) of the 617 respondents reported experiencing UTI symptoms, with 165 of them falling into the high-awareness group. This suggests that individuals with greater awareness are more likely to report symptoms. In contrast, a larger proportion of respondents (134) belonged to the lowest-awareness group, indicating that poor awareness may be linked to a failure to recognize symptoms, while 250 respondents reported no symptoms. Additionally, there is a noticeable variation between the 50+ demographic and younger age groups, suggesting that younger respondents may have higher awareness levels than older ones. Post-hoc comparisons indicate that divorced women exhibit significantly higher awareness levels than both married and unmarried women, suggesting that marital status influences UTI awareness. As shown in the group statistics, Hindu respondents demonstrate greater awareness of UTIs compared to Muslim respondents, with a mean awareness score of 2.09 versus 1.73. Interestingly, illiteracy may be associated with higher awareness, possibly due to reliance on traditional knowledge or alternative information sources. This is supported by the t-test, which indicates that the awareness gap between illiterate respondents and those with only primary education is statistically significant (t = 3.925, p = 0.000). Therefore, educational background plays a role in shaping UTI awareness.

7.1 Implications to Policymakers

The tea industry is one of the few sectors that actively prioritizes women workers. This emphasis is due to their exceptional skill in plucking tea leaves, a task that requires precision and dexterity, often attributed to their nimble fingers. Harvesting two leaves and a bud without harming the plant demands significant expertise (Choudhury, 2018). This industry plays a critical role in the nation's economy. Firstly, as a labour-intensive sector, it provides substantial employment opportunities. Secondly, it bolsters the economy by earning foreign exchange through tea exports. Thirdly, the industry fosters the socioeconomic development of rural areas, as tea plantations are predominantly located in underdeveloped regions. Furthermore, it contributes to the national budget and supports environmental sustainability.

7.2 Implications to Tea Garden Management

The findings of our study carry significant policy implications for improving socioeconomic conditions. Many tea pluckers in our country have low literacy levels and lack the knowledge to maintain proper hygiene practices. In this context, government initiatives focused on health and hygiene awareness can help reduce the prevalence of certain illnesses. The results indicate that insufficient education and awareness are key factors contributing to poor hygiene and health practices, which may lead to symptoms of urinary tract infections (UTIs).

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Table 18 Test of Normality

| | Kolmogorov-Smirnov[a] | | | | | |
	Statistic	Df	Sig.	Statistic	df	Sig.
I heard about what UTIs	.254	617	.150	.829	617	.172
I have experienced symptoms of burning sensations while urinating	.382	617	.520	.702	617	.550
I am aware delay in urination can cause UTI	.309	617	.470	.790	617	.390
I am aware that drinking less water can cause UTI	.400	617	.486	.722	617	.480
I know maintenance of proper hygiene can prevent UTI	.306	617	.058	.839	617	.097
I feel UTI is serious	.276	617	.785	.839	617	.658
I feel symptoms of a burning sensation/pain in urination, then I visit hospital	.330	617	.157	.799	617	.187
I feel symptoms of a burning sensation/pain in urination, I drink more water	.308	617	.108	.769	617	.098

I feel the symptoms of UTI is common	.255	617	.582	.815	617	.486
I think female are more prone to UTI than male	.305	617	.782	.819	617	.665

a. Lilliefors Significance Correction