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Original Research Article

Knowledge, attitude and preventive practices regarding sexually transmitted infections among reproductive-age adults in rural Malappuram district, Kerala: a cross-sectional study

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ABSTRACT

Background: STIs remain a major global public health problem due to high incidence, complications and impact on reproductive health. In India, STIs contribute significantly to reproductive morbidity, while awareness regarding STIs other than HIV and their prevention remains limited. Assessing KAP regarding STIs among reproductive-age adults is essential to improve prevention strategies and reduce disease burden.
Methods: A hospital-based descriptive cross-sectional study was conducted among individuals aged 15-49 years attending OBG OPDs in Malappuram district, Kerala. A total of 300 participants were selected using stratified random sampling with systematic selection and data were collected through face-to-face interviews using a semi-structured questionnaire assessing socio-demographic variables and STI KAP. Data were analyzed using SPSS v26 with chi-square test for bivariate analysis ($p \leq 0.05$).
Results: Among 300 participants, good STI knowledge was observed in 37% while 63% had poor knowledge. Good attitude was present in 42% while 58% had poor attitude. Only 24% demonstrated good preventive practices while 76% had poor practices regarding STIs.
Conclusions: KAP regarding STIs among reproductive-age adults was inadequate, indicating important gaps in awareness and adoption of preventive behaviours. Strengthening targeted health education and improving access to reliable sexual health information are essential to improve KAP and enhance STI prevention and control.

Keywords: Sexually transmitted diseases, Health knowledge attitudes practice, Sexual behaviour, Risk-taking, Condoms, Reproductive health, HIV

INTRODUCTION

Sexually transmitted infections (STIs) remain an important public health problem worldwide because of their high incidence, long-term complications and impact on reproductive and sexual health. According to the World Health Organization, more than 1 million STIs are acquired every day globally, and an estimated 374 million new infections occur annually with one of the four curable STIs—chlamydia, gonorrhoea, syphilis and trichomoniasis. In addition, over 500 million people aged 15-49 years are estimated to have genital infection with herpes simplex virus.[1,2] Global epidemiological estimates in 2021 reported 1,645,333 incident cases of HIV and approximately 722 million incident cases of other STIs worldwide, with 40.3 million DALYs attributable to HIV and about 7.9 million DALYs due to other STIs. The global age-standardized incidence rate of HIV declined from 36.7 per 100,000 population in 1990 to 20.7 per 100,000 in 2021, whereas the incidence of other STIs

remained relatively stable, increasing slightly from 8692.6 to 8871.7 per 100,000 population. Projections indicate that by 2030, the HIV incidence may decline further to about 12.9 per 100,000, while the incidence of other STIs is expected to increase to around 9150 per 100,000 population globally. Many STIs remain asymptomatic, which facilitates continued transmission and delays treatment, thereby contributing to infertility, adverse pregnancy outcomes and increased susceptibility to human immunodeficiency virus infection.[2-4] In India, STIs continue to contribute substantially to the burden of reproductive morbidity among sexually active populations. National estimates suggest that nearly 6% of the adult population may have one or more STIs at any given time, resulting in approximately 30-35 million episodes annually.[5,6] A study from North India reported that 15% of participants had an STI, with Candida infection accounting for 66.67% of cases, while chlamydia and trichomonas each contributed 13.33% and one case of syphilis was detected.[6] In India, higher STI risk has been reported among key populations, including MSM (87.3%), transgender individuals (69.2%), female sex workers (57.5%) and injecting drug users (60.7%), with younger age, marital status and family structure associated with increased risk.[7] Although large-scale awareness programmes have improved knowledge regarding HIV/AIDS, awareness about other STIs and their preventive measures remains inadequate in many communities. Limited knowledge, misconceptions, stigma related to sexual health and unsafe sexual practices continue to hinder early diagnosis and prevention, particularly among individuals in the reproductive age group.[8,9]

Several studies have examined awareness and behavioural aspects related to STIs among young populations.[10-13] A study conducted among high school students in Thrissur reported that only about 40% of participants had good knowledge regarding STIs, while the majority had poor knowledge levels.[10] Similarly, research among college students in Bengaluru observed that although almost all participants were aware of HIV infection, less than half had knowledge regarding other STIs and their complications.[11] A study conducted in Haryana, India reported that 44% of women had never heard of STI/RTI, the prevalence of self-reported STI/RTI symptoms was 60% and only 40% sought treatment, with many considering the condition a minor problem.[12] These findings indicate that awareness about STIs other than HIV remains insufficient even among educated groups, suggesting the need for further community-based assessments focusing on knowledge, attitude, and preventive practices.[11-13]

In Kerala, the number of reported STI cases increased from 15,296 in 2021–22 to 19,323 in 2022–23, with more than 13,840 cases recorded by February of the 2023-24 financial year, indicating a rising trend across the state, including districts such as Malappuram.[14] The Malappuram district of Kerala has a large rural population with distinct sociocultural characteristics that may influence awareness and health-seeking behaviour related to sexual and reproductive health. However, community-based data assessing knowledge, attitude and preventive practices regarding STIs among reproductive-age adults in rural areas of Malappuram are limited. Assessing these factors is important for identifying knowledge gaps, misconceptions and behavioural patterns that may contribute to continued transmission.[12-15] Therefore, the present study was conducted to evaluate the knowledge, attitude, and preventive practices regarding STIs and associated factors among reproductive-age adults in rural Malappuram district, Kerala, with the aim of generating evidence that may assist in planning targeted health education and prevention strategies in the community.

METHODS

Study design, setting and duration

The present hospital-based descriptive cross-sectional study was conducted in the OBG OPDs of three major health facilities in Malappuram district, Kerala, India: MES Medical College, Perinthalmanna; District Hospital, Perinthalmanna; and Community Health Centre, Mankada. Data were collected over a six-month period from June 2021 to December 2021.

Study population, sample size and sampling

Inclusion criteria

The study population consisted of individuals belonging to the reproductive age group (15-49 years) attending the obstetrics and gynecology outpatient departments of MES Medical College, Perinthalmanna; District Hospital, Perinthalmanna and Community Health Centre, Mankada in Malappuram district, Kerala. Participants who were willing to provide informed consent were included in the study.

Exclusion criteria

Individuals who did not consent to participate, those who were mentally unstable and those who were unable to comprehend the questionnaire were excluded from the study.

Sample size

The sample size was calculated using the formula $n=Z^2pq/d^2$, where Z=1.96 at 95% confidence level, p=prevalence of good knowledge regarding STIs (40.5%) based on a previous study conducted at Thrissur Medical College by Sunil et al, 11 q=100−p (59.5%) and d=absolute precision of 6%. The calculated minimum sample size was 268, which was increased to 300 to improve the reliability of the estimates and to account for possible non-response.

Sampling

Stratified random sampling was adopted by considering the three selected health facilities as separate strata. From each facility, 100 participants were included in the study. Within each OPD, participants were selected using systematic random sampling. Based on the average daily attendance of eligible patients, a sampling interval was calculated, and every 'k'th eligible patient attending the OBG OPD was selected after choosing a random starting point until the required sample size was achieved.

Method of data collection and data analysis

Data were collected using a semi-structured, pre-designed questionnaire through face-to-face interview method. The questionnaire was developed based on previously validated tools used in similar studies conducted in different parts of India.[10-13] Questions from these studies were adapted and compiled to suit the objectives of the present study and to accommodate local sociocultural and geographical variations. The questionnaire consisted of two sections.

The first section included socio-demographic and clinical characteristics of the participants, such as age, gender, education, occupation, type of family and socioeconomic status, etc. The second section assessed knowledge, attitude, and preventive practices regarding STI. This section consisted of a total of 30 items, with 10 questions each addressing knowledge, attitude, and preventive practices related to STIs. Each correct response was assigned an appropriate score and the total scores for knowledge, attitude and preventive practices were calculated for each participant. Based on the overall mean±standard deviation of the scores, the participants were categorized into "good knowledge and poor knowledge", "good attitude and poor attitude", and "good preventive practices and poor preventive practices". A pilot study was conducted among 30 participants (10% of the calculated sample size) attending the OBG OPD to assess the feasibility, clarity, validity and appropriateness of the questionnaire. Necessary modifications were made based on the responses obtained during the pilot phase to improve the clarity and relevance of the questions. The participants included in the pilot study were not included in the final analysis. After obtaining informed consent, eligible participants were interviewed using the finalized questionnaire and the responses were recorded systematically. The collected data were broken down into percentages and cross-tabulated for several variables. Version 26 of the SPSS software was used for the analysis. Where applicable, chi-square values were generated for bivariate analysis, and a p value of 0.05 or less was regarded as statistically significant.

Ethical consideration

All participants were assured of complete confidentiality and anonymity and participation in the study was entirely voluntary. The purpose and nature of the study were explained to all potential participants prior to enrolment, and written informed consent was obtained from those willing to participate. Ethical clearance for the study was obtained from the Institutional Ethics Sub-Committee of MES Medical College with reference number MES/CM/08/2024. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

RESULTS

Sociodemographic characteristics of study participants (n=300)

Among the 300 study participants, the majority belonged to the age group of 25-34 years (42.7%). Females constituted the majority of the study population (76.0%), and most participants were married (80.3%). More than half of the participants had one to two children (55.7%). Nearly half of the participants had completed high school or intermediate education (49.3%) and a large proportion were unemployed or unskilled workers (44.3%). Most participants belonged to nuclear families (57.3%) and the majority followed Islam (66.0%). Regarding socioeconomic status, the largest proportion belonged to the lower middle class (46.3%). More than half of the participants reported age at marriage between 20-25 years (54.7%). Television or newspapers were the most common sources of mass media exposure (44.0%), while media and the internet were the most frequently reported sources of information about STIs (48.7%). These findings indicate that the study population predominantly consisted of married women from nuclear families with moderate educational status and media exposure. (Table 1).

Clinical and reproductive characteristics of study participants (n=300)

Among the study participants, the majority reported no history of STI symptoms in the past (85.7%), and most had no previous diagnosis of STI (90.3%). Among those who reported symptoms, more than half sought treatment from government hospitals (51.2%).

Condom use was low, with the majority reporting that they never used condoms (82.0%). Awareness of HIV testing services was high among participants (72.3%), although a majority had never undergone HIV testing (66.3%). Most participants had one to two children (56.3%). Regarding contraceptive use, other methods such as OCP, IUCD or sterilization were the most commonly reported (40.3%). Among those who reported symptoms, vaginal discharge was the most common complaint (48.8%). These findings suggest that although awareness of HIV services was relatively high, preventive practices such as condom use and health-seeking behaviour for STI symptoms remained limited (Table 2).

Table 1: Socio-demographic characteristics of study participants (n=300).

Variables	Frequency (N)	Percentage (%)
Age group (years)		
15-24	74	24.7
25-34	128	42.7
35-49	98	32.6
Gender		
Male	72	24.0
Female	228	76.0
Marital status		
Married	241	80.3
Unmarried	46	15.3
Widowed/divorced	13	4.3
Number of children		
None	58	19.3
1-2	167	55.7
≥3	75	25.0
Educational status		
Graduate and above	69	23.0
High school/intermediate	148	49.3
Primary/illiterate	83	27.7
Occupation		
Professional/skilled	63	21.0
Semi-skilled/clerical /farmer	104	34.7
Unemployed/unskilled	133	44.3
Type of family		
Nuclear	172	57.3
Joint	93	31.0
Three-generation family	35	11.7
Religion		
Muslim	198	66.0
Hindu	84	28.0
Christian/others	18	6.0
Socioeconomic status		
Upper/upper middle	52	17.3
Lower middle	139	46.3
Upper lower/lower	109	36.3
Age at marriage (years)		
<20	86	28.7
20-25	164	54.7
>25	50	16.6
Exposure to mass media		
Television/newspaper	132	44.0
Internet/social media	118	39.3
None	50	16.7
Source of information about STIs		
Health professionals/ health workers	82	27.3
Media/internet	146	48.7
Friends/relatives	72	24.0

Knowledge, attitude and practice towards STIs of study participants (n=300)

Knowledge of STIs

In the present study, 111 participants (37%) had good knowledge regarding sexually transmitted infections. The remaining 189 participants (63%) demonstrated poor knowledge regarding STIs. Among the knowledge-related questions, 78% of the participants correctly reported that they were aware of the term sexually transmitted disease. Nearly 71% correctly identified HIV as a sexually transmitted infection. About 64% correctly answered that tuberculosis is not an STD. Around 59% correctly recognized unusual genital discharge as a symptom of STDs. Additionally, 62% of the participants correctly identified HIV/AIDS as an infection that can be transmitted through unprotected sexual intercourse, sharing needles and from mother to child. Furthermore, 55% of the participants correctly identified human papillomavirus as an STI that can be prevented through vaccination. Nearly 60% correctly responded that antenatal screening and treatment can help prevent mother-to-child transmission of STIs (Figure 1).

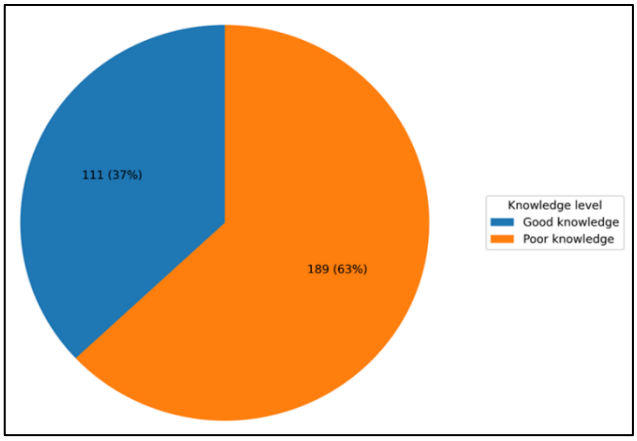

Figure 1: Knowledge of STI among study population (n=300).

Attitude towards STI's

In the present study, 126 participants (42%) demonstrated a good attitude towards sexually transmitted infections. However, a larger proportion of participants, 174 (58%), exhibited a poor attitude regarding STIs.

Among the attitude-related questions, 58% of the participants agreed that sex education is necessary for young people. Nearly 36% disagreed with the statement that patients with STIs should be isolated or avoided. About 63% agreed that partners should seek medical help if symptoms of STIs occur. Around 42% agreed that young adults with STIs should receive appropriate treatment. Nearly 47% agreed that screening for STIs is beneficial. About 33% disagreed with the statement that STIs can be self-treated using information from the

internet. Additionally, 45% of the participants agreed that watching pornography may contribute to risky sexual practices that increase the risk of STIs (Figure 2).

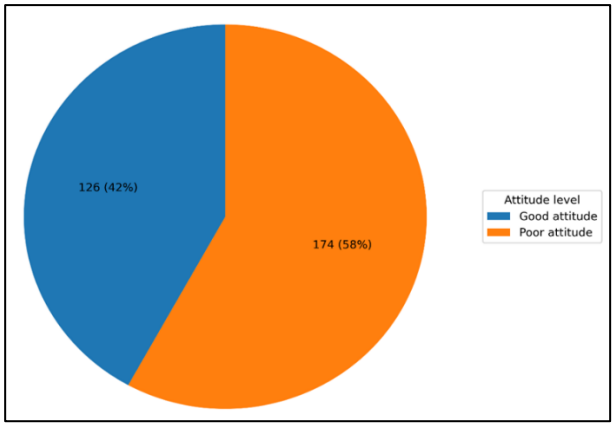

Figure 2: Attitude of STI among study population (n=300).

Practice of STIs

In the present study, only 72 participants (24%) demonstrated good preventive practices regarding sexually transmitted infections.

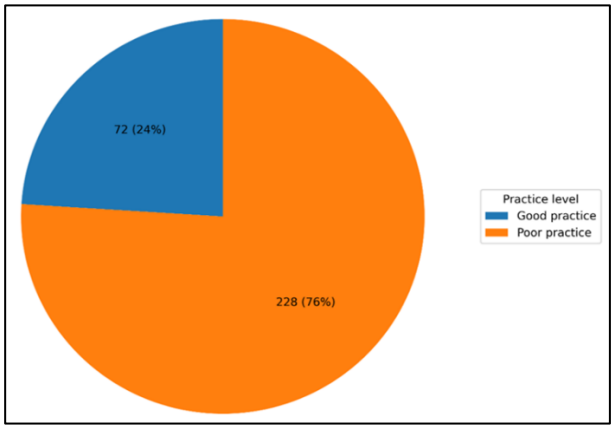

Figure 3: Preventive practices of STI among study population (n=300).

However, a substantial majority of participants, 228 (76%), exhibited poor preventive practices related to STIs. Regarding preventive practices related to STIs, only a limited proportion of participants reported appropriate practices.

Condom use during sexual intercourse was reported by 18% of the participants and only 12% reported using condoms consistently. Most participants reported having a single sexual partner (79%), while only 4% reported same-sex intercourse. Hepatitis B vaccination was reported by 27% of the participants, whereas only 13% reported receiving HPV vaccination. Regular screening for STIs was reported by 21% of participants. About 35% reported habits of smoking or alcohol intake. Nearly 19% reported having sexual intercourse during menstruation. Around 46% reported washing the genital area after sexual intercourse (Figure 3).

Table 2: Clinical and reproductive characteristics of study participants (n=300).

Variables	Frequency (N)	Percentage (%)
History of STI symptoms in the past		
Yes	43	14.3
No	257	85.7
Previous diagnosis of STI		
Yes	29	9.7
No	271	90.3
Treatment seeking behaviour for STI symptoms (n=43)		
Government hospital	22	51.2
Private hospital	14	32.6
Self-medication/no treatment	7	16.2
Use of condoms		
Always	18	6.0
Sometimes	36	12.0
Never	246	82.0
Awareness of HIV testing services		
Yes	217	72.3
No	83	27.7
History of HIV testing		
Yes	101	33.7
No	199	66.3
Parity (number of deliveries)		
0	67	22.3
1-2	169	56.3
≥3	64	21.4
Use of contraceptive methods		
Condom	54	18.0
Other contraceptives (OCP/IUCD/sterilization)	121	40.3
None	125	41.7
Type of symptoms among those reporting symptoms (n=43)		
Vaginal discharge	21	48.8
Genital ulcer	8	18.6
Lower abdominal pain/ burning micturition	14	32.6

Table 3: Association of factors with knowledge of STIs (n=300).

Variables	Good knowledge N (%)	Poor knowledge N (%)	X²/p value
Age group (years)			
15-24	38 (51.4)	36 (48.6)	9.71/0.007
25-34	45 (35.2)	83 (64.8)	
35-49	28 (28.6)	70 (71.4)	
Gender			
Male	15 (20.8)	57 (79.2)	10.62/0.001
Female	96 (42.1)	132 (57.9)	
Marital status			
Married	100 (41.5)	141 (58.5)	11.67/0.003
Unmarried	7 (15.2)	39 (84.8)	
Widowed/divorced	4 (30.8)	9 (69.2)	
Educational status			
Graduate and above	40 (58.0)	29 (42.0)	24.20/<0.001
High school/intermediate	55 (37.2)	93 (62.8)	
Primary/illiterate	16 (19.3)	67 (80.7)	
Socioeconomic status			
Upper/upper middle	30 (57.7)	22 (42.3)	14.61/0.001
Lower middle	52 (37.4)	87 (62.6)	
Upper lower/lower	29 (26.6)	80 (73.4)	
History of STI symptoms			
Yes	26 (60.5)	17 (39.5)	10.71/0.001
No	85 (33.1)	172 (66.9)	
Use of condoms			
Always	14 (77.8)	4 (22.2)	21.59/<0.001
Sometimes	20 (55.6)	16 (44.4)	
Never	77 (31.3)	169 (68.7)	
Parity			
0	18 (26.9)	49 (73.1)	12.06/0.002
1-2	58 (34.3)	111 (65.7)	
≥3	35 (54.7)	29 (45.3)	

Table 4: Association of factors with attitude of STIs (n=300).

Variables	Good attitude N (%)	Poor attitude N (%)	X²/p value
Age group (years)			
15-24	40 (54.1)	34 (45.9)	6.66/0.036
25-34	52 (40.6)	76 (59.4)	
35-49	34 (34.7)	64 (65.3)	
Marital status			
Married	112 (46.5)	129 (53.5)	10.40/0.006
Unmarried	10 (21.7)	36 (78.3)	
Widowed/divorced	4 (30.8)	9 (69.2)	
Educational status			
Graduate and above	38 (55.1)	31 (44.9)	10.77/0.005
High school/intermediate	64 (43.2)	84 (56.8)	
Primary/illiterate	24 (28.9)	59 (71.1)	
Type of family			
Nuclear	60 (34.9)	112 (65.1)	10.90/0.004
Joint	44 (47.3)	49 (52.7)	
Three-generation family	22 (62.9)	13 (37.1)	
Exposure to mass media			
Television/newspaper	50 (37.9)	82 (62.1)	6.76/0.034
Internet/social media	60 (50.8)	58 (49.2)	

Continued.

Variables	Good attitude N (%)	Poor attitude N (%)	X²/p value
None	16 (32.0)	34 (68.0)	
History of STI symptoms			
Yes	30 (69.8)	13 (30.2)	15.8/<0.001
No	96 (37.4)	161 (62.6)	
History of HIV testing			
Yes	60 (59.4)	41 (40.6)	18.9/<0.001
No	66 (33.2)	133 (66.8)	

Table 5: Association of factors with preventive practices of STIs (n=300).

Variables	Good practice N (%)	Poor practice N (%)	X²/p value
Age group (years)			
15-24	10 (13.5)	64 (86.5)	22.91/<0.001
25-34	22 (17.2)	106 (82.8)	
35-49	40 (40.8)	58 (59.2)	
Gender			
Male	28 (38.9)	44 (61.1)	10.46/0.001
Female	44 (19.3)	184 (80.7)	
Educational status			
Graduate and above	30 (43.5)	39 (56.5)	21.31/<0.001
High school/intermediate	32 (21.6)	116 (78.4)	
Primary/illiterate	10 (12.0)	73 (88.0)	
Type of family			
Nuclear	30 (17.4)	142 (82.6)	9.56/0.008
Joint	30 (32.3)	63 (67.7)	
Three-generation family	12 (34.3)	23 (65.7)	
Socioeconomic status			
Upper/upper middle	25 (48.1)	27 (51.9)	21.19/<0.001
Lower middle	30 (21.6)	109 (78.4)	
Upper lower/lower	17 (15.6)	92 (84.4)	
Age at marriage (years)			
<20	15 (17.4)	71 (82.6)	13.63/0.001
20-25	35 (21.3)	129 (78.7)	
>25	22 (44.0)	28 (56.0)	
Exposure to mass media			
Television/newspaper	20 (15.2)	112 (84.8)	12.00/0.003
Internet/social media	40 (33.9)	78 (66.1)	
None	12 (24.0)	38 (76.0)	
History of STI symptoms			
Yes	20 (46.5)	23 (53.5)	12.54/<0.001
No	52 (20.2)	205 (79.8)	
Use of condoms			
Always	15 (83.3)	3 (16.7)	57.03/<0.001
Sometimes	18 (50.0)	18 (50.0)	
Never	39 (15.9)	207 (84.1)	
History of HIV testing			
Yes	40 (39.6)	61 (60.4)	19.06/<0.001
No	32 (16.1)	167 (83.9)	
Knowledge on STIs			
Good knowledge (n=111)	45 (40.5)	66 (59.5)	26.42/<0.001
Poor knowledge (n=189)	27 (14.3)	162 (85.7)	
Attitude towards STIs			
Good attitude (n=126)	50 (39.7)	76 (60.3)	2.29/<0.001
Poor attitude (n=174)	22 (12.6)	152 (87.4)	

Determinants of KAP of STI (n=300)

Knowledge of STIs determinants: Higher knowledge was observed among participants aged 15-24 years (51.4%) compared to older age groups (p=0.007). Females demonstrated better knowledge (42.1%) than males (20.8%) (p=0.001). Married participants had higher knowledge (41.5%) compared to unmarried individuals (15.2%) (p=0.003). Participants with graduate-level education showed higher knowledge (58.0%) than those with lower educational status (p<0.001). Similarly, participants belonging to upper socioeconomic class (57.7%), those with a history of STI symptoms (60.5%), consistent condom users (77.8%) and those with higher parity (54.7%) demonstrated significantly better knowledge regarding STIs (p<0.05). These findings indicate that demographic, behavioral and reproductive factors significantly influenced knowledge regarding STIs among the study population (Table 3).

Attitude towards STIs determinants: Younger participants aged 15-24 years demonstrated better attitude (54.1%) compared with older age groups (p=0.036). Married participants had a higher positive attitude (46.5%) than unmarried individuals (21.7%) (p=0.006). Participants with graduate-level education showed better attitude (55.1%) compared with those with lower educational status (p=0.005). Participants from three-generation families (62.9%) and joint families (47.3%) demonstrated better attitude compared with nuclear families (p=0.004). Exposure to internet or social media was associated with higher positive attitude (50.8%) (p=0.034). Participants with a history of STI symptoms (69.8%) and those who had undergone HIV testing (59.4%) also demonstrated significantly better attitude regarding STIs (p<0.001) (Table 4).

Preventive practice of STIs determinants: older participants aged 35-49 years demonstrated better preventive practices (40.8%) compared with younger age groups (p<0.001). Males showed better practices (38.9%) than females (19.3%) (p=0.001). Participants with graduate-level education (43.5%), those belonging to upper socioeconomic class (48.1%) and those married after 25 years of age (44.0%) demonstrated significantly better preventive practices (p<0.05). Participants from joint families also showed relatively better practices (32.3%) compared with nuclear families (p=0.008). Exposure to internet or social media (33.9%), history of STI symptoms (46.5%), condom use (83.3% among consistent users) and previous HIV testing (39.6%) were significantly associated with better preventive practices regarding STIs (p<0.05). Participants with good knowledge demonstrated better preventive practices (40.5%) compared with those with poor knowledge (14.3%) (p<0.001). Similarly, participants with good attitude showed better practices (39.7%) compared with those with poor attitude (12.6%) (p<0.001), indicating that improved knowledge and positive attitudes were associated with better STI preventive practices (Table 5).

DISCUSSION

The level of knowledge observed in the present study was comparable to findings reported by Sunil et al, who documented good knowledge among 40% of participants compared with 37% in the present study, while awareness of HIV as an STI was higher in their study (86.5%) compared with 71%. Recognition of genital discharge as a symptom was lower in the study by Sunil et al (36.1%) compared with 59% in the present study.[11] Vasudev et al reported much higher awareness of transmission routes, with 97.4% identifying sexual transmission and 85.7% recognizing blood transfusion, compared with 62% awareness in the present study.[10] Preventive practices also differed, as Sunil et al reported condom use identified as prevention by 43% and Agarwal et al reported partner condom use in 22%, both higher than the 18% condom use observed in the present study.[11,13] Treatment-seeking behaviour was reported by Rizwan et al in 40% and by Aishwarya Kumar et al in 33.4%, indicating similarly low healthcare-seeking patterns.[12,14] Furthermore, Agarwal et al and Aishwarya Kumar et al identified education and socioeconomic status as important determinants of knowledge, which was consistent with the associations observed in the present study.[13,14] Some studies additionally reported barriers such as embarrassment, cultural stigma, lack of time and limited awareness of national STI programs influencing STI-related behaviour; however, these factors were not examined in the present study.

International studies have reported varying levels of knowledge, attitude and preventive practices regarding STIs when compared with the present findings. Winarto et al in Indonesia reported higher good knowledge (84%) and positive attitude (88%) compared with 37% and 42% in the present study, while condom use was 32% compared with 18%.[17] Di Gennaro et al in Italy reported a median KAP score of 14/29 and higher scores among students vaccinated against HPV, whereas HPV vaccination in the present study was only 13%.[18] Moname et al in Bangladesh reported STI awareness among 90% compared with 78% awareness in the present study and condom use among males was 54.5% compared with 18%, while STI testing was 15% compared with 21% screening in the present study.[19] Mohammad Zin et al in Malaysia reported high knowledge in 33.3% compared with 37% in the present study, while awareness of HIV/AIDS was higher at 95% compared with 71%.[20] Bakhom et al in Egypt also reported low awareness and preventive practices and demonstrated associations of knowledge with age and higher education, which were similar to the determinants observed in the present study.[21] Some international studies additionally reported factors such as HPV vaccination status, sexual orientation, intravenous drug use and school type influencing STI-related behaviour; however, these factors were not assessed in the present study. The slight differences between these studies and the present study may be attributed to variations in study population,

sociocultural context, educational background, access to sexual health information and healthcare services across different countries.

Studies from different states in India have reported varying levels of STI knowledge and practices compared with the present findings. Subbarao et al in Karnataka reported STI awareness among 90% and knowledge of other STIs among 64%, both higher than the 78% awareness observed in the present study, while symptom awareness was <50%, lower than the 59% recognition reported in the present study.[22] S S Lal et al in Kerala reported symptom awareness in 34% and knowledge of STD–AIDS association in 47%, both lower than the 59% symptom recognition and 71% HIV identification observed in the present study.[23] Hemalatha et al in Andhra Pradesh reported condom use of only 8.9% with regular partners and HIV prevalence of 16.3% among female sex workers.[24] Thushar Rai et al in Uttarakhand reported STD knowledge in 51.2% compared with 37% in the present study, while condom use for prevention was 72.9%, much higher than the 18% reported in the present study.[25] Khalil et al in Maharashtra also reported that knowledge of HIV/STD influenced preventive intention, which was similar to the association between knowledge, attitude and preventive practices observed in the present study.[26] Some studies also reported factors such as religion, urban residence, language of health education, and client cooperation influencing STI behaviour, which were not assessed in the present study. The similarities across studies may be due to comparable sociocultural settings, health education exposure and patterns of sexual health awareness in the Indian population.

Findings from several Indian and international studies show patterns comparable with the present observations with some numerical differences. Wandeep Kaur et al in a systematic review reported consistently low STI knowledge across Asia, especially among women with lower education and socioeconomic status, which was consistent with the determinants observed in the present study.[27] Vidya Rani et al in Uttar Pradesh reported RTI awareness among 42.16%, slightly higher than the 37% observed in the present study, while recognition of vaginal discharge as a symptom was 35.41%, lower than the 59% reported in the present study and 40% identified multiple sexual partners as a transmission route compared with 62% awareness of transmission routes in the present study.[28] Choudary et al in West Bengal reported limited correct knowledge of RTI transmission and prevention, though higher knowledge was associated with the 25-29 year age group, higher education and higher socioeconomic status, similar to the determinants observed in the present study.[29] Jindal et al in Goa reported RTI/STI awareness in 64% participants and recognition of vaginal discharge in 59%, comparable to the 59% symptom recognition in the present study, while condom use for prevention was reported by 36% compared with 18% in the present study and good knowledge was present in only 9% compared with 37% in the present study.[30] Folasayo et al in Malaysia reported that 86.6% had heard of STDs and 83.6% identified HIV as an STD, both higher than the 78% awareness and 71% HIV identification observed in the present study, while condom protection awareness was 63.8% and screening awareness was 88.8%, both higher than the preventive practices observed in the present study.[31] Some studies additionally reported factors such as urban residence, occupation, faculty type, cultural stigma and gender inequality influencing STI behaviour, which were not assessed in the present study due to methodological limitations. Even though slight differences exist, most Indian and international studies show similar patterns, likely due to comparable sociocultural context and health education exposure.

Strengths and limitations

A major strength of this study was the inclusion of participants from three different levels of healthcare facilities using a stratified random sampling method, which improved the representativeness and reliability of the findings. This study has certain limitations that should be considered while interpreting the findings. As the study was conducted in selected hospital-based OBG outpatient settings in Malappuram district, the findings may not be fully generalizable to the entire community or to individuals who do not seek healthcare services. The cross-sectional design limits the ability to establish causal relationships between knowledge, attitude and preventive practices and their associated factors. Information was collected through self-reported responses during face-to-face interviews, which may have introduced recall bias or social desirability bias, particularly for sensitive topics related to sexual behaviour. Additionally, the study relied on a questionnaire-based assessment and some behavioural or contextual factors influencing STI-related practices may not have been captured.

CONCLUSION

The present study demonstrated that knowledge, attitude, and preventive practices regarding STIs among reproductive-age adults were suboptimal, with a majority of participants exhibiting poor knowledge (63%), poor attitude (58%) and poor preventive practices (76%). Although awareness of certain aspects of STI transmission and symptoms was present, important gaps remained in the comprehensive understanding and adoption of preventive behaviours. Preventive practices such as consistent condom use, vaccination and regular screening were limited, indicating that awareness alone does not necessarily translate into appropriate health behaviour. The observed associations suggest that educational status, socioeconomic conditions and prior exposure to STI-related information influence individuals' understanding and health-seeking behaviour. Participants with better knowledge and positive attitudes were more likely to adopt safer practices, supporting the concept that behavioural change is closely linked to

awareness and perception of risk. These findings highlight the need for strengthened health education, improved access to reliable sexual health information, and promotion of preventive services to enhance STI prevention and control among reproductive-age adults.

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