



RESEARCH ARTICLE

# Knowledge, attitudes, and preventive practices towards sexually transmitted infections among youth in Tonga: local evidence to strengthen preventive actions

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## ABSTRACT

**Background:** Sexually transmitted infections (STIs) remain a public health concern due to their profound impact on sexual and reproductive health, particularly in developing countries. Many nations have investigated the root causes of STIs, however, there are limited studies published in the small island developing states in the Pacific, including Tonga. The lack of adequate information in the local context causes significant challenges to the proper planning and effective implementation of STIs prevention and control programs.

**Aim:** This study aimed to assess the knowledge, attitudes, practices, and health seeking behaviours towards STIs among youth in Tonga, with a view to generating local evidence to strengthen preventive policies and targeted interventions.

**Methods:** This cross-sectional study was conducted on a sample of 433 youth aged 15-24 years in Tonga. Interviews were conducted by trained interviewers using a standardised questionnaire that collected information on demographic characteristics, knowledge, attitudes, practices, health seeking behaviours towards STIs and the barriers to accessing sexual health services. The descriptive results and associations between variables were also presented.

**Results:** Of the total youth survey, 233 (54%) were females, 277 (64%) were unemployed, and 399 (92%) were unmarried. Less than half of youth correctly identified HIV, chlamydia, and syphilis as STIs. The percentage of youth who correctly answered the routes of transmission and the symptoms of STIs were low. Infertility (51%) was the most recognised complication, and one third of youth correctly answered that cervical cancer, ectopic pregnancy, and stillbirth are some of the complications. Over 90% of youth perceived that condoms protect against the diseases; however, approximately 30% thought that the use of a condom is not required if both partners have symptoms of STIs and multiple sexual partners play no role in diseases transmission. Of the sexually active youth, only 47% used a condom the first time they had sex. The main reason was the limited availability of condoms. It was reported that 31% of females and 66% of males consumed alcohol, a contributor to risky sexual practices. Less than half of youth reported that they would access clinics if they had symptoms. The main barriers to seeking sexual health services were 'being too embarrassed' and issues with privacy at the clinics.

**Conclusion:** This study highlighted the urgent need to strengthen national preventive policies and culturally acceptable targeted interventions to tackle STIs more effectively. The findings also provided a timely reminder to policymakers and health leaders to invest additional resources to effectively prevent and control; incorporate comprehensive and culturally acceptable sexual health education in schools; improve privacy, confidentiality, and accessibility of sexual health services in all relevant health care settings in Tonga.

**Keywords:** Sexually transmitted infections, Youth, knowledge, attitudes, sexual practices

## Introduction

Globally, sexually transmitted infections (STIs) remain a public health concern due to their profound impact on sexual and reproductive health. More than one million STIs are acquired each day worldwide, and approximately 374 million new infections were caused by one of the four curable STIs, such as chlamydia, gonorrhoea, syphilis, and trichomoniasis.<sup>1,2</sup> In the Western Pacific Region, an estimated 108- million new cases of STIs were reported.<sup>1</sup> This imposes an enormous social and economic burden, particularly on low resource developing nations, due to the high health care expenditures for managing STIs and their associated deadly complications.

Most common STIs, such as chlamydia, gonorrhoea, syphilis, trichomoniasis, hepatitis B, herpes simplex virus, human papilloma virus, and HIV can be prevented. If infected, some STIs (e.g., gonorrhoea) can be totally cured, while others can be controlled to prolong life (e.g., HIV) with effective treatment. Anyone who is sexually active is at risk of STIs, however, the risk is higher among youth due to a combination of biological, behavioural, and cultural factors.<sup>2</sup> Adolescents differ from adults in the way they behave and the way they make decisions. They often experience peer pressure to experiment with sex at an early age and engage in risky sexual practices.<sup>3-5</sup> In the United States, approximately 20- million new STIs occur every year, and youth account for 50%.<sup>2,3</sup> In Australia, chlamydia remained the most reported STIs among youth, and the cases of gonorrhoea and syphilis were also increasing.<sup>6,7</sup> In some Pacific Island nations, it was estimated that approximately 25% of sexually active young people have an STI, and chlamydia was the most common disease.<sup>8-9</sup> In Tonga, records from STIs clinic at Vaiola Hospital showed that STIs are more common among youth.<sup>8</sup> Youth generally have limited access to sexual health services, and this could lead to serious complications and further transmission of STIs.<sup>2-4</sup>

Comprehensive Sexuality Education (CSE) helps young people acquire better knowledge about STIs, change their attitudes, and reduce risky sexual practices.<sup>8</sup> It is crucial for the youth to understand and be aware of the symptoms and complications of STIs and practice safe sex. When youth do not access comprehensive information about their sexual health, they become vulnerable to coercion, abuse, unintended pregnancies, STIs, and HIV.<sup>8</sup> Consuming alcohol could create impaired decisions and influence safe sex knowledge and cultural factors can influence youth attitudes towards sexual practices.<sup>8</sup>

In addition, studies documented that youth face significant challenges in accessing STI services due to the issues of confidentiality, stigma, and costs in many countries.<sup>3,10</sup> A survey conducted in six Pacific Island countries, including Tonga, found that the clinics were not youth-friendly and there was a lack of privacy in the health care services.<sup>8</sup> It is important for health care providers to understand the knowledge and attitudes of youth towards STIs, as well as their current sexual practices and barriers to accessing sexual health, in order to educate them, promote safe sex, and provide appropriate youth friendly services.

Many countries from different regions have investigated the knowledge, attitudes, practices, and health seeking behaviours towards STIs among youth, however, there are limited studies published for the small island states in the Pacific region. Despite some technical reports on the high prevalence of STIs in Tonga, there is limited recent peer-reviewed literature that examines the root causes of STIs among youth. The lack of adequate information in the local context causes significant challenges to the proper planning and effective implementation of STIs prevention and control program for the target population. Consequently, this study aimed to assess the knowledge, attitudes, practices, and health seeking behaviours towards STIs among youth 15-24 years old in Tonga, with a view to generating local evidence to strengthen preventive policies and targeted interventions.

## Materials and Methods

This cross-sectional study was conducted in 2020 on a convenience sample of 433 youth aged 15-24 years living in Tongatapu, the main island within the Tonga Islands group, who provided consent to participate in the study. The study locations were the common youth spots in the communities, the STI clinic at Vaiola Hospital, and the clinic at the Tonga Family Health Association (TFHA).

Face-to-face interviews were conducted by trained interviewers from TFHA using a standardised questionnaire adapted from similar studies conducted elsewhere<sup>11-13</sup> and piloted in Tonga. The participants information sheet, consent form, and questionnaires were made available and administered in both English and Tongan.

The questionnaire collected information on 1) socio-demographic characteristics such as age, sex, level of education, place of residence, occupation, marital status, and sexual relationship; 2) knowledge on the types of STIs, causes, routes of transmission, symptoms, complications, and protective measures; 3) attitudes towards condom use, multiple sexual partners, health screening, treatment, and others; 4) practices on condom use, commercial sex, multiple sexual partners, and alcohol consumption; and 5) health-seeking behaviours and barriers to accessing sexual health services.

The data were compiled and analysed using STATA Version 14.1 statistical software (StataCorp LLC, 4905 Lakeway Drive, College Station, TX 77845, USA). A descriptive statistic was used, and the data were presented in numbers and percentages. Pearson's chi-square test was used to analyse the association between categorical variables, and statistical significance was defined as  $P < 0.05$ . This study was approved by the Ministry of Health's National Research Health Ethics Committee of Tonga.

## Results

### i. SOCIO-DEMOGRAPHIC CHARACTERISTICS

Of the 433 youth aged 15-24 years, 233 (54.0%) were females, 249 (57.5%) were aged between 20 and 24 years, 286 (66.1%) attended secondary school, 256 (61.2%) lived in urban areas, 277 (64.0%) were unemployed, and 399 (92.2%) were unmarried. The majority, 294 (67.9%), of youth reported that they do not have sexual partners (Table 1).

**Table 1: Socio-demographic characteristic**

Variables		Females N (%) n=233	Males N (%) n=200	Total N (%) n=433	p-value
<b>Age</b>	15-19	95 (40.8)	89 (44.5)	184 (42.5)	0.434
	20-24	138 (59.2)	111 (55.5)	249 (57.5)	
<b>Highest level of education</b>	Never attended school	4 (1.7)	6 (3.0)	10 (2.3)	<0.001 *
	Primary school	2 (0.9)	5 (2.5)	7 (1.6)	
	Secondary school	137 (58.8)	149 (74.5)	286 (66.1)	
	Higher education	90 (38.6)	40 (20.0)	130 (30.0)	
<b>Place of Residence</b>	Urban	160 (68.7)	105 (52.5)	265 (61.2)	0.001 *
	Rural	73 (31.3)	95 (47.5)	168 (38.8)	
<b>Occupation</b>	Transport worker	2 (0.9)	1 (0.5)	3 (0.7)	<0.001 *
	Police/ Military	3 (1.3)	4 (2.0)	7 (1.6)	
	Construction/Labor	5 (2.2)	19 (9.5)	24 (5.5)	
	Fisherman/Seafarer	0 (0.0)	3 (1.5)	3 (0.7)	
	Farmer	0 (0.0)	9 (4.5)	9 (2.1)	
	Professional	3 (1.3)	1 (0.5)	4 (1.0)	
	Seasonal worker	1 (0.4)	7 (3.5)	8 (1.8)	
	Housewife	47 (20.2)	5 (2.5)	52 (12.0)	
	Civil servant	32 (13.7)	14 (7.0)	46 (10.6)	
	Not employed	140 (60.1)	137 (68.5)	277 (64.0)	
<b>Married</b>	Yes	22 (9.4)	12 (6.0)	34 (7.8)	0.184
	No	211 (90.6)	188 (94.0)	399 (92.2)	
<b>Sexual relationship</b>	Yes	64 (27.5)	75(37.5)	139 (32.1)	0.026*
	No	169 (72.5)	125 (62.5)	294 (67.9)	

\*Significant result by chi-square test (P<0.05)

ii. KNOWLEDGE

Of the STIs, gonorrhoea was the most recognised infection (55.4%), whereas less than 50% correctly identified HIV/AIDS, chlamydia, and syphilis as STIs. Approximately 60% correctly answered that bacteria and viruses are the causes of STIs. The majority (85.5%) recognised that sexual intercourse is the main route of STI transmission. The percentage of youth who correctly answered the symptoms of STIs were low, whereas 59.4% of respondents aware that people with STIs can have no symptoms. Of the complications of STIs, infertility (51.3%) was the most recognised complication, and

approximately one-third of the participants correctly answered that cervical cancer, ectopic pregnancy, and stillbirth are some of the complications of STIs (Table 2).

The main source of information that they gained on STIs was mainly from their friends. The majority of youth were aware that the use of condoms can reduce the risk of STIs transmission (339 youth, 78.3%), alcohol intake increases an individual's susceptibility to STIs (308 youth, 71.1%), and having multiple sexual partners increases the chances of contracting STIs (377 youth, 87%) (Table 2).

**Table 2: Knowledge about Sexually Transmitted Infections**

Variables	Females N (%) n=233	Males N (%) n=200	Total N (%) n=433	p-value
<b>Correctly recognized the following as STIs</b>				
▪ Gonorrhoea-	130 (55.8)	110 (55.0)	240 (55.4)	0.868
▪ Chlamydia-	102 (43.8)	74 (37.0)	176 (40.6)	0.152
▪ HIV/AIDS-	110 (47.2)	97 (48.5)	207 (47.8)	0.789
▪ Syphilis-	59 (25.3)	40 (20.0)	99 (22.9)	0.189
▪ Tuberculosis	192 (82.4)	174 (87.0)	366 (84.5)	0.187
▪ Asthma	222 (95.3)	191 (95.5)	413 (95.4)	0.913
<b>Correctly recognised the following as causes of STIs</b>				
▪ Mosquitoes	222 (95.3)	185 (92.5)	407 (94.0)	0.225
▪ Bacteria+	149 (63.9)	119 (59.5)	268 (61.9)	0.342
▪ Virus+	146 (62.7)	119 (59.5)	265 (61.2)	0.501
▪ Fungus+	44 (18.9)	39 (19.5)	83 (19.2)	0.871
▪ Parasites+	12 (5.1)	9 (4.5)	21 (4.8)	0.754
<b>Correctly recognised the following as routes of STI transmission</b>				
▪ Sexual intercourse#	197 (84.5)	173 (86.5)	370 (85.5)	0.566
▪ Blood transfusion#	79 (33.9)	74 (37.0)	153 (35.3)	0.502
▪ Sharing infected needles#	80 (34.3)	74 (37.0)	154 (35.6)	0.564

Variables	Females N (%) n=233	Males N (%) n=200	Total N (%) n=433	p-value
▪ Sharing food/drinks	204 (87.5)	170 (85.0)	374 (86.4)	0.440
▪ Sharing clothes	198 (85.0)	175 (87.5)	373 (86.1)	0.449
▪ mother-to-child transmission#	49 (21.0)	42 (21.0)	91 (21.0)	<0.001*
▪ Kissing	192 (82.4)	166 (83.0)	358 (82.7)	0.870
<b>Correctly recognised the following as symptoms of STIs</b>				
▪ Pain while passing out urine <sup>β</sup>	150 (64.4)	136 (68.0)	286 (66.1)	0.427
▪ Ulcers in the genital organ <sup>β</sup>	69 (29.6)	67 (33.5)	136 (31.4)	0.385
▪ Discharge from the penis <sup>β</sup>	149 (63.9)	149 (74.5)	298 (68.8)	0.018*
▪ Discharge from the vagina <sup>β</sup>	144 (61.8)	103 (51.5)	247 (57.0)	0.031*
▪ Itching around the vagina <sup>β</sup>	77 (33.5)	38 (19.0)	115 (26.6)	<0.001*
▪ Painless ulcer on the mouth and genital area <sup>β</sup>	81 (34.8)	53 (26.5)	134 (30.9)	0.064
▪ People with STIs can have no symptoms <sup>β</sup>	136 (58.4)	121 (60.8)	257 (59.4)	0.750
<b>Correctly recognised the following as complications of STIs</b>				
▪ Infertility <sup>^</sup>	113 (48.5)	109 (54.5)	222 (51.3)	0.213
▪ Cervical cancer <sup>^</sup>	105 (45.1)	78 (39.0)	183 (42.3)	0.203
▪ Body weakness	110 (47.2)	96 (48.0)	206 (47.6)	0.870
▪ Ectopic pregnancy <sup>^</sup>	82 (35.2)	52 (26.0)	134 (30.9)	0.039 *
▪ Still birth <sup>^</sup>	79 (33.9)	56 (28.0)	135 (31.2)	0.186
<b>Agreed with the following statements on protective measures</b>				
▪ Use of contraceptive pills can reduce risk of STIs.	37 (15.9)	36 (18.0)	73 (16.9)	0.654
▪ Use of condoms can reduce the risk of being infected with an STI.	171 (73.4)	168 (84.0)	339 (78.3)	0.028*
▪ Alcohol intake can increase an individual's susceptibility to STIs.	162 (69.5)	146 (73.0)	308 (71.1)	0.424
▪ Having multiple sexual partners can increase chances of being infected with STIs.	200 (85.8)	177 (88.5)	377 (87.1)	0.690
▪ Sexual abstinence is the most effective means of avoiding STIs.	197 (84.5)	167 (83.5)	364 (84.1)	0.297

Correct types of STIs; <sup>+</sup> Correct causative organisms of STIs; <sup>#</sup> Correct routes of STI transmission; <sup>β</sup> Correct symptoms of STIs <sup>^</sup> Correct complications of STIs; \* Significant result by chi-square test (p<0.05)

iii. ATTITUDE  
Over 90% perceived that condoms protect against contracting STIs, screening for STIs is good, being contracted by STIs is worrisome, and they would seek treatment if they noticed symptoms of STIs. However,

approximately 30% perceived that the use of a condom is not required if both partners have symptoms of STIs and multiple sexual partners play no role in STIs transmission.

**Table 3: Attitude towards Sexually Transmitted Infections**

Variables	Females N (%) n=233	Males N (%) n=200	Total N (%) n=433	p-value
<b>Agreed with the following statements:</b>				
▪ Condoms protect against STIs.	206 (88.4)	184 (92.0)	390 (90.1)	0.213
▪ Not necessary to use condoms during sex.	56 (24.0)	71 (35.5)	127 (29.3)	0.009*
▪ No need to use condom if both partners have STI.	72 (31.0)	65 (32.5)	137 (31.6)	0.744
▪ Multiple sexual partners play no role in STI transmission.	72 (30.9)	81 (40.5)	153 (35.3)	0.037*
▪ Condoms play important role in preventing STIs.	198 (85.0)	179 (90.0)	377 (87.1)	0.122
▪ Not necessary to discuss STI preventions in academic institutions.	50 (21.5)	53 (26.5)	103 (23.8)	0.219
▪ STI screening is good.	212 (91.0)	183 (91.5)	395 (91.2)	0.851
▪ Watching/reading pornographic materials contribute to risky sexual practices.	119 (51.1)	126 (63.0)	245 (56.6)	0.013*
▪ STIs not dangerous because can be cured.	86 (36.9)	78 (39.0)	164 (37.9)	0.655
▪ STIs can cause death if not treated.	187 (80.3)	164 (82.0)	351 (81.1)	0.645
▪ I am worried about contracting STI.	212 (91.0)	180 (90.0)	392 (90.5)	0.727
▪ Homosexual men spread STIs.	102 (43.8)	91 (45.5)	193 (44.6)	0.719
▪ If I notice STIs symptoms, I should seek treatment.	224 (96.1)	193 (96.5)	417 (96.3)	0.842
▪ If notice symptoms of STIs in partner, advise to seek treatment.	221 (94.8)	194 (97.0)	415 (95.8)	0.264

\*Significant result by chi-square test (P<0.05)



## iv. PRACTICES

Regarding sexual behaviours and practices, 123 (28%) youth reported that they had sex before, with a significantly higher proportion of males (37%) than females (21%). The mean age for sexual debut was 18±2.7 years (range 11-24 years). A few (7%) participants reported that they paid money or gave goods to someone for sex. Participants reported that they had an average of 2 sexual partners (range 1-20 partners) in the past 12 months. Of those who had sex experience before, only 47% reported that they used a condom the first time they had sex. The main reason was the limited availability of condoms. It was reported that 31% of females and 66% of males consumed alcohol, a contributor to risky sexual practices.

## v. HEALTH SEEKING BEHAVIOURS AND BARRIERS FOR ACCESSING SEXUAL HEALTH SERVICES

Less than half of youth (42% females and 45% males) reported that they would go to a STI clinic when having STI symptoms. Only 2% of female and 9% of male disclosed their history of getting treated for STIs. Approximately half of the participants responded that they prefer to attend private clinics and Tonga Family Health clinic if they have STI symptoms, however, only around 18% reported that they would get treatment from community health centres closer to their place of residence. The main barriers to seeking sexual health services were 'being too embarrassed' (71% females, 66% males) and issues with privacy at clinics (55% females, 57% males).

## Discussion

This study showed that most youth in Tonga have limited knowledge of STIs, and many of them do not practice protective measures. Condoms were not easily accessible, and barriers to accessing sexual health services were reported. This highlighted the urgent need to strengthen preventive policies and targeted interventions to prevent and control STIs in Tonga.

Regarding knowledge of STIs, this study found that less than 50% of youth correctly identified HIV, chlamydia, and syphilis as STIs. The knowledge is much lower than the studies found in Malaysia (83.6% correctly identified HIV as STI and 63.9% identified syphilis as STI),<sup>11</sup> China (95% correctly answered syphilis as STI),<sup>14</sup> and countries in other regions.<sup>15-17</sup> Most youth in this study struggled with recognising the routes of STIs transmission. Only 30% of youth in this study were aware that cervical cancer, ectopic pregnancy, and stillbirth were some of the complications, whereas other studies reported that more than 60% were fully aware of the complications.<sup>11</sup> This demonstrated that youth in Tonga have limited knowledge of STIs, and there is a need to strengthen STIs education and awareness among the youth population.

The key challenge is the cultural factor among the Tonga population, which influences to discussion about sexual health.<sup>18</sup> In addition, given that CSE is still not fully incorporated in schools in Tonga,<sup>18</sup> youth in this study reported that they heard about STIs mainly from friends but not from their parents or schools. This further highlighted the cultural influences compromising open discussion about sex and sexual health at home with their families. With no preventive policy measures in place, a

lack of knowledge about STIs would place the young generation at risk for negative sexual health consequences.<sup>11</sup> This will further challenge the national health system and increase the social and economic burden on the government and their families if action is not taken.

This study presented high proportions of positive attitudes towards STIs. For example, more than 90% of youth perceived that condoms protect against contracting STIs and screening for STIs is good. Despite the low knowledge found in this study, more than 95% reported that they would seek treatment if they noticed symptoms of STIs. Health sector should capitalise on it and strengthen STI testing and counselling services for youth. Even though condom use among sexually active participants was low, the majority still feel that condoms play a vital role in preventing STIs. Youth from other studies<sup>11,19</sup> perceived that multiple sex partners are a major risk factor for STIs, however, the participants in this study assumed that numerous partners play no role in STIs. Culturally acceptable health promotion and STI awareness programs at different settings, such as schools, workplaces, communities, etc., should be further strengthened to reach the vulnerable population in Tonga.

Approximately one-third of youth in this study were already sexually experienced, with a mean age of sexual debut of 18 years. Early sexual debut is one crucial factor that puts youth at higher risk of HIV.<sup>19</sup> Those who start sex at an early age are more likely to engage in unprotected sexual intercourse and acquire STIs, including HIV.<sup>20</sup> The issue of commercial sex found in this study is also alarming, and it could become a major public health challenge if not properly addressed. Of those who had sex experience before, only half reported that they used condoms during the first time they had sex. The main barrier was the limited availability and accessibility of condoms. It is a public health concern that would create risks for both STIs and teenage pregnancies. Other studies reported that less than 50% of males and 20% of females aged 15-19 hardly use condoms and raised similar concerns.<sup>21</sup> Providing the right information on condom use at the right time is critical to preventing sexual health problems. In addition, the high prevalence of alcohol consumption, a major contributor to risky sexual practices, is a challenge in Tonga. Previous studies also reported that there is a significant association between alcohol binge drinking and engaging multiple sex partners among youth in Tongan and Vanuatu.<sup>22</sup> Social circumstances influence youth's decision-making skills, and therefore there is a need to strengthen policies to protect the young generation.

Evidence has shown that youth's health seeking behaviour is influenced by the confidentiality and friendliness of health service providers.<sup>23</sup> Most youth in low- and middle-income countries are not seeking timely and appropriate medical care, which contributes to the further transmission of STIs.<sup>23</sup> This is also a key concern in Tonga, given that the main barriers to seeking sexual health services reported by youth were 'being too embarrassed' and privacy issues at the clinics, which is consistent with the findings from other studies.<sup>24,25</sup> This highlighted the need to improve confidentiality, youth friendly services,

and privacy measures in the health centres in Tonga to improve health seeking behaviour among youth. Establishing a quality sexual health service should be a priority for all health authorities.

Despite our study provides valuable information and evidence, there are certain limitations. For example, the casual relationships and predictors of behaviours and attitudes of youth were not examined, the associations of sociodemographic and other factors with sexual practices were not investigated, a small sample size could not represent the entire youth population in Tonga, and culture and taboos in Tongan society may contribute to under-reporting of sexual behaviours and practices. Nonetheless, this study filled a knowledge gap, added evidence to the pool of existing literature, identified important information to scale up targeted actions against STIs and improve sexual health among youth in Tonga.

## Conclusion

To conclude, this study highlighted the urgent need to enhance national preventive policies and strengthen culturally acceptable targeted interventions to tackle the emerging STIs in low resource island states like Tonga. The findings also provided a timely reminder to policymakers and health leaders to invest additional resources to effectively prevent and control STIs,

incorporate comprehensive and culturally acceptable sexual health education in schools, and strengthen privacy, confidentiality, and quality of sexual health services in all relevant health care settings. In addition, this study also draws attention to the need for future studies on their sexual practices and the inclusion of STIs testing to determine the prevalence of STIs among youth. This will generate additional evidence for effective prevention and control policies and strategies to combat STIs. Youth have the right to access sexual and reproductive health services. Health education, promotion, and awareness should be provided to the population of different age groups, and stigma and discrimination should be eliminated so that youth can access quality services for their health and wellbeing.

## Conflict of interest

The authors have no conflicts of interest to declare.

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