

Sexually Transmitted Infections (STIs) Knowledge Assessment of Adults in a US South Eastern Texas Region

Israel G. Msengi^{1*}, Clementine Msengi², Scholastique Nikuze¹, Joel Barton¹

¹Health and Kinesiology Department, Lamar University, Beaumont, Texas, USA

²Center for Doctoral Studies in Educational Leadership, Lamar University, Beaumont, Texas, USA

Email: *igmsengi@my.lamar.edu, cmmsengi@my.lamar.edu, snikuze@lamar.edu

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Abstract

The purpose of this cross-sectional descriptive study was to assess knowledge level regarding signs and symptoms, prevention, treatment of STIs among a sample of residents from Southeastern Texas. One hundred and fifty-seven participants age 18 and over responded to the 23 questionnaire items. Questionnaires were distributed to mostly public places such as hair salons, fitness centers, health centers, gas stations, apartments, and stores. Results indicated that 50.3% of participants reported syphilis was not curable; while over 61% reported gonorrhea was incurable. Over 64% of respondents reported they did know the symptoms for syphilis and over 70% believed that syphilis was vaccine preventable. The data collected from this study indicated that some residents from Southeast Texas lack basic information concerning Syphilis, Gonorrhea, and Chlamydia with regard to prevention, signs and symptoms, and treatment. The cost and effort to increase educational programs and educational messages appear to be justified. Implications for practice include increasing funding and efforts to provide more educational programs focusing on sexually transmitted disease prevention, health literary education to dispel the myths and stigma related to STIs and community wide collaboration efforts to increase awareness.

Keywords

Sexually Transmitted Infections (STIs), Syphilis, Gonorrhea, Chlamydia, HIV/AIDS, Prevention

1. Introduction

“Sexually Transmitted Infections (STIs) are nowadays a common group of reportable infectious diseases in most countries particularly among ages 15 to 50 years old and in infants” (De Schryver & Meheus (1990), p. 639) [1]. Sexually transmitted infections continue to pose a growing public health concern in both high and low income countries. According to the World Health Organization (WHO), there are nearly 357 million people globally who are infected with one of the four common STIs: syphilis, chlamydia, trichomoniasis or gonorrhoea (WHO, 2016) [2].

WHO (2016) estimates that over one million individuals acquire an STI daily. Sexual contacts such as vaginal, oral, and anal are the major modes of transmission. A majority of infected individuals have no symptoms. Estimated new cases of curable STIs, by WHO regions, were as follows: 126 million in the Americas, 128 million in the western pacific region, 93 million in the African region, 26 million in the eastern Mediterranean region, 79 million in the southeastern region, and 47 million individuals in the European region (WHO, 2013) [3].

1.1. Literature Review

Many individuals and communities in the United States and other parts of the world are, in most cases, reluctant to address sexual health issues openly due to the biological and social characteristics of these diseases (Katz, 2014) [4]. STIs are public health problems that lack easy solutions because they are rooted in human behavior and fundamental societal problems (Center for Disease Control and Prevention Sexually Transmitted Disease Surveillance [CDC], 2009) [5].

Since all individuals and communities are impacted either directly or indirectly through the medical cost or death toll engendered by these infections, everyone has a vested interest in prevention of STIs (Eng & Butler, 1997 [6]; Carmona-Gutierrez, Kainz, & Madeo, 2016) [7]. The challenge remains in deciding ways to enable individuals and communities to openly confront issues surrounding sexuality and STIs. However, STIs comprise a unique category of infectious diseases because their transmission largely depends on behavioral factors (Aral, Fenton & Lipshutz, 2013) [8].

1.2. Sexually Transmitted Infections (STIs) in the United States

In the United States, more than 19.7 million new cases of STIs occur every year (CDC Fact Sheet, 2013 [9], 2016) [10]. In 2016 alone, there were more than 2 million new cases of Chlamydia, Gonorrhoea, and Syphilis in the Americans; indicating a growing trend of STIs (CDC Fact Sheet, 2016). Mostly affected are adolescents and young adults (CDC Fact Sheet, 2016). The United States ranks high among developed countries with the highest rates of STIs in the world; with over 1.5 million cases of reported Chlamydia, 468,000 cases of Gonorrhoea,

27,814 cases of Syphilis (primary and secondary), and 628 cases of congenital Syphilis (CDC Fact Sheet, 2016). STIs are hidden epidemics which have a tremendous health and economic impact in the United States and around the world (Eng & Butler, 1997). The United States spends \$16 billion in medical cost to treat STIs (CDC Fact Sheet, 2013, 2016).

In the United States, illicit drug use and sexual conduct have been strongly linked with incidences of STIs (CDC, 2015) [11]. For instance, people who inject drugs accounted for 6% of HIV infections, in 2015 (CDC Fast Facts, 2016). In 2016, syphilis increased by 17.6% from 2015, both Chlamydia and gonorrhea also increased by 4.7% and 17.5% respectively from 2015 to 2016 (CDC infographic, 2016) [12]. Higher incidence rates have been reported from southeastern states over other regions of the United States. In the United States, as a whole, racial disparities exist in terms of the prevalence of STI cases and infection rates. There are much higher rates of STIs among ethnic or racial minorities than among Whites (Hamilton & Morris, 2015) [13]. African Americans bear the heaviest STI burden (Bridges, 2014). The national data for gonorrhea, chlamydia, and syphilis showed that Black Americans had a high prevalence of two of these three infections. For instance, Blacks accounted for 58.4% of all gonorrhea cases in United States, 48% of chlamydia sufferers, and 37.3% of all syphilis cases in United States (CDC, 2016) [14]. Also, gonorrhea rate of 1856.5 per 100,000 cases has been reported among African American women between the ages of 20 - 24; which is eight times higher than their White counterparts. National trends on syphilis infections show a decrease in the infection rate in recent years, although a significant disparity was shown among some groups (CDC, 2013). For example, the rate of reported primary and secondary syphilis among Black men aged 20 - 24 years was 105.0 cases per 100,000 males; 6.4 times higher than the rate among White men in the same age group (16.4 cases per 100,000 males) (CDC, 2016). Also, syphilis rate among Black women are 15 times that of White women (CDC, 2013).

Nearly 20 million new STIs are reported every year with the cost of 16.4 billion dollars to the healthcare system (CDC, 2013, 2016) [15]. Socioeconomic status has been linked to increased incidences of STIs in rural or urban areas. Poverty, lack of access to health care, poor living conditions, and the lack of education are some of socioeconomic indicators leading to increased STI rates (Santelli, Lowry, & Brener, 2000 [16]; CDC, 2013). Although initiatives to combat increased incidence of STIs (bacterial or viral) have been in various capacities, the infection rate is still high. According to the CDC (2013, 2016) and Bridges (2014) [17], young people are considered to be at higher risk of contracting STIs. Knowing signs and symptoms of STIs is an essential factor for individuals to make the decision to undergo testing and seek treatment. Studies have reported existing relationship between STI knowledge, timely testing and treatment seeking (Malta, Bastos, Stratbdee, *et al.*) [18]. Greenberg (2002) [19] reported that individuals who previously contracted STIs had demonstrated

lower basic knowledge of the signs and symptoms of STIs. However, other studies have shown that STI knowledge had no correlation with sexual behavior (Castora, 2005 [20]; Shoveller, Johnson, Savoy & Pietersma, 2006) [21]. The current study did not examine these correlations, but, instead, focused on participants' knowledge of STIs.

1.3. Sexually Transmitted Infections (STIs) in Texas

According to the CDC's 2016 report on Viral Hepatitis, STD, and TB Prevention, for the three common STIs: chlamydia, gonorrhea, and syphilis, Texas ranked 15th in the nation for chlamydia with 142,952 cases at the rate of 520.4/100,000 population. Regarding gonorrhea, Texas ranked 17 in the nation with 42,472 cases at the rate of 154.6/100,000 population. In terms of primary and secondary syphilis, Texas ranked 16th in the nation, while syphilis at all stages, Texas had 9564 cases in 2016. The infection trend indicates an increase year by year. For instance, the number of syphilis cases from previous years showed: 7057 cases in 2012, 7044 cases in 2013, 7804 in 2014, and 8250 cases in 2015. Specific areas of the state with higher Syphilis cases included Round Rock and Austin with 825 cases in 2016 compared to 478 cases in 2012. Other Metropolitan areas such as Dallas Fort Worth and Arlington showed 2661 cases in 2016 compared to 2141 cases in 2012, The Woodlands and Sugar Land reported 2817 cases in 2016 compared to 2246 in 2012, and San Antonio-New Braunfels had 1126 cases of Syphilis in 2016 compared to 983 in 2012.

In the Southeastern Texas region, particularly the Golden Triangle area, the number of syphilis cases grew from 24 in 2006 to over 300 in 2008; by 2015 the number had reached 574 cases (Beaumont Enterprise, 2009) [22]. Despite the increase in the number of syphilis cases, the emphasis for individuals with STIs to seek testing and treatment has been very low. Lichtenstein, Neal, and Brodsky (2008) [23] argued that since STIs were highly stigmatized, regardless of perceived seriousness, most people were reluctant to get tested. However, interventions can help reduce the stigma.

Following the abrupt increase in syphilis cases, health officials in Southeast Texas launched a "Stomp Out Syphilis" campaign to educate people about syphilis and the importance of getting tested. This program was sponsored by the Texas Department of State Health Services in collaboration with officials from local Health Departments as well as other community professionals in the area. This campaign involved radio and television advertisements as well as community outreach.

2. Methodology

The purpose of the survey was to determine knowledge level concerning signs and symptoms, prevention and treatment of STIs. Du, Thomas, McNutt, and Coles (2008) [24] argue that understanding the knowledge level of the community is critical to the development of disease control interventions.

The study sought to answer two questions:

- 1) To what extent do participants know the various kinds of STIs?
- 2) To what extent do participants know the cause, signs, symptoms, and treatment of STIs?

2.1. Participants

This cross-sectional study surveyed a diverse group of residents in a southeastern Texas region city with an estimated population of 130,000. The sample contained 157 individuals with an age range of 18 to 55 years of age, both male and female. This sample size was determined to be satisfactory in yielding significant results with a confidence level of 95% and a 7.8% margin of error. The study participants included employed, unemployed, retired, educated as well as uneducated individuals.

Due to the general nature of the topic being explored, a convenient sample (non-probability sampling) with a captive audience approach was utilized in obtaining participants for this study (Abrams, 2010 [25]; Sedgwick, 2013) [26]. Included in the sample were health professionals attending workshops, hair saloon attendants, fitness trainers, customers in gas stations and grocery stores. Study participants were gauged on their knowledge regarding STIs, signs and symptoms, prevention, as well as treatment options.

2.2. Instrument and Data Collection

The instrument consisted of 23 questions adopted from the Sexually Transmitted Disease Knowledge Questionnaire [STD-KQ] (Jaworski & Carey, 2007) [27]. The instrument measures knowledge on six common sexually transmitted diseases such as gonorrhea, chlamydia, hepatitis B, and genital herpes, HIV/AIDS, and the human papilloma virus. The questionnaire sought answers on the STI's cause and whether it is curable or incurable as well as other general STIs knowledge questions. The questionnaire has been utilized in a number of studies and is deemed valid (Pereira & Carmo, 2014) [28].

After obtaining approval to conduct the study by a local University's Internal Review Board (IRB), the questionnaires were distributed to individuals in various locations including hair salons, fitness centers, health centers, gas stations, apartments, health meetings as well as workshops, and stores. Questionnaire distribution was performed by two faculty members and four health education trained students from a local university. Participants were presented with a letter which described the purpose of the survey and were asked to complete the questionnaire, if they desired to do so. Participation in the study was voluntary and anonymous. No personal identification information was taken. The number of completed questionnaires totaled 157.

2.3. Data Processing and Analysis

After completing the data collection process, the IBM SPSS program was utilized to enter, process/clean, and analyze the data. The analysis included descriptive

statistics such as percentages and frequencies, means and standard deviations which were performed in order to assess the sample characteristics. Another analytical tool that was utilized is the Cross-tabulation analysis. Cross-tabulation was also performed to generating contingency tables by displaying joint frequency of data values in order to compare responses from two or more categorical variables. Cross tabulation helped to determine the frequencies and percentages of a combination of variable categories and determine the relationship between the study variables.

3. Results

Participants in this study were from Southeastern Texas region. The majority of the participants were between the ages of 18 - 55 (66.9%). Forty-six percent were African American, 32.2% Caucasian, 9.9% Latino, and others (11.9%). Females represented the largest group of participants (83.2%). Sixty-seven percent ($n = 103$) of the participants were employed. The majority of participants had either a high school diploma (34.2%) or four-year college degree (29.6%). Fifty-eight percent of the participants ($n = 90$) reported they received medical exams at least once a year, while 19% had physical exams twice per year and 15% had exams only once in three years.

3.1. Knowledge about STIs

Participants were asked to identify from a list of infectious diseases in the questionnaire whether they were in the category of STIs or not. Over 90% of respondents were able to correctly identified pneumonia, lupus, pertussis and diabetes as not belonging in the group of STIs (see **Figure 1**).

3.2. Knowledge about STIs Treatment

Interesting results were observed with regard to three specific knowledge level questions concerning the treatment of chlamydia, syphilis, and gonorrhea. Half of the participants (50.3%) considered syphilis to be incurable. Yet still a little over 40% reported chlamydia and 38% reported gonorrhea as incurable STIs. In addition, 27% of participants believed genital wart was curable (see **Figure 2**).

A cross tabulation was performed in order to examine whether ethnicity or education level variables had an impact on these findings. Two demographic variables, ethnicity and education levels, had to be recoded in order to combine some categories with fewer respondents to allow cross tabulation to be performed. For example, Ethnicity with six categories was recoded into Race to generate two groups (Non-White = 1, White = 2) and Education with five response categories was recoded into education level which generated two groups: those with less than a four-year degree and those with a four-year degree or a graduate degree.

The cross tabulation results indicated that among the majority ($n = 103$ vs. 49) respondents (Non-White), less than a half of them (43.7%) reported syphilis was

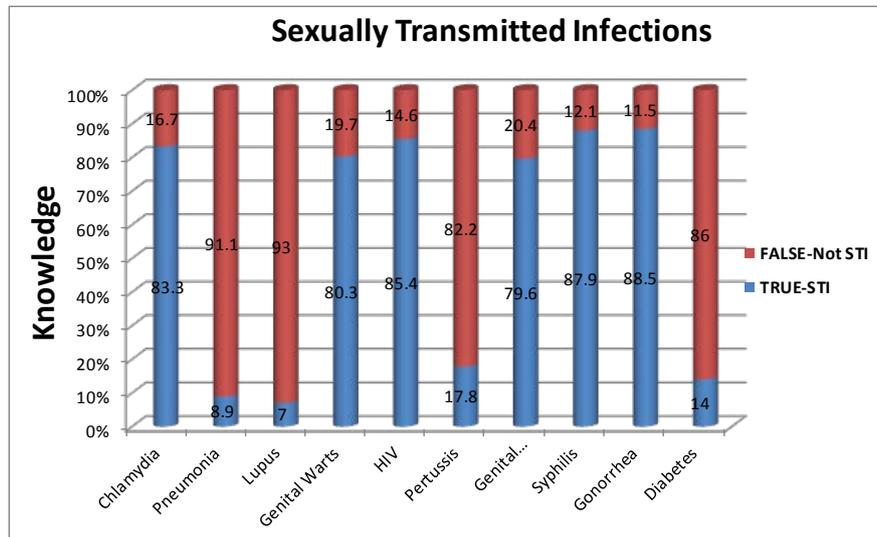


Figure 1. Knowledge percentage responses for sexually transmitted infections (N = 157).

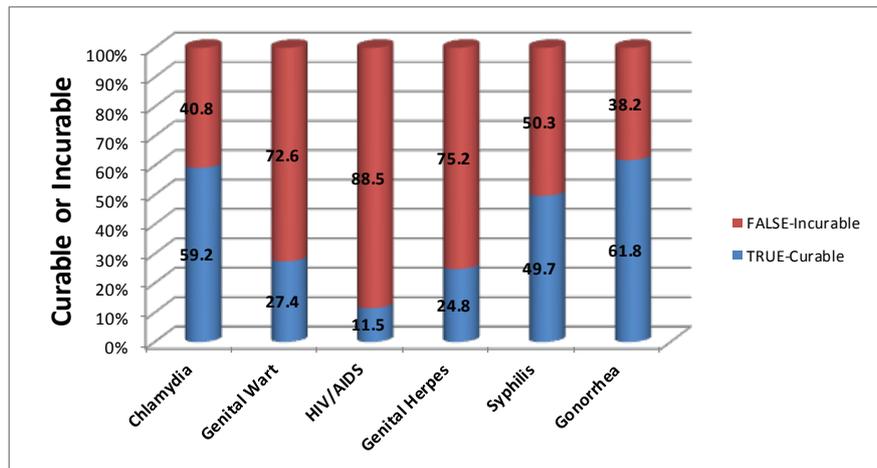


Figure 2. Knowledge percentage Responses for curable or non-curable sexually transmitted infections (N = 157).

curable while a little over a half (56.3%) reported gonorrhoea was curable. In terms of education level, the majority of participants had less than a four-year degree ($n = 98$ vs. 54). Nearly half of the participants with less than a four-year degree (52%) reported syphilis was not curable, while 40% indicated gonorrhoea was not curable.

3.3. Knowledge about Prevention, Signs and Symptoms and Transmission

Participants were asked about general knowledge questions regarding STIs prevention, signs and symptoms as well as mode of transmission. Table 1 presents frequencies and percentages of responses for each question item.

Table 1 shows responses on knowledge questions about the signs and symptoms of STIs, and how they are transmitted and prevented. A majority of

Table 1. Knowledge question responses-percentage of correct answers picked (N = 157).

Item	True		False	
	n	%	n	%
STI with greatest increase in S.E. Texas (syphilis)	123	83.1	34	16.9
False statement about STIs (trans. No syms)	102	69.4	55	30.2
Long-term effects of untreated syphilis (dementia)	104	71.2	53	28.8
Riskiest sexual activity to cause HIV (vaginal or anal)	131	89.1	26	10.9
Common contraction ways (needles, intercourse, etc)	136	89.3	21	10.7
*Chlamydia symptoms (generalized rash)	77	49.0	80	50.9
STIs contracted on toilet sit (None)	100	71.9	39	28.1
*STI linked to Cervical Cancer (HPV infection)	22	15.7	135	84.3
*Characteristics of Primary syphilis (lesion at infect. site)	44	35.2	113	64.8
*Characteristics of Secondary Syphilis (rash on palm)	47	29.9	110	70.1
Vaccine preventable STIs (HPV)	112	71.3	45	28.7
Sexually active person (protect, comm., receive treatment)	126	81.8	28	18.2
Best way to avoid STIs (Use condoms or abstain)	131	86.8	20	13.3

Note: Words in brackets denotes correct answer picked for the questions.

respondents did not know the symptoms for syphilis, including the lesion at the site where the organism enters the body (64.8%). Over half of the participants (70.1%) reported they did not know the rash on the palm of the hand was a secondary stage syphilis symptom. Nearly 15% of participants believed syphilis was vaccine-preventable. Even though a generalized rash is a symptom of syphilis, 50.9% reported that it was one of the symptoms of chlamydia.

4. Discussion

Knowledge about STIs is essential in minimizing the prevalence, decreasing infection rates, promoting early diagnosis, and facilitating adherence to treatment (Taylor, Jinabhai, Sathiparsad, & Vries, 2014) [29]. This study examined STI knowledge (particularly syphilis) in regard to signs, symptoms, prevention, and available treatment options. The results of this study suggest that a large number of participants lacked basic knowledge or information concerning syphilis, gonorrhea, and chlamydia. Similar findings have been reported in previous studies. Anderson-Ellstrom and Milsom (2002) [30], in their study that focused on the knowledge and attitudes toward STIs showed that participants were often inaccurate in their impressions concerning viral infections and the possibility of asymptomatic transmission. However, Anderson-Ellstrom and Milsom (2002) study revealed an association between higher knowledge level of STIs and experience of more partners as well as history of an STI. However, Lorimer and Hart (2010) [31], while examining knowledge about chlamydia among men and

women found participants' knowledge about chlamydia was limited despite advancements in technology and information-sharing prevalent in today's world. However, Nsuami, Sanders and Taylor (2010) argue that it has not been determined conclusively whether greater knowledge of sexually transmitted infections is associated with lower rates of STIs [32]. This assertion is supported by a study that was conducted among long-distance truck drivers in Peru. This study found that despite a majority of participants being aware of STIs such as HIV/AIDS, only a few recognized STIs symptoms. The study also found that the prevalence of STIs among truck drivers was not different from that of the general public (Garcia, Fazio, Bayer, *et al.*, 2017) [33].

Although findings of this study may not be generalizable to the entire Southeastern Texas population, these findings suggest existing lack of knowledge about STIs regardless of the availability of information concerning preventive measures.

It can be argued that higher knowledge on STIs can play a role in enhancing healthy practices and protective sexual communication. Assessing the association between knowledge about STIs and sexual behaviors and STIs protection such as use of condoms, Burazeri, Roshi, and Tavanxhi (2004) found an overall association of knowledge about STIs with consistent condom use [34]. In addition, results from the current study showed that STI knowledge can impact the type and amount of sexually protective behaviors demonstrated, such as testing for STIs.

5. Conclusion

Given the findings of this study, the researchers concluded that the cost and effort of increased educational and intervention programs are justified and, therefore, should be encouraged, supported and expanded where possible.

6. Limitations

This study had the following limitations:

- 1) The sample composed of 83% of women due to convenient sampling approach.
- 2) Results of this study may not represent the knowledge level of the general population of Southeast Texas. Therefore, findings may not be generalizable to the entire region or state.

7. Implications for Practice

Based on the results of this study, the following recommendations and implications are offered:

- 1) Health promotion and education leaders should continue to offer and expand health education programs in southeast Texas. Such efforts could include seeking more funding in order to provide a community-wide educational program.

2) Health leaders should advocate for comprehensive health literacy in order to dispel myths and stigmas related to STIs.

3) Community leaders in schools, faith-based groups, businesses, and other entities engaged in community health efforts should work in collaboration with health leaders to provide more education on the severity, prevention, and treatment of STIs.

8. Recommendations for Future Studies

Based on the results of this research, the following recommendations for future studies were made:

1) Investigate the impact of socio-cultural, environmental, and economic factors of sexual behaviors.

2) Explore the best communication tools, which can be used to disseminate the knowledge needed to most individuals regardless of social-demographic factors, such as age, race, income, educational level, and others.

3) Assess knowledge gap among populations similar to the nation's hardest hit and most vulnerable groups such as those aged 15 to 24 years who comprise the majority of chlamydia and gonorrhea infections nationally. Future studies should also target gay, bisexual, and other men who have sex with men; the literature indicates that these populations face the highest rates of syphilis and HIV co-infection.

4) Additionally, risk factors among women of reproductive age should be assessed. Recent Syphilis data suggest that pregnant women are experiencing severe disparities and severe consequences from untreated STDs, particularly with the recent increase in congenital syphilis.

5) Additional research looking at the factors contributing to knowledge of the STIs in South East Texas is recommended, preferably a quantitative study using random sampling.

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