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The Prevalence And Risk Factors Of Sexually Transmitted Infections Among Pregnant Refugee Women In Three Baptist Health Institutions In Yaounde, Center Region Of Cameroon

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ABSTRACT

Sexually Transmitted Infections (STIs) is a major public health challenge because of its unmeasurable negative impact on sexual and reproductive health globally hence, identifying the risk factors is important in curtailing acquisition and transmission. Cameroon hosts over 480,000 refugees from nearby countries so, establishing the prevalence and risk factors of STIs among pregnant refugee women is of public health interest since they are the second most common cause of death among women between 15-44 years in Africa. This was a retrospective, cross-sectional, non-experimental hospital-based study among pregnant refugee women where ANC (Antenatal) records were explored to establish the prevalence and structured questionnaire administered in their communities to identify risk factors in Yaounde'. Descriptive statistics was used to analyze the demographic data and Logistic regression was performed to determine the associations between dependent (STIs) and independent variables (age, marital status, educational level, employment) using Pearson's Chi square, $P < 0.05$ considered as significant with 95% CI. A general infection prevalence of 218/522 (41.76 %) was established with the following infections identified ; hepatitis B 35(6.70%), candidiasis 21(4.02%), HIV 19(3.64%), syphilis 13(2.49%) where BV 84(16.09%) and UTI 111(21.26%) considered predisposing factors to STIs with significant difference among infections. The highest prevalence of 63(43.15%) was among age group >30years, 64(100%) of them were not married, 64(100%) formally unemployed, 40(62%) of them had no formal education and 23(36%) had little knowledge on STIs. More public health intervention programs could be strengthened to promote reproductive health in pregnant women, with a focus on refugee women in Cameroon who are mostly exposed to unwanted pregnancies and abuses.

Keywords : Sexually Transmitted Infections, refugees, risk factors, prevalence.

INTRODUCTION

BACKGROUND

The world is currently experiencing greatest refugee crisis since the World War II.

Globally, there are approximately eighty million displaced individuals with one quarter of them being women and girls of reproductive age, twenty-six million of whom are refugees who live in resource-poor countries with weak health care systems, scarce protective equipment, poor testing and treatment capacity (Desmyth et al., 2021; Saifee et al., 2021). Due to its peaceful nature and socio-political development, Cameroon hosts over 480,000 refugees from Central African Republic (CAR), Rwanda, Liberia, Chad, Democratic Republic of Congo (formal Zaire), Ghana, Syria, Mauritania, Equatorial Guinea and Nigeria (United Nation, 2023). Recently, Cameroon has been receiving refugees from neighboring countries who enter through Garoua-Boulai, Kentzou, Gbiti, Ngaoui, Gbatoua-Godole and Yamba (Aretouyap *et al.*, 2017).

The escalating conflict in Nigeria and Northern Cameroon has driven a large influx of refugees from the Central African Republic (CAF) into Cameroon. These refugees, who have lost everything to the war, including their homes, livelihoods, and traditional way of life, are now struggling to rebuild their lives in Cameroon's Eastern and Northern Regions (United Nation, 2023; Walbert, 2014).

United Nation High Commission for Refugees (UNHCR) is a global non-profit making organization founded on December 14th, 1950 by the United Nation with headquarters in Geneva, Switzerland. It is dedicated to saving lives and protecting the rights of refugees, forcibly displaced communities and stateless people and to assist in the voluntary repatriation, local integration or resettlement to a third country (UNHCR, 2022). The UNHCR has choose

Cameroon Baptist Convention Health Services (CBCHS) precisely Etougebe Baptist Hospital (EBHY), Ekoumdoum Baptist Hospital (EKBHY) and Nkoabang Baptist Health Center (NBHC) all in Yaoundé, Center Region of Cameroon as points of care for this health grant to refugee pregnant women, children below 5 years and persons above 50 years of age (UNHCR, 2022). This grant lasted from 21st February, 2022 to December 6th, 2022 during which high attendance of pregnant refugee women were recorded in these health facilities.

The general objective of this study was to determine the prevalence and identify the risk factors associated with STIs among these pregnant refugee women. The specific objectives were to determine the prevalence of STIs, identify socio-demographic factors (age, educational level, marital status, occupation) associated with STIs, assess behavioral and reproductive health risk factors (sexual practices, number of sexual partners, usage of preservatives, access to antenatal care) associated with STIs and assess level of awareness on STIs among this study group.

MATERIALS AND METHOD

Study area

This study was carried out among pregnant refugee women who received antenatal care and/or delivery in EBHY, EKBHY and NBHCY all in Yaoundé, Center Region of Cameroon which are situated in two Health Districts: Biyem-assi and Nkoldongo.

Yaoundé is located in the Mfoundi Division, Center Region of Cameroon. It is the political capital of Cameroon which is located at an elevation of 750 meters (2500 feet) above sea level with a Latitude (Lat) of 3.844119 and a Longitude (Long) of 11.501346. It has a degree, minutes and seconds (DMS) Lat of 3°50'38.8284"N and DMS Long of 11°30'4.8456"E, Easting of 777,803.20 and Universal

Transverse Mercator (UTM) Easting of 425,303.79 (Britannica, 2020; WHO, 2023). Yaoundé is situated on a hilly forest plateau between Nyong and Sanaga rivers in the south-central part of the country. It is the second largest metropolis in Cameroon. This city was founded as an ivory trading post and it still handles the production and distribution of some of the country's main exports of Ivory. A metropolis area population of Yaoundé in 2022 was 4.337000 million, a 4.15% increase from 2021 (Britannica, 2020). Most of the inhabitants are civil servants, teachers and traders as well as private sector employees with cocoa as the main cash crop with French being the main language spoken followed by English. Yaoundé is made up of six Health Districts namely: Biyem-assi, Cite Verte, Djoungolo, Efoulan, Nkolbisson and Nkolndongo (WHO, 2016) with two main referral hospitals (Central and the Regional hospitals) as well as many supporting hospitals (Britannica, 2020).

Yaoundé host many Non-governmental organizations (NGOs) which are headquarters for a variety of international organizations (UNHCR, UNICEF), government ministry headquarters as well as a fairly sizable urban refugee population making it a convenient choice for a research site. The health of refugees and other forcibly displaced persons is a key component of protection and priority for the UNHCR who works closely with government and partner organizations to implement health programs with emphasis on primary health care (PHC) with the aim to minimize mortality and morbidity among them by granting free preventive and curative services (UNHCR, 2012). This grant is limited to children below five years of age, pregnant women and adult above fifty years of age specifically to those who are registered under the scheme (UNHCR, 2012). EBHY, EKBHY and NBHC being points of care for these refugees in Yaoundé became a motivational factor for this study to be carried there.

Study design

It was a retrospective cross-sectional, non-experimental hospital-based study in three Baptist institutions: NBHCY, EBHY and EKBHY all in Yaoundé, Center Region of Cameroon using socio-demographic and health survey data. Hospital registers from February 21st to December 6th, 2022 were reviewed for infections on pregnant refugee women and survey was also carried out from March 2nd to 31st, 2023 on same study participants to determine their knowledge on STIs.

Study population

The study targeted pregnant refugee women irrespective of their nationality who received antenatal care and /or post-natal in EBHY, EKBHY and NBHC in Yaoundé, Center Region of Cameroon. Administrative authorization was gotten from the Regional Delegation of public health for Center Region and ethical clearance was gotten from Cameroon Baptist Convention Health Services Institutional Review Board (CBCHSIRB).

Data collection and processing

A random sampling method was used to identify and select the study population giving everyone an equal chance of being selected into the study from the entire population. To minimize sampling bias, all eligible pregnant refugee women attending the participating health facilities within the study period were included.

Structured opened ended questionnaires were administered by the principal investigator to these refugee women who met the inclusion criteria in their communities to identify the risk factors of STIs. The questionnaire was divided into two sections; section "A" which was for socio-demographic characteristics (age, marital status, level of education, occupational status) and section "B" which was level of knowledge on STIs (general knowledge, transmission, treatment,

prevention, antenatal care and delivery before the UNHCR grant). The risk factors assessed were client-centered (age, educational level, knowledge on STIs), socio-economic (occupation) and lifestyle (marital status) and were determined following the response from the socio-demographic data.

Clinical data were recorded on a data collection form with regards to their status in the following most common STIs: HIV, syphilis, gonorrhea, hepatitis B, vaginal candidiasis and predisposing infections to STIs like urinary tract infection and bacterial vaginosis (BV). These data were extracted from the medical records in the respective health facilities.

Data was entered into a password protected computer which could be accessed only by the principal investigator. Daily data monitoring was done to ensure completeness and timeliness of data.

Data analysis

Raw data was entered into Microsoft Excel spreadsheet and later imported into R version 4.2.3 for statistical analysis. Descriptive statistics were used to analyze both the clinical and demographic data according to the different variables which was then presented as percentages, on tables, text, and charts. Frequencies, means and standard deviations were computed to summarize the data and calculations were done for continuous variables (number of parasites) while frequency distributions were calculated for categorical variables (age group). To compare proportions between the dependent (STIs) and the independent variables (presence of parasites, Number of infections, age groups), Pearson Chi square and Fisher exact tests were used. To quantify the difference in exposition to STIs, logistic regression was used which arrested all potential confounding factors, from which odd ratios and associated P values were presented where by p-values less than 0.05 ($P < 0.05$) were considered

significant. For the demographic data or categorical variables (marital status, occupation, educational level, before UNHCR medical grant, level of knowledge), the outcomes were computed, various percentages calculated and results presented on tables.

RESULTS

Socio-demographic characteristics

A total of 64 socio-demographic data was collected from their communities and in these health facilities (study sites) where by 03(5%) of them were less than 20 years of age, 38(59%) were between 20 and 30 years of age and 23(36%) were greater than 30 years of age. Participants are scattered all over Yaoundé, living mostly at construction sites in uncompleted buildings especially at the extremes of the city. Majority of the participants came from Nkoabang and Manguier which are all extremes of the city. Most of the participants had no specific address since their current location depended on their activity. A total of 522 clinical data was extracted from antenatal records: 37 from Etougebe Baptist Hospital Yaoundé (EBHY), 280 from Ekoumdoum Baptist Hospital Yaoundé (EKBY), and 205 from Nkoabang Baptist Health Center Yaoundé (NBHC). A higher proportion of them 331 (63.4%) were of age group 20 to 30 years of age with the mean age being 27.25 years. Socio-demographic characteristics gave a p-value of > 0.05 , ranging from 0.250 to 0.828 (Fig. 4).

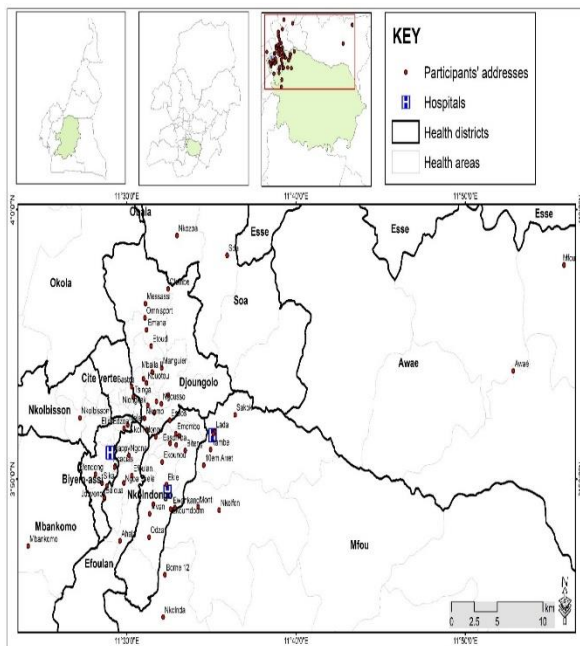


Fig 1: Map Showing addresses/location of participants (Source: Research work).

Source: Student's research work.

General prevalence of infections

Data of 522 pregnant refugee women aged between 15 and 41 years was analyzed in the study. Two hundred and eighteen (218) tested positive for at least one of the infections giving an overall prevalence is 41.76 %.

Table 1: Overall prevalence of infections

	Number Infected	Total	Prevalence
Infections	218	522	41.76 (37.59 – 46.06)

Pearson's x-square = 271.65, p-value < 0.0001

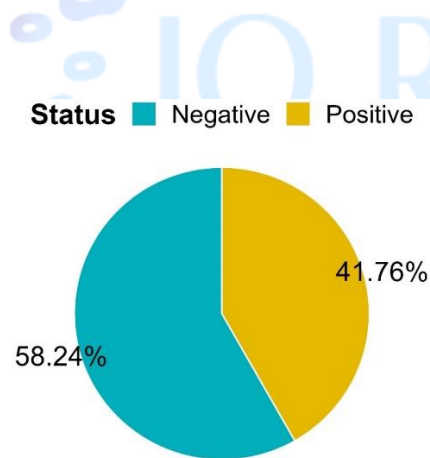


Fig 2: A pie chart showing overall prevalence of infections.

Prevalence of the various infections

The prevalence for the different infections ranged from 2.5% to 21.3%. The most prevalent infection detected was UTI with 111 (21.26%) followed by BV with 84 (16.09%), HBV with 35 (6.70%), Candidiasis with 21 (4.02%), HIV with 19 (3.64%) and the least prevalent was syphilis with 13 (2.49%). No gonorrhea infection was detected. P-values with respect to infections gave 2.2e-16 which is far less than 0.05.

Table 2: Prevalence of the different infections identified.

Infection	Number Infected	Number non-infected	Prevalence in %
Hepatitis B	35	487	6.7 (4.85 – 9.21)
HIV	19	503	3.64 (2.33 – 5.64)
Syphilis	13	509	2.49 (1.45 – 4.25)
UTI	111	411	21.26 (17.95 – 25.00)
BV	84	438	16.09 (13.0 – 17.0)
Candidiasis	21	501	4.02 (2.63 – 6.10)
Gonorrhea	00	522	0.00

Pearson's Chi-square = 271.65, p-value < 0.0001

Table 3: Number of infections versus age groups and multiple infections

Majority of the participants were between 20 – 30 years of age having a total prevalence of 42.0% while the age group of less than 20 (<20 years) had a prevalence of 35.56%. The study gave 159 as single infection and 59 as multiple infections with age group greater than 30 years (>30 years) having the highest prevalence of 63 (43.15%).

Number of Infections	< 20 years	20 – 30 years	>30 years	Total
0	29/45 (64.44)	192/331 (58.01)	83/146 (56.85)	304/522 (58.24)
1	12/45 (26.67)	102/331 (30.82)	45/146 (30.82)	159/522 (30.46)
2	4/45 (8.89)	33/331 (9.97)	16/146 (10.96)	53/522 (10.15)
3	0	4/331 (1.21)	2/146 (1.37)	6/522 (1.15)
Total Prevalence	35.56%	42.0%	43.15%	
OR	1	1.31	0.38	

P = 0.99

Risk factors

Age group	Infect ed	Non-infect ed	Prevalence	OR	p
< 20	16	29	35.56 (22.9 – 50.60)	1	0.66
20 – 30	139	192	41.99 (36.77 – 47.40)	1.31(0.69 – 2.56)	0.41
>30	63	83	43.15 (35.32 – 51.34)	0.38 (0.70 – 2.80)	0.37

The risk factors assessed from socio-demographic characteristic response were client-centered (age, educational level, knowledge on STIs), socio-economic (occupation) and lifestyle (marital status) factors. From the 64 correspondents, 64 (100%) were concubinating either as monogamy 20 (31%) or polygamy 44 (69%). All (100%) of them were not formally employed; 51 (80%) were house wives while 13 (20%) of them were self-employed having a little start up business of their own. 40 (62%) of these women has had no formal education, 21 (33%) had completed primary education while 03 (05%) did not complete secondary education. Before the UNHCR health grant, 13 (20%) did not attend ANC and delivered at home, 35 (55%) attended ANC and delivered in hospitals/ health care centers while 16 (25%) attended ANC in health facilities and then delivered at home. Majority of the participants had no specific address since they were very mobile. The younger one indulges in sexual activities, the more sexual partners one turn to have with age or as you age.

Out of the 45 women screened in the age group of less than 20 (<20) years of age, 16 were diagnosed of STI giving a prevalence of 35.56%. In the age group between 20 to 30 years of age, 331 were screened and 139 were tested positive for STI giving a prevalence of 41.99%. The highest prevalence of 43.15% came from the age group of greater than 30 (>30) years of age where out of the 146 screened, 63 were tested positive for intestinal parasites.

Risk factors with respect to marital status, educational level, and ANC and delivery before the UNHCR health grant.

All (100%) of the participants were unmarried and lived with a partner [either one (31%) or multiple (69%)]. This means that they were not limited to one sexual partner, and their sexual relationships could be ended and new ones started at any time. The more education a participant had, the better they understood sexually transmitted infections (STIs), how they are transmitted, treated, prevented, and controlled. Sixty-two percent (62%) of the participants had no formal education, so they likely had very little understanding of STIs. Twenty percent (20%) of the participants had no clinical antenatal care (ANC) and gave birth at home. This means that they did not have access to health information about STIs, which increases their risk of contracting them. None (00%) of the participants were formally employed, and 80% of them were idle. This means that they had a lot of time on their hands, which could lead to risky sexual behavior.

Table 4: Prevalence with respect to age groups.

Table 5: Risk factors with respect to marital status, educational level, ANC visits before the UNCHR medical grant.

Parameter	Number/64	Percentage (%)	
Marital Status	Married	00	00
	Cohabiting as monogamy	20	31
	Cohabiting as polygamy	44	69
Educational level	No formal education	40	62
	Attempted primary school	21	33
	Attempted secondary school	03	05
Self-employment	Petite business	13	20

	Nothing at all	51	80
Before UNHCR medical grant	Home deliveries	13	20
	Hospital deliveries	35	55
	Both hospital and home deliveries	16	25

Risk factors with respect to knowledge

Participants' knowledge on STI was ascertained questions sought to understand general knowledge about them transmission, treatment, control, and prevention. A total of 64 women were interviewed where 23 (36%) knew what STIs were all about, 23 (100%) knew about transmission [through sharps 20 (87%), sexual contact 22 (96%), promiscuity 23 (100%) and other routes 17 (74%)], 19 (83%) about prevention and control, 18 (78%) about treatment. 64% of them had no knowledge about STIs at all.

Table 6: Level of knowledge on STIs

Knowledge	Response	Number	Percentage
Generally,	Yes	23	36
	No	41	64
On transmission	Yes	23	100
	No	00	00
On treatment and control	Yes	18	78
	No	05	22
On prevention	Yes	19	83
	No	4	17

Risk factors with respect to infections showed that UTI and BV were incriminated with prevalence of 21.3% and 16.1% respectively.

DISCUSSION

In this study, we found out that refugees are scattered all over Yaoundé hence, cannot be seen under one District with more at the extremes of the town where there is space especially construction sites since most of them live in uncompleted buildings where they do basic economic activities like farming, "petite" businesses. The long distance between health facilities and locations also account for the reluctant spirit among these women to seek for ANC hence, contributing to most of them delivering babies at home and being ignorant about their health status. A majority of them do not have specific location; they keep moving from one angle of the town to another in search for basic needs. It is believed that this

movement involves change in sexual partners hence, increasing the spread of STIs from infected persons to uninfected persons. These findings are in line with that established in Kampala where refugees choose city sites with more pleasurable activities (Bernstein and Okelle, 2007). The socio-demographic characteristics (address, month, age) did not show any statistical association to these infections.

This study revealed a high prevalence 41.76% (218/522) of infections with the leading infection being UTI (21.3%) and the least being syphilis (2.5%) as oppose to CA being the leading infection (31.8%) in a similar study in Gambia (Isara and Baldeh, 2021). This study showed that the different infections are significantly different from one another hence, the 21.3% for UTI is significantly different in our studies. This overall prevalence 218(41.76%) is higher than 14.9% prevalence established in a similar study in Guinea Bissau (Cowley *et al.*, 2021) and lower than

the 53.6% established among pregnant women in West Coast Region of Gambia (Isara and Baldeh, 2021). This prevalence shows that 218 women tested positive for at least one infection where by 59 had multiple infections. This is in confirmation with a similar study done in Johannesburg, South Africa where multiple infections were isolated from 30% of the pregnant women (Mullick *et al.*, 2005). The prevalence of syphilis in this study was 2.5% which is greater than the 0.89% established in Guinea Bissau (Cowley *et al.*, 2021) and lower than the 6.8% among pregnant women in Gambia (Isara and Baldeh, 2021). No gonorrhea was detected as opposed to 3.8% established in Guinea Bissau (Cowley *et al.*, 2021), 1.8% in Gambia (Isara and Baldeh, 2021). The prevalence of UTI in this study was 21.3% which is in line with the 25.2% established among pregnant women in Amassoma, Southern Nigeria (Lawani, 2015) and higher than the 12.7% prevalence established among pregnant women in Southern Ethiopia (Deme and Edao, 2016). It was observed that the prevalence of STIs among these women increased with increasing age group that is 16(35.56%) for less than 20 years, 139(41.99%) between 20 and 30 years and 63(43.15%) greater than 30 years of age. This is contrary to a similar study carried out in West Coast Region of Gambia where STIs in pregnant women decreased with increasing age from 65(57.2%) in 15-24 years age group to 13(38.2%) in 35-44-year age group (Isara and Baldeh, 2021). This study showed that pregnant refugee women are highly exposed to STIs with greater exposition found in the age group greater than 30 years (>30 years) though not statistically significant. This is because most refugee women have difficulties accessing ANC, STI screening and treatment due to limited health facilities, cost, transportation or legal barriers. Also untreated STIs especially without timely diagnosis can persist and spread in the community, pregnancy-related biological changes (hormonal and immune changes during pregnancy may increase susceptibility to infections or make existing infections more noticeable) increasing the prevalence among these women. They are also at increased risk of rape, sexual exploitation (due to poverty and economic dependency which results in financial insecurity hence, increasing the vulnerability of women), forced marriages, intimate partner violence, multiple or high-risk sexual partners, low use of condoms (women have little power to negotiate condom use with their partners because of cultural norms, unequal gender relations or fear of violence) all of which can increase the risk of STIs.

Out of the 64 correspondents, 64 (100%) were cohabiting either as monogamy 20 (31%) or polygamy 44 (69%) with respect to marital status. This contributes to increase promiscuity among the refugee population hence, divorce or separation is easy. 64(100%) were formally unemployed with 51(80%) doing basically nothing which accounts for idleness among this population who then find pleasure in delivering in illegal relationships. 40 (62%) of these women has no formal education which contributes to ignorance and low comprehension of facts especially symptomology on STIs among them leading to worrisome high prevalence of infections. This is in line with a similar study carried out in Gambia among pregnant women where ignorance, multiple sexual partners were highlighted as risk factors to STIs (Isara and Baldeh, 2021). Before the UNHCR health grant, about 13 (20%) usually deliver at home and 16 (25%) attend ANC and deliver at home and in hospitals/ health care centers which accounts for most of them not being screened for STIs hence, infect other individuals especially their fetus(es) ignorantly, no medical follow-up as they harbor the STI germs. A similar impression was drawn from an interview among refugees in Nairobi, Kenya (Pavanello, 2010) and in Waves by Upchurch (Upchurch *et al.*, 2004) where they expressed their satisfaction with some of these unhealthy habits and find no reason for a change. Among the 23(100%) of those who had knowledge on STIs, 22(96%) had adequate knowledge on HIV implying there's little or no knowledge on other STIs. This concurs to a similar study carried out in Babessi Sub-Division, a rural low-resource setting in the North West Region of Cameroon where 76.7% of the pregnant women had adequate knowledge on HIV precisely (Sama C. B. *et al.*, 2017). A similar impression was drawn from a similar study carried out in West Coast Region of Gambia among pregnant women (Isara and Baldeh, 2021). This implies that many of those women could manifest symptoms of STIs without paying attention to it. This predicts a great danger to the health of the pregnant women and their unborn children. UTI and BV were identified in study with prevalence of 21.3% and 16.1% respectively which concurs to a similar study that demonstrated co-infection between UTI and STIs where 33.3% (58/174) women with BV showed positive for UTI and also indicating that women with BV have significantly increased risk of UTI (Sumati and Saritha, 2009) which are all risk factors to STIs. Poor knowledge of STIs contributed by limited education and inadequate access to health information which reduces awareness of STI prevention, symptoms and the importance of early treatment is a great area of concern.

CONCLUSION

In this study, we found out that majority of the participants came from extremities of the city where they find life more pleasurable with no specific address and falling within the age group of group 20 to 30 years.

The findings revealed a high prevalence (41.8%) of infection among these pregnant refugee women residing in Yaoundé, Center Region of Cameroon with UTI [318(21.3%)] being the most prevalence and syphilis 139(2.5%) being the least with 27% cases of multiple infections. This demonstrates a considerable burden of STIs stressing the need for diagnostic testing to facilitate early detection and treatment of these infections in order to hinder ongoing transmission.

The risk factors to STIs identified were ignorance, illegal sexual relationships which pushes them into multiple sexual partnership, low educational level, idleness, early initiation of sexual practices, infections (like UTI and BV) hence, women could manifest symptoms and spread STIs without paying attention to them.

I recommend health policy makers to: implement targeted STI screening protocols especially during their first and third ANC visit as well as treatment. Strengthen ANC services by integrating STI services into routine maternal and child health programs. Improve access to diagnosis and treatment by providing free or subsidized STI testing and treatment as well as ensure consistent supply of essential medicine in their health facilities. Strengthen health education through community education on STI prevention, safe sexual practices and importance of early ANC using cultural appropriate materials and local languages. Promote partner notification and treatment to reduce reinfection by encouraging confidentiality, develop partner friendly services within their health facilities. Address sexual and gender-based violence (SGBV) by strengthening prevention and response to sexual violence programs and giving post sexual exposure prophylaxis to victims as well possible referral where need be. Train health care workers to provide regular training on STI diagnosis, treatment guidance, counselling, confidentiality and culturally sensitive care. Strengthen routine surveillance and monitoring systems for prevalence and treatment outcomes as well as use the data as guidance for resource allocation among the refugee population. Increase collaboration between Ministry of Public Health, NGOs humanitarian organization, and refugee agencies to improve STI prevention and reproductive health services. Support women's empowerment by

promoting female education, economic empowerment and access to reproductive health information so women can make informed decisions about sexual health. Implementing the above recommendations will reduce maternal and neonatal complications associated to with untreated STIs and improve pregnancy outcomes.

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CONFLICT OF INTEREST

None declared.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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