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The Prevalence of Tuberculosis Among Internal Displaced Persons In Alsalam Camp, Nyala South Darfur State - Sudan (2019 – 2021)

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Prevalence; Tuberculosis; IDPS Camp; South Darfur -Sudan

1. Abstract

Tuberculosis (TB) continues to be one of the leading causes of death worldwide, and the largest prevalence of this disease is in Asia (59%) and Africa (26%). Approximately 4% of all new TB cases and 20% of previously treated cases are multidrug-resistant TB (MDR TB, characterized by resistance to isoniazid and rifampin, in the Sudan has a large population of internally displaced persons, this bad condition increased the prevalence of 209 cases per 100,000 of the population and 50,000 incident cases during 2009, this study is community-based a descriptive cross-sectional study conducted in is Alsalam IDPs camp in South Darfur state- to know the prevalence of tuberculosis and look for the risk factors associated with the disease, and the sample was selected to represent all sectors within the camp, and the sample size was determinant by the formula: N = (z^2 (p.q))/d^2, which included 400 persons, and data were collected by questionnaire to interviewing one person from each selected household, interviews with key persons and TB test were applied for all suspected cases, and data were analysis by statistical program for social sciences (SPSS) computer package latest version no 26. and the main results of this study, the prevalence of tuberculosis (positive cases) is 2.2% (9). The majority of people 54.86% (220) know that TB signs and symptoms are coughing for a long time, most of the people 53.9% (216) they don't know the methods of tuberculosis transmission, while 24.9% (100) of people mentioned tuberculosis is transmitted through cough and air, the study shows there is a strong relationship between a number of people sleeping in one room and TB those slept3 persons and more is high prevalence3(0,75%), while the study found the prevalence of TB low among people received health education message than those not received health education message 5(1,25%).

2. Introduction

Tuberculosis has a long history, it was present before the beginning of recorded history and has left its mark on human creativity, music, art, and literature; and has influenced the advance of biomedical sciences and healthcare. The causative agent, is mycobacterium tuberculosis, may have killed more persons than any other microbial pathogen, this disease discovered by the Robert Koch on March 24, 1882 in Berlin [1]. Tuberculosis (TB) is an infectious disease caused by a group of highly related organisms comprising the Mycobacterium tuberculosis complex (MTBC), which includes M. tuberculosis, M. Africanism, and M. bovis. Although all members of MTBC might cause disease in humans, M. tuberculosis and M. Africanum are the primary cause of disease in humans globally, whereas M. bovis primarily causes disease in cattle [2]. The World Health Organization estimates that 8.8 million people develop active TB disease every year. Of these people, 95% live in developing countries. More than 75% of TB-related disease and death occurs among people between the ages of 15 and 54, the most economically active segment of the population. It is estimated that TB kills 1.5 to 2 million people each year - on average one person every 15 seconds. Of these deaths, about 98% are in developing countries [3]. Tuberculosis (TB) continues to be one of the leading causes of death worldwide, and the largest prevalence of this disease in Asia (59%) and Africa (26%). Approximately 4% of all new TB cases and 20% of previously treated cases are multi-

drug-resistant TB (MDR TB, characterized by resistance to isoniazid and rifampin) [4]. The republic of Sudan has a large population of internally displaced persons. so it has a high burden of tuberculosis (TB) with a prevalence of 209 cases per 100,000 of the population and 50,000 incident cases during 2009[5]. Tuberculosis (TB) is a disease caused by bacteria that are spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine in most cases, TB is treatable and curable; however, persons with TB can die if they do not get proper treatment [6]. Bacteriological examinations include sputum smear microscopy it allows simple and reliable identification of patients with M+ PTB, but has low sensitivity. Culture is much more sensitive but requires a more equipped and qualified laboratory. TB is mainly transmitted by airborne transmission. The source of infection is a patient with pulmonary (or laryngeal) TB who expectorates bacilli. During coughing, speaking, or sneezing, the patient produces tiny infectious droplets from the bronchial tree; an aerosol of droplets each of which contains a number of bacilli, these droplets dry out and remain in the air for several hours [7]. The number of TB infectious droplets projected into the atmosphere by a patient is very high when coughing (3500) or sneezing (1 million), when they come into contact with the air these droplets rapidly dry and become very light particles, which still containing live bacilli, and remain suspended in the air in an enclosed space, the droplets can remain suspended for a long time, and the bacilli remain alive for several hours in the dark, these are "infectious particles, when people live or sleep near a patient, they are at risk of inhaling infectious particles [8].The period from infection to development of the first symptoms is usually four to 12 weeks, but the infection may persist for months or even years before the disease develops ,a person with the disease can infect others for several weeks after he or she begins treatment, and the symptoms of TB include; general weaknesses, weight loss, fever, and night sweats ,in pulmonary tuberculosis, the symptoms include persistent cough, a cough lasting for more than 2-3 weeks, chest pain, chills, discolored or bloody sputum, fatigue, loss of appetite, pain with breathing, severe headache, shortness of breath, slight fever, tiredness or weakness, weight loss, in young children, however the only sign of pulmonary TB may be stunted growth or failure to thrive [9]. The term case detection used by WHO, means that a patient is diagnosed as having TB (correctly or incorrectly), and is reported within the national surveillance system, and then to WHO. Smear-positive cases are the focus of DOTS program because they are the principal sources of infection to others, because sputum smear microscopy is a highly specific (if somewhat insensitive) method of diagnosis, and because patients with smear-positive disease typically suffer higher rates of morbidity and mortality than smear negative patients [10]. Tuberculosis can also be diagnosed with the aid of other techniques that allow a presumptive diagnosis and sometimes confirm pulmonary and extra-pulmonary form. Radiography used for pulmonary TB; chest x-ray useful for the diagnosis of M- PTB and TB in children. Tuberculin skin test (PPD) it is cutaneous hypersensitivity to tuberculin reflects a delayed hypersensitivity reaction to M. Tuberculosis antigen. A positive reaction signifies that an infection has occurred, but it does not determine if the TB is latent or active, and is not synonymous with immunity [7]. Serological tests attempt to demonstrate the presence of circulating antibodies, using mycobacterial antigens to recognition of antigens by the antibodies present in infected individuals could aid in the diagnosis of disease at certain extra-pulmonary sites for which diagnosis by bacteriology or histology is difficult [8]. In many developing countries progress in establishing integrated tuberculosis control activities has been very slow since the eighties. Since tuberculosis continuous to attack millions of people, every year, particularly in the less developing countries, new imaginative approaches were badly needed [11]. Health education for behavior change and community outreach in addition to others are crosscutting components for TB programs contributing in prevention and control disease [12]. The development of effective treatment for tuberculosis has been one of the most significant advances during this century, the objective of treatment is cure that is, the elimination of both the fast and slowly multiplying bacilli from patient's body and the treatment should be easily available free of charge to every patient detected. The patient must take the correct drugs at the correct dosage for correct length of time; incomplete treatment puts patient at risk of relapse and development of bacterial resistance and, importantly, the community at risk of infection with resistant organisms. [13]. The standardized regimens for anti-TB treatment include five essential medicines designated as "first line": isoniazid (H), rifampicin (R), pyrazinamide (Z), ethambutol (E) and streptomycin (S), dose given according to weight. All TB patients with strain susceptible to the first line drugs must be treated with same treatment regimen for six month or 12 months according to the site of involvement. For treatment of new and retreatment cases of pulmonary or extra-pulmonary TB, the standardized regimen consisting of two phases: 1 the initial (intensive) phase: uses four drugs (rifampicin, isoniazid, pyrazinamide and ethambutol) administered for two months. This is followed by 2 a Continuation phase: with two drugs (rifampicin and isoniazid) for four months [14]. Statistics in Sudan showed that, the treatment success rate of new and relapsed cases registered in 2012 was 75.0%. Drug-resistant tuberculosis is estimated at 1.9% among new cases and 20.0% among previously treated cases [15]. The BCG vaccine is prepared from live attenuated tubercle bacilli that have lost some of their virulence; the introduction of these bacilli into the body provokes the same immunological reactions as primary infection with tubercle bacilli, without leading to disease. BCG vaccination confers partial immunity, essentially against the consequences of primary infection, and particularly against the

acute forms of tuberculosis in children [8]. The BCG vaccine protects against childhood TB, but this immunity diminishes with age, which is not perfect for its limited ability to protect against the adult form of TB. Therefore, TB still represents a main and yet increasing global dilemma. For this reason, the development of a new more efficient TB vaccine than the current BCG vaccine is one of the main concerns in TB research. The Bacilli Calmette and Guerin vaccine. The currently licensed vaccine against TB, BCG is an attenuated strain of Mycobacterium Bovis a mycobacterium that infects cattle [16]. Two meta-analyses of the published results of BCG vaccine clinical trials and case-control studies confirmed that the protective efficacy of BCG for preventing serious forms of TB in children is high (i.e., >80%). These analyses, however, did not clarify the protective efficacy of BCG for preventing pulmonary TB in adolescents and adults; this protective efficacy is variable and equivocal. The concern of the public health community about the resurgence and changing nature of TB in the United States prompted a re-evaluation of the role of BCG vaccination in the prevention and control of TB. CDC, the Advisory Committee for the Elimination of Tuberculosis [17]. The recent main factor and challenges facing the TB program's success and prevalence are the MDR. In a cross-sectional study during 2011, conducted in East Sudan Kassala, to study Multi-drug resistance tuberculosis, the study found that drug resistance M. tuberculosis in Kassala State was high (30%) and was found to be mainly (83.3%) due to mutations in the rpoB gene [18]. The study found that the TB control program in Khartoum State achieved a 77.2% case detection rate of the smear-positive cases, and 73.5% treatment success rate, and a case fatality rate of 2.2%, a treatment failure rate of 2.2%, and a default rate of 14.1%. There was no system to detect the prevalence of MDR-TB (multi-drug-resistant TB) or HIV (human immunodeficiency virus) among the TB cases. The program was not well implemented at locality or health area levels [19]. The study was conducted in Sudan, which included 243-suspected TB patients in TB clinics in any of three cities located in different parts of Sudan. Khartoum (Central), Port Sudan (Eastern), and Al Obeid (Western). The study was looking for patient information; the study resulted that TB is spread all over Sudan, and showed more males than females were found to have TB (187:57). In the study, the number of males was 186 (74.7%). Of them, 72 were workers (30.4%), 26 were farmers (10.7%), 30 were free workers (unskilled laborers) (12.3%), 27 were unemployed (11.9%), 16 were students (7%), 11 were drivers (4.9%), and 4 were soldiers (1.6%). The number of females included in this study was 57 (25.3%). Of them, 35 were homemakers (14.4%), 6 were female students (2.5%), 14 were workers (5.7%), and 2 were teachers (0.8%). while 78 (31.8%) were single, 10 (4.0%) were widowed, and 7 (3%) were divorced. The disease was found to be prevalent in all parts of Sudan. According to the residence of the patients, which was classified as urban and rural, 156 (64.1%) were urban and 87 (35.9%) were rural. 34 (8.1%) of them live in houses made of concrete, 78 (32.1%) in houses built of bricks, 90 (37%) built of mud; the remaining houses were 35 (14.4%) Gutiya, 4 (1.0%) British, and 2 (0.5%) made of straw.93 (38.3%) patients were illiterates and 18 (7.4%) went to khalwa while the educated vary in their education from primary to university, 66 (27.4%) had primary education, 8 (3.3%) stopped at the intermediate level, 48 (19.8%) had a secondary level of education while only 3 (1.1%) went to university. The patients included in the study commonly complained of cough, fever, and shortness of breath. The duration of these symptoms varied from 6 weeks to 3 years. Of the 243 subjects included in the study, 179 (74%) were new cases, 44 (18.1%) relapsed, 16 (6.5%) were patients with interrupted anti-TB treatment, and 4 (1.8%) were cases of failure of treatment. Of the study participants, 179 (74%) had no history of treatment while 64 (26%) received first-line anti-TB treatment. Microscopic result Two hundred and forty-three sputum samples from TB patients included in the study were processed for staining using ZN stain and examined by the light microscope. 207(85.2%) of them were positive showing AFB in ZN stain. Cultures of sputa from 191 of 243 pulmonary TB patients (78.6%) were positive for mycobacteria. 149 (75%) were successfully sub-cultured on LJ. 19 (13%) cultures were contaminated and only 149 isolates were used for biochemical identification and sensitivity testing [20].

During the year 2011, 670 patients were registered at Kassala hospital in Sudan with clinical, laboratory, and radiological evidence proven TB. Their mean age (SD) was 34.1 (18) years. The majority of these patients had less than secondary education, males, and of rural residence. Of the total patients, 36.8% were non-skill workers, 26.1% were skill workers, 25.4% were employees, and 11.7% were homemakers. Pulmonary TB accounted for 73.4% (492/670) while extra-pulmonary TB was reported in 26.6% (178/670) of all TB patients. The mean age (SD) was not significantly different between the cases and controls (670 in each arm), 34.1 (18.0) vs. 33.8 (8.5), P=0.7. TB patients were those who had less education and the infection was more likely common among male patients [21]. The study was conducted in Sudan which includes 53 children (63.1%) belonging to the original Eastern Sudan ethnic groups and 50 children (59.5%) living inside the city. The male to female ratio was almost equal (43:41). Almost all the group is of low socioeconomic background. The most common presenting symptom was the loss of weight (100%), anorexia (92.8%), mood changes and fever (90.5%) cough (79.8%) and sweating (61.9%). Fever most commonly was of a continuous history of close family member contact was detected in 25% of cases. The mean duration of symptoms was 46 days with ranges from 10 days up to 6 months. Pulmonary TB was statistically significantly associated with the presence of cough (p-value of 0.042) but no significant association between pulmonary disease and fever was detected (p-value > 0.6). Difficulty breathing at rest occurred in 23 (27.4%) of the children and the weight loss was severe in 50 (59.5%) of patients.

Rarer symptoms were back deformity in 5 children and convulsions in six children. Convulsions have a statistically significant correlation with severe types of TB (miliary or meningitis types) with a p-value of > 0.001. Seventeen of the children were admitted twice or more to the hospital previously. There were 51 children who were BCG vaccinated but about half of the vaccinated children did not show a BCG scar [22]. Sudan is one of the developing countries with a high prevalence rate of tuberculosis; the second country after Pakistan in the eastern Mediterranean region EMRO, tuberculosis considers one of the public health important events in the country, statistics showed the incidence is 1.2% or 120 TB patients for 100000 populations (9) and recently WHO stated according to the last available data for country profile (Estimates of TB burden 2018) the total TB incidence is 71 per 100 000 populations this is 30000 cases[23]. A study conducted in Patients with active/quiescent tuberculosis who presented to the Department of Tuberculosis and Chest Diseases, Government Medical College, Patiala, Punjab, India, with complaints of breathlessness and had rhonchi on examination were subjected to bronchodilator reversibility testing to prove if they were suffering from concomitant asthma, the results: Over 6 months, 69 patients with tuberculosis along with asthma were found. Only 21/69 (30.4%) patients. Developed tuberculosis after asthma. 48/69 (69.6%) patients developed asthma after tuberculosis. Majority (25/48=52.1%) of them developed asthma within 5 years of completion of ATT (p=0.020). Only 2/48 (2.9%) patients had a positive family history of asthma. Lung function abnormalities correlated with the extent of radiological involvement in these patients who developed asthma after tuberculosis (p ≤0.0001) [24]. A study conducted in Ethiopia to know the level of tuberculosis knowledge among adults the study shows knowledge is low and varied by socioeconomic group. Tuberculosis control programs should consider appropriate strategies for tuberculosis education, promotion, communication, and social mobilization to address the rural women, youths, the poor, less educated people, and unskilled workers [25].

3. Material and Methods

3.1. Study design and setting

Community-based a descriptive cross-sectional study conducted in is Alsalam IDPs camp in South Darfur state in Sudan, in the period of 2019 – 2021. The aim of this study to measure the prevalence and risk factors of tuberculosis.

3.2. Sampling

Sample selected to represent all cluster within the camp and the sample size determinant by the following formula: N =(z^2 (p.q))/ d^2 , where the sample size calculated N =(z^2 (p.q))/d^2 , =(2^2 (0.5.0.5))/⟦0.05⟧^2 , = (4 (0.25))/0.0025, = 1/0.0025, so the samples size, N = 400 households, and the clusters were selected randomly to determine the number of households selected from each cluster; sample size (400 HHs) divided by the cluster sample (5) = (400 HHs)/5 = 80 household selected from each of the five clusters, the key persons was selected randomly to interview, and all suspected cases were selected to TB test.

3.3. Data collection and analysis

the data were collected use deferent tools which included, questionnaire, KoBo toolbox program designed and used for data collection, interview with key persons, check list and TB test. In addition, the data was analysis use statistical program for social sciences (SPSS) computer package latest version no 26.0.

3.4. Research Ethics Considerations

Ethical permission for the study was obtained, by consulting and receiving approval from the university of Shendi, and ministry of health, the local health authority, Community Leaders in the camp, and consent those who are interviewed.

4. Result

- The TB, program targeting to detect 4424 cases from the community this year 2020, currently detected only 774 cases represent 23% from the annual target, program planned to establish 50 TB centers (TBMUs / DOTS) in the south Darfur state.
- There is no government support for TB programs, only there is a partnership with international organizations, the ministry of health provides health cadres, training.
- There support from the global fund, which is not enough as well as this support reduced in 2016, the current support from the global fund (2020) include, medical supplies, treatment, and laboratories equipment's, as well as training, annual meetings, annual monitoring, and supervision, no support from the government of Sudan at all. (Figure 1)

31.2% (125) of participants are illiterate or who did not have any education, were 31.2% (125), and 30.4% (122) of them completed basic/primary level school, and 25.5% (104) of them attended Khalwa. (Figure 2)

The study shows the majority of participants 82% (329) they do not know the causative of tuberculosis, while 7.7% (31) of participants mentioned bacteria cause tuberculosis, and 5.5% (22) of them said it causes by virus. (Figure 3)

The majority of participants 52.6% (211) mentioned tuberculosis is an infectious disease, while 40.9% (164) answered they don't know if it is infectious or not and 6.5% (26) of respondents mentioned tuberculosis is not an infectious disease (Figure 4)

The majority of participants 54.86% (220) mentioned TB signs and symptoms are coughing for a long time, while 42.14% (169) of the participants they do not know, the sign and symptoms of tuberculosis, where an equal percentage 14.46% (58) of participants mentioned TB signs and symptoms are fever or difficulty of breathing. (Figure 5)

53.9% (216) of participants do not know the methods of tuberculosis transmission, while 24.9% (100) of them mentioned tuberculosis is transmitted through cough and air, and 11.2% (45) said it transmits through unclean food or water while 6.2% (25) see that TB is transmitted through contacting others in public areas. (Figure 6)

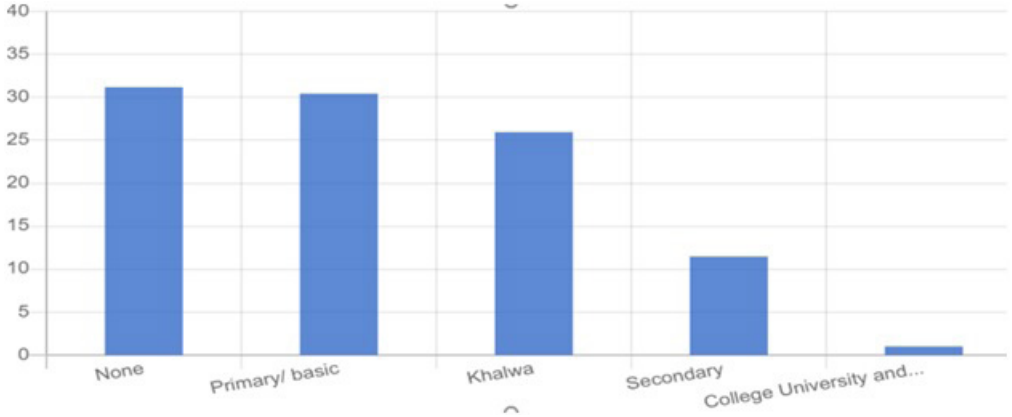

Figure 1: Education level of participants at Alsalam IDPs camp, South Darfur State, November 2020, N = 401

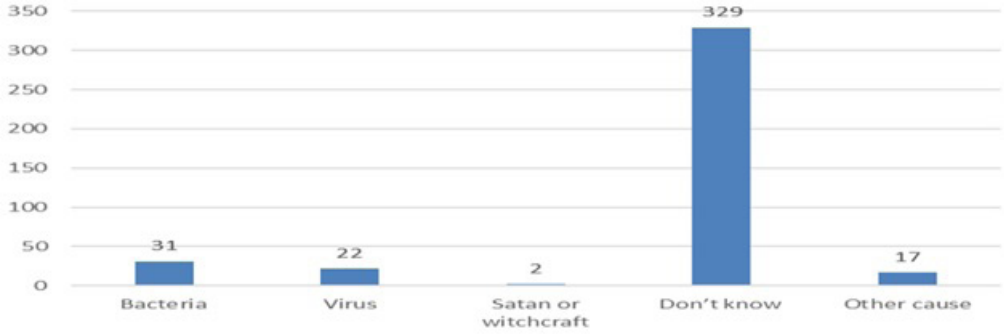

Figure 2: Illustrated the knowledge of participants of the causative agent of TB at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

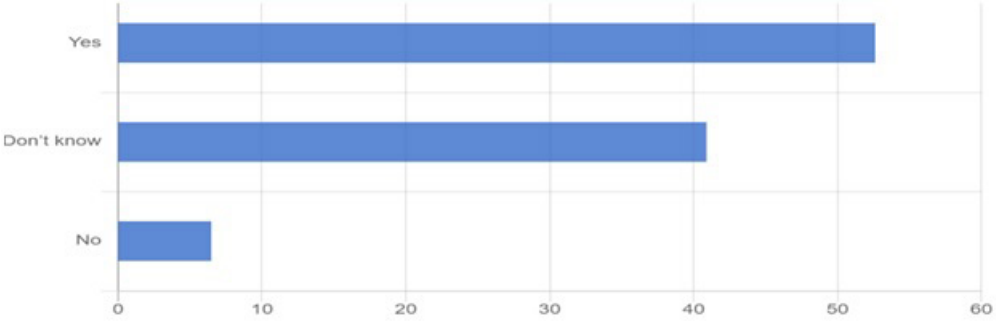

Figure 3: Demonstrated the knowledge of participants is tuberculosis if it infectious or not at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

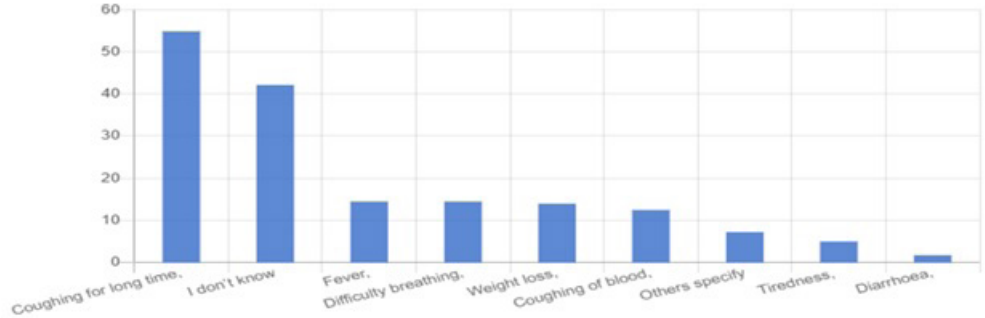

Figure 4: Demonstrated the knowledge of participants of TB symptoms at Alsalam IDPs camp, South Darfur State, November 2020, N = 401

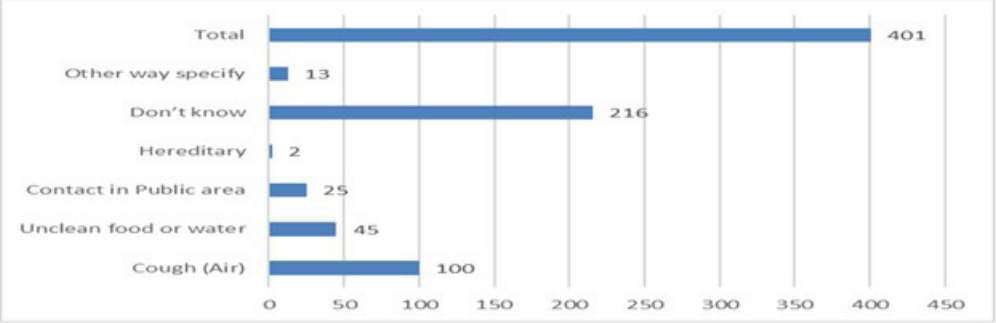

Figure 5: The knowledge of participants the transmission methods TB is transmitted in Alsalam IDPs camp; South Dar State, November 2020, N = 401

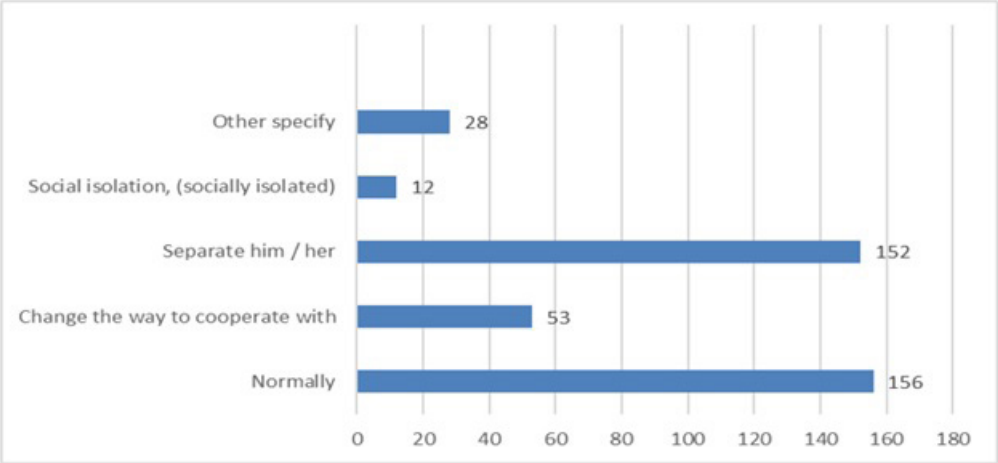

Figure 6: Shows the knowledge, attitudes, and practices of families and their contact with the TB patient family member at Alsalam IDPs camp, South Darfur State, November 2020 , N = 401

38.9% (156) of the families' patients contact normally with TB patients without any precautions, and 37.9% (152) of families separate TB patients from other family members, and 13.2% (53) of families change the way of a deal with TB patients. (Table 1)

9(2.2%) of participants are TB sputum test results positive, and 392(97.8%) of the negative result (Table 2)

The study shows sector number one high prevalence (smear-positive) 7(1, 75%) and there is the relation between the sector and TB prevalence, sector one high crowded. (Table 3)

There is strong relation between people who has signs and symptoms and considered suspected TB case, send for test and the prevalence of TB (smear positive), the prevalence high among people who has signs and symptoms 9 (2.24%). (Table 4)

The study shows the people who have previous infection of TB was a low prevalence of 1(0.25%) TB (smear-positive) than those who do not have the previous infection. (Table 5)

The study shows there is a strong relationship between the number of people sleeping in a room and positive sputum test results, found 3 people slept in one room is high prevalence3(0,75%). (Table 6)

The prevalence of TB (sputum -Smear positive) is high among people who have do not receive health education message 5 (1, 25%), than those who have received health education message 4 (1%). (Table 7)

The prevalence of TB (smear positive) is high among those not have previous history of Asthma 7 (1, 75%), while those have TB (smear positive) and have previous history of asthma is 2 (0.5%).

Table 1: Shows the prevalence of tuberculosis in Alsalam IDPs camp, South Darfur State, November 2020, N = 401.

TB sputum test results					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive	9	2.2	2.2	2.2
	Negative	392	97.8	97.8	97.8
	Total	401	100	100	100

9(2.2%) of participants are TB sputum test results positive, and 392(97.8%) of the negative result

Table 2: Shows the TB prevalence (smear-positive) within different sectors, at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

Number of camp sector	Distribution the prevalence of TB among sectors (sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
1	7	1,75%	80	19,95%	87	22%
3	0	0,00%	80	19,95%	80	20%
5	1	0,25%	86	21,45%	87	22%
7	0	0,00%	73	18,20%	73	18%
9	1	0,25%	73	18,20%	74	18%
Total	9	2,24%	392	97,76%	401	100%

$Ch^2 = 18.349$ p. value = 0.010

The study shows sector number one high prevalence (smear-positive) 7(1, 75%) and there is the relation between the sector and TB prevalence, sector one high crowded.

Table 3: Illustrated the relation between people who has signs and symptoms and considered suspected TB case, and the prevalence of TB (smear-positive), at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

The present of signs and symptoms, suspected case, send for test	TB status (if there are symptoms – sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
Yes	9	2,24%	8	2,00%	17	4,24%
No	0	0,00%	384	95,76%	384	95,76%
Total	9	2,24%	392	97,76%	401	100%

$Ch^2 = 207.962$ p. value = 0.000 significant

There is strong relation between people who has signs and symptoms and considered suspected TB case, send for test and the prevalence of TB (smear positive), the prevalence high among people who has signs and symptoms 9 (2.24%).

Table 4: Shows the relation between people who have the previous infection of TB and the tuberculosis prevalence (smear-positive), at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

Have you ever been infected with TB	TB status (if there are symptoms – sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
Yes	1	0,25%	4	1,00%	5	1,25%
No	8	2,00%	388	96,76%	396	98,75%
Total	9	2,24%	392	97,76%	401	100%

$chi^2 = 7.275$ p. value = 0.007

The study shows the people who have previous infection of TB was a low prevalence of 1(0.25%) TB (smear-positive) than those who do not have the previous infection.

Table 5: Illustrated the relationship between the number of people sleeping in a room (house crowded) and tuberculosis prevalence (smear-positive), at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

Number of people sleeping in a room	TB status (if there are symptoms – sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
1	0	0,00%	8	2,00%	8	2%
2	2	0,50%	104	25,94%	106	26%
3	3	0,75%	129	32,17%	132	33%
4	2	0,50%	99	24,69%	101	25%
5	1	0,25%	27	6,73%	28	7%
6	0	0,00%	13	3,24%	13	3%
7	0	0,00%	10	2,49%	10	2%
8	0	0,00%	1	0,25%	1	0%
9	1	0,25%	0	0,00%	1	0%
10	0	0,00%	1	0,25%	1	0%
Total	9	2,24%	392	97,76%	401	100%

$Ch^2 = 44.632$ p. value = 0.000

The study shows there is a strong relationship between the number of people sleeping in a room and positive sputum test results, found 3 people slept in one room is high prevalence3(0,75%).

Table 6: Demonstrated the relation between people receiving health education messages related to TB and the prevalence of TB (smear-positive), at Alsalam IDPs camp; South Darfur State, November 2020, N = 401

Did you receive any health education messages related to TB?	TB status (if there are symptoms – sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
Yes	4	1,00%	67	16,71%	71	17,71%
No	5	1,25%	325	81,05%	330	82,29%
Total	9	2,24%	392	97,76%	401	100%

Chi^2= 4.517 p. value = 0.034 significant

The prevalence of TB (sputum -Smear positive) is high among people who have do not receive health education message 5 (1, 25%), than those who have received health education message 4 (1%).

Table 7: Shows the relation between Asthma and prevalence of tuberculosis prevalence (smear positive), at Alsalam IDPs camp; South Darfur State, November 2020, N = 401.

History with Asthma	TB status (if there are symptoms – sputum test results)				Total	
	Positive		Negative			
	No	%	No	%	No	%
Yes	2	0,50%	17	4,24%	19	4,74%
No	7	1,75%	375	93,52%	382	95,26%
Total	9	2,24%	392	97,76%	401	100%

Chi^2 = 6.235 p. value = 0.013

The prevalence of TB (smear positive) is high among those not have previous history of Asthma 7 (1, 75%), while those have TB (smear positive) and have previous history of asthma is 2 (0.5%).

5. Discussion

The study shows the prevalence of TB was 9 (2, 2%), this agree with mentioned by (5) and (23) the Republic of Sudan has a large population of internally displaced persons. It has a high burden of tuberculosis (TB) with a prevalence of 209 cases per 100,000 of the population and 50,000 incident cases during 2009. statistics showed the incidence is 1.2% or 120 TB patients for 100000 populations, WHO stated according to the last available data for Sudan country profile (Estimates of TB burden 2018) the total TB incidence is 71 per 100 000 populations this is 30000 cases.

The study illustrated the majority of people 54.86% (220) mentioned the signs and symptoms of TB are coughing for a long time this agrees with mentioned by (9) the symptoms of TB include; general weaknesses, weight loss, fever, and night sweats. In pulmonary tuberculosis, the symptoms include persistent cough, a cough lasting for more than 2-3 weeks, Chest Pain, Chills, Discoloured or bloody sputum, fatigue, loss of appetite, pain with breathing, severe headache, shortness of breath, slight fever, tiredness or weakness, weight loss.

The majority of participants 24.9% (100) mentioned tuberculosis is transmitted through cough and air and 11.2% (45) of them said it transmits through unclean food or water while 6.2% (25) see that TB is transmitted through contacting others in public areas, this similar to mentioned by (7) TB is mainly transmitted by airborne transmission, the source of infection is a patient with pulmonary (or laryngeal) TB who expectorates bacilli. During coughing, speaking, or sneezing, the patient produces tiny infectious droplets from the bronchial tree; an aerosol of droplets each of which contains a number of bacilli, these droplets dry out and remain in the air for several hours.

The study shows most people 82% (329) they do not know the causative agent of tuberculosis, while 7.7% (31) of participants mentioned tuberculosis is caused by bacteria, and 5.5% (22) said it causes by a virus, this agrees with mentioned by (25) A study conducted in Ethiopia to know the level of tuberculosis knowledge among adults the study shows knowledge is low and varied by socioeconomic group. Tuberculosis control programs should consider appropriate strategies for tuberculosis education, promotion.

The study shows the majority of participants 52.6% (211) mentioned tuberculosis is an infectious disease this agrees with (6) Tuberculosis (TB) is a disease caused by bacteria that are spread from person to person through the air. And agree with (3) as mentioned "Refugee and displaced populations are known to be at increased risk for TB. This finding is believed to be caused, in part, by increased risks for malnutrition and overcrowding, which lead to increased susceptibility to and transmission of TB"

The study demonstrated a strong relationship between the number of people sleeping in a room, while 3 people slept in one room is high prevalence3(0,75%), this agrees with (8) When people live or sleep near a patient, they are at risk of inhaling TB infectious particles.

The study shows the people who have the previous infection of TB have a low prevalence of 1(0.25%) TB (smear-positive), this agrees with (8) the introduction of the bacilli into the body provokes the same immunological reactions as primary infection with tubercle bacilli, without leading to disease.

There is a strong relationship between participants who received health education messages of TB, so the prevalence is low among those who received health education messages 4(1, %). This agree with (12) health education for behavior change and community outreach in addition to others are cross-cutting components for TB programs contributing to prevention and control.

The study showed the prevalence of TB high among suspected cases that have signs and symptoms of TB was 9 (2.24%). this agrees with (9) the symptoms of TB include; general weaknesses, weight loss, fever, and night sweats. In pulmonary tuberculosis, the symptoms include persistent cough, a cough lasting for more than 2-3 weeks.

The study demonstrated the positive relationship between Asthma and tuberculosis, the prevalence of TB was low among those who have a history of asthma was 2 (0.5%), this dis agree with (24) 69 patients with tuberculosis along with asthma were found. Only 21/69 (30.4%) patient has developed tuberculosis after asthma. 48/69 (69.6%) patients developed asthma after tuberculosis. The majority (25/48=52.1%) of them developed asthma within 5 years of completion of ATT (p=0.020). Only 2/48 (2.9%) patients had a positive family history of asthma.

6. Conclusion

The prevalence of tuberculosis (positive cases) was 9 (2.2%). The study shows the majority of people 220(54.86%) mentioned the signs and symptoms of TB is coughing for a long time. Most of the people 216(53.9%) they do not know the methods of tuberculosis transmission, while 100 (24.9%) of people mentioned tuberculosis is transmitted through cough and air. The study shows there is a strong relationship between the number of people slept in one room those slept (3 people) in one room is high prevalence 3(0,75%), while the study found the prevalence of TB low among people received health education message than those not received health education message 5(1,25%).

7. Recommendations

1. Health education programmers to preventions and control of TB disease should be an increase
2. Government and INGOs to support socioeconomic activities mainly to improve living condition, improve housing conditions and reduce the number of persons per a room, improve the ventilation rooms Improve housing conditions and reduce the number of people sleep per one room, and improve the ventilation rooms
3. Increase the vaccinations programmers (BCG) to cover all the IDP camps.
4. National TB program to activate Alsalam TBMU and apply Active case findings besides the mentioned community outreach activities

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