

Original Article

Knowledge, Risk Factors and Preventive Practices against Tuberculosis among Pottery Workers in Southwestern Nigeria

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ABSTRACT

Mortality and morbidity figures associated with tuberculosis are generally scary. Raw materials involved in the pottery making process contain crystalline silica which has been documented as risk factors to the development of tuberculosis. Unfortunately Nigeria pottery workers have no formal occupational health services. This study determined the knowledge of risk factors and preventive practices against pulmonary tuberculosis among pottery workers in Oye, Nigeria. A descriptive cross sectional study was carried out among 198 pottery workers selected using multistage sampling method. Research instrument consisted of a semi structured interviewer administered pretested questionnaire. Data was analyzed using the SPSS software version 23.0. Results shows that a one hundred and ninety four (98%) of the respondents have ever heard of pulmonary tuberculosis, 178(89.9%) of them don't know whether clay soil contained chemicals that could predispose them to tuberculosis. Only 64.1%, 56.6% and 59.1% had good mean general knowledge, good mean knowledge of prevention and good mean perception scores to tuberculosis respectively. Sixty three (31.8%) said that pottery workers are among those at risk of developing Tuberculosis (TB). Only 51 (25.8%) said they used protective equipment. Predictors of good general knowledge and good perception of TB include age above 24 years, being female, having post primary school education, having spent more than 5 years in pottery business and using protective devices ($p < 0.005$). There is need for recognition and prioritization of all silica-exposed workers for screening and treatment services in anti-TB programmes of the Government.

Keywords: Pottery workers, Silica, Hazards, Tuberculosis, Knowledge

INTRODUCTION

Mortality and morbidity figures associated with TB are generally scary, whereas ending the epidemic of Tuberculosis by 2030 is one of the highly strategic health targets of the Sustainable Development Goals. In 2018, an estimated 10 million people fell ill with

tuberculosis (TB) worldwide, out of which about 1.5 million people died in the same year.¹ Nigeria ranked 5th among the 22 highest disease burden countries in the world and 2nd only to South Africa on the African continent.² No fewer than 460,000 cases of TB are reported annually in Nigeria.¹ Despite Nigeria being one of the countries in the world to use the new standard approach of “Directly

Observed Treatment Short Course” to treat tuberculosis, the true prevalence of bacteriologically-confirmed pulmonary tuberculosis can only be directly measured in nationwide population-based surveys which are not readily available. Air polluted by dust in workplaces is associated with a wide variety of occupational respiratory diseases and pulmonary problem. Ceramic and pottery workers are in danger of exposure to dust particles, including crystalline silica. These are generated in many phases of ceramic and pottery materials production and puts handlers at potentially risk of developing occupational pulmonary respiratory diseases.³ Chronic inhalation exposure to ceramic and pottery dust has been associated with elevated risk of pneumoconiosis, chronic bronchitis, and tuberculosis among both male and female workers.^{3,4}

The procedures of mixing, sieving and shaping of pots involve raising dusty particles, which in the absence of precautions, produces a tremendous amount of dust in the air of the work rooms.

Exposure to almost any kind of dust even for a short time is apt to irritate the respiratory tract and produce coughing. It is the desire of the international community that a concerted global effort is made to promote Occupational Safety and Health strategies to prevent tuberculosis (TB), especially in high-risk occupations. These include but not limited to, silica dust exposed workers in mining, construction, pottery and other industries. In Nigeria, pottery sites are mainly owned by individuals and governments who are probably not keen on observing the standard safety practice for their employees. Like in many other informal sectors, most pottery industries are usually small to medium scale industries with little or no occupational health services on ground.^{5,6} A study on knowledge of risk factors for TB would assist those at risk towards taking proactive measures towards disease prevention. This study therefore aimed to determine the knowledge and risk factors for pulmonary tuberculosis among pottery workers in Oye in Southwestern Nigeria.

MATERIALS AND METHODS

Oye community in Southwestern Nigeria is a traditional city noted for pottery and clay production. The prevalence of TB in Oye is not known. This is a descriptive cross sectional study carried out to assess knowledge and risk factors for TB among pottery workers. All pottery workers who used clay for various purposes at the study site constituted the target population. An eligible respondent is a pottery worker who is registered with the central association and who has been in pottery business for at least 5 years. Sample size was calculated using the modified Leslie Fishers formula and a prevalence of pottery workers who have heard about TB disease.⁷ A sample size of 200 was arrived at after correcting for attrition and non response. A multi- stage sampling procedure was used for the selection of respondents. These include selection of six out of the nine pottery clusters within Oye by simple random sampling (simple balloting) in stage 1; and selection of two out of three sub-clusters in an average cluster by simple random sampling (balloting) in Stage 2. The 3rd stage involved a systematic sampling of one in three names on pottery workers list in a sub-cluster and this continued until the desired sample size was reached. A semi-structured, interviewer-administered, pre-tested questionnaire was used in data collection. Sections of the questionnaire included socio-demographic data of pottery workers, factors related to knowledge of pottery workers on the risk of pulmonary tuberculosis, risk assessment to TB and preventive practices against TB infection. A vernacular version of the question was prepared for the illiterate respondents, and these were back translated to English from the local Yoruba language. Data was entered into the computer system and analysed using the SPSS software version 23.0. Charts and frequency tables were generated. Mean scores were generated about risk factors (high or low) and knowledge (good or poor). P-value was considered significant at values less or equals to 0.05 for all inferential statistics done at bi-variate and multivariate analysis levels.

RESULTS

Two hundred (200) pottery workers were recruited for this study; complete responses were obtained from 198, giving a response rate of 99%. Table 1 shows the socio-demographic characteristics of the pottery workers. Mean age was 55.7 ± 5.8 years, 154 (77.3%) were females, 77 (38.9%) attained primary level education, while 90 (45.5%) had been in pottery work for about 7 to 8 years. Table 2 shows the knowledge of pottery workers on pulmonary tuberculosis; 194 (98%) of the respondents has ever heard of pulmonary tuberculosis and 110 (55.8%) of them heard of it through the health facility, 191 (96.5%) of them knew that tuberculosis was dangerous. High proportions 186 (93.9%) of them knew that tuberculosis could kill. Majority 178 (89.9%) of them did not know whether the clay soil they handles contained chemicals that could predispose them to tuberculosis. Few 45 (22.7%) of the respondents reported they had ever had tuberculosis. Majority 143 (72.2%) of them reported that tuberculosis could be cured. Most 186 (93.9%) believed that tuberculosis could be transmitted by inhaling infected air. Table 3 shows the knowledge about pulmonary tuberculosis prevention and DOTs program. It showed that 21 (10.6%) of the respondents have ever heard of DOTs program while 19 (9.6%) reported effectiveness for treatment of TB by DOTs program. Majority 149 (75.3%) of the respondents said that TB is preventable - by taking drugs 135 (90.6%) and through immunization 131 (87.9%). Only 64.1%, 56.6% and 59.1% had good mean general knowledge, good mean knowledge of prevention and good mean perception scores respectively according to Figure 1. Table 4 shows the perception and preventive measures on pulmonary tuberculosis. It shows that 63 (31.8%) said that pottery workers were among those at risk for developing TB, while 42 (21.2%) said that some workers in pottery industry may have TB. Majority 196 (99.0%) said that one can contact TB if working with untreated TB patients, 197 (99.5%) believed that going for TB test early when coughing for more than a month is advisable, 142 (71.7%) believed that taking TB drugs for treatment of TB is the

best treatment advisable. Only 51 (25.8%) said they used protective equipment like face mask, goggles etc, with 19 (37.3%) using it regularly. Reasons for not using protective devices include poor environmental sanitation (95.5%), wet preparation (76.3%) while few 1% claimed it is due to the availability of the first aid box.

Table 5 shows bivariate and multivariate analysis between some socio-demographic characteristics and selected outcome variables of interest. A statistically significant association was found between general knowledge of TB and age, gender, education status, no of years of experience working in pottery industry and use of personal protective devices ($p < 0.05$). Similar association was found with

Table 1: Socio-demographic characteristics of respondents (N=198)

Variables	Frequency (n)	Percentage (%)
Age(years)		
18-27	15	7.6
28-37	25	12.6
38-47	14	7.1
48-57	71	35.9
≥ 58	73	36.9
Sex		
Male	44	22.2
Female	154	77.3
Family structure		
Monogamous	53	26.8
Polygamous	145	73.2
Marital status		
Single	20	10.1
Married	141	71.2
Separated/divorced/widowed/widower	37	18.7
Tribe		
Yoruba	188	94.9
Igbo	5	2.5
Hausa	5	2.5
Educational level		
No formal education	51	25.8
Primary	77	38.9
Secondary	58	29.3
Tertiary	12	6.0
Period of being in to pottery work		
1-2	9	4.5
3-4	10	5.1
5-6	40	20.2
7-8	90	45.5
>9	49	24.7
Income (Naira)		
5000	6	3.0
10000	13	6.6
15000	32	16.2
20000	94	47.5
25000	53	26.8

Table 2: Knowledge of pottery workers on pulmonary tuberculosis (N=198)

Variables	Frequency (n)	Percentage (%)
Ever heard about tuberculosis		
Yes	194	98.0
No	4	2.0
*Source of information		
Friends	75	38.1
Health facility	110	55.8
Co-workers	18	9.1
Television	122	61.9
Tuberculosis is dangerous		
Yes	191	96.5
No	3	1.5
Don't know	4	2.0
Tuberculosis can kill		
Yes	186	93.9
No	6	3.0
Don't know	6	3.0
How common is Tuberculosis among pottery workers		
Not common	162	81.8
Common	34	17.2
Very common	2	1.0
Clay contains chemical that can predispose you to TB		
Yes	16	8.1
No	4	2.0
Don't know	178	89.9
Protect yourself against dust inhalation		
Yes	76	38.4
No	122	61.6
*If yes, protective measures		
Handkerchief	n=76 16	21.1
Face mask	60	78.9
Anybody with TB now and before		
Yes	45	22.7
No	153	77.3
Tuberculosis can be cured		
Yes	143	72.2
No	5	2.5
Don't know	50	25.3
If yes, how		
Modern treatment	n=143 132	92.3
Traditional	10	7.0
Faith healing	1	0.7
How's Tuberculosis transmitted		
Through sexual intercourse	5	2.5
Through bad food and water	7	3.6
By inhaling infected air	186	93.9

Table 3: Knowledge about pulmonary tuberculosis prevention and DOTs program (N=198)

Variables	Frequency	Percentage
Ever heard about DOTs programme		
Yes	21	10.6
No	104	52.5
Don't know	73	36.9
There is effectiveness for treatment of TB by DOTs program		
Yes		
No	19	9.6
	179	90.4
If yes, how		
Sneezing	8	42.1
Singing	8	42.1
Talking	3	15.8
Do you know that TB is preventable		
Yes	149	75.3
No	1	0.5
Don't know	48	24.2
If yes, means of prevention		
Immunization	131	87.9
Taking drugs	135	90.6
Practice good hygiene	50	33.6
Use of protective devices	34	22.8
Herb	52	34.9
Traditional healer	21	14.1
Other preventive measures		
Cover mouth while coughing	169	85.4
Cover nose while sneezing	172	86.9
Avoid overcrowding	75	37.9
Going for screening	25	12.6
Eat well and nutritious food	20	10.1
BCG vaccines protect infants against tuberculosis		
Yes	171	86.4
No	11	5.6
Don't know	16	8.1
Do you use protective equipment like nose mask, goggles and others		
Yes	51	25.8
No	147	74.2
Reasons for not using protective devices (multiple responses with n=51)		
Not necessary	30	58.6
Inconvenient	14	27.3
Not always available	20	39.4
Often forgot	4	8.6

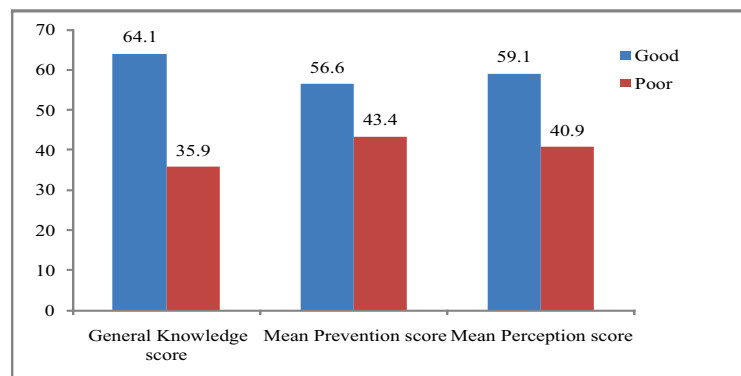


Figure 1: Mean score of TB knowledge and perception

Table 4: Perception and preventive measure on pulmonary tuberculosis (N=198)

Variables	Frequency (n)	Percentage (%)
Pottery workers are among the at risk group of developing TB	63	31.8
Yes	135	68.2
No		
Do you think that some workers in pottery industry may have TB		
Yes	42	21.2
No	24	12.1
Don't know	132	66.7
If you are living or working with untreated TB patients you can contact it		
Yes	196	99.0
No	2	1.0
Going for TB test early when coughing for more than a month is advisable		
Yes	197	99.5
No	1	0.5
Taking TB drugs for treatment TB is best treatment and advisable		
Yes	142	71.7
No	54	28.3
I will advise anyone coughing for more than a month to go for chest x-ray		
Yes	139	70.2
No	59	29.8
How regularly do you use protective device (n=51)	n=51	
Regularly	19	37.3
Not regularly	27	52.9
Don't use at all	5	9.8
Do you think you can never have TB		
Yes	177	89.4
No	21	10.6
Who are those who could have TB then if not you	n=21	
My friend	7	33.3
Other workers	14	66.7
Reasons why you said friend or other workers are at risk	n=21	
Not using face mask	10	47.6
Not using goggle	2	1.0
Not using nose cover	18	85.7
Will you like to be using preventive measures regularly		
Yes	183	92.4
No	15	7.6
*If yes, type of preventive measure	n=183	
Face mask	107	58.5
Goggle	42	22.9
Nose mask	158	86.3

* Multiple responses

Table 5: Association between knowledge and perception of pottery workers to TB and selected socio-demographic variables

	General mean knowledge scores		Statistics	Mean perception scores		Statistics
	Good	Poor		Good	Poor	
Age in years			X ² =4.876			X ² =14.939
<24	28(51.9)	26(48.1)	p=0.021**	20(37.0)	34(63.0)	p=0.001
<24*	99(68.8)	45(31.2)		97(67.4)	47(32.6)	
Gender			X ² =13.275			X ² =27.198
Male	18(40.9)	26(59.1)	p=0.001**	11(25.0)	33(75.0)	p=<0.001
Female*	109(70.8)	45(29.2)		106(68.8)	48(31.2)	
Education status			X ² =9.415			X ² =13.974
Up to primary	92(71.9)	36(28.1)	p=0.002**	88(68.8)	40(31.2)	p=<0.001
Secondary and above*	35(50.0)	35(50.0)		29(41.4)	41(58.6)	
No of years in pottery			X ² =4.916			X ² =7.847
<5 years	31(52.5)	28(47.5)	p=0.021**	26(44.1)	33(55.9)	p=0.004
>5 years*	96(69.1)	43(30.9)		91(65.5)	48(34.5)	
Use protective device (n=51)			X ² =10.831			X ² =18.853
Yes	23(45.1)	28(54.9)	p=0.001**	17(33.3)	34(66.7)	p=0.001
No*	104(70.7)	43(29.3)		100(68.0)	47(32.0)	

Binary logistic regression (with good mean general knowledge)

	Mean good general knowledge			Mean good perception scores		
	95%CI		OR/ P value	95%CI		OR P value
	Lower	Upper		Lower	Upper	
Age in years						
<24	0.2582	0.9280	0.49	0.1483	0.5476	0.29
<24*			0.015			0.001
Gender						
Male	0.1428	0.5722	0.29	0.0704	0.3237	0.15
Female*			0.001			0.001
Education status						
Up to primary*	0.3933	4.6875	2.56	1.6987	5.6951	3.11
Secondary and above			0.001			0.001
No of years in pottery						
<5 years	0.2655	0.9264	0.50	0.2232	0.7738	0.42
>5 years*			0.014			0.002
Use protective device (n=51)						
Yes*	0.1762	0.6546	0.34	0.1193	0.4627	0.24
No			0.001			0.001

**Statistical significance *Reference category

mean perception scores of respondents ($p < 0.005$). Predictors of good general knowledge and good perception of studied pottery workers to TB include age above 24 years, being a female, having post primary school education, having spent more than 5 years in pottery business and using protective devices, though all these observations were found to be statistically significant ($p < 0.005$).

DISCUSSION

Pot making is one of the traditional handwork for which the people of the study area and many other communities are known for. It serves as a source of livelihood for many despite their predisposition to TB by the handling of clay and silica materials in their operations. The socio-demographic characteristics of pottery workers in our study supports that from another Nigerian study,⁸ in which majority were females, with lower level of education. Another cross-sectional survey in Thailand also reported female dominance among pottery workers.⁹ The female characteristics of patience and paying attention to fine details may be responsible for the affinity for pottery work among them.

Majority of the respondents having ever heard about tuberculosis holds a good prospect for TB prevention and control. This figure is higher when compared to another similar study among potters and ceramic workers.¹⁰ Good knowledge is an indicator that respondents would search for in-depth information on mode of acquiring the disease, as well as, what can be done to treat the illness. Some studies revealed that people who have good knowledge adhere more to good TB preventive practices and seek medical treatment early.^{11,12} More than half of our respondents had knowledge of tuberculosis from the health facility, which is in agreement with another local study where more than half of their respondents also had knowledge of tuberculosis and associated hazards from the hospital while seeking health care.⁸

Majority of our respondents did not know if clay soil contained chemicals that may predispose them to

tuberculosis. This figure is far higher when compared to findings from another study.¹⁰ The pattern is however better when compared to another Nigerian study,⁸ where it was found that about half of the respondents were not aware of hazards associated with working with clay. Good general knowledge of TB and its prevention was found among two thirds of our respondents, similar to findings from another study.¹³

Only one quarter of our respondents said they used protective equipment like face mask, goggles and others. This usage pattern is low or poor and not encouraging when compared to other studies,^{8,13} and far lower when compared to another Nigerian study where majority of their respondents reported a high magnitude of utilization of personal protective equipment.¹⁴ However, another study in Dhaka conducted among pottery workers reported non-use of protective devices among two-thirds of the respondents.¹¹ Majority of the respondents indicated willingness to be using preventive measures regularly. This supports another Nigerian study by another study.¹¹ Poor awareness and low use of protective devices may also be attributed to the low level of education observed among the pottery workers in this study, and similar findings from other studies.^{9,14}

CONCLUSION

Pottery workers have a high risk of contracting TB due to the processes involved in their occupation. The low level of education observed among the pottery workers in this study may have accounted for the poor awareness and low use of protective devices. We recommend the need to educate pottery workers, recognize and prioritize all silica-exposed workers for screening and treatment services and their prioritization in anti -TB programmes of Government.

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Conflict of interest

None to declare

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