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A Quantitative Descriptive Cross Sectional Study About Knowledge Levels of Drug Resistant Tuberculosis Among the Residents of Port Elizabeth, Eastern Cape Province, South Africa

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Abstract
Background: A high level of knowledge about Multi-Drug Resistant Tuberculosis is very important for TB prevention and control among community members. Objective: The aim of this study was to assess knowledge levels of Multi-Drug Resistant Tuberculosis among the residents of Port Elizabeth. Material and methods: A quantitative descriptive cross sectional study was conducted. The research sample consisted of 400 residents (190 males and 210 females) who were purposefully and conveniently selected in Port Elizabeth. Four point likert scale close-ended questionnaires were used to collect data. Results: The majority (56%) of the residents of Port Elizabeth had poor knowledgeable levels about Multi-Drug Resistant Tuberculosis. Secondly, more females and adults showed poor knowledge levels of Multi-Drug Resistant Tuberculosis than males and youth. Conclusion: Participants had poor knowledge and misconceptions about the disease. More adults and females were more vulnerable and at risk of infection than youth and males. There is a need for increased coverage and develop educational material in different languages that are appropriate for the various levels of literacy. The aims of the MDR-TB de-centralisation was to improve access and acceptability. Acceptability can be achieved if people have proper knowledge about the disease and hence a need to scale up education interventions, the involvement of the infected and traditional practitioners in the delivery of such interventions.

Key Words: Knowledge, Tuberculosis, Multi-Drug Resistant Tuberculosis and Tuberculosis

1. INTRODUCTION AND BACKGROUND

Tuberculosis (TB) is an infectious deadly contagious but preventable disease. The high incidence of TB globally is a cause for concern and a huge threat to public health (Kodisang, 2014: 12). According to the World Health Organization (WHO) in 2016, there were an estimated 10.4 million new TB cases in the world, and 10% was living with HIV. 95% were adults of whom 65% was males 74% of these people live in Africa, and almost 64% of the total was from seven countries (India, Indonesia, Philippines, Russia, Pakistan Nigeria, and South Africa) (WHO: 2017). In 2014, the 22 high TB burdened countries accounted for almost 83% of all the estimated new TB cases globally (WHO, 2017).

The emergence of Multi-Drug Resistant Tuberculosis (MDR-TB) further poses a more serious threat to control of TB worldwide. In 2016, there were an estimated 600 000 new cases of Rifampicin Resistant Tuberculosis (RR-TB) globally of which 490 000 had MDR-TB. About 47% of the RR-TB cases lived in India, China, and Russia. 129 689 people were notified as having started MDR-TB treatment in 2016 (WHO, 2017).

In SA, during the initial outbreak of the MDR-TB, the National Tuberculosis Program required that all Multi-Drug Resistant TB patients be hospitalised for an initial period of six months as required by the South African National Department of Health. The patients were admitted to isolation wards or hospitalised at the centralised MDR-TB site for a long period, and their discharge was dependent on the attainment of three culture-negative sputum that were taken a month apart. Challenges such as delayed treatment initiation, unavailability of beds, poor treatment, and infection control measures and pressure from human rights groups were some of the challenges that lead the passing of the de-centralisation and de-institutionalisation policy for management of MDR-TB in 2011. Its aims were to treat patients closer to their families, and thereby promote acceptance among community members while reducing costs associated with taking treatment. (South African National Department of Health, 2011).

In SA, KwaZulu-Natal (KZN) is the Province with the highest number of people infected with Multi-Drug Resistant-TB. It was in 2005 at the Church of Scotland Hospital in Kwa-Zulu Natal, Tugela Ferry where Extensive Drug Resistant Tuberculosis (XDR-TB) was first identified in SA with a mortality rate of 98% (Ahmed, Velayati & Mohammed, 2016: 253). The province of the Western Cape (WC) and the Eastern Cape (EC) are lying in the second and the third spot after Kwa-Zulu Natal with regard to the number of people infected with Multi-Drug Resistant-TB respectively (Ndjeka, 2014: 4; Kodisang, 2014: 2).

Port Elizabeth (PE) in the Nelson Mandela Bay Municipality (NMBM) is one major city in the EC, South Africa. TB was declared a crisis in the NMBM and in 2011, an announcement was made in the EP Herald that war against TB was lost in the NMBM (Ndabeni and Hayward, 2011: 12). One in 100 people is infected with TB in the NMBM. Secondly, 90% of those diagnosed with TB are also co-infected with HIV and or AIDS. NMBM has also recorded the second highest rates of HIV deaths after Mangaung (185.9 per 100 000) with (123.4 per 100 000 (Health-e, 2018). NMBM has a 3rd highest rate of TB treatment defaulters and also ranks among the ten worst metros in the country for deaths caused TB, TB cure and treatment success rate (Pillay, 2015: 2).

Previous TB control and prevention strategies were largely focussing on biomedical interventions. There is growing evidence that such interventions alone are not enough to curb the spread of this deadly disease. Researchers are also looking at the possibilities of including social aspects such as community or patient education and awareness. The literature also indicates that changes in socio economic status and improvements of patient knowledge and attitudes strengthen TB control. The WHO have also included education interventions as one of its priorities (Maharaj, Ross, Maharaj & Campbell, 2016 2).

Public knowledge about MDR-TB has been poorly researched despite the growing interest in socio-economic aspects of this disease. Accurate MDR-TB knowledge is of significance for curbing and preventing the spread of disease in the community. There is also an association between negative attitudes and low knowledge about a disease (Wang, Wada, Hoshi, Sasaki, Ezoe & Satoh, 2013: 64). Inadequate knowledge, erroneous beliefs, and misconceptions regarding TB is exacerbating its spread (Wieland, Weis & Yawn, 2012: 14).
Fear of social isolation, prejudice, stigmatization, and discrimination by family healthcare workers and community members also hinder TB prevention and control as they lead to treatment default, abandonment of treatment by those already diagnosed and non-disclosure of health status and delays in health seeking and diagnosis by community members (Ma, Ren & Wang, 2015: 312).

The National Department of Health has embarked on community outreach programs and intensive educational campaigns throughout the country both in rural and urban areas to try and educate people about TB and HIV and AIDS (Fana, Mayekiso & Gwandure, 2013: 64). If community members do not understand government policies and interventions on MDR-TB, they are less likely to accept the decentralised health projects in their communities. When people have a low knowledge, they are less likely to take advantage of the health facilities at

their communities and seek help for treatment of diseases like MDR-TB. Lack of knowledge about diseases is associated with negative attitudes towards diseases (Fana et al., 2013: 62).

In a study that was conducted to assess knowledge of Multi-Drug Resistant-TB among healthcare workers and patients, more than half of the respondents had poor knowledge, misconceptions and erroneous beliefs about Multi-Drug Resistant-TB (Malangu & Adebanjo, 2015: 4; Patle & Khase 2014: 51). Erroneous beliefs such as breaking of cultural rules that demanded sexual abstinence after death of a family member and lack of knowledge was also found among the respondents in a study that was conducted to assess knowledge, attitudes and perceptions of patients about TB and MDR-TB (Esmaeli, Ali, Agonafir, Desale, Yaregal, & Desta, 2013: 785; Edgington, Sekatane & Goldstein, 2002: 1075). Other studies reported misconceptions about causes of TB such TB being caused by witchcraft, 'evil eye' and Satan (Adebe, 2010: 4), cold weather (Gelaw, Genebo, Dejene, Lemma & Eyob, 2001: 387). A study carried out in Eastern Cape to assess stigma associated with TB in the era of HIV and AIDS found that TB was a highly stigmatised disease and that resulted in MDR TB patients being secretive and reluctant to visit a clinic for ongoing medication (Moller & Erstad, 2007: 117) .

It is also of significance to note that there is a problematic relationship between the knowledge of a disease and behaviour. There is a gap in research to explore knowledge and behaviour in relation to MDR-TB.
In SA, there are also few studies that explain why certain individuals are continuing to behave in ways that make them vulnerable to infection even after attending health education programme. There is not enough research that indicates the link between knowledge of MDR-TB and communities engaging in health protective behaviours (Fana et al., 2013: 59).

There is also a gap in the literature with regard to research on knowledge levels among the general population about MDR-TB. The number of TB related deaths is unacceptably high considering the fact that with timely diagnosis and correct treatment which is freely available at various public health centres or clinics in SA. Furthermore, almost all people infected with tuberculosis can be cured. The emergence of MDR-TB and its continuing spread despite the biomedical interventions and efforts to mitigate and curb its spread in society is also unacceptable. This paper addresses some of these challenges by undertaking a study to assess community's knowledge levels about this deadly, highly contagious but preventable disease in Port Elizabeth in the NMBM.

2. THEORETICAL FRAMEWORK

In this study, the researcher has chosen to use Knowledge, Attitude, Behaviour, and Practices (KABP) methodology. KABP is not a theoretical framework or philosophical paradigm, but a method used by public health researchers to assess the community's understanding and response to a disease. KABP studies are highly focused on evaluations that are used to measure changes in human knowledge, attitudes, and practices in relation to disease prevention. KABP studies tell us what people know about certain things, how they feel, and how they behave. In this study, only one aspect of the KABP methodology was considered, and that is, knowledge (K) of community members about MDR-TB (Nathalie, Leila, Claire, Nathalie, Caroline, & Josiane, 2013: 1011).

This study emerges because of the observed gap in literature and theory with regard to MDR-TB knowledge of residents of the PE in the Nelson Mandela Bay Municipality. This study assesses knowledge levels of MDR-TB among the residents of PE. This study also establishes Port Elizabeth's resident's MDR-TB knowledge according to age and gender.

3. RESEARCH METHODOLOGY AND DESIGN

The study design

In this cross-sectional study, a descriptive, non-experimental research design with a quantitative approach was used to investigate knowledge levels about MDR-TB among residents of Port Elizabeth in the Nelson Mandela Bay Municipality, Eastern Cape, South Africa.

The study setting

Figure 1: Eastern Cape District Municipalities

Klopper (2013: 453).

Nelson Mandela Bay Municipality is the third largest and most densely populated district in the Eastern Cape Province, South Africa and has a population of about just over one million. The Nelson Mandela Bay Municipality has 60 wards and is made up of Port Elizabeth (48), Uitenhage and Despatch (12).

The unemployment rate is in the NMBM is 36%, 45, 3% Eastern Cape Province and 36.8% nationally. Female-headed households are at about 41%, and it is in Port Elizabeth, Kwa-Zakhele in the Nelson Mandela Bay Municipality where 98% of 580 households used bucket system and that 81% of them used paraffin as their source of energy (Statistics SA, 2013).

Study participants and sampling

The study participants were residents of Port Elizabeth in the Nelson Mandela Bay Municipality who were 18 years old above. The sample size was 422. It was calculated using the population of Nelson Mandela Bay Municipality 1 152 115 and statistical variables of 95% (CI), 5% significance interval and then factoring in a 10% non-response rate (384 + 38 = 422).

In this study, multi-stage sampling was used to select the research respondents. The sampling strategy was purposive at one level when only 48 Port Elizabeth wards from the list of the 60 wards in the Nelson Mandela Bay Municipality were selected for the study purpose. It was also random at another level when every 5th ward was selected from the list of the 48 Port Elizabeth wards until 10 wards were selected for the purpose of this study. It was also purposive at another level when the 18 years old and above research respondents were selected. It was also accidental or convenient at another level when data was collected in the 10 wards in those residential areas that were more accessible and closer to the researchers. 42 respondents were selected to participate in this study from each of the ten wards. Lastly, it was also accidental or convenient when data was collected from anyone that met the inclusion criteria, gave consent and was available in the house at the time of data collection.

Research instrument and pilot study

The researcher developed an English language questionnaire with the assistance of the research supervisor, health educator, and an MDR-TB specialist. The researcher collected data with the assistance of two research

assistants using these structured questionnaires. The first part of the questionnaire dealt with the socio-demographic details of the participants.

The second part dealt with knowledge of about the risk, severity, causes, transmission mode and prevention methods, diagnosis, treatment and management of Multi-Drug Resistant Tuberculosis. The ratings were as follows: strongly agree 1, agree 2, disagree 3 and strongly disagree 4. The scale of 1-4 was used in this study in order to prevent the respondents from choosing a neutral answer.

A pilot study was conducted in two wards in the Despatch/Uitenhage area to test the feasibility of the study, and that included the methodology, administration procedures, and the research instrument in order to check for inaccuracies and ambiguity. A sample of 63 individuals (15%) of the initially planned sample of 422 of the main study was included in the pilot study. These participants were excluded from the actual study.

The validity of the research instrument was checked through inter-ratter assessment of its usefulness in collecting the required information from the respondents. Adjustments were made on time required to complete the questionnaires. In order to assess the participant's knowledge of MDR-TB the respondents were asked to tick a response that represented their knowledge about the disease. The ratings were as follows: strongly agree and agree was made1 and disagree and strongly disagree was made 2. All correct answers yielded 1 point, and incorrect opinions and missing data yielded no points. The responses were then added together in order to yield a knowledge score that ranged between 0 and 25. High scores were an indication of high awareness and knowledge levels about Multi-Drug Resistant Tuberculosis. A score of 0 to 16 was categorised to be a poor knowledge score, and a score from 17 to 25 was categorised as a good knowledge score.

Data analysis

Data entry was carried out by the researcher and data was analysed using SPSS® statistical package for descriptive statistics. Data were summarised using descriptive methods such as frequency and range.

4. ETHICAL CONSIDERATIONS

This research study was approved by the Higher Degrees Ethical Committee for Research Involving Human Subjects of the University of Fort Hare (ethics number IJE 171SFAN01). All study participants gave consent before participating in the study to the researcher and the two research assistants.

5. RESEARCH RESULTS

The response rate of the respondents

Figure 2: Response rate
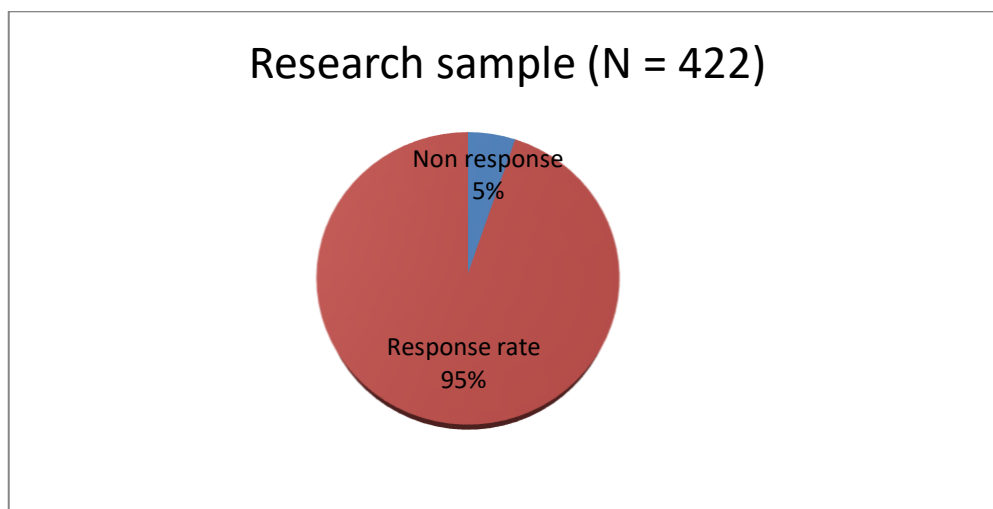
Field study (2016)

As shown in figure 2 the sample was 422. Of the 422, only 400 questionnaires were useable and that amounted to a response rate was 95%. 22 questionnaires were incomplete as some of the respondents decided to withdraw from the study or refused to give consent and that constituted a 5% non-response rate.

Age of the respondents

Figure 3 Age of the respondents
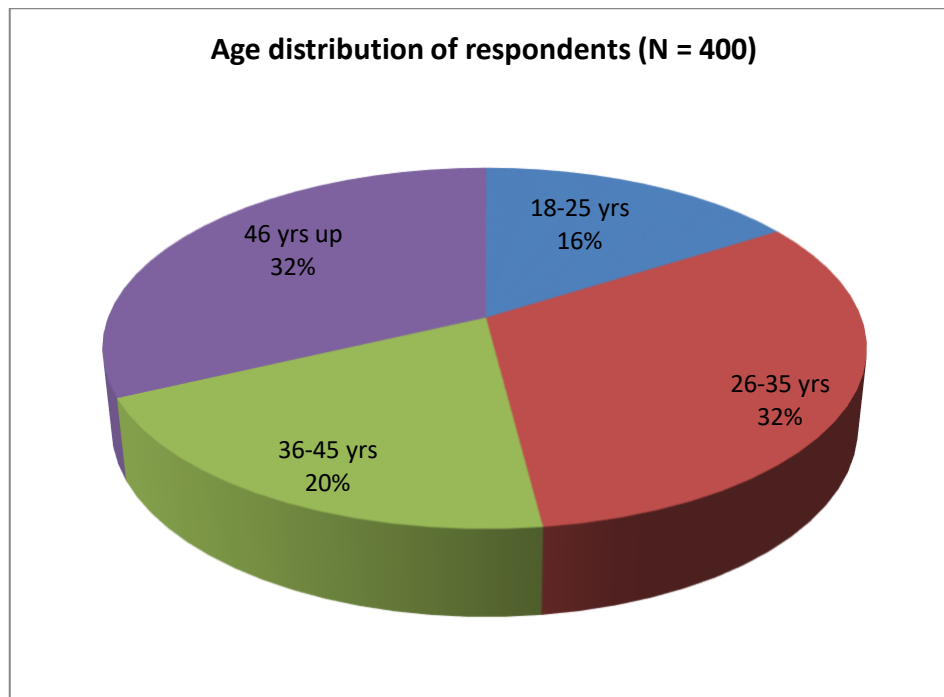
Field study (2016)

As illustrated in figure 3 the results show that the respondents with the ages between 26 to 35 years and 46 years and above were equally represented at 32%. The respondents with the ages between 18 to 25 years were the least represented in this study. This is common in most studies which are conducted during the day as it is expected that the vast majority of youth are of school going age and therefore at various educational institutions, while others are beginning to work.

Table 1: Socio-demographic characteristics of the respondents

Variables	Frequency	Percentage
Gender		
Males	190	47%
Females	210	53%
Race		
African	270	68%
Coloured	93	23%
Indian	12	3%
White	25	6%
Marital status		
Single	218	54%
Married	114	29%
Widow	48	12%
Divorcee	20	5%
Educational status		
No formal education	41	10%

Primary education	150	37%
High school education	86	22%
Tertiary education	123	31%
Employment status		
Employed	150	37%
Unemployed	250	63%
Family monthly income		
R 4999 and less	233	58%
R 5000 – R9999	71	18%
R 10000 – R14999	61	15%
R 15000 and up	35	9%
Type of settlement		
Formal settlement	224	56%
Informal settlement	176	44%
Number of family members in the household		
1 – 2	100	25%
3 – 4	253	63%
5 – 6	47	12%
The main source of drug-resistant TB information		
Healthcare workers and teachers	56	14%
Family members and friends	86	22%
Television and radio	137	34%
Television, radio, and internet	121	30%

Field study (2016)

Table 1 shows that majority of the respondents in this study were Africans, females, unemployed and single. Table 1 further indicates that the majority of the research subjects in this study earned R 4 999 ($357) and less per month. Most of the participants in this study were also residing informal settlement and were staying with three to four family members in their house. Table 1 also reveals that most (10%) and (37%) of the respondents respectively had no formal education and finished primary education. Most of the respondents also indicated that television and radio was their main source of MDR-TB information.

Respondents' knowledge levels of Multi-Drug Resistant Tuberculosis

Table 2: Respondents knowledge levels of Multi Drug-Resistant Tuberculosis

Variables	Female N = 210		Males N = 190	
	Freq.	%	Freq.	%
1. Statement relating to causes, perceived severity and risk of MDR TB				
a. Bacteria resistant to Rifampicin and Isoniazid	191	91	172	91
b. Anyone can be infected by MDR-TB	135	64	125	66
c. Dust, smoking, poverty and drinking alcohol cause MDR-TB	62	29	62	33
d. The incorrect and incomplete treatment regimen	133	63	122	64
e. MDR-TB is dangerous and a problem in my area	210	100	190	100
	146	**69**	**134**	**71**

Variables	Female N = 210		Males N = 190	
	Freq.	%	Freq.	%
2. Statements relating to signs and symptoms of MDR-TB				
a. Weight loss and loss of appetite	185	88	170	89
b. Cough that lasts longer than 3 weeks	186	89	154	81
c. Nightmares and hallucinations	158	75	141	74
d. Chest pains and shortness of breath	166	79	147	77
e. Coughing up of blood	210	100	190	100
	181	**86**	**160**	**84**
3. Statement relating to the transmission of MDR-TB				
a. Witchcraft	135	64	125	66
b. Through the air when infected coughs & sneeze	180	86	165	87
c. Hereditary and spread through blood	197	94	175	92
d. Through hugs and handshake with the infected	24	11	22	12
e. Touching items in public spaces or areas	80	38	83	44
	123	**59**	**114**	**60**

Variables	Female N = 210		Males N = 190	
	Freq.	%	Freq.	%
4. Statements relating to prevention of MDR-TB				
a. Cover mouth & nose when coughing & sneezing	172	82	163	86
b. Avoid close contact for a long period with infected	189	90	166	87
c. By avoiding hugs and handshakes	49	23	55	29
d. By opening windows and wearing musk	125	59	107	56
e. Taking traditional medicine & herbal remedies	106	50	100	53
	128	**61**	**118**	**62**
5. Statements relating to MDR-TB diagnosis and treatment				
a. MDR-TB infected remain infectious while on and after completion of treatment	149	71	141	74
b. MDR-TB treatment is provided freely at designated DR-TB centres	191	91	179	94
c. Psychosis vision and hearing loss are side effects of DR-TB treatment	72	34	69	36

d. Treatment duration for DR-TB is 6 to 12 months	63	30	61	32
e. MDR-TB treatment outcomes are evaluated by sputum tests and chest X-rays	191	91	159	84
	133	**63**	**122**	**64**

Field study (2016)

Table 2, presents data relating to knowledge of causes and perceived severity of risk, signs and symptoms, transmission, prevention, diagnosis treatment and management of MDR-TB. Overall, Table 2 reveals poor knowledge levels of MDR-TB among the respondents of this study. The results show that the respondents were knowledgeable of the severity of risk, causes, signs, and symptoms of MDR-TB. The findings also show poor knowledge levels about the transmission, infection prevention, diagnosis methods and the treatment and management of MDR-TB.

The findings in Table 2 illustrates that only a few respondents (31%) knew that dust, smoking, poverty and drinking alcohol were not the causes of MDR-TB whereas (63%) and (91%) respectively knew that incorrect regimen and bacteria resistant to Isoniazid and Rifampicin caused of MDR-TB.

The results in Table 2 also shows that the majority of the respondents knew that loss of appetite and weight, coughing of blood, coughing for more than three weeks and chest pains were the signs and symptoms of MDR-TB. Study participants also knew that nightmares and hallucinations were not signs and symptoms of MDR-TB.

The research results in Table 2 reveals that the majority of the respondents knew that MDR-TB was transmitted through the air when an infected person coughs or sneezes .The results also indicate that more than a third of the participants in this study believed that MDR-TB was transmitted through witchcraft.

Table 2 further indicates that the majority of the respondents in this study knew that covering mouth when coughing or sneezing, avoiding close contact with the infected for long periods and the opening of windows and wearing of the mask were some of the infection prevention methods for the spread of MDR-TB. About 51% and 26% of the respondents respectively knew that traditional and herbal remedies and avoiding hugs and kisses were not MDR-TB prevention methods.

Lastly, the results in Table 2 also show that a quarter of the study participants knew the side effects and the duration of MDR-TB treatment. The results also show that the majority of the respondents knew that MDR-TB infected were not infectious when on and after treatment completion.
Table 2 reveals that overall, male respondents showed higher scores than female respondents on knowledge of the causes and the perceived severity and risk of MDR-TB. Yet it also illustrates that female participants were more knowledgeable and aware with regard to the signs and the symptoms of MDR-TB than the male participants. The research results further show that all the study participants knew that coughing up blood was another sign and symptom of tuberculosis.

Table 2 indicates that male respondents were more knowledgeable and aware of transmission mode and methods of MDR-TB than female respondents even though female respondents showed that they were more aware and knowledgeable about the transmission of MDR-TB. Females did note that TB is not hereditary and not spread through blood.

Male respondents showed better MDR-TB prevention knowledge than females. More males knew that covering mouth and nose when coughing and sneezing was a method of preventing the spread of MDR-TB. More male respondents also knew that traditional medicine & herbal remedies and avoiding hugs and handshakes were not appropriate methods for the prevention of infection and spread of MDR-TB. The results also show that more females were more aware and knowledgeable about avoidance of close contact for long periods, opening of windows and wearing of the mask when with infected as infection prevention methods than males.

Lastly, male respondents showed higher scores than females on knowledge of diagnosis, treatment, and management of MDR-TB. More males knew treatment duration for MDR-TB, MDR-TB treatment side effects such as psychosis vision and hearing loss compared to females. More males than females knew that MDR-TB treatment was provided freely and that those in treatment were not infectious during and after treatment completion. More female than males knew that sputum test and chest X-rays were MDR-TB treatment outcomes evaluation methods.

Knowledge of MDR-TB according to age

Table 3: Knowledge of Multi-Drug Resistant Tuberculosis according to age

Age	Number of respondents	Right answers	Percentage	Wrong answers	Percentage
18 – 35 years	192	106	55%	86	45%
36 – 68 years	208	70	34%	138	66%
Total	**400**	**176**	**44%**	**224**	**56%**

Field study (2016)

Table 3 illustrate that youth showed high scores of knowledge of MDR-TB than adults.

Knowledge of MDR-TB according to gender

Table 4: Knowledge of Multi-Drug Resistant Tuberculosis according to gender

Gender	Number of respondents	Right answers	Percentage	Wrong answers	Percentage
Male	190	88	46%	102	54%
Females	210	88	42%	122	58%
Total	**400**	**176**	**44%**	**224**	**56%**

Field study (2016)

Table 4 illustrates that more male than females showed greater knowledgeable of MDR-TB.

6. DISCUSSION

The emergence of Drug-Resistant strains of Mycobacterium tuberculosis has become a major threat to public health. SA as a member state to the WHO needs to work towards the achievement of the WHO new targets of achieving 100% decline in incidence and deaths due to TB by 2035 and towards the Sustainable Development Goals (SDG) of ending TB by the year 2030.

If the above targets are to be met, community members must possess appropriate knowledge with regard to the causes of MDR-TB, its sign and symptoms, transmission, prevention and treatment modes, and methods so that they can be able to take appropriate actions to control and prevent the spread of this disease.

The results of the present study illustrate that some of the community members lacked proper knowledge about MDR-TB. 56% of the residents of Port Elizabeth showed poor knowledge levels of MDR-TB. Secondly, more females (58%) and adults (66%) had poor knowledge levels of MDR-TB than males (54%) and youth (45%). In

line with the above findings less than half of the respondents showed good knowledge of MDR-TB (Javed, Tahir, Hashmi, & Jamil, 2016: 1; Malangu & Adebanjo, 2015: 1). Literature shows that studies assessing knowledge of MDR-TB were mainly conducted among health care workers, patients and few assessments were done among community members (Malangu & Adebanjo, 2015: 1).

These findings are discouraging considering the fact that SA is one of the recipients from the Global Fund to fight the spread of TB and HIV and AID in Africa (Fana et al., 2013: 69). Lack of knowledge about MDR-TB can also be as the results of low literacy levels that were evident among the research respondents. The findings show that 47% of the respondents possessed educational levels below high school education. Acquiring MDR-TB related knowledge might be a challenge to those with low literacy levels. Low literacy or educational levels are associated with poor or inadequate knowledge of disease (Gelaw, 2016: 9). Comprehensive TB knowledge is associated with high education, while uneducated people and those with primary education had high odds of low knowledge, due to inability to acquire MDR-TB related information (Abebe & Demissie, 2012: 1).
The majority of the respondents in this study were unemployed (63%), and many reported living on with 3 to 6 members if a house (75%), having monthly family income of less than R 4999 (58%) and less than half lived in informal settlement (44%) and possessed educational levels below high school education (47%). The above socio-demographic characteristics show that many participants were economically and socially vulnerable.

The adoption of positive health-related behaviours such as treatment adherence, being in a well-ventilated area, and avoidance of contact for long periods with MDR-TB infected might prove difficult for some of the research respondents due to the above mentioned socio-demographic characteristics. TB is mainly found in areas where there are high levels of poverty, overcrowding and among malnourished populations (Kalichman, Watt, Sikkema, Skinner & Pieterse, 2012: 959).

The study results also indicate that some of the study participants had erroneous beliefs, misconceptions, and distorted information about the causes, signs and symptoms, transmission mode, prevention, diagnosis and treatment methods of MDR-TB. Almost a third of the respondents in the present study did not believe that anyone could be infected with MDR-TB. This is in line with other studies that have shown that distorted risk perception makes society susceptible to infection (Natalie et al., 2013: 1122).

The research results show that the majority of respondents knew that MDR-TB caused by bacteria resistant to rifampicin and isoniazid and incomplete and incorrect treatment regimen. In line with the above findings, bacteria (Maharaj, Ross, Maharaj & Campbell, 2016: 3) cause MDR-TB. Some of the respondents believed that MDR-TB was transmitted through witchcraft. TB suspects usually present themselves late to seek medical assistance because they first seek assistance from traditional healers as they believe that they are capable of curing TB (Haasnoot et al., 2010: 903) and that TB was caused by witchcraft, evil eye and Satan (Adebe et al., 2010: 3).

The study also revealed that some of the respondents believed that they could prevent themselves from being infected with MDR-TB by taking traditional medicine and herbal remedies. In line with the findings, respondents indicated that they consult traditional healers and make use of herbal and traditional remedies to treat TB (Bati et al., 2013: 734).
 Some of the respondents believed that MDR-TB was a hereditary disease and that it was transmitted through the blood in the family.

Similar to the above findings respondents indicated that MDR-TB was created in their body, they were not infected by anybody or inside the body of their family members and that, they could not use drugs to treat it (Burtscher, Van den Bergh, Toktosunov, Angmo, Samieva & Arechaga, 2016: 7).

Some of these beliefs can also be attributed to the fact that MDR-TB is a transmitted through the air and people can stay for a long period before latent infection became active. Furthermore, delay in health-seeking also increases the risks of infection among close contacts and therefore by the time one gets diagnosed too many people are already infected within the same family. Some of the respondents had a false belief that MDR-TB infected people were infectious while they were on treatment and after completion of treatment. Patients in

KwaZulu-Natal also developed false beliefs that TB was incurable like HIV and AIDS as they witnessed deaths of other patients daily in hospitals (Naidoo, Taylor & Jinabhal, 2007: 48). In a study conducted in a high burdened country to assess knowledge and attitudes about MDR-TB and Extreme Drug Resistant Tuberculosis (XDR-TB), it was revealed that students had a false belief that XDR-TB was non-curable (Javed et al., 2016: 6).

Such beliefs can also be attributed to lack of appropriate knowledge among the respondents, and misinterpretation of observations made from health care workers such as isolation of infected or TB suspects, wearing of masks and washing of hands when dealing with patients as compliance measures to nosocomial infections prevention or control policies. The lack of treatment adherence, abandoning of treatment when people feel better leads to relapse and reactivation of infection.

Knowledge about the duration of treatment is of significance as it might assist in ensuring treatment adherence even when patients are feeling better and increases early intervention to stop the spread of the disease. Javed et al., (2016: 4) and Kansal, Behera & Sarin (2014: 30) respectively revealed that 20% and 49.34% of the respondents knew the duration of MDR-TB treatment. This was similar to the results of this study where only 31% of the respondents knew the duration of MDR-TB treatment.

Knowledge of TB drugs side effects can also assist in ensuring that the infected do not stop taking their medication but rather adhere to it and report on time to healthcare workers the adverse drug reactions for proper advice. MDR-TB treatment is worse than the disease itself (Burtscher et al., 2016: 11). It is also among the most painful treatments regarding side effects and duration (Isaakidis, Rangan, Pradhan, Ladomirska, Reid & Kielmann, 2013: 1131).

Surprisingly, the study results illustrated that more males than females respondents showed greater or good awareness and knowledge of MDR-TB and that is in agreement with a study conducted in India (Konda, Melo & Giri: 566). Men have greater public involvement than women and hence greater exposure to TB. It is also a social norm for women to be homebound while men are interacting with the outside world (Gelaw, 2016: 9). These findings can possibly be attributed to the changes in the curriculum and the introduction of subjects such as life orientation or sciences. They can also be attributed to the cultural beliefs that have placed more emphasis on educating boys than girls (Nkomazana, 2008: 92).

In contrast to the above findings, studies that were previously conducted have revealed that females were more aware and knowledgeable than males (Fana et al., 2013: 59). Females are said to seek health care services more often than men do, and that exposes them to more health-related information than men. It is also stated that men are more reluctant to accompany their pregnant wives to the healthcare centres (Makhunga-Ramfolo et al., 2011: 9).

These findings are in contrast to previous studies, which revealed that youth generally showed health risk behaviours or practices (Gwandure & Mayekiso, 2011: 35).

Limitations

There were limitations in making inferences about the meaning of the research results.
The study was conducted in Port Elizabeth, in the NMBM, and therefore a generalisation of the findings to other residential areas provincially and nationally is limited. Secondly, there were limitations in making inferences about the meaning of the research results because this study was descriptive in nature. Thirdly, since the sample was not chosen at random, but through convenience sampling, the sample was not representative of the population that was being studied. The selection bias resulted in over or under-representation of certain groups, as some of the residents who were studying and working were left out of this study as it was carried out during weekdays and those who left their places of residence early and returned late from work and school were missed out in this study.

Recommendations

Based on the findings of this study, it is recommended that MDR-TB health education interventions and awareness campaigns are intensified. Future education interventions should focus on addressing misconceptions and erroneous beliefs about Multi-Drug Resistant Tuberculosis. More attention should be placed on health education campaigns, and interventions should be directed at adults and females. Research also reveals that empowering women is like empowering the whole community. Health promotion initiatives and program coverage should be extended to include places where most people spend most of their time (schools, shopping malls, churches, and sports clubs).

In delivering such programs, health educators together with People living with MDR-TB should be used to facilitate the learning process and offered an opportunity to interact with others and offer first-hand information about their lived experience. Such interaction could assist in increasing the general awareness and knowledge levels about different types of MDR-TB and also in creating cues for action and promote adaption of positive health behaviours and actions and thereby assist in curbing the spread of Multi-Drug Resistant Tuberculosis. Health educators can also work together with community health nurses, community leaders, TB and HIV and AIDS volunteers, spiritual or faith and traditional health practitioners in the dissemination of knowledge about MDR-TB in the Nelson Mandela Bay Municipality and the Eastern Cape at large.

Conclusion

This research assessed knowledge levels of MDR-TB of Port Elizabeth residents. The pattern of respondent's responses was shown using descriptive statistics. In this study, the majority of respondents had poor knowledge levels of Multi-Drug Resistant Tuberculosis. Secondly, adults and females had poor knowledge levels of MDR-TB compared to youth and males. Many respondents are considered to be high risk and vulnerable. The respondents are also highly susceptibility to MDR-TB infection because of their living conditions. Furthermore, the results indicate gaps in knowledge levels about MDR-TB, which could make them vulnerable to MDR-TB infection. The results of this study indicate that some of the research respondents were not aware of the side effects of MDR-TB drugs. These findings highlight the need for education about MDR-TB treatment and its side effects. The deficiency in knowledge about MDR-TB among the adults and female research respondents highlight their vulnerability to infection and health risk.

Inadequate knowledge and misconceptions about prevention and transmission of MDR-TB are a threat to the successful control and prevention of the spread of this deadly but preventable disease. The success of the de-institutionalisation and de-centralisation policy in promoting acceptance among community members largely depend on them having appropriate knowledge non-discriminatory or judgemental attitudes towards the MDR-TB infected. All community members need to be aware of how to protect themselves. MDR-TB information and programs that culturally sensitive should be provided to community members using different media or methods in order to enlighten them and dispel misconceptions and erroneous beliefs with regard to MDR-TB. The efforts of the TB control program will be fruitless if community misconceptions about the risk, causes, transmission, prevention, and management of MDR-TB are not properly dealt with.

Authors' contributions

The authors contributed equally to this work.

Competing interest

The authors have no competing interest to declare

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