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Characteristics and Status of Treatment for Multi-Drug Resistant Tuberculosis (MDRTB) Patients in a TB-DOTS Centre in the Province of Jolo, Sulu, Philippines

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ABSTRACT

Background: The study focuses on the characteristics and status of treatment for multi-drug-resistant tuberculosis (MDRTB) at the TB-DOTS Centres of Jolo Sulu from 2018 to 2019. **Objective:** The study's primary goal is to describe and investigate MDRTB treatment characteristics and status, as well as identify factors that influence treatment. **Methods:** A mixed-methods research design through an explanatory sequential approach was used. The quantitative approach employed data mining of existing and available data records of MDR-TB clients at respective health centres at Jolo and Sulu and tools assessing factors influencing treatment. The qualitative approach was done through interviews with the MDR-TB clients, and total remuneration and purposive sampling were applied in selecting participants. The data gathered were presented using frequency and percentage distribution and processed using SPSS v.21, and themes and subthemes were extracted and analyzed using In-Vivo qualitative software. **Results:** MDR-TB clients were mostly mid-adults and heads of families, with a treatment history focusing more on pulmonary relapse (the first line of defense) and poor treatment outcomes. The factors that influenced treatment were financial constraints, lack of knowledge, distance, transportation, and work. Themes derived include contagious yet treatable disease, challenging family socio-economic status, role justification, and treatment centres as havens. **Conclusion:** The study highlights the need for a comprehensive assessment of the status of the health condition of TB clients and patients enrolled at the TB-DOTS centre of Jolo Sulu. Nursing plays a vital role in managing and treating TB in these areas. The findings suggest that financial constraints, lack of knowledge, and access to treatment are significant barriers to MDRTB treatment. The study emphasizes the need for interventions to improve TB treatment outcomes and reduce the burden of MDRTB in the community.

Keywords: Multi-Drug Resistant; Philippines; Tuberculosis; Treatment; TB-DOTS

INTRODUCTION

Tuberculosis (TB) is a contagious illness primarily impacting the lungs but with the potential to spread to other parts of the body (Prabal & Maiti, 2018; Zaporojan *et al*., 2024). As a healthcare profession, nursing plays a crucial role in the management and treatment of TB, particularly in regions like the Philippines, where the disease remains a significant public health challenge. The Philippines has seen a decline in the successful treatment rate of TB, leading to an increase in multi-drug-resistant tuberculosis (MDR-TB) cases, which significantly contribute to the country's mortality rates (Bernardo *et al*., 2022; Kak *et al*., 2020; PSA, 2021; Alsulami *et al*., 2024). Approximately one million Filipinos currently have active TB, ranking the country third highest globally in TB prevalence (Lansang *et al*., 2021; Weiler, 2019). The prevalence of TB is particularly high

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in rural areas with extreme poverty and in urban areas due to overcrowding, despite numerous efforts and interventions aimed at eradicating the disease (Dean *et al*., 2022; Mutembo *et al*., 2019; Kimani *et al*., 2021; Tupasi *et al*., 2017).

The successful treatment of TB is influenced by various factors such as financial constraints, lack of knowledge, forgetfulness, poor health, family support, anxiety, drug reactions, miscommunications, denial, healthcare provider dynamics, and social stigma (Gebreweld *et al*., 2018; Kimani *et al*., 2021; Tupasi *et al*., 2016; Wang *et al*., 2023). These challenges highlight the critical role of nurses in providing comprehensive care that addresses not only the medical but also the psychological and social aspects of TB treatment.

In Sulu, a province in the Philippines with high TB prevalence, the socio-political dynamics significantly influence healthcare promotion, treatment, and disease prevention. Sulu, comprising several island municipalities, is one of the poorest provinces in the Philippines, contributing to its high TB prevalence (Macapagal, Montiel, & Canuday, 2018; Mutembo *et al*., 2019; Qazi *et al*., 2022). In 2018, Sulu had a poverty incidence rate of 66.7 percent, increasing to 71.9 percent among families, highlighting the severe poverty levels that can predict the patterns of MDR-TB emergence and re-emergence (Dhestina, Santoso, & Sahiratmadja, 2022).

The Tuberculosis Direct Observed Treatment Short (TB-DOTS) centre in Jolo, a densely populated part of Sulu, faces numerous challenges. These challenges include healthcare worker shortages, government healthcare strategy limitations, and extended family structures that complicate follow-up and treatment compliance (Bernardo *et al*., 2022; Bruno, 1973). Ensuring follow-up and compliance with treatment regimens is crucial for promoting health among MDR-TB patients, necessitating an understanding of the characteristics and status of the disease. Effective nursing care and consistent follow-ups are essential for high cure rates for TB patients, requiring support from multiple parties including nurses (Sari, Juniarti, & Yani, 2020).

However, managing MDR-TB is increasingly complex, and interventions are often difficult to access, especially for those lacking knowledge about MDR-TB. Providing care is particularly challenging for healthcare workers in the TB-DOTS centre in Jolo, Sulu. Nurses play a critical role in patient education, ensuring patients understand their condition and the importance of adhering to treatment regimens (Mukattil & Pangandaman, 2024; Labrague, 2024). They also provide emotional support and practical assistance to help patients navigate the healthcare system. By addressing these multifaceted challenges, healthcare providers can improve treatment outcomes and reduce the spread of MDR-TB in Sulu. This study aims to explore the impact of these factors on TB treatment success and the critical role of nursing in enhancing patient outcomes in such high-risk areas.

METHODOLOGY

Study Design

This study is mixed-methods research, particularly an explanatory sequential research design that is quantitative followed by a qualitative approach. Accordingly, it is an approach that requires further discussion or explanation of specific quantitative results, such as clarification of the behaviour or status of a set of data in an individual or a group (Ivankova, Creswell, & Stick, 2016). As used in this study, a quantitative approach was made primarily to retrieve and descriptively report the characteristics and status of treatment of MDR-TB patients as participants, which included their age, sex, treatment history, registration group, bacteriologic status, treatment regimen, duration of treatment, and treatment outcomes. Then, a qualitative approach was made through interviews with selected MDR-TB patients as participants to explore their perspectives about the disease, their role, and their impressions of the healthcare services provided at the TB-DOTS centre, yielding themes and subthemes.

Participants and Study Setting

Quantitative Strand

The respondents or participants in the quantitative strand are based on the retrieved data from the records at

the TB-DOTS centre in Jolo Sulu for the years 2018–2019, which included information about their age, sex, treatment history, registration group, bacteriologic status, treatment regimen, duration of treatment, and treatment outcomes. All of the MDR-TB patients in the record have been considered qualified participants, except for those that have not completed the treatment process in the initial stage of consultation, i.e., those that cannot be contacted have been excluded or are not residents of the Province of Sulu, Philippines. For the record, there were twenty-eight (28) and sixteen (16) MDR-TB patients in 2018 and 2019, respectively (n = 44).

Qualitative Strand

The retrieved record of MDR-TB patients in the said inclusive year as participants (n = 44) was contacted by the researchers to invite them for an interview. The inclusion criteria for an interview include: (1) being a resident in the far-flung areas of the province of Sulu; (2) being officially listed as an MDR-TB patient at Jolo, Sulu's TB-DOTS centre; and (3) being willing to participate. Participants who agreed to be part of the study were visited at home and interviewed at their convenience. There were nine (9) participants interviewed who reached saturation with responses.

Instruments or Tool

Quantitative Strand

This study uses a three-part instrument or tool for both quantitative and qualitative data. The first part is a simplified tabular form divided into eight columns. It records the information about MDR-TB patients retrieved from the TB-DOTS centre in Jolo, Sulu. The tabular form tool has been patterned from the TB-DOTS centre format about the list of officially enrolled TB patients in the province of Sulu. The second part is also for the study's quantitative strand, which asked about internal and external factors influencing MDR-TB treatment. Experts validated the contents of the enlisted factors, finding them reliable based on pilot testing (Cronbach = 0.83).

Qualitative Strand

For the qualitative strand, the tool utilized was an interview guide questionnaire composed of six (6) general questions with a follow-up question to have a free conversation or interview with the participants. The questions in the tool focus on factors or reasons affecting the treatment regimen of MDR-TB patients at TB-DOTS centres.

Data Collection

Quantitative Strand

Institutional protocols and ethical guidelines for data gathering have guided this research. The administrators and key officials of the TB-DOTS centre in the province of Sulu have been tapped and asked permission to retrieve information about the list of TB patients enlisted at the records office of the centre. A communication and letter of intent have been secured to work with the information manager to retrieve information. The researchers extracted only the necessary information, specifically the list of MDR-TB patients, which included their age, sex, treatment history, registration group, bacteriologic status, treatment regimen, duration of treatment, and treatment outcomes, and transcribed it in tabular form as a tool.

Qualitative Strand

Prior to the interview with the participants, informed consent was secured after a discussion of the detailed content of the questionnaire and the purpose of the study. The interview happened at a convenient time for the participants at their respective homes. Proxemics of 2 to 3 meters between the interviewer and the participants have been instituted as part of the protocol. Every interview session took about 30 to 60 minutes and was audio recorded with permission.

As part of ethical compliance, this research secured communication with and asked permission from the City Health and TB-DOTS Centre offices of the province of Sulu before conducting the study. Also, the college-based ethics committee of MSU-CHS, through its graduate office, evaluated the content and soundness of the

research related to ethical concerns. Informed consent has been designed to emphasize, secure, and consider the participants' rights, such as their right to withdraw, the confidentiality of data or information gathered, and the risks and benefits of participating in the study. The specific content of informed consent was discussed verbally with the participants, who voluntarily affixed their signatures to their participation. All participants in the quantitative and qualitative strands of the study have been treated with the utmost confidentiality by assigning codes and pseudonyms. The World Health Organization (WHO) research ethics guidelines guided the researchers in observing ethical principles in this study (WHO, 2020).

Data Analysis

Quantitative Strand

The retrieved data about MDR-TB patients that was recorded in tabular format has been transcribed in the Microsoft Excel software application to assign coding, which was then extracted to Statistical Package and Service Solution (SPSS) software version 21 for the analysis and presentation of findings through frequency, percentage distribution, and mean to describe the characteristics and status of MDR-TB patients at TB-DOTS centres in Jolo Sulu.

Qualitative Strand

The audio-recorded interview was manually transcribed in the Microsoft Word application software, which was then extracted into In-Vivo software and yielded words that aided the researchers in constructing themes and subthemes. The data analysis process was based on standard practice, such that recorded data was transcribed, familiarized, coded, looked for themes, analyzed, and then labeled and defined themes (Vaismoradi, Turunen, & Bondas, 2013). The unfamiliar data or vague responses in the interview session with participants have been clarified and verified for accuracy and truthfulness through a follow-up session of interviews. The scheme outcome from NVivo includes the identification of four significant themes and their respective sub-themes. These themes represent the main ideas or topics that emerged from the analysis of the audio-recorded interviews. The sub-themes provide further categorization and elaboration within each main theme.

Ethical Consideration

This research has been approved by the Research Ethics Committee of the Mindanao State University, Philippines with the Reference No. MSUCON-REC030222 on 2nd March, 2022.

RESULTS

Quantitative Results

The findings in Table 1 show the frequency, percentage distribution, and mean of the characteristics and status of MDR-TB clients in terms of age, sex, treatment history, registration group, bacteriologic status, treatment regimen, duration of treatment, and treatment outcomes in the years 2018–2019. The data mining based on the given year showed that most of the MDR-TB clients in 2018 were mainly mid-adults (ages 31–40; 43%) and younger in 2019 (ages 21–30; 50%). The treatment history revealed that 36% of the clients had pulmonary cases, and 64% had relapsed on first-line drugs (R-FLD) in 2018. There is also more pulmonary R-FLD (87%), as well as some progress towards pulmonary relapse second-line drugs [R-SLD] (23% for the year 2019). Similarly, in 2018, the registration group of clients showed a higher percentage of relapse (42%), and 'treatment after failure' (37%). Clients received "BC-Rifampicin Resistant" in 2018 (100%) and 2019 (87%), according to their bacteriological status. The presentation also reveals that, according to their treatment regimen, most clients (71% in 2018) received at least six (6) types of medications, including Kanamycin, Ofloxacin, Moxifloxacin, Ethambutol, and Isoniazid, depending on the treatment outcome. In 2019, the number of medications varied, ranging from 6 to 10 types. With this, treatment outcomes reported that at least 28% had completed treatment, 21% had lost follow-up, were cured (14%), and a significant number died (28%). In 2019, treatment outcomes revealed that a larger number, 62%, had lost follow-up, about a quarter had completed treatment (25%), and half of them had died (12%).

Table 1: Descriptive Characteristics and Status of MDR-TB Patients

MDR-TB Clients	2018 Data		2019 Data	
	Freq.	*% Dist.*	*Freq.*	*% Dist.*
Age				
18 to 20 years old	2	7.14	0	0
21 to 30 years old	4	14.29	8	50
31 to 40 years old	12	42.86	2	12.5
41 to 50 years old	2	7.14	4	25
51 to 60 years old	2	7.14	2	12.5
61 to 60 years old	6	21.43	0	0
Sex				
Male	20	71.43	10	62.5
Female	8	28.57	6	37.5
Treatment History				
Pulmonary	10	35.71	0	0
Pulmonary R-FLD	18	64.29	14	87.5
Pulmonary R-SLD	0	0	2	12.5
Registration Group				
New	10	35.71	0	0
Relapse	12	42.86	4	25
Treatment After Failure	2	7.14	6	37.5
Previous Treatment Outcome Unknown	0	0	2	12.5
Treatment After Lost to Follow-up	4	14.29	4	25
Bacteriologic Status				
BC- Rifampicin Resistant	28	100	14	87.5
CD- Rifampicin Resistant	0	0	2	12.5
Duration of Treatment				
9 months	28	100	14	87.5
12 months	0	0	2	12.5
Treatment Outcome				
Lost to follow-up	6	21.43	10	62.5
Treatment Completed	8	28.57	4	25
Cured	4	14.29	0	0
Died	8	28.57	2	12.5
Unknown	2	7.14	0	0
Total	28	100	16	100

Table 2 shows the internal and external factors influencing MDR-TB treatment. Financial constraints (31%), as well as a lack of knowledge (22%), are the main internal factors influencing TB-DOTS patients' treatment. Some of these factors include forgetfulness (11%), feelings of unwellness (9%), family support (9%), anxiety (6%), drug reactions (4%), miscommunications (2%), and denial (2%). The distance between the participants' location and the TB-DOTS centre (20%), the means of transportation (16%), the time demands of their work (13%), travel or relocation of residence (13%), and the availability of medicines (13%), are the main external factors that influence the treatment of MDR-TB. Healthcare workers' attitudes (6%), treatment facilities' schedules (9%), social responsibilities (4%), and stigma (2%) are some of the external factors.

T*able 2: Factors Influencing MDR-TB Treatment*

Internal Factors	*Freq.*	%	External Factors	*Freq.*	%
Financial constraint	14	31.81	Distance of TB-DOTS centre	9	20.45
Lack of knowledge	10	22.72	Transportation	7	15.90
Forgetfulness	5	11.36	Demanding work	6	13.63
Feeling unwell	4	9.09	Travelled/ relocated	6	13.63
Family support	4	9.09	Availability of medicines	6	13.63
Anxiety	3	6.81	Facilities schedule of treatment	4	9.09
Drug reaction	2	4.54	Healthcare workers attitude	3	6.81
Miscommunication	1	2.27	Social responsibilities	2	4.54
Denial	1	2.27	Stigma	1	2.27
Total	44	100%	**Total**	44	100%

Qualitative Results

Setting an interview for the most convenient time for MDR-TB clients at the TB-DOTS centre was challenging because the participants were diverse. Constant communication, regular follow-ups, and establishing rapport were crucial to the process. The analysis of the interview data revealed four significant themes, each with two sub-themes. Theme 1 is contagious yet treatable, with subthemes such as seeking treatment at the TB-DOTS centre' and 'treated to save the family from infection'; Theme 2 challenges the socio-economic status of the family, with subthemes such as 'lack of financial support', 'guilt as the family's breadwinner', and 'prioritizing job over health'; Theme 3 focuses on role justification within the family, encompassing subthemes such as 'finding a role that doesn't burden the family' and 'concealing health conditions to the family'. Theme 4: TB-DOTS Centre as a Haven, featuring subthemes such as supportive healthcare workers' and 'laudable free healthcare services'.

Theme 1: Contagious Yet Treatable

The patients with MDR-TB discovered that their condition is contagious and can possibly infect their family members. However, medical treatment at the TB-DOTS centre can prevent it. Patients have viewed the course of treatment as beneficial because it can prevent their families from having the disease. So, they have cited the importance of regular consultation in health centre as part of treatment compliance. They are motivated and determined to complete the treatment course as a patient. The statement below, with subthemes, describes how the patients, as participants, shared their perspectives about their condition as MDR-TB patients.

Subtheme 1: Seeking Treatment at TB DOTS Centre

The patients with MDR-TB emphasized the importance of seeking treatment at the TB-DOTS centre to learn more about their condition and take advantage of the available treatment. Several patients expressed that they have regularly visited the health centre to address their concerns about treating their condition. They mentioned that seeking medical treatment is part of the successful outcome of being free of the disease and preventing possible future complications. The statements below describe their perspectives on seeking treatment for their condition:

"The MDR-TB is an illness that I acquired. It is contagious and much worse, it can cause death. We should be careful when we are being treated and not skip any set day to take medicines to prevent further complications" (P6).

"A nurse informed me that MDR-TB is curable if and only if the medicines required from the TB DOTS centre will be taken as prescribed and without skipping a single day" (P5).

"I need to be motivated and determined to continue treatment. MDR-TB patients like me have gone so hard on taking medicines because we need to take 16 medicines a day and 1 injection provided by the TB DOTS centre" (P9).

Subtheme 2: Treated to save the Family from being Infected

The primary goal of MDR-TB patients' treatment is to prevent infection in their families. They discussed the

challenges faced by an individual with the disease and expressed a desire to prevent their family from going through the same hardships. They have learned that their disease condition is treatable or curable, and they express a desire to receive treatment for the betterment of their family. The participants' responses are as follows:

"My nephews and nieces made me understand MDR-TB and that it should be cured so as not to contaminate my whole family and others" (P2).

"For me, the treatment of this illness also benefits my family and me" (P3).

"As for my understanding, MDRTB is very contagious, and if this illness is left untreated, this may cause death. I must be treated and cured not only for myself but also for my family…" (P4).

Theme 2: Challenging Family Socio-Economic Status

As aforementioned, MDR-TB patients expressed their motivation and dedication to comply with the treatment required and available at the TB-DOTS centre to save themselves from infecting their family members. However, patients expressed worries about the obstacles or difficulties that hindered them from adhering to the treatment plan or the necessary medications provided by the TB-DOTS centres during their physical presence or in-person visits. Several interviews with the patients and an analysis of the data revealed the following subthemes: (1) Lack of financial support; (2) Guilt as the family breadwinner; and (3) Prioritizing job earnings over health.

Subtheme 1: Lacking Financial Support

MDR-TB patients had expressed interest and motivation in complying with all the treatment regimens prescribed by the TB-DOTS centre in their respective locales; however, the inherent challenges in their situation have contributed to the failure and perhaps relapse in the treatment of the disease. The challenge that emerged, as shared by the participants, is related to the lack of financial support.

"I was able to stop treatment before because of a financial problem since I was responsible for providing for my family's daily needs…." (P6).

"One reason why I sometimes skipped treatment is financial problem. Knowing that I am living far away from TB Dots centre, the transportation back and forth is very expensive" (P7).

"Sometimes, the reason why it's difficult for me to go TB DOTS centre is because I don't have any means to sustain my back-and-forth transportation… My family's income is only good for our daily food to eat" (P3).

"As I have said, the only reason that influences treatment of my health problem is financial worry. I am forced to borrow money from our neighbour for my transportation" (P3).

Subtheme 2: Guilt as the Breadwinner of the Family

MDR-TB patients are mostly mid-adults who are considered to be the head of the family or have an essential role in supporting the family members. Their role in the family and the disease have caused them to feel a sense of guilt, as they are often the primary providers for their family's needs.

"Knowing that the medicine for MDRTB is free, I told myself that I should be treated and that I would be strong enough to work hard... But I stopped going back to the TB DOTS centre; it made me feel guilty as I neglected the chance to be immediately treated" (P4).

"The vital reason that I strongly hold to cure the disease (MDR-TB) I have because all my children are still young, so if I don't help myself to get cured no one will provide or support them. My children are too young and cannot necessarily support what they need in their lives" (P5).

"Knowing that the medicines being given in TB DOTS Centre is for free, as a provider, I intend to be treated so that I would be able to live longer and continue providing everything for my family. But by working hard, it made me forget my treatment due to very low income which can only afford food" (P4).

Subtheme 3: Job Earning Over Health

The lack of support for MDRTB patients, which is a prerequisite for accessing and availing treatment at the TB-DOTS centre, has led them to prioritize earning money to meet their physiologic needs, particularly those of their family. This causes them to miss out on the essential treatment and services that are readily available at the TB-DOTS centre.

"My husband and I are helping each other to provide for every need of our family; I will not stop helping my husband, and that was the reason I was merely motivated to be cured at first…. Despite being motivated to be cured, I need to stop my treatment to help my husband make money for our family" (P4).

"The nurses who work in the TB DOTS Centre are the ones providing health services to my family… However, the support they have given us is not enough. I need to work hard for me to be able to go to the TB DOTS Centre for treatment…Job becomes a priority than health" (P6).

"We have some means to save and to support ourselves. We are all working, our income is small and enough for some extra consumption, and so sometimes health is being undermined" (P8).

Theme 3: Role Justification in the Family

As expected, a family member's illness can lead to a shift in roles and responsibilities. The pandemic and simultaneous diagnosis of an MDR-TB patient have distorted role identification, resulting in overlaps with family circle roles. In these dimensions, the subthemes that emerged are: (1) finding a role that is not a burden; and (2) keeping health conditions a secret from the family.

Subtheme 1: Finding a Role not to be a Burden to the Family

Despite the disease condition, MDR-TB patients have expressed their essential role in the family. They are trying their best to fulfil their responsibilities as a provider for the family and find a purposeful alternative role to contribute something to the family that makes them not feel a burden. The patients acknowledged their families' financial struggles and found that their role should not be a burden. These expressions stem from their shared experiences, as outlined below:

"Sometimes it feels like nothing but a burden to my family. All I can do is help them do the household, so I can at least have a little role in my family" (P6).

"I concluded that I was just "a burden" to my nephew and niece. Because they care and have truly treated me as their mother, so I should stand as their mother. That is why I am determined to be treated and cured" (P2).

"My role in the family has never changed whether I am ill or not. I would work if there is a job to work for, but if it's no job to work for I still manage to have some means to earn" (P3).

- "My children are helping to make a small income so that I could have a little rest…So I do some household, so that by the time my tired children be at home, they can directly go to our table and have something to eat" (P4).

Subtheme 2: Concealing Health Conditions to the Family

MDR-TB patients have attempted to conceal their health issues from their family members to avoid causing worry or disrupting their expected role within the family. They seek treatment as healthy individuals who fulfill their responsible role in the family.

"The first time I got sick, my family was not affected because I never told them about having tuberculosis; that is why I never continued to seek further treatment after 1 month of taking TB drugs or medication and continued working hard

"I do not let my family knows about my illness; they would not let me work. I would still be working to help sustain my family's needs" (P6).

Theme 4: TB-DOTS Centre as a haven

The MDR-TB patients expressed gratitude for having a TB-DOTS centre in their locality to access free

healthcare and quality services. They have an excellent perception shared by healthcare providers operating the health centres rendering TB-DOTS services. In these dimensions, the subthemes that emerged were (1) supportive healthcare workers and (2) laudable free healthcare services.

Subtheme 1: Supportive Healthcare Workers

MDR-TB patients have expressed interest in regularly visiting MDR-TB centres due to the healthcare workers' willingness to share their concerns and commitment to treating their disease. Some of them have expressed motivation and inspiration due to their highly supportive role and the high quality of services they provide.

"The nurses assigned are very concerned about us (patients) in the treatment for our recovery from this illness. The TB DOTS centre has good services and regulations as well" (P2).

"The health services in the TB DOTS centre are reliable. The staff nurses provide everything that is needed for my treatment. They have done their jobs perfectly. They even immediately addressed my concerns so that illiterate patients like me can understand it" (P4).

"The TB DOTS centre are the facility where I go for treatment to cure my illness. The nurses working in TB DOTS centre are supportive, they never have stopped providing quality care for their patients" (P5).

Subtheme 2: Laudable Free Healthcare Services

MDR-TB patients admired the healthcare workers for the healthcare services they were providing to the patients. They expressed that the healthcare services are seamless and deserving of praise. Patients, as participants, shared that:

"The TB DOTS Centre, the one that provides free MDR-TB medicines, and the service they offer are good enough for us to be determined to get well" (P5).

"The health services being rendered by the nurses and other staff in TB DOTS Centre are all for free. Even the snacks are for free, so worthy to visit and be treated" (P7).

"I found so easy to seek treatment in the TB DOTS centre because all are for free. Also, the nurse working in TB DOTS is also delivering quality services, rendering enough care, and encouraging us to have determination to be treated" (P7).

DISCUSSION

In the province of Sulu, most of the MDR-TB cases recorded at the Jolo TB-DOTS centre are male mid-adults, often the heads of their families. This demographic trend can be attributed to their advancing age, the physiological decline of their immune systems due to stress, and the multiple roles they fulfill as breadwinners. The responsibility of providing for their families often places immense pressure on these individuals, which may negatively impact their health and adherence to medical treatments. Studies have shown that personal characteristics significantly influence treatment adherence, with older and younger age groups, as well as those with high mobility, being at higher risk for nonadherence, which predisposes them to MDR-TB (Biset *et al.*, 2024; Subih, Abu Saleh, & Malak, 2023). This underscores the essential role of nursing in offering tailored support and interventions to improve adherence rates among these high-risk groups.

The progression of treatment from first line to second-line of defence drugs due to nonadherence highlights the critical role of patient education and support in managing MDR-TB. Studies indicate that a lack of understanding regarding the necessity of long treatment periods contributes to poor adherence. Patients often have limited knowledge about TB and its treatment but are highly aware of the potential adverse effects, which can deter them from completing their medication regimen (Maifitrianti, Wiyati, & Hasanah 2024; Al-Noumani, Omari, & Al-Naamani, 2023; Alene *et al.*, 2019). This underscores the importance of healthcare workers, particularly nurses, in providing comprehensive education about TB, emphasizing the importance of adhering to the treatment plan despite potential side effects. Nurses, as front-line caregivers, play a crucial role in educating patients, offering psychological support, and helping them navigate the complexities of their treatment regimens (Al-Noumani, Al Omari, & Al-Naamani, 2023).

Social conflicts, such as the frequent displacement of people due to civilian and government-army conflicts involving extremists, further complicate the management of MDR-TB in Sulu. These displacements disrupt well-established healthcare linkages and systems, altering patients' health status and overall quality of life (Yabes, 2021). The instability caused by such conflicts makes it difficult for patients to maintain consistent treatment, leading to lost follow-ups, undocumented cases, and increased relapse rates (Al- Noumani, Al Omari, & Al-Naamani, 2023). Nurses, often working in these volatile environments, must adapt quickly to changing circumstances to ensure continuity of care and support for their patients.

The requirement for patients to adhere to a treatment duration of at least nine months has resulted in significant challenges, including patient mortality. Many patients have succumbed to the disease, and almost none have been fully cured, highlighting the dire need for improved healthcare interventions (Octaviani *et al.*, 2024; Maifitrianti *et al*., 2024). Nurses can play a pivotal role in this aspect by closely monitoring patients, providing consistent follow-up care, and implementing community-based support programmes to improve treatment adherence and outcomes (Octaviani *et al*., 2024; Adisa, Ayandokun, & Ige 2021).

Limitations

The study acknowledges its limitations, primarily focusing on MDR-TB cases in the province of Sulu, which may not be generalizable to other regions or countries with different cultural, social, and economic contexts. The absence of comparative data from other regions limits the ability to determine whether the findings are unique to Sulu or applicable to broader populations. Additionally, the limited sample size of quantitative respondents may affect the validity and reliability of the study findings. Future research should consider multicentre or multinational studies with larger and more diverse samples to confirm the generalizability of the findings and address potential confounding factors. This approach would provide a more comprehensive understanding of MDR-TB management and its impact on various populations.

Addressing the challenges of MDR-TB in Sulu requires a multifaceted approach that includes enhancing patient education, improving adherence to treatment, and providing robust support systems. Nurses, as pivotal players in the healthcare system, are essential in driving these interventions. By leveraging their unique position to educate, support, and advocate for patients, nurses can significantly improve health outcomes and quality of life for those affected by MDR-TB.

CONCLUSION

Nursing care plays a pivotal role in managing MDR-TB among the Tausug population. Nurses are at the forefront of providing patient education, emphasizing the importance of adherence to treatment plans, and offering psychosocial support. They are instrumental in building trust with patients, which encourages disclosure of their health conditions and facilitates better management of the disease. The nursing approach must include culturally sensitive education that addresses the specific socioeconomic challenges faced by patients, helping them to understand the long-term benefits of completing their treatment despite immediate hardships.

Furthermore, an unfavorable treatment outcome is closely linked to the patients' difficult socioeconomic situations, such as the lack of financial support and the challenge of prioritizing treatment over feeding their families. Many patients rationalize their non-adherence by viewing their role as providers as a non-negotiable duty, not as a burden. This highlights the need for nurses and healthcare providers to work collaboratively with social workers and community organizations to create comprehensive support systems that address both the medical and socioeconomic aspects of MDR-TB care.

Effective nursing care and support systems are essential in improving treatment adherence and outcomes for MDR-TB patients. By addressing the socioeconomic barriers and fostering a supportive environment, healthcare providers can help patients overcome the challenges they face, ultimately leading to better health outcomes and reduced transmission of MDR-TB within the community.

Conflict of Interest

The authors declare that they have no competing interests.

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