

The Multifaceted Roles and Challenges of Public Health Nurses in Caring Tuberculosis Patients: Community-based TB Management

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Abstract. Tuberculosis (TB) is considered one of the pressing global health challenges. The Philippines ranks fourth worldwide in TB cases. TB remains one of the leading causes of death in the country, which calls for urgent and emergent proper care management of TB patients. In most cases, TB can be managed effectively and efficiently within the community, except in instances where treatment-related complications arise, necessitating hospitalization. The study examines the multifaceted roles, challenges, responsibilities, and difficulties of PHNs in managing TB patients in District 2 and District 3 of Laguna Province, Philippines. A quantitative, descriptive comparative research design was utilized, involving 63 PHNs who responded to a self-developed questionnaire. Three experts validated the instrument and pilot-tested it to ensure its reliability. Data were analyzed using frequency and percentage distribution, mean formula, standard deviation, Cronbach's Alpha, Kruskal-Wallis, and Mann-Whitney U tests. The findings reveal that PHNs in both districts effectively adhered to their roles as TB patient care nurses, showing a strong commitment to patient management and disease control. However, they face considerable challenges, including fears of contracting TB, patient non-compliance, and inadequate medical resources. Despite these challenges, the study found no significant differences in perceived difficulties when grouped by age, sex, or years of experience. This research underscores the urgent need for increased support, resources, and protective measures for PHNs to tackle TB more effectively. Addressing these challenges is vital to achieving SDG 3, Good health and well-being worldwide good health, promoting healthy lifestyles, preventive measures, and modern, efficient healthcare for everyone, and the context of this study addressed SDG 3 targets a 90% reduction in TB deaths by 2030.

Keywords: Community health; Tuberculosis patient management; Nursing.

1.0 Introduction

Tuberculosis (TB), a disease that has existed for nearly three million years, according to the Centers for Disease Control and Prevention (CDC, 2023), affects various internal organs and is categorized into pulmonary TB (PTB) and extrapulmonary TB. PTB, caused by *Mycobacterium tuberculosis* (MTB), is the most prevalent, accounting

for 85% of TB cases (Akande, 2020). TB spreads through the air, with active cases showing symptoms like a prolonged cough, fever, weight loss, and night sweats, while latent TB remains asymptomatic but can progress (Beena et al., 2020). Data from the World Health Organization (WHO, 2023) indicates that TB affects approximately 10.6 million people globally, with the highest incidences in eight countries, including the Philippines, which ranks fourth. Despite the availability of treatment, TB remains a leading cause of death in the Philippines. Effective management includes the BCG vaccine, medications, and community support. First-line treatments are ethambutol, isoniazid, pyrazinamide, and rifampicin, with second-line drugs for drug-resistant cases (NTP, 2022). Multiple programs, such as Sustainable Development Goal (SDG) number three, the National Tuberculosis Control Program (NTP), and Directly Observed Therapy (DOT), aim to eradicate TB.

Public health nurses (PHNs) play a crucial role in these efforts, as their clients are all individuals and their families living in the community. For Baluku et al. (2023), tackling PHN Career Overview, all the aspects that affect and contribute positively or negatively to an individual's health are to be assessed by the PHN. It encompasses assessing and evaluating the environment and healthcare needs, ensuring the availability of resources for the community, managing budgets for health programs and resources, advocating for the target population for disease prevention, collaborating with other government and non-government agencies to develop health access, and so forth. According to Mozafaripour (2020), PHNs ensure the general health and security of the community through instruction, promotion, and healthcare provision. Quality patient care is achieved through a combination of current knowledge and skills and safe procedural practices, leading to patient satisfaction, recovery, and reduced healthcare costs. The key elements of practical nursing include skillful practice, informed understanding, and strong communication. Patient care suffers significantly when these components are absent, especially with an unprofessional workforce. (Ghahramanian. et al. (2020). Furthermore, according to WHO (2020), PHNs are also responsible for providing health services, including vaccinations and health advice, to ensure continuous TB treatment and maintain high standards of care. Despite their importance, there is a global shortage of nurses. As of 2021, there are only a total of 16,183 PHNs. (Statistica, 2023). There was one PHN for every 4.91 thousand people. (Public Health Nurse Demographics and Statistics in the United States, 2023). That is why an estimated need for an additional 9 million nurses by 2030 is declared in the SDG. (WHO, 2022).

As TB can be managed in the community, according to Friedman et al. (2018), community involvement is vital for TB treatment continuity and reducing cases (Addy et al., 2019). In a typical setting, patients with treatment-related complications such as drug adverse events, life-threatening conditions, and other treatment measures not manageable outside the hospital are the ones who are admitted to the hospital. Other TB cases that are manageable outside the hospital are under the care of the PHN. Hospitalization is frequently not required for the successful treatment of TB. Numerous highly effective initiatives emphasize community-based care, minimizing the duration of hospital stays. (Friedman, E. et al., 2018).

In Laguna, as of 2022, the Provincial Health Office (PHO) recorded 23,509 TB cases in all forms among a population of 3,448,503. District 2 has the highest number of cases 7,920, while District 3 has 4,377 cases. However, only a portion of these cases are recorded as cured and treated, highlighting the need for effective community-based TB management. Researchers aimed to explore the perceived roles and challenges of PHNs in TB patient care, driven by concerns about the scarcity of PHNs in the Philippines and the chronic nature of TB. Aligning with global health goals, the study sought to address a knowledge gap in understanding the complexities of PHN practices in community-based TB management and their impact on achieving SDG 3 (Siddaiah et al., 2019).

This research study aims to determine the multifaceted roles and challenges perceived by the PHNs in caring for TB patients in District 2 and District 3 of Laguna Province. Particularly, the research study anticipated answering the demographic profile of the respondents according to age, sex, and years of experience as PHNs, their level of compliance regarding their roles in caring for TB patients in the community, the challenges they faced, and the significant difference between the respondents' perceived challenges to their demographic profile.

2.0 Methodology

2.1 Research Design

The study utilized a quantitative approach with a descriptive-comparative method. A quantitative research approach can uncover patterns, determine averages, make predictions, verify causal connections, and extend

findings to broader populations by collecting and interpreting numerical data. (Bhandari, 2023). A descriptive method's primary objective is correctly and thoroughly describing a population, situation, or phenomenon. (McCombes, 2023). Comparative studies investigate the similarities and differences between various places, subjects, and objects by analyzing and evaluating phenomena and facts using quantitative and qualitative approaches. (Coccia & Benati, 2018) In the study by Wang et al. (2023), a quantitative descriptive-comparative approach was used to analyze the impact of air pollutants on tuberculosis incidence. The researchers collected numerical data, applied statistical models, and compared results across different variables, exemplifying how this method helps identify patterns and differences in health outcomes. This aligns with the descriptive aspect of summarizing cases and the comparative aspect of evaluating variations across conditions. A quantitative approach was utilized as the research study sought to determine the perceived roles and challenges of PHNs in caring for TB patients. The study used numerical data collected through surveys and research questionnaires to interpret the data. In addition, it is a descriptive method because the researchers describe the respondents according to their demographic profile, specifically in their age, sex, and years of experience as PHN. It is a comparative research method because the researchers seek to determine if there is a significant difference between the demographic profile of the respondents and their perceived challenges as PHN.

2.2 Research Locale

The study has been conducted in Districts 2 and 3 of Laguna Province. When choosing the locale, the researchers considered the number of PHNs, TB cases, and the treatment success rate. District 2 was chosen by the researchers because it had the highest number of cases of TB in Laguna Province, with 7,920 recorded TB in all forms, and had the highest success rate of treatment, 97%, according to PHO in 2022. While District 3 did not have the lowest TB cases among the four districts of Laguna province, it had the lowest success rate of treatment with only 91%.

2.3 Research Participants

The research study's respondents are 63 Filipino PHNs. Purposive and voluntary sampling were utilized. Respondents must be PHNs in Districts 2 and 3 of Laguna Province who handle and care for TB patients and are willing to participate in the study. A greater proportion of respondents are between 31 and 40 years old (70%), female PHNs (76%), and respondents with 6 to 10 years of experience (33%).

2.4 Research Instrument

A self-made questionnaire written in English consists of three sections: a consent form, a demographic profile, and 15 15-item questionnaire about the roles and challenges of PHNs in caring for TB patients, using a Likert scale ranging from (4) Always to (1) Never. The questionnaire was validated by three experts in the field of public health nursing using an authorized validation tool. To further establish the validity of the self-made researched instrument, the researchers conducted a pilot testing in 10 PHNs in two municipalities of Quezon Province that are not part of the researched locale. The pilot test result was computed using Statistical Package for Social Science v27 to compute Cronbach's Alpha value. This shows that both roles of the PHN subscale ($\alpha = 0.814$) and challenges experienced by the PHN subscale ($\alpha = 0.808$) have good reliabilities.

2.5 Data Gathering Procedure

The researchers made and submitted a letter to the PHO and requested data in the most recent year regarding the total number of TB cases and PHNs in District 2 and District 3 of Laguna province. To move forward, the researchers wrote a letter to the Dean of the College of Nursing at Canossa College and conducted the study outside the school premises. After acquiring the authorization letter, the researchers contacted and asked for permission from the City Health Office (CHO) of Tiaong and Candelaria, Quezon Province, and conducted the pilot testing allotted to PHNs in the area with an informed consent letter addressed to the respondents of the self-made questionnaire signed and authorized by the research adviser and the Dean of College in Nursing of Canossa College. After obtaining the authorization needed, the researchers conducted the pilot testing face-to-face. The researchers went to 10 PHNs and explained the purpose and objective of the study one by one. After the pilot testing and approval to proceed with the study, the researchers wrote a letter to the CHO of each municipality and city in Districts 2 and 3 of Laguna province, which the research adviser and Dean of the College of Nursing in Canossa College approved. Afterward, data gathering was conducted face-to-face, utilizing survey questionnaires and Google Forms as data collection instruments. In conclusion, the precise number of respondents is 63 PHNs.

2.6 Ethical Considerations

The researchers provide strict ethical considerations throughout the study. Before the data collection, the researchers sought an authorization letter from the Dean of the College of Nursing at Canossa College and the City Health Office of each municipality of Districts 2 and 3 of Laguna province. Informed consent was given to the respondents. The researchers apply the following ethical guidelines to value and protect the rights of respondents involved in the research study. First, the researchers ensured that no harm would be done to the respondents. Second, the respondents can decide whether to participate in the studies. Third, the identity of the respondents and the data gathered in the study were protected and remained confidential throughout the research study. Lastly, informed consent, which contains the purpose and objective of the study and the rights of every respondent, is given to every respondent. Furthermore, to ensure ethical integrity, the researchers assisted respondents with questions regarding the questionnaire, ensuring accurate data collection. By adhering to these ethical standards, the researchers aimed to uphold the dignity and rights of all respondents while contributing valuable insights into the multifaced roles and challenges of PHNs in caring for TB patients in the community setting.

3.0 Results and Discussion

3.1 Demographic Profile of the Respondents

Table 1 shows the demographic profile of the respondents when grouped according to age; dissecting each age bracket, the number of respondents aged from 20 years to 30 years old was 4 (6%), which is the lowest, indicating that there are only a few PHNs that handles TB in District 2 and District 3 of Laguna Province ranging from this age. Respondents aged 31 to 40 were 44 (70%), which is the highest, indicating that more PHNs handle TB in both districts of Laguna Province ranging from this age. This contradicts the statistics of Public Health Nurse Demographics and Statistics in the United States (2023); as of 2021, the average age of PHNs was 40 or older, accounting for 59% of the overall population.

Table 1. Demographic profile of the respondents in terms of age

Age Bracket	Frequency	Percentage (%)
20 - 30	4	6
31 - 40	44	70
41 - 50	7	11
51 - 60	8	13
Total	63	100.0

Table 2 shows the demographic profile of the respondents when grouped according to sex; out of 63 PHNs that handle and care for TB patients, 15 (24%) were males, and 48 (76%) were females. This indicates that more female PHNs handle and care for TB patients in District 2 and District 3 of Laguna Province. Societal expectations regarding gender roles have historically dictated that caregiving and nurturing roles are more suited to women. Furthermore, we are living in technologies and social media where media portrayals and cultural representations often reinforce the stereotype of nurses as female caregivers. This can be seen in popular culture, where nurses are frequently depicted as women providing comfort and support to patients. Such representations contribute to normalizing the idea that nursing is a female-dominated profession. Just like in the study of Lapitan (2023), where the dominance of female PHNs possibly comes from stereotypes that persist around nursing roles, with Florence Nightingale, the pioneer of modern nursing, often portrayed as the "Mother of Nursing," reinforcing the expectation of caring, nurturing and femininity in the profession. This perpetuates the stereotype that nurses are primarily female professionals, a notion that endures today. Moreover, the data supports the statistics from Public Health Nurse Demographics and Statistics in the United States (2023), which state that there are more female PHNs than male PHNs.

Table 2. Demographic profile of the respondents in terms of sex

Sex Bracket	Frequency	Percentage (%)
Female	48	76
Male	15	24
Total	63	100.0

Table 3 corresponds to the demographic profile of the respondents when grouped according to years of experience as PHNs who handle TB patients. According to the data, 3 (5%) of the PHNs handling TB patients in Districts 2 and District 3 Laguna Province had less than one year of experience. Moreover, ranging from 1 year to 5 years of

experience, there were records of 17 (27%) PHNs. The greatest proportion of responses with 6 to 10 years of experience were 21 (33%) PHNs. For 11 to 15 years of experience, there were 13 (21%) PHNs. Furthermore, 4 (6%) PHNs have 16 to 20 years of experience, and 3 (5%) PHNs have 21 to 25 years of experience. Then, 2 (3%) PHNs have 26 to 30 years of experience. Lastly, there were no respondents with more than 31 years of experience as PHNs who handled TB in both districts in Laguna Province.

Table 3. Demographic profile of the respondents in terms of years of experience in handling TB patients

Years of Experience	Frequency	Percentage (%)
< 1	3	5
1 - 5	17	27
6 - 10	21	33
11 - 15	13	21
16 - 20	4	6
21 - 25	3	5
26 - 30	2	3
> 31	0	0
Total	63	100.0

3.2 Level of Compliance Regarding Roles in Caring TB Patients

Table 4. Level of compliance of respondents regarding their roles in caring TB patients

Roles of PHNs	Mean	SD	Interpretation
I perform a thorough assessment and evaluation for my TB patients and formulate a personalized treatment and care plan.	3.71	0.52	Fully Compliant
I provide fundamental health education about preventive measures, diagnostic procedures, and treatment to my TB patients, their families, and relatives.	3.79	0.48	Fully Compliant
I reach out to patients who have missed their scheduled follow-up appointments.	3.65	0.63	Fully Compliant
I report all severe adverse events through a prescribed reporting form or system.	3.73	0.54	Fully Compliant
I emphasize the importance of adherence and completion of each encounter.	3.81	0.43	Fully Compliant
I provide emotional support and encouragement to patients and their families to reduce social isolation and improve treatment adherence.	3.65	0.63	Fully Compliant
I attend formal training and coaching by senior-trained health staff about TB management and utilizing the Integrated Tuberculosis Information System (ITIS).	3.21	0.97	Mostly Compliant
Overall	3.65	0.60	Fully Compliant

Table 4 shows the average and interpretation of the level of compliance of PHNs in their roles. As reflected in the results, the respondent's performance across these roles averages 3.65 with a standard deviation of 0.60, interpreted as fully compliant, indicating a strong adherence to the prescribed guidelines and standards for TB patient care. The interpretation of the provided data suggests that the healthcare provider is effectively fulfilling their responsibilities in managing TB patients. The respondents demonstrate a consistent level of compliance across various roles, such as assessment, education, follow-up, reporting adverse events, emphasizing adherence, providing emotional support, and attending training. Their persistent adherence to their responsibilities demonstrates the PHN's dedication to providing comprehensive treatment for patients with TB. A potential rationale for why PHNs are fully compliant with their roles is that, according to NTP (2022), one important driving force behind providing high-quality healthcare at all levels is the implementation of patient-centeredness in TB services.

3.3 Perceived Challenges Faced

Table 5 reveals that despite the overall interpretation of disagree, there are three challenges that PHNs encounter in taking care of TB patients in the community. The highest average is 2.95, interpreted as "agree," which shows that most PHNs in Districts 2 and 3 of Laguna Province have a fear of contracting both active and latent TB. Additionally, the average of 2.79 with a standard deviation of 0.81, interpreted as "agree," suggests that PHNs

face difficulties when patients are reluctant to follow their treatment regimens, underscoring a crucial problem in managing tuberculosis. There are serious consequences associated with not following treatment plans, such as drug-resistant strains of TB developing, treatment failure, and relapse. Designing interventions to enhance treatment outcomes and lower transmission rates requires understanding the obstacles to adherence. Moreover, the average of 2.57 and a standard deviation of 0.82, interpreted as “agree,” suggests that PHNs encounter shortages in medical resources, equipment, and medication for TB patients. Limited access to essential supplies may compromise the ability of PHNs to effectively diagnose, treat, and manage TB cases, potentially leading to delays in care or suboptimal treatment outcomes. Insufficient access to diagnostic tools, such as laboratory tests for TB detection, may result in missed or delayed diagnoses, allowing the disease to continue spreading unchecked.

Table 5. Perceived challenges faced by PHNs in caring for TB patients

Perceived challenges faced by PHNs	Mean	SD	Interpretation
I encounter a shortage of medical resources, equipment, and medication for my TB patient.	2.57	0.82	Agree
I face situations where patients express hesitancy to adhere to the treatment process for TB.	2.79	0.81	Agree
I experience being stigmatized when handling TB patients.	2.19	0.86	Disagree
I have a hard time dealing with patients who have an insufficient understanding of the importance of active participation in the treatment process.	2.37	0.68	Disagree
Due to my heavy workload, I feel overwhelmed and less able to dedicate sufficient time to each TB patient.	2.19	0.93	Disagree
I experience overcrowding at the RHU.	2.40	0.83	Disagree
I experienced a lack of coordination among different healthcare providers and agencies, which is crucial for TB management.	1.89	0.84	Disagree
I am afraid of acquiring both active and latent TB.	2.95	1.10	Agree
Overall	2.42	0.86	Disagree

3.4 Differences in Perceived Challenges when Grouped According to Demographic Profile

Table 6 shows the significant difference between respondents' perceived challenges in caring for TB patients when grouped according to age. This was conducted using the Kruskal Wallis H Test. The Result shows no significant difference among groups ($p=0.154$). This finding suggests that PHNs perceived the same challenges in caring for TB patients regardless of age. This implies universality in the difficulties faced by PHNs of all ages in their efforts to manage and support individuals affected by TB within their communities. These challenges likely span various dimensions of TB care, including clinical complexity, resource limitations, patient and community dynamics, and professional support needs.

Table 6. Differences in perceived challenges

Variables	p	Interpretation
Age	.154	Not significant
Gender	.319	Not significant
Years	.277	Not significant

Table 6 also revealed that when PHNs were categorized by sex, there was not a significant difference in how they perceived challenges in caring for TB patients, as indicated by the Mann-Whitney U Test ($p=0.319$). This suggests that regardless of sex, PHNs face similar challenges when caring for TB patients. This finding aligns with a study by Göktepe and Sarıköse (2022), which found that male and female nurses encounter a mix of advantages, disadvantages, similarities, and differences in their work environment. Both genders experience challenges and difficulties related to workplace relations and environment, and there is no significant difference in the perceived challenges when they are grouped according to their sex.

Finally, Table 6 shows that the Kruskal-Wallis H test was conducted to test whether there are no significant differences in the perceived challenges faced by PHNs when grouped according to their years of experience. Results show no significant difference among the groups ($p=0.277$). This suggests that PHNs face similar challenges regardless of how long they have worked in the field.

4.0 Conclusion

All in all, the PHNs in Districts 2 and 3 of Laguna Province fully comply with their roles, except in attending trainings and seminars, which are interpreted as primarily compliant, and perceived three challenges in caring for TB patients. Which includes a shortage of medical resources, patients' hesitancy to adhere to TB treatment and fear of acquiring TB. The study's findings imply that the predominance of younger nurses aged 31-40 highlights an opportunity to create training and mentorship programs that support their growth and foster experience-sharing among colleagues. Additionally, the fact that nurses are "mostly compliant" with formal training suggests the need to make these training opportunities more engaging and accessible. Hence, they feel better equipped and confident in their roles. Lastly, the challenges related to resource shortages and patient adherence emphasize the urgent need for advocacy to improve resource distribution and develop effective strategies to help patients stick to their treatment plans. Apart from advocating regular screening and consistent use of protective gear to prevent contracting communicable diseases for PHNs, researchers also suggest enhancing their immune system through nutrition and exercise regimens and improving ventilation. To address the concerns of respondents, such as fear of acquiring the disease, implementing educational initiatives that build understanding and trust in TB treatment and addressing concerns and misconceptions through door-to-door visits and school-based programs involving PHNs, healthcare workers, and community leaders is crucial. Family members and close contacts of TB patients should also participate in these programs to mitigate their high risk of exposure and reduce stigma. Community leaders should prioritize disseminating information about TB prevention and treatment through regular educational sessions and visual aids like videos and leaflets and encourage community support by donating supplies, as PHNs face shortages in medical resources. Thus, this research study highlights areas for policy improvement, training enhancements, and resource allocation in public health nursing for TB patients to achieve SDG 3.

Furthermore, there is no significant difference between respondents' demographic profile and perceived challenges. It suggests that regardless of the respondents age, sex, and years of experience as PHN in caring for TB patients in the community, they perceived the same challenges, which shows universality in the difficulties faced by them in their efforts to manage and support individuals affected by TB within their communities. These challenges likely span various dimensions of TB care, including clinical complexity, resource limitations, patient and community dynamics, and professional support needs. Also, despite the time they have worked in the sector, PHNs frequently face comparable obstacles throughout their employment. These difficulties are caused by structural problems deeply embedded in larger societal norms and the healthcare system. Whether seasoned professionals or novices in the field, PHNs may encounter challenges because of resource constraints and misunderstandings about their jobs by the general public. In order to effectively serve their communities, PHNs must constantly adapt to new public health concerns, work toward healthcare delivery equality, and get beyond obstacles. In addition, the experienced PHNs must lead by example and guide their novice professional colleagues.

This research study can benefit the community by sharing its findings and raising awareness about the challenges PHNs face and the importance of TB treatment adherence. Strengthening and ensuring the implementation of management for TB patients in the community, such as increasing the number of PHNs and enhancing their immune systems, is vital to ensure they are physically capable of performing their job duties effectively and reduce the chance of nurses becoming infected, thus minimizing the risk for further transmission. Comprehensive health education programs are needed to raise awareness about the disease and the importance of adhering to prescribed treatments. This could foster stronger community support for health workers and encourage collaboration between public health officials and the local population in managing TB cases, especially in the locale of the research study. This study delimits Districts 2 and 3 of Laguna Province only and was done from October 2023 to April 2024.

5.0 Contributions of Authors

The main authors, CNO, MAM, CAT, IMA, MSC, and RNT, contributed equally to the research paper. KC and MQ, as supervisors, overseeing the paper and providing guidance for improvement, also contributed. Once the manuscript was complete, all authors collaboratively reviewed it through discussions and revisions to enhance its quality further. All authors agreed on the final version of the paper.

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