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Fear of Infection, Motivation, and Rewards Related to Health Cadres Performance in Tuberculosis Case Detection

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ABSTRACT

Background: Indonesia remains one of the countries with the highest tuberculosis (TB) burden globally. In Poso District, the 2023 Case Detection Rate (CDR) reached only 65.87%, still below the national target of 75%. Low case detection contributes to delayed diagnosis, persistent community transmission, and failure to reach TB elimination targets. Objective: To analyze factors associated with the performance of health cadres in detecting TB cases in the working area of Tagolu Primary Health Center, Poso District.
Methods: This descriptive cross-sectional study involved all active health cadres (n=52) selected through total sampling. Data were collected using validated structured questionnaires. Variables included fear of infection, stigma, motivation, rewards, and cadre performance. Data were analyzed using descriptive statistics and Chi-square tests with a significance level of α = 0.05.
Results: Three variables were significantly associated with cadre performance: fear of TB transmission (p = 0.024), motivation (p = 0.004), and rewards (p = 0.039). Stigma was not significantly associated (p = 0.579). Most cadres had high fear of infection (63.5%), low motivation (57.7%), and perceived rewards as adequate (69.2%). A total of 61.5% demonstrated good performance in TB case detection.
Conclusion: Fear of infection, motivation, and rewards are significant determinants of cadre performance in TB case detection. Improving protective equipment availability, strengthening training, and implementing sustainable reward mechanisms are essential to enhance early TB detection in the community.

INTRODUCTION

Tuberculosis (TB) remains a major public health challenge globally and in Indonesia. According to the 2022 Global Tuberculosis Report, Indonesia ranks second after India in the number of TB cases, with an estimated 969,000 cases and 150,000 deaths each year (World Health Organization, 2022). Despite ongoing national control efforts, only 45.7% of estimated TB cases were successfully detected and reported in 2022, leaving more than half of cases undiagnosed. This persistent detection gap increases community transmission, delays treatment, and undermines national TB elimination goals.

At the subnational level, similar challenges are observed. In Poso District, the Case Detection Rate (CDR) in 2023 reached only 65.87%, falling short of the national target of 80%.

Additionally, only 46.46% of individuals suspected of TB received diagnostic services in accordance with national standards (Dinas Kesehatan Kabupaten Poso, 2023). These indicators highlight weaknesses in early case detection efforts, especially at the primary healthcare level, where public health nurses and TB cadres play a key role in active case finding (Mohd Ghazali et al., 2025). Without improvements in early detection, undiagnosed TB cases remain an important source of continued community transmission (Cilloni et al., 2020).

Community health cadres are essential partners in the implementation of active case finding strategies (Probandari et al., 2019). They are involved in identifying TB suspects, conducting home visits, providing health education, and supporting contact tracing (Komara et al., 2019). However, previous studies have shown that cadre performance is often suboptimal, influenced by multiple factors such as limited training, lack of motivation, high workload, social stigma, and insufficient incentives (Nuraisya et al., 2018). During the COVID-19 pandemic, cadres also experienced fear and uncertainty, leading to reduced engagement in community based screening activities (Muthmainaha & Indarjo, 2022). These challenges threaten the effectiveness of TB programs at the grassroots level (Shimels et al., 2021).

Several individual and contextual factors may influence cadre performance in TB case detection. Fear of infection is frequently reported among cadres who conduct home visits or interact closely with suspected TB patients, especially when infection prevention supplies are limited (Xu et al., 2022). Motivation is another key determinant of cadre performance, shaped by recognition, perceived importance of their role, and opportunities for skills development. Additionally, rewards or incentives both financial and non-financial are known to enhance cadre engagement and productivity. However, the extent to which these factors influence cadre performance in Poso District has not been well documented.

Considering the limited empirical evidence in this setting, this study aims to analyze the relationship between fear of TB transmission, motivation, and rewards with the performance of community health cadres in TB case detection in the working area of Tagolu Primary Health Center, Poso District. Understanding these factors is essential for strengthening the capacity and effectiveness of cadres in supporting early detection efforts and achieving national TB elimination targets by 2030.

METHODS

Study Design and Setting

This study employed a quantitative analytic design using a cross-sectional approach. The research was conducted in the working area of Tagolu Primary Health Center, Lage Subdistrict, Poso District. The study site was selected because of its low tuberculosis Case Detection Rate (CDR) and the strategic role of community health cadres in active case finding.

Population and Sample

The study population consisted of all active community health cadres working under the Tagolu Primary Health Center. A total sampling technique was applied, and all cadres who met the inclusion criteria were included, resulting in 52 respondents. Inclusion criteria were: active cadres during the study period, willingness to participate by signing informed consent, and the ability to read and complete the questionnaire independently. Exclusion criteria included cadres who were on leave, ill, unreachable during data collection, or who submitted incomplete questionnaires.

Variables and Instruments

The independent variables were fear of TB infection, community stigma, cadre motivation, and rewards. The dependent variable was cadre performance in TB case detection. Data were collected using a structured questionnaire that had undergone expert content validation. Reliability testing from a previous pilot showed Cronbach's alpha values greater than 0.70, indicating good internal consistency.

Data Collection and Analysis
Data collection involved self-administered questionnaires, brief clarification interviews, and direct observation of cadre activities. Univariate analysis was used to describe the frequency distribution of respondent characteristics and study variables. Bivariate analysis was performed using the Chi-square test with a significance level of $\alpha = 0.05$ and a 95% confidence interval.

Ethical Considerations
The study protocol received ethical approval from the Health Research Ethics Committee of Poltekkes Kemenkes Palu (Approval No. 002172/KEPK POLTEKKES KEMENKES PALU/2025). Participation was voluntary, and confidentiality was maintained throughout the research process.

RESULTS

The results of this study present a descriptive and analytical overview of the factors associated with the performance of health cadres in detecting tuberculosis cases in the Lage Subdistrict, Poso Regency. Data were obtained from 52 respondents and analyzed to describe their characteristics, levels of fear of infection, stigma, motivation, rewards, and overall performance. The findings are summarized in the tables below to provide a clear depiction of the distribution of variables and the relationships observed**.**

Table 1. Characteristics of Respondents (n = 52)

Characteristics	Frequency (n)	Percentage (%)
Age		
21–30 years	4	7.7
31–40 years	17	32.7
41–50 years	17	32.7
51–60 years	13	25.0
≥60 years	1	1.9
Sex		
Male	2	3.8
Female	50	96.2
Education		
Elementary School	6	11.5
Junior High School	14	26.9
Senior High School	28	53.8
Higher Education	4	7.7
Years of Service		
1–3 years	15	28.8
4–6 years	15	28.8
7–9 years	8	15.4
≥10 years	14	26.9
TB Training History		
Ever attended training	9	17.3
Never attended training	43	82.7

Most cadres were aged 31–50 years (65.4%), predominantly female (96.2%), and mostly educated at the senior high school level (53.8%). More than half had served as cadres for ≥4 years, and the majority (82.7%) had never attended TB-related training.

Table 2. Distribution of Study Variables

Variable	Frequency (n)	Percentage (%)
Fear of TB infection		
High	33	63.5
Low	19	36.5
Community stigma		
Low	30	57.7
High	22	42.3
Motivation		
High	22	42.3
Low	30	57.7
Reward		
Good	36	69.2
Poor	16	30.8
Cadre Performance		
Good	32	61.5
Poor	20	38.5

Fear of infection was high in 63.5% of cadres, and more than half reported low motivation (57.7%). Most cadres felt they received good rewards (69.2%), and 61.5% demonstrated good performance in TB case detection.

Table 3. Factors Associated With Cadre Performance

Variable	Good Performance		Poor Performance		p-value
	n	%	n	%	
Fear of infection					
Low	16	50	3	15	0.024
High	16	50	17	85	
Community stigma					
Low	17	53.1	13	65	0.579
High	15	46.9	7	35	
Motivation					
High	19	59.4	3	15	0.004
Low	13	40.6	17	85	
Reward					
Good	26	81.3	10	50	0.039
Poor	6	18.8	10	50	

Table 3 presents the association between fear of TB transmission, stigma, motivation, and rewards with the performance of health cadres in tuberculosis case detection. The results show that fear of infection, motivation, and rewards are significantly associated with cadre performance ($p < 0.05$). Cadres with a high level of fear were more likely to demonstrate poor performance compared to those with low fear. Motivation also showed a strong relationship with performance, where cadres with high motivation predominantly exhibited good performance. Similarly, adequate rewards were associated with better performance outcomes. In contrast, community stigma was not significantly related to cadre performance ($p = 0.579$). These findings indicate that psychological and motivational factors play a more influential role in determining performance than stigma.

DISCUSSION

The findings of this study demonstrate that fear of TB transmission, motivation, and rewards are significantly associated with the performance of health cadres in tuberculosis case detection (Probandari et al., 2019). These results indicate that cadre performance is influenced not only by technical skills but also by psychological, internal, and external support factors that

shape their readiness and effectiveness in conducting active case finding (MacPherson et al., 2019).

This study found that cadres with higher levels of fear of TB transmission tended to have poorer performance (Buregyeya et al., 2016). Fear of contagion can influence avoidance behavior, reduce the willingness to interact with suspected TB patients, and decrease participation in active screening activities (Rusdiana et al., 2025). This finding aligns with risk perception theory, which explains that individuals who perceive high personal risk are more likely to avoid tasks perceived as dangerous, particularly when protective equipment or infection control measures are perceived as inadequate (Purnaningsih et al., 2022). Previous studies have similarly reported that fear of infection can reduce the involvement of frontline health workers in TB detection programs, especially when personal protective equipment and training are limited (Kigozi et al., 2020).

Motivation also showed a significant relationship with cadre performance (Khan et al., 2019). Cadres who reported higher motivation demonstrated better performance in identifying suspected TB cases (Chairani et al., 2023). Motivation is an essential intrinsic factor that strengthens work engagement, persistence, and willingness to perform community-based health tasks (Prihanti et al., 2020). Both intrinsic motivators such as a sense of contribution, community recognition, and personal satisfaction and extrinsic motivators such as supportive supervision and workload clarity play an important role in driving performance. This result is consistent with previous studies suggesting that well-motivated community health workers perform more effectively in TB programs and contribute to improved case detection rates (Khan et al., 2019).

In addition, rewards were found to have a significant association with cadre performance. Incentives, whether financial or non-financial, can enhance cadre participation by reducing structural barriers, such as transportation costs and time constraints, while increasing work satisfaction and engagement. Recognition in the form of certificates, appreciation from community leaders, or formal acknowledgment has also been shown to reinforce positive performance. This finding supports evidence from other settings that rewards can be effective in improving the contribution of community health workers to TB control efforts (Sitorus et al., 2022).

Overall, the study highlights the importance of addressing both psychological and structural factors to optimize cadre performance in TB case detection (Ramos & Mestre, 2022). Strengthening infection-prevention measures, providing regular training, enhancing cadre motivation, and implementing fair and consistent reward systems are essential strategies to support cadres in fulfilling their critical role in TB control (Purnaningsih et al., 2022).

This study has several limitations that should be considered in interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between fear of infection, motivation, rewards, and cadre performance; the associations observed can only describe correlations at a single point in time. Second, the use of self-administered questionnaires may introduce response bias, particularly social desirability bias, as cadres may overreport positive behaviors. Third, the study was conducted in a single primary health care area (Puskesmas Tagolu), which may limit the generalizability of the results to other regions with different demographic or programmatic characteristics. Fourth, variables such as workload, supervision quality, and availability of infection prevention tools were not measured, even though they may influence cadre performance. Future research should involve a broader study area, employ longitudinal designs, and incorporate more comprehensive variables to better understand factors influencing community health worker performance in TB case detection

CONCLUSION

The findings of this study demonstrate that three primary factors fear of TB transmission, motivation, and rewards are significantly associated with the performance of health cadres in detecting tuberculosis cases in the working area of Tagolu Health Center, Poso Regency. Cadres with higher fear levels showed lower performance, indicating the strong influence of

psychological responses related to perceived infection risk. Motivation also played an essential role, where cadres with high motivation demonstrated better performance in carrying out active case finding tasks. Furthermore, adequate rewards, both financial and non-financial, were found to support and enhance cadre performance. These results highlight that cadre performance is strongly shaped by internal, psychological, and external support factors.

To improve the performance of health cadres in tuberculosis case detection, it is recommended that the health service enhances cadre protection through the provision of adequate personal protective equipment (PPE), strengthens motivation through regular supervision and structured capacity-building programs, and implements consistent reward mechanisms both financial and non-financial to support sustained engagement and improved active case finding.

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