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## Impact of Staffing Ratios on Patient Outcomes in Inpatient Drug Addiction Treatment and Rehabilitation Centers in Bicol Region

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### Abstract

**Aim:** This study examined how staffing ratios affect patient outcomes in inpatient drug rehabilitation centers in the Bicol Region, focusing on recovery, relapse, treatment completion, and mental improvements.

**Methodology:** The study utilized a descriptive-correlational design to investigate the relationship between staffing ratios and patient outcomes in the two government rehabilitation centers located in the Bicol Region. Purposive sampling was employed to select staff and patient participants. Data were collected via a validated researcher-developed questionnaire and analyzed using descriptive statistics and Pearson correlation, adhering to ethical research protocols.

**Results:** Findings revealed staffing shortages, with ratios falling below national and international standards. Shortages in specialists such as psychologists and addiction counselors led to limited individualized care, higher relapse risks, burnout among staff, and reduced treatment efficiency. Facilities with better ratios showed higher recovery and adherence rates.

**Conclusion:** Adequate staffing is vital to improving rehabilitation outcomes. Optimizing ratios through evidence-based staffing policies and workforce development will enhance patient recovery, reduce relapse, and ensure sustainable care in Bicol rehabilitation centers.

**Keywords:** Staffing Ratios, Rehabilitation, Patient Outcomes, Recovery, Relapse

### INTRODUCTION

Drug addiction remains a major global health challenge, affecting approximately 296 million individuals in 2021—a 23% increase compared with the previous decade (Zhang et al., 2024). Despite advancements in treatment approaches, the effectiveness of rehabilitation continues to depend largely on adequate staffing to ensure quality care and patient engagement. Previous studies have demonstrated that insufficient staff-to-patient ratios are linked to higher relapse risks and lower recovery outcomes (Dall’Ora et al., 2022; Volkow, 2023).

In the Philippine context, about 1.8 million individuals are estimated to use illegal drugs, underscoring the urgent need for effective and sustainable rehabilitation programs (Kanamori et al., 2024). However, many rehabilitation facilities across the country face persistent staffing shortages, which increase workloads and reduce the consistency of patient outcomes (Department of Health [DOH], 2023). These issues are particularly evident in the Bicol Region, where centers often operate with limited human resources, hindering individualized patient care and recovery progress.

While global literature has established a strong link between staffing adequacy and improved treatment outcomes, few empirical studies in the Philippines have examined this relationship, particularly within inpatient drug rehabilitation settings. Most existing research focuses on hospitals or treatment models rather than workforce sufficiency. This gap necessitates a systematic investigation of how staffing ratios influence patient outcomes, including recovery, relapse reduction, and treatment completion.



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This study specifically examined the impact of staffing adequacy on patient outcomes in the Malinao and Camarines Sur Treatment and Rehabilitation Centers in the Bicol Region. The inadequate number of psychologists, addiction counselors, and social workers in these facilities limits individualized care and comprehensive patient monitoring. Addressing this research gap is crucial to strengthening evidence-based policies, improving recovery rates, and enhancing the sustainability of rehabilitation programs in the Philippines.

The study contributes to the academic community by advancing the body of knowledge in rehabilitation science and healthcare management, emphasizing workforce adequacy as a critical determinant of recovery success. It also offers practical value to local policymakers and practitioners by informing workforce planning, optimizing staffing policies, and improving the overall quality and accessibility of rehabilitation services in the Bicol Region and beyond.

## Review of Related Literature and Studies

Adequate staffing has been widely recognized as a key determinant of patient recovery and service quality in rehabilitation environments. Needleman et al. (2024) emphasized that higher nurse-to-patient ratios significantly enhance care outcomes and reduce mortality, underscoring the vital role of workforce adequacy in treatment effectiveness. Similarly, Juvé-Udina et al. (2025) reported that sufficient staffing promotes consistent and personalized care, fostering greater patient engagement and rehabilitation success.

Continuous professional development is also essential in maintaining high-quality care. Studies revealed that ongoing education improves staff competence, confidence, and adherence to evidence-based practices, leading to enhanced patient recovery (Vázquez-Calatayud et al., 2021; Stavropoulou et al., 2025). Conversely, heavy workloads and poor task distribution contribute to stress, burnout, and reduced service quality (Dall'Ora et al., 2020; Mudallal et al., 2022). Fair and efficient workload allocation, therefore, supports both staff well-being and sustained care delivery.

The availability of adequate resources also plays a pivotal role in effective rehabilitation. When financial, material, and human resources are sufficient, both staff performance and patient outcomes improve markedly (Al-Maaitah et al., 2023; Holmér et al., 2023). Effective communication between staff and patients is another critical factor; it builds trust, fosters cooperation, and strengthens treatment adherence. However, high workloads and time constraints can limit engagement, weaken rapport, and compromise recovery efficacy (McCabe & Timmins, 2020; O'Connell et al., 2021).

Despite extensive international evidence connecting staffing adequacy, professional development, and patient outcomes, empirical research within Philippine drug rehabilitation centers remains scarce. Most local studies have focused on hospital settings, neglecting the unique organizational and therapeutic dynamics of rehabilitation facilities. This lack of localized evidence presents a gap in understanding how staffing adequacy influences patient recovery, relapse prevention, and treatment completion within the Philippine context.

The present study bridges this gap by evaluating the impact of staffing adequacy on patient outcomes in government-operated rehabilitation centers in the Bicol Region. By situating the analysis within a local context, it contributes both to international literature and to national policy formulation aimed at strengthening rehabilitation workforce systems.

## Theoretical and Conceptual Frameworks

This study is grounded in established theoretical foundations that collectively elucidate the relationship between staffing adequacy and patient outcomes in healthcare and rehabilitation contexts. Aiken's Nursing Workforce Theory posits that sufficient staffing and supportive work environments enhance the quality and safety of care (Lasater et al., 2021). Donabedian's Quality-of-Care Model identifies workforce adequacy as a key structural component influencing care processes and outcomes (Dall'Ora et al., 2022). From an organizational standpoint, von Bertalanffy's Systems Theory emphasizes that healthcare institutions operate as interdependent systems wherein adequate staffing ensures operational harmony and efficiency (Lamé et al., 2023).



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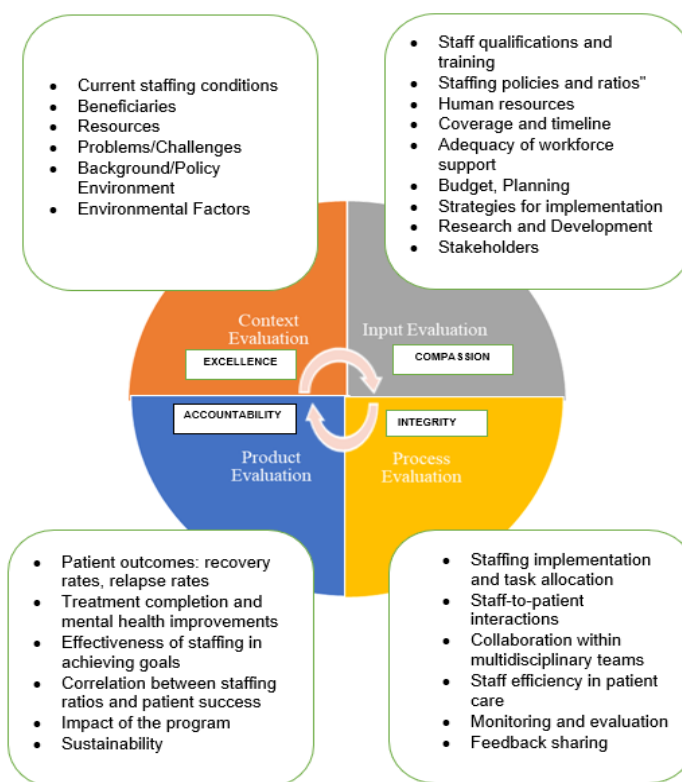
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Watson's Theory of Human Caring highlights the centrality of compassionate, person-centered interactions in building trust and promoting recovery among individuals with substance dependence (Curcio et al., 2024). Complementing these perspectives, Bakker and Demerouti's Job Demands-Resources Theory underscores that balanced workloads and adequate resources enhance employee well-being and performance, leading to improved patient outcomes (Bakker et al., 2023).

Integrating these theoretical perspectives, the study developed the Comprehensive Staffing and Care Outcome (CSCO) Framework, which posits that adequate, competent, and compassionate staffing directly influences rehabilitation effectiveness. Guided by the CIPP Model (Context, Input, Process, Product), the framework assesses how contextual conditions, workforce competencies, and implementation processes affect rehabilitation outcomes such as patient recovery, relapse reduction, and treatment completion.

The CSCO Framework guided all stages of the study: (1) data collection by structuring survey indicators across the CIPP dimensions; (2) data analysis by aligning variables with contextual and process factors; and (3) interpretation by linking staffing patterns with observed patient outcomes.

To illustrate these interrelationships, a conceptual paradigm was developed, visually depicting how staffing adequacy and workforce performance interact to influence recovery outcomes and overall service sustainability. This integrative framework provided a holistic foundation for understanding the structural and human factors that determine the effectiveness of inpatient rehabilitation services in the Bicol Region.



### Statement of the Problem

Drug addiction remains a major global and national concern, affecting millions of individuals and straining public health systems worldwide. In 2021, approximately 296 million people were reported to have used drugs globally, a 23% increase over the previous decade (Zhang et al., 2024). In the Philippines, around 1.8 million individuals are





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estimated to use illegal drugs, indicating the urgent need for effective treatment and rehabilitation programs (Kanamori et al., 2024). Despite the continuous development of rehabilitation models, the effectiveness of these programs largely depends on adequate staffing that ensures individualized care, therapeutic engagement, and sustainable recovery.

However, many treatment and rehabilitation centers across the country continue to experience staff shortages, particularly among psychologists, counselors, and social workers (Department of Health [DOH], 2023). The Bicol Region, in particular, faces significant staffing inadequacies in its inpatient drug rehabilitation centers, which impede the delivery of quality services and patient monitoring. These workforce limitations contribute to increased relapse rates, burnout among staff, and inconsistent recovery outcomes.

Although international studies have examined the relationship between staffing ratios and patient outcomes, very few empirical investigations in the Philippines have quantitatively assessed this relationship, especially within government-operated rehabilitation settings. Most local studies focus on hospital environments or treatment approaches rather than on staffing adequacy and workforce efficiency. This gap in empirical data hinders the development of evidence-based staffing policies that could strengthen rehabilitation services in the country.

Therefore, this study seeks to examine the impact of staffing ratios on patient outcomes in inpatient drug addiction treatment and rehabilitation centers in the Bicol Region. Specifically, it aims to evaluate the current staffing situation, analyze its relationship with recovery and relapse rates, and identify workforce challenges that influence treatment outcomes. The study further seeks to develop a Comprehensive Staffing Optimization Framework (CSOF) that could inform policy formulation, workforce planning, and service improvement in rehabilitation centers.

## Research Objectives

### General Objective

To examine the impact of staffing ratios on patient outcomes in inpatient drug addiction treatment and rehabilitation centers in the Bicol Region.

### Specific Objectives

- To assess the current staffing status of inpatient drug addiction treatment and rehabilitation centers in the Bicol Region in terms of:
  - staff-to-patient ratios, and
  - workforce distribution.
- To determine the impact of staffing ratios on patient outcomes in terms of:
  - recovery rates,
  - relapse rates,
  - treatment completion, and
  - mental health improvements.
- To test the significant relationship between staffing ratios and patient outcomes in inpatient drug rehabilitation centers.
- To identify the challenges in staffing that affect patient care and recovery in terms of:
  - workforce availability,
  - training and qualifications,
  - workload distribution,
  - resource allocation, and
  - staff-patient interaction.
- To develop a Comprehensive Staffing Optimization Framework (CSOF) for inpatient drug rehabilitation centers in the Bicol Region.

### Research Questions

- What is the current staffing status of inpatient drug addiction treatment and rehabilitation centers in the Bicol Region in terms of:
  - staff-to-patient ratios, and
  - workforce distribution?
- How do staffing ratios affect patient outcomes in terms of:
  - recovery rates,
  - relapse rates,



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- c. treatment completion, and
- d. mental health improvements?
3. Is there a significant relationship between staffing ratios and patient outcomes in inpatient drug rehabilitation centers?
4. What challenges in staffing affect patient care and recovery in terms of:
  - a. workforce availability,
  - b. training and qualifications,
  - c. workload distribution,
  - d. resource allocation, and
  - e. staff-patient interaction?
5. What framework can be developed to optimize staffing ratios and improve patient outcomes in inpatient drug rehabilitation centers in the Bicol Region?

### Hypothesis

There is no significant relationship between staffing ratios and patient outcomes in inpatient drug addiction treatment and rehabilitation centers in the Bicol Region.

### METHODS

#### Research Design

This study employed a descriptive-correlational research design to determine the relationship between staffing ratios and patient outcomes in inpatient drug addiction treatment and rehabilitation centers in the Bicol Region. The design was appropriate because it allowed the researcher to describe the current staffing conditions and examine statistically how staffing adequacy influenced measurable outcomes such as recovery, relapse, treatment completion, and mental health improvement. The correlational aspect of the design enabled the identification of the strength and direction of association between staffing ratios and patient outcomes without manipulating variables, making it suitable for real-world institutional settings.

#### Population and Sampling

The study population consisted of staff and patients from the two government-operated inpatient drug rehabilitation centers in the Bicol Region—the Malinao Treatment and Rehabilitation Center and Camarines Sur Treatment and Rehabilitation Center. The respondents of the study were categorized into three groups: 102 service care providers (comprising of physicians, nurses, psychologists, social workers, medical technologists, radiological technologists, etc), 150 non-health care providers (including administrative personnel, security guards, drivers, cooks, utility workers, house parents etc.) and 252 recipients of care (undergoing rehabilitation at the time of data collection & their relatives) for a total of 504 participants from both facilities.

Purposive sampling was employed to ensure that participants possessed relevant experience and knowledge about the center's staffing conditions and patient recovery processes. The inclusion criteria for staff participants were: (1) at least six months of employment at the rehabilitation center, and (2) direct involvement in patient care or treatment operations. Patient participants were included if they had been admitted for at least three months and were medically cleared to participate in the study. This sampling technique was deemed appropriate because it allowed the researcher to target respondents who could provide accurate and meaningful data about staffing and treatment outcomes.

#### Research Instrument

Data were gathered using a researcher-developed questionnaire composed of four sections: (1) demographic and professional profile of staff and patients; (2) staffing ratios and workforce adequacy; (3) patient outcomes covering recovery, relapse, treatment completion, and mental health improvements; and (4) challenges related to staffing, workload, and service delivery.

The instrument underwent content validation by a panel of three experts—one in healthcare management, one in psychology and rehabilitation, and one in quantitative research methodology. Their qualifications included post graduate degrees and at least ten years of experience in their respective fields. Based on their feedback, the instrument was revised for clarity, relevance, and comprehensiveness. A pilot test was conducted among 10 staff members and



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10 patients from a rehabilitation facility not included in the main study to assess reliability. The resulting Cronbach's alpha coefficient of 0.89 indicated high internal consistency.

### Data Collection Procedures

Data collection was conducted from the third week to March to the fourth week of April 2025, following the approval of the research proposal by the institutional review committee and the authorization from the Department of Health (DOH).

After obtaining permission from the center administrators, the researcher coordinated with assigned focal persons in each facility to distribute the questionnaires. The purpose of the study was explained to all participants prior to administration. Staff respondents accomplished the questionnaires during their regular duty hours, while patient respondents completed theirs during group counseling sessions under the supervision of facility personnel. Completed questionnaires were collected immediately after completion to ensure data integrity.

To maintain objectivity and avoid bias, the researcher refrained from influencing responses and allowed participants to answer independently. All questionnaires were checked for completeness and accuracy before data encoding and statistical processing.

### Data Analysis

Quantitative data were analyzed using descriptive and inferential statistical techniques through the Statistical Package for the Social Sciences (SPSS) software.

1. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to describe the staffing conditions, workforce distribution, and patient outcome variables.
2. Pearson's Product-Moment Correlation Coefficient ( $r$ ) was applied to determine the relationship between staffing ratios and patient outcomes.
3. The level of significance was set at 0.05, and interpretations were made based on established statistical decision rules.

The statistical results were used to validate the hypotheses and directly answer the corresponding research questions. Findings were interpreted in relation to the study's conceptual framework and existing literature to identify trends and implications for staffing policy and rehabilitation management.

### Ethics in Research

The study strictly adhered to the ethical standards of research involving human participants. Prior to data collection, approval was obtained from the Institutional Ethics Review Committee of Bicol College and the Department of Health Regional Office.

All participants were informed of the study's objectives, procedures, and voluntary nature. Written informed consent was secured from both staff and patient respondents. Participants were assured of anonymity and confidentiality, and all personal identifiers were removed during data analysis. The collected data were stored in password-protected files accessible only to the researcher. Respondents were informed of their right to withdraw from participation at any stage without any penalty or consequence.

Ethical compliance ensured that the study upheld the principles of respect for persons, beneficence, and justice, as prescribed by the National Ethical Guidelines for Health and Health-Related Research (2022).

### RESULTS and DISCUSSION

This section presents the findings of the study on staffing adequacy, patient outcomes, and related challenges in inpatient drug addiction treatment and rehabilitation centers in the Bicol Region. Discussions are integrated immediately after each result to ensure coherence and supported by relevant, up-to-date literature.

#### 1. Current Staffing Status in Inpatient Drug Addiction Treatment and Rehabilitation Centers (DATRCs)

##### a. Staff-to-Patient Ratios

Findings indicated that staffing levels in both the Malinao Treatment and Rehabilitation Center (MTRC) and the Camarines Sur Treatment and Rehabilitation Center (CSTRC) were generally rated as *Adequate to Highly Adequate*. Patients perceived staff numbers as sufficient to meet their needs; however, service providers reported workload





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imbalances, limited monitoring capacity, and stress during peak service periods. This divergence suggests that patient satisfaction may obscure underlying staffing inefficiencies.

Although staffing appeared adequate, reliance on a small number of specialists raised sustainability concerns and the risk of burnout. Strengthening recruitment, retention, and staff development remains vital to ensure sustainable, high-quality rehabilitation services. These findings are consistent with Wang et al. (2023), who emphasized that optimal staffing ratios improve patient outcomes and minimize care delays and safety risks.

## b. Workforce Distribution

Both rehabilitation centers maintained *Adequate to Highly Adequate* workforce distributions across major professional categories. While CSTRC demonstrated better organization and staffing stability, MTRC experienced periodic shortages during high-demand periods. Balanced staffing was associated with improved safety and service quality. Dall'Ora et al. (2022) confirmed that higher nurse staffing levels reduce mortality and adverse incidents, while Zajac et al. (2021) highlighted that coordinated team structures minimize strain among providers and enhance continuity of care.

## 2. Impact of Staffing Ratios on Patient Outcomes

### a. Recovery Rates

Adequate staffing significantly contributed to improved recovery rates in both MTRC and CSTRC. Service providers emphasized that sufficient staffing facilitated timely interventions and reduced burnout, while patients acknowledged that appropriate staff availability promoted engagement and adherence to therapy. Sustaining optimal staff-to-patient ratios therefore strengthens service quality and long-term recovery outcomes.

These findings corroborate Juvé-Udina et al. (2025), who found that higher staffing levels foster personalized care and better recovery rates, while Needleman et al. (2024) observed that understaffing leads to treatment delays and higher patient mortality.

### b. Relapse Rates

Both rehabilitation centers rated the effect of staffing adequacy on relapse prevention as *Very High*. Sufficient staffing enabled continuous monitoring, early detection of relapse indicators, and consistent follow-up care. Service providers noted that adequate staff numbers allowed timely interventions, while patients valued the steady availability of counselors.

These findings affirm that adequate staffing is critical for relapse prevention, aligning with Yamashita et al. (2021), who reported that supportive staff interactions enhance resilience and reduce relapse risk, and Alanazi et al. (2023), who found that adequate staffing lowers missed care rates and improves safety in treatment settings.

### c. Treatment Completion

Both centers reported *Very High* ratings from both patients and staff concerning staffing's impact on treatment completion. Adequate staffing facilitated consistent care delivery, timely therapy sessions, and sustained patient motivation. However, slight workload disparities affected client perceptions. These findings emphasize that sufficient staffing promotes adherence and reduces dropout rates.

Yoon et al. (2022) found that adequate staffing enhances continuity of care, while Kim et al. (2024) concluded that balanced nurse-to-patient ratios strengthen treatment reliability and completion rates.

### d. Mental Health Improvements

Both MTRC and CSTRC reported that staffing adequacy had a *Very High* impact on clients' psychological well-being. Adequate staff presence was associated with reduced anxiety, improved coping mechanisms, and enhanced motivation for recovery. These results affirm that sufficient staffing is essential for fostering emotional stability and promoting holistic rehabilitation.

This finding aligns with Park et al. (2020), who demonstrated that higher nurse staffing levels in psychiatric settings improve patient mental health outcomes, and Bonilla et al. (2021), who emphasized that adequate mental health staffing supports treatment adherence and service utilization.



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### 3. Relationship Between Staffing Ratios and Patient Outcomes

Correlation analysis revealed a moderate positive relationship between staffing ratios and recovery rates ( $r = 0.414$ ,  $p = 0.069$ ) and relapse prevention ( $r = 0.579$ ,  $p = 0.079$ ), suggesting that higher staffing levels tended to improve these outcomes; however, the relationships were not statistically significant at the 0.05 level. Correlations with treatment completion ( $r = -0.013$ ,  $p = 0.971$ ) and mental health improvement ( $r = 0.409$ ,  $p = 0.151$ ) were weak and statistically insignificant.

Although not all correlations reached significance, the observed trends indicate that adequate staffing has practical, if not always statistically measurable, effects on patient recovery and relapse prevention. These findings are consistent with Maxey et al. (2025), who emphasized that workforce adequacy contributes substantially to service quality and rehabilitation success in substance use treatment settings.

### 4. Challenges and Gaps in Staffing Affecting Patient Care and Recovery

#### a. Workforce Availability

Both centers experienced staff shortages during weekends and night shifts, which limited patient monitoring and continuity of care. The scarcity of specialists, particularly psychologists and social workers, compelled existing staff to assume multiple responsibilities, leading to fatigue and reduced care quality. These findings concur with Shin et al. (2021), who linked inadequate staffing to higher patient risks and interrupted care, and Cho et al. (2022), who reported that workforce shortages compromise patient safety and elevate mortality risks.

#### b. Training and Qualifications

Respondents from both centers cited gaps in staff training, particularly in managing co-occurring mental health and addiction disorders. The absence of regular refresher courses was a recurring concern. Continuous professional development enhances competence and patient outcomes, as supported by Vázquez-Calatayud et al. (2021) and Stavropoulou et al. (2025), who demonstrated that structured education programs strengthen professional proficiency and care delivery.

#### c. Workload Distribution

Both centers reported unequal work distribution, with some staff members caring for excessive patient loads. This imbalance contributed to stress, burnout, and limited individualized care. These findings affirm that uneven workload allocation negatively affects staff performance and patient outcomes. Ferramosca et al. (2023) and Maghsoud et al. (2022) found that heavy workloads reduce service quality and increase emotional exhaustion, while Babamohamadi et al. (2023) emphasized that equitable task allocation sustains effective rehabilitation services.

#### d. Resource Allocation

Resource inadequacies were noted in both centers. MTRC faced shortages in medical and rehabilitation equipment, while CSTRC struggled with budget constraints that limited hiring and program expansion. These deficiencies hindered service continuity and patient recovery. Al-Maaitah et al. (2023) and Holmér et al. (2023) similarly noted that sufficient resources enhance care quality and staff performance, while shortages disrupt service efficiency and patient outcomes.

#### e. Staff–Patient Interaction

Both centers reported limited time for counseling and individualized attention due to heavy workloads. Staff constraints reduced opportunities for empathetic communication and therapeutic bonding. Abid et al. (2023) found that inadequate staffing weakens nurse–patient interaction and satisfaction, while Marques et al. (2021) observed that sustained workload strain diminishes empathy and personalized care, undermining patient engagement and recovery success.

### 5. Development of the Comprehensive Staffing Optimization Framework (CSOF)

The study developed the Comprehensive Staffing Optimization Framework (CSOF) to address identified gaps in workforce adequacy, training, workload balance, and communication. The framework integrates workforce planning, continuous training, equitable task allocation, adequate resource support, and enhanced therapeutic engagement. It promotes a holistic and sustainable model of staffing adequacy, emphasizing both quantity and quality of care to strengthen recovery outcomes and minimize relapse in rehabilitation centers.





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## Conclusions

The study concluded that staffing ratios and workforce distributions in MTRC and CSTRC were generally adequate, yet challenges persisted in workload balance, specialist availability, and sustainability. Patient outcomes revealed that recovery and relapse prevention were moderately influenced by staffing adequacy, whereas treatment completion and mental health improvements required broader institutional interventions.

Persistent issues related to workforce shortages, insufficient training, resource limitations, and constrained staff-patient interactions demonstrated that numerical adequacy alone does not ensure consistent care quality. The development of the Comprehensive Staffing Optimization Framework (CSOF) provided a structured and evidence-based approach to addressing these systemic challenges by integrating staffing policies, continuous professional development, and patient-centered strategies.

## Recommendations

1. The Department of Health (DOH)–Bicol Center for Health Development, in collaboration with the Provincial Governments of Albay and Camarines Sur, may adopt the Comprehensive Staffing Optimization Framework to enhance staffing policies, workforce planning, and rehabilitation services.
2. Hospital administrators may strengthen recruitment and retention strategies for specialized professionals, ensure equitable workload distribution, and support continuous staff training to sustain care quality and staff well-being.
3. The Dangerous Drugs Board (DDB) and Philippine Drug Enforcement Agency (PDEA) may integrate the framework into national rehabilitation initiatives to align staffing policies with national anti-drug efforts.
4. The Philippine Nurses Association (PNA) and allied professional organizations may promote advocacy, mentorship, and peer support programs to enhance workforce resilience and morale.
5. Collaborative initiatives among government agencies, academic institutions, and rehabilitation centers may be pursued to validate, refine, and expand the CSOF for broader application and long-term impact on national rehabilitation systems.

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