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Strategies to Improve Psychiatrist Understaffing in Psychiatric Hospitals in Rural and Underserved Communities: Addressing Administrative Challenges

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Abstract

Psychiatric hospitals across the United States face a worsening shortage of psychiatrists, particularly in rural and underserved communities, which limits timely mental health care, increases wait times, and places unsustainable strain on the psychiatric workforce. The purpose of this integrative review was to identify administrative strategies that can mitigate psychiatrist understaffing and support sustainable care delivery in psychiatric hospitals. An integrative review methodology was used to explore both empirical and nonempirical literature, resulting in 92 articles, including 32 peer-reviewed sources and several supporting studies selected through a systematic search, screening, and critical appraisal. Thematic analysis of the evidence revealed five main themes: expanding the psychiatrist workforce, funding rural training programs, reducing burnout, providing leadership and team training, and improving equity in underserved communities. Eleven subthemes emerged from the five themes: increasing psychiatrist supply, leveraging psychiatric mental health nurse practitioners, recruiting regionally, developing pipeline programs, addressing emotional exhaustion, enhancing retention, building leadership capacity, strengthening interdisciplinary collaboration, promoting role clarity, expanding rural access, and supporting marginalized populations. Four strategic recommendations emerged from the thematic findings: expanding regional training pipelines, improving retention through emotional support and workplace flexibility, strengthening interdisciplinary team integration, and leveraging adaptive leadership to coordinate team-based care. These strategies, grounded in the integrated team effectiveness model, offer system-level solutions to improve team function, reduce turnover, and expand psychiatric access—advancing equity and resilience in underserved communities.

Part 1: Practice-Based Problem

Problem of Interest

The shortage of psychiatrists in the United States has reached critical levels, creating significant challenges for psychiatric hospitals, especially in rural and underserved communities where more than half of the counties lack adequate mental health providers, leading to prolonged wait times and limited access to essential psychiatric care (Andrilla et al., 2018; Morales et al., 2020). This shortage has exacerbated existing disparities in mental health service delivery, as rural areas face persistent workforce deficits and insufficient psychiatric bed capacity, which hinder hospitals' ability to meet community needs effectively (McBain et al., 2022).

The problem is compounded by increased demand for mental health services, as highlighted by Andrilla et al. (2018) and Aggarwal et al. (2022), who emphasized the disparities in behavioral health provider availability across different regions and the pressing need for workforce planning solutions. Cai et al. (2022) further elaborated on trends indicating that limited residency training slots and other systemic factors have worsened the shortage, particularly in rural areas. As Bruza-Augatis et al. (2024) noted, addressing this shortage was crucial for equitable healthcare access, which is essential for achieving positive social change by enhancing mental health outcomes across all communities. Additionally, McBain et al. (2022) identified a shortfall of approximately 12 psychiatric beds per 100,000 people nationwide, equating to a need for over 10,000 additional beds. The psychiatrist shortage is especially acute in rural areas, exacerbating access issues as patients frequently encounter long wait times or are turned away due to capacity constraints.

Healthcare Administration Problem

Background

Psychiatric hospitals face substantial challenges due to the psychiatrist shortage, which disproportionately affects rural and underserved areas (Henning-Smith et al., 2024). Historical workforce challenges have persisted, while Boniol et al. (2022) pointed out that the global distribution of healthcare workers remains uneven, contributing to the national shortage. Donohue et al. (2024) examined how financial constraints exacerbate these issues, underscoring the significant strain placed on psychiatric hospitals. In addition to the shortage of psychiatrists, the limited availability of psychiatric beds exacerbates the pressure on these facilities (McBain et al., 2022). The combined shortage of psychiatrists and bed capacity presented a significant healthcare administration problem that requires innovative strategies to ensure adequate staffing, enhance service quality, and meet mental health regulatory requirements.

Operational Problem

The immediacy and relevance of the psychiatrist shortage are underscored by its implications for public health. For example, McBain et al. (2019) documented geographic disparities and growth issues within the field of child psychiatry, while Kalb et al. (2019) reinforced the urgency of additional providers by highlighting the rise in psychiatric emergency visits among youth. Morales et al. (2020) further emphasized the significant disparities faced by rural populations, where mental health services are critically limited. The scarcity of psychiatric resources has particularly severe consequences, as Ku et al. (2021) directly linked mental health shortage areas with higher suicide rates, illustrating the devastating impact of inadequate access to care on community health outcomes.

Additionally, systemic barriers to care, particularly in low-income areas were noted by Rameez and Nasir (2023), further complicating efforts to bridge the mental health service gap. Oh et al. (2022) supported this by illustrating the low participation rates in Medicare among psychiatrists, which restricts access to care for many. Furthermore, McBain et al. (2022) noted that the shortage of psychiatric beds added another layer of urgency, underscoring the need for systemic improvements to meet both patient and provider needs effectively.

Ideal State of Operations

To achieve an ideal operational state, psychiatric hospitals needed to ensure sufficient bed capacity to accommodate patient needs effectively and equitably across regions. Mundt et al. (2021) and Jones (2023) identified that the minimum threshold for psychiatric beds should be 30 beds per 100,000 population, providing a baseline for essential services and preventing system strain. At the optimal level, Mundt et al. suggested 60 beds per 100,000 as a target to support sustainable mental healthcare across varying demographics. O'Reilly et al. (2019) further refined these recommendations, indicating that 50 to 70 beds per 100,000 may be necessary to fully meet demand and maintain quality in both acute and residential psychiatric care settings. These recommendations aligned with the need to adapt to diverse regional requirements and provide comprehensive mental health services, especially in underserved areas.

In addition to these quantitative benchmarks, expanded healthcare infrastructure is crucial. Ramesh et al. (2023) emphasized that counties lacking access to both psychiatrists and essential resources, like broadband, face greater disparities in mental health outcomes. Addressing these shortages is not only a matter of aligning with bed

capacity standards but also involves investing in healthcare infrastructure to mitigate access gaps, particularly in rural and underserved areas.

The post-pandemic landscape has further amplified the need to address behavioral health disparities. Rice et al. (2023) emphasized that the pandemic exacerbated existing inequities in mental healthcare access, increasing demand for behavioral health services. Greilich et al. (2023) further highlighted the importance of fostering teamwork and developing critical competencies among healthcare providers. Enhanced training programs and recruitment initiatives are essential to build a resilient psychiatric workforce capable of adapting to evolving mental health service demands.

By achieving these benchmarks for bed capacity, supporting healthcare infrastructure, and fostering a resilient workforce, psychiatric hospitals can better position themselves to deliver equitable mental healthcare. These steps are crucial for meeting both immediate and long-term community needs, ultimately contributing to social equity and improved public health outcomes (Greilich et al., 2023; Jones, 2023; Mundt et al., 2021; Ramesh et al., 2023; Rice et al., 2023).

Professional Practice Gap Statement

The persistent issue of psychiatrist understaffing in psychiatric hospitals, particularly in underserved areas, has been well-documented (Bonilla et al., 2021; Cai et al., 2022). Current research suggests that a national standard for psychiatric beds should range between 60 beds per 100,000 population as optimal and 30 beds as a minimum threshold (Jones, 2023). However, many regions fall below even these minimum levels, exacerbating the psychiatrist shortage's impact on mental health services. The ideal state, as described by Aggarwal et al. (2022), envisioned a workforce that met national

standards, with sufficient resources for recruitment, retention, and strategic distribution to bridge existing gaps in both staffing and bed capacity.

Summary of Evidence

The shortage of psychiatrists represents a critical healthcare administration issue. Katayama et al. (2023) highlighted the notable disparities in workforce distribution and access to care, which negatively impact patient outcomes. According to Miller et al. (2022), the COVID-19 pandemic has exacerbated financial challenges within psychiatric services, complicating efforts to address shortages. These financial strains underscore the need for innovative strategies in workforce management to address the impacts of systemic inequities (Hoffmann et al., 2022). Additionally, Ramesh et al. (2023) underscored the implications of limited access to mental health services in areas that lack both broadband and psychiatric care, which highlighted the connection between access issues and adverse mental health outcomes like suicide and overdose. This reinforces the urgency for healthcare systems to adopt comprehensive, innovative solutions to workforce challenges.

Purpose of the Integrative Review

The purpose of this integrative review is to examine the administrative challenges associated with the national psychiatrist shortage and explore strategies that psychiatric hospitals can adopt to recruit, retain, and equitably distribute psychiatrists. By addressing the healthcare administration problem of psychiatrist understaffing, the current integrative review aims to identify practical strategies that healthcare leaders can implement to improve workforce management, hospital efficiency, and patient outcomes, particularly in rural and underserved areas (Bonilla et al., 2021; Morales et al., 2020).

Additionally, this review will consider the impact of social determinants, such as geographic barriers, broadband access limitations, and socioeconomic disparities, on access to mental health services (Donohue et al., 2024; Ku et al., 2021; Miller et al., 2022; Ramesh et al., 2023), highlighting how these factors contribute to disparities in mental health outcomes.

Integrative Review Question

The following review question is key to this integrative review. What administrative strategies are effective for improving the recruitment, retention, and equitable distribution of psychiatrists in psychiatric hospitals, particularly in rural and underserved areas? The causes and implications concerning the psychiatrist workforce shortage in the United States are examined throughout this project.

Theoretical and/or Conceptual Framework

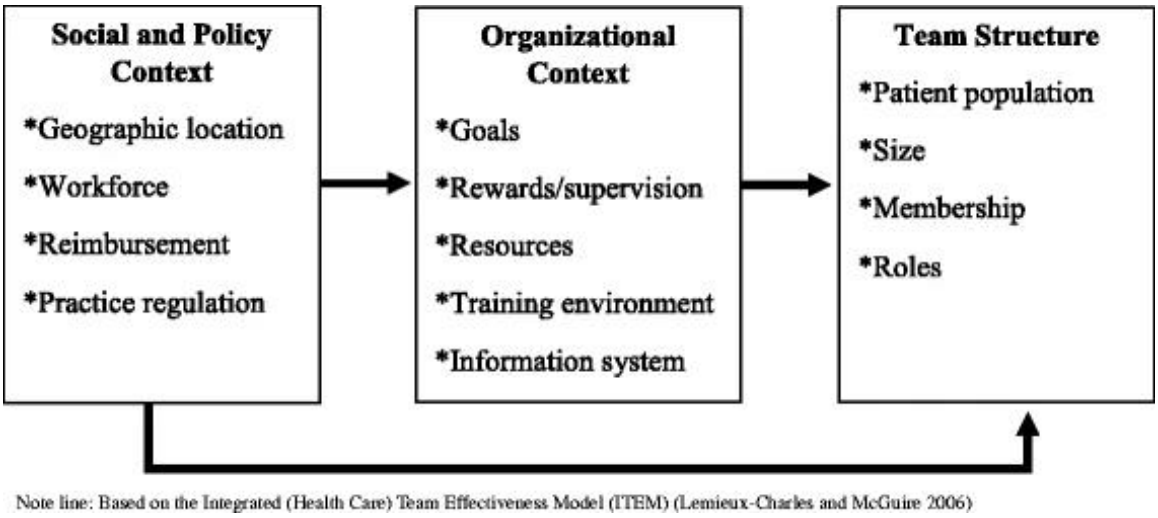
The integrated team effectiveness model (ITEM), originating from organizational psychology, serves as a structured framework for improving team dynamics in healthcare, specifically within psychiatric hospitals facing psychiatrist shortages (Anderson et al., 2021). Contextual factors such as organizational support significantly influence the implementation of team-based care, which is essential in environments marked by resource limitations like rural and underserved areas (Cross, 2018). This model provides a comprehensive approach to examining how administrative strategies can enhance workforce management. Role dedication and collaboration within interprofessional teams are also emphasized as core elements within the ITEM (Rowland et al., 2018).

The ITEM's focus on coordination, mutual trust, and role clarity addresses the challenges posed by psychiatrist understaffing. These components foster effective teamwork, which is crucial under workforce strain, as they help maintain adaptability and resilience in high-stress environments like psychiatric hospitals (Zajac et al., 2021). The ability to adapt to changing conditions is vital for sustaining team performance, which aligns with the ITEM's emphasis on team task design and coordination, enabling team members to continually adjust to meet patient needs efficiently (Anderson et al. 2021). Additionally, the framework's adaptability is particularly beneficial in areas with limited psychiatric resources, reinforcing its relevance to your study's focus on improving service delivery in rural communities (Wang et al., 2023).

The figure from BMC Primary Care (see Figure 1), illustrated how the ITEM conceptualizes the interaction between various contextual inputs and team processes within healthcare settings. This visual framework showcases how social and policy contexts, alongside organizational factors, converge to influence team dynamics through core elements like coordination, mutual trust, and role clarity (Leach et al., 2017). By highlighting the role of these broader contexts, including geographic, socioeconomic, and organizational factors, the figure emphasized how these factors shaped teamwork and impacted healthcare delivery, especially in underserved areas. Furthermore, the visualization reinforces the ITEM's relevance to addressing psychiatrist understaffing by demonstrating how coordinated teamwork can help mitigate the effects of resource limitations. This adaptability is crucial for improving mental health service delivery in rural and underserved communities (Mongelli et al., 2020; Rice et al., 2023).

Figure 1

Visual Portrayal of the ITEM Framework in Healthcare Settings. From "Primary care multidisciplinary teams in practice: A qualitative study," by B. Leach, P. Morgan, J. Strand de Oliveira, et al., 2017, *BMC Family Practice*, *18*(1), Article 115. https://doi.org/10.1186/s12875-017-0701-6. Licensed under CC BY 4.0.



(Leach et al., 2017)

In alignment with these insights, this study leveraged the ITEM to explore team-based administrative strategies that could mitigate psychiatrist understaffing. By focusing on coordination, mutual trust, and role clarity, the ITEM provides a comprehensive approach that supports effective teamwork and makes it well-suited for exploring strategies aimed at mitigating workforce challenges in psychiatric hospitals and through which workforce distribution and stability can be enhanced. Using the ITEM as a framework not only addressed immediate staffing concerns but also supports equitable access to mental health services, essential for improving patient outcomes and achieving broader social change in psychiatric care.

Part 2: Literature Review, Quality Appraisal, and Analysis

Literature Search Strategy

This integrative review aimed to examine how healthcare administrators are addressing the psychiatrist shortage in U.S. psychiatric hospital settings, particularly those located in rural and underserved communities. To support the purpose of the study and align with the guiding framework–the ITEM–I conducted a targeted search to identify research on administrative topics that provide problem-solving strategies related to the review question: What administrative strategies are effective for improving the recruitment, retention, and equitable distribution of psychiatrists in psychiatric hospitals, particularly in rural and underserved areas?

The review focuses on literature published from 2019 to 2024 and draws from a broad set of databases to capture the multidisciplinary nature of healthcare administration. Searches were conducted using PubMed, MEDLINE, PsycINFO, CINAHL Plus with Full Text, ScienceDirect, ProQuest Health & Medical Collection, and EBSCOhost. Google Scholar was also used to identify relevant literature through manual reference checks and citation mining.

Search terms were developed to reflect the administrative nature of the topic. These included: *psychiatrist shortage*, *mental health workforce*, *psychiatric hospital staffing*, *rural healthcare*, *psychiatric provider turnover*, *recruitment and retention strategies*, and *telepsychiatry*. Boolean logic (AND, OR, NOT) was used to structure the queries, while MeSH terms–such as “Mental Health Services,” “Health Workforce,” and “Telemedicine,” were applied where available to improve search precision. Filters were

applied to limit results to peer-reviewed studies published in English, with U.S. relevance, during the five-year target window.

Because literature focused narrowly on psychiatrist shortages within rural psychiatric hospitals was limited, the inclusion criteria were designed with flexibility to capture studies discussing workforce distribution, staffing models, and retention strategies within broader mental health systems. Studies involving psychiatric nurse practitioners or telepsychiatry were also included when they contributed to understanding gaps in psychiatric provider access from an organizational or administrative perspective. Detailed criteria are presented in Table 1, and a complete search log is provided in Appendix B.

Table 1

Inclusion and Exclusion Search Criteria

Inclusion search criteria	Exclusion search criteria
• Published within the last 5 years (2019–2024)	• Published before 2019
• Peer-reviewed scholarly journal articles	• News articles, blogs, opinion pieces
• U.S.-based studies relevant to psychiatric healthcare	• International studies without U.S. relevance
• Focused on administrative strategies/solutions	• Articles focusing only on clinical interventions
• Articles addressing workforce shortages, recruitment, or retention	• Articles without any relation to psychiatrist understaffing
• Applies to inpatient psychiatric hospitals or underserved settings	• Focused only on outpatient or non-hospital settings

Search Process

The initial database searches produced 150 records. Manual techniques, such as reviewing bibliographies of key articles, contributed eight additional studies. After

removing duplicates and screening titles, 100 records remained. Abstract screening was performed using the criteria in Table 1, and 70 articles were excluded for reasons such as narrow clinical focus, lack of administrative content, or irrelevance to psychiatrist workforce challenges in the United States. The remaining 30 articles were retained for full-text review and underwent critical appraisal to ensure alignment with the research purpose. Those sources were then coded for synthesis and are outlined in Appendix D. Because this review relied exclusively on publicly available literature and did not involve human subjects, institutional review board (IRB) approval was not required.

Quality Appraisal

To ensure that only robust and relevant evidence was synthesized, each of the 30 articles selected for this review underwent a structured evaluation using the Johns Hopkins Evidence-Based Practice Research Appraisal Tool (see Appendix C). The appraisal process assessed both the strength and quality of the evidence in relation to the practice-based problem, focusing on psychiatrist understaffing in psychiatric care environments.

In terms of strength of evidence, the final selection included 20 studies rated at Level III, three at Level IV, and seven at Level V. These ratings reflect a balanced representation of study designs, including quantitative analyses, mixed-methods research, and systematic reviews. On the quality scale, 27 studies were rated as high quality, whereas three were categorized as good quality. This distribution reflected that most of the literature used in this review was grounded in methodologically sound and well-documented research, strengthening the reliability of the thematic findings.

All sources were published between 2019 and 2024, ensuring the literature reflects current administrative and workforce challenges facing psychiatric health service organizations. The selected studies span various healthcare delivery settings such as inpatient psychiatric hospitals, telepsychiatry programs, and broader behavioral health systems. Target populations within these studies included psychiatrists, psychiatric mental health nurse practitioners (PMHNPs), hospital administrators, and multidisciplinary care teams involved in psychiatric service delivery.

Each article was assessed not only for methodological integrity but also for its applicability to the conceptual framework of the study, the ITEM. Studies were evaluated for how they addressed dimensions of organizational functioning, such as team dynamics, interprofessional communication, leadership support, and structural strategies that help maintain psychiatric workforce sustainability. The ITEM framework guided the analytic approach by shaping how the literature was selected, evaluated, and synthesized to yield meaningful insights into administrative strategies related to recruitment, retention, and psychiatric workforce model restructuring. Appraisal results directly informed the thematic coding process, presented in Tables 2 and 3. A complete breakdown of appraisal outcomes is available in Appendix C.

Thematic Analysis of Literature

A systematic thematic analysis was conducted to synthesize patterns and administrative insights from the 30 peer-reviewed articles included in this integrative review. Using a structured coding approach, I identified key phrases and recurring concepts across sources to develop initial codes. Among the most frequently identified codes were *psychiatrist recruitment*, *Medicaid/Medicare payment barriers and*

reimbursement, burnout prevention, *telepsychiatry implementation*, *loan repayment initiatives*, and *team training*. These codes were further refined and clustered into five overarching themes, each representing a strategic area of focus within the literature related to psychiatrist understaffing in psychiatric care environments. Each theme includes two clearly defined subthemes grounded in evidence from the selected studies.

Table 2 presents all themes identified during the data extraction and analysis process in Appendix D. These themes represent recurring administrative focus areas across the selected literature and served as the foundation for the final thematic structure summarized in Table 3.

Table 2

All Themes From Appendix D

• Psychiatrist workforce shortages • Pipeline development and early exposure • Rural residency and fellowship funding • Leverage PMHNPs as a stopgap • Loan repayment and recruitment incentives • Burnout and emotional fatigue • Wellness and mental health support programs • Flexible scheduling and hybrid work models	• Leadership development and interdisciplinary training • Onboarding support and role clarity • Digital psychiatry skill-building • Telepsychiatry implementation and platform adoption • Medicare and Medicaid reimbursement gaps • Legislative and infrastructure policy incentives • Access disparities in rural and underserved areas

These themes reflect the administrative focus of this review: Expand Psychiatrist Recruitment, Strengthen Retention and Reduce Turnover, Improve Training and Team Collaboration, Implement Financial and Policy Incentives, and Enhance Telepsychiatry

Access. Each theme comprised clearly defined subthemes and was grounded in empirical evidence from recent literature.

Table 3

Final Themes and Subthemes

Main Themes	Subthemes
Expand Psychiatrist Recruitment	• Strengthen Residency and Fellowship Pathways • Build Workforce Pipeline Programs • Leverage PMHNPs as a Stopgap
Strengthen Retention and Reduce Turnover	• Offer Wellness and Burnout Prevention Programs • Increase Flexible Work Models
Improve Training and Team Collaboration	• Provide Interdisciplinary and Leadership Training • Enhance Onboarding and Role Clarity
Implement Financial and Policy Incentives	• Improve Reimbursement Structures • Enact Legislative Staffing Policies
Enhance Telepsychiatry Access	• Expand Digital Service Use • Train Providers in Telehealth Tools

Reducing turnover and sustaining a stable psychiatric workforce emerged as a central theme across the literature, recognized as essential to the success of long-term recruitment efforts. Multiple studies emphasized that retaining existing staff is both cost-effective and essential for maintaining continuity of care, particularly in high-need or rural psychiatric settings. Research by De Vries et al. (2023), Frogner and Dill (2022), Mahmoud et al. (2021), and Smallwood et al. (2023) emphasized that leadership support, flexible work models, and wellness initiatives are critical to promoting staff stability and sustaining the psychiatric workforce over time. In this way, retention strategies

functioned not only to stabilize current staffing levels but also to support broader administrative efforts aimed at strengthening psychiatric care delivery. Some sources further noted that targeted retention efforts have also become increasingly necessary for PMHNPs due to post-COVID burnout and professional strain (Bruza-Augatis et al., 2024; Cai et al., 2022).

Retention-focused strategies were also prominent across the literature. Mahmoud et al. (2021) and Smallwood et al. (2023) described how addressing emotional fatigue, workload balance, and burnout through structured wellness initiatives and flexible scheduling improved job satisfaction and reduced turnover among psychiatric professionals. These findings aligned with the theme of strengthening retention and reducing turnover, through subthemes such as offering wellness and burnout prevention programs and expanding flexible work models. Together, these strategies supported workforce stability and long-term engagement in psychiatric care settings. Although not the central focus, retention-related strategies that supported both psychiatrists and PMHNPs were described as contributing to the stabilization of psychiatric service delivery, especially in high-demand rural areas (Bruza-Augatis et al., 2024).

To achieve long-term workforce stability, several studies emphasized the importance of early-stage recruitment strategies, particularly those focused on building the psychiatrist pipeline from an early stage and incentivizing provider placement in underserved areas. Arredondo et al. (2023) emphasized that policy-driven incentives, such as federal loan forgiveness, positively impact psychiatrists' willingness to work in rural and underserved areas, whereas Chan et al. (2020) highlighted the importance of location-based residency placements in supporting rural workforce expansion. Similarly,

Chan et al., Dahal et al. (2023), and Henning-Smith et al. (2024) highlighted the value of psychiatric exposure during medical school and rural-based residency placements to expand workforce distribution. Sullivan et al. (2021) and Talley (2023) both further emphasized fellowship expansion as a critical component of strengthening the psychiatric workforce pipeline. Although not designed to replace psychiatrists, PMHNP programs were also occasionally referenced as an adaptive supplement to support psychiatric care capacity in rural locations (Bruza-Augatis et al., 2024; Cai et al., 2022; Donohue et al., 2024).

In addition to preparing future psychiatrists through early education, several studies emphasized the importance of ongoing training and team-based support for those already in practice. These efforts were described as essential for equipping psychiatric staff with the skills, structure, and support needed to remain effective in high-demand settings, and to address turnover and workforce instability. Rowland et al. (2018), Torous et al. (2020), and Wang et al. (2023) highlighted the need for leadership and role clarity training, digital skills development, and interdisciplinary team training, respectively. These findings aligned with the theme of improving training and team collaboration and reinforced the role of continuous development in stabilizing psychiatric care environments. Together, these strategies were consistently presented as essential for workforce integration, staff engagement, and long-term retention in psychiatric hospital settings—core outcomes that the ITEM emphasizes as critical to sustaining high-functioning mental health teams.

In addition to recruitment, retention, and training, financial and policy intervention strategies, particularly the use of financial incentives, were consistently

positioned as foundational administrative tools for stabilizing and expanding the psychiatric workforce. Several studies, such as Arredondo et al. (2023), Henning-Smith et al. (2024), and Noya et al. (2022) highlighted direct compensation mechanisms, including loan repayment programs and rural-specific recruitment bonuses, as strategies to attract psychiatrists to high-need areas. In other cases, financial strategies were embedded within broader policy reforms and legislative policy changes. Buerhaus et al. (2023), Oh et al. (2022), Talley (2023), and Zhu et al. (2023) emphasized the need for those systemic reforms, including improved Medicaid and Medicare reimbursement models, legislative staffing incentives, and policy-driven support for telepsychiatry expansion, to strengthen and sustain the psychiatric workforce over the long term.

These thematic results align with the ITEM, as each theme touches on elements of organizational support, interprofessional communication, and structured leadership as drivers of high-functioning teams, core principles of the framework. Collectively, the evidence from the selected literature reinforces how administrative leadership can directly influence staffing outcomes, optimizing recruitment, retention, and service delivery through both traditional and innovative workforce models aimed at strengthening psychiatric care in vulnerable areas.

Conclusion

This integrative review synthesizes literature on administrative strategies to address psychiatrist understaffing, with a focus on solutions relevant to psychiatric hospitals in rural and underserved areas. The systemic review process includes the search strategy, quality appraisal, and thematic analysis of 30 peer-reviewed studies, resulting in five major themes: Expand Psychiatrist Recruitment, Strengthen Retention and Reduce

Turnover, Improve Training and Team Collaboration, Implement Financial and Policy Incentives, and Enhance Telepsychiatry Access. These thematic findings reflect a blend of traditional and forward-looking strategies that administrators can apply to mitigate workforce shortages and strengthen psychiatric staffing stability. Subthemes are deliberately refined to include only the most actionable administrative focus areas under each theme, reflecting a clear, strategic framework.

Part 3: Presentation of Results and Interpretation of Findings

This section presents the results of the thematic analysis of 30 peer-reviewed studies examining psychiatrist understaffing in psychiatric hospitals, particularly in rural and underserved areas. Findings are structured into five main themes and eleven subthemes, with each theme aligned to the ITEM. Themes reflected distinct areas of administrative action that contribute to workforce stability and access to psychiatric care.

Presentation of Results

Across the literature, key strategies emerged that reflect hospital-, policy-, and workforce-level administrative decisions. The most common areas of focus included increasing recruitment into psychiatry, preventing provider turnover, enhancing team-based infrastructure, implementing financial and legislative incentives, and adopting telepsychiatry to expand reach. Findings confirmed that psychiatrist shortages were not simply the result of clinical supply-demand imbalances, but the product of system-wide administrative gaps that can be mitigated through coordinated planning.

Thematic Concepts Map

Appendix E includes the thematic/concepts map outlining relationships between the five main themes and ten subthemes. The visual map situates each strategy within broader domains of administrative control, showing how recruitment, retention, training, financial policies, and telehealth interact. These interconnected strategies collectively supported a sustainable, equitable psychiatric workforce. This thematic structure allowed for a systematic grouping of solutions that aligned with workforce challenges identified in the literature, including geographic disparities, training pipeline gaps, and retention barriers (Dahal et al., 2023; Henning-Smith et al., 2024). These themes closely reflected

administrative issues raised throughout Part 2, which emphasized that workforce instability stems from misalignment between recruitment practices, training locations, and support infrastructure (Bruza-Augatis et al., 2024; Talley, 2023).

Theoretical Foundation: ITEM

The ITEM provides the framework for interpreting how administrative strategies affect psychiatric workforce outcomes. The ITEM emphasizes team structure, organizational support, communication, and coordination. The themes derived from this review reflected ITEM principles such as shared leadership, role clarity, and collaboration, particularly in high-stress psychiatric environments. The model highlights the importance of organizational support, team cohesion, and role clarity as drivers of effectiveness across complex systems (Rowland et al., 2018). The principles were echoed in Part 2 findings, where administrative initiatives such as structured onboarding, flexible scheduling, and leadership development directly contributed to stronger psychiatric workforce integration and lower turnover (Appleton et al., 2023; Zajac et al., 2021).

Explanation of Themes and Subthemes

The five themes and eleven subthemes are listed below with concise explanations. Each theme highlights a major administrative area that influenced psychiatrist staffing outcomes, whereas subthemes represents actionable strategies supported by the literature.

- **Expand Psychiatrist Recruitment:** This theme emphasizes system-wide strategies to grow the psychiatrist workforce, particularly in rural and underserved communities. Studies emphasized the importance of location-based training, early exposure to psychiatry, and temporary use of PMHNPs

as workforce stabilizers (Arredondo et al., 2023; Chan et al., 2020; Dahal et al., 2023).

  - *Strengthen Residency and Fellowship Pathways:* Expanding rural and underserved training opportunities aligned education with service region needs and increased the likelihood of long-term placement. This ultimately reduced recruitment turnover cycles (Henning-Smith et al., 2024; Talley, 2023).
  - *Build Workforce Pipeline Programs:* Early academic outreach and specialty exposure helped generate long-term interest in psychiatry and ensured a consistent flow of psychiatrists. This decreased gaps from delayed or failed recruitment (Dahal et al., 2023; Sullivan et al., 2021).
  - *Leverage PMHNPs as a Stopgap:* PMHNPs, when well-integrated into teams, provided critical support where psychiatrists were unavailable. This eased staffing workload pressures, prevented burnout, and reduced turnover while maintaining quality (Bruza-Augatis et al., 2024; Cai et al., 2022).

- **Strengthen Retention and Reduce Turnover:** Retention initiatives focused on emotional well-being, workload balance, and structural support were repeatedly linked to improved job satisfaction and workforce longevity (Mahmoud et al., 2023; Summers et al., 2020).
  - *Offer Wellness and Burnout Prevention Programs:* Administrative emotional support infrastructure, like peer programs, leave policies,

and mental health access, was linked to improved job satisfaction, reduced burnout, and higher retention (Frogner & Dill, 2022).

  - *Increase Flexible Work Models:* Remote and hybrid flexibility options improved psychiatrist engagement and reduced stress. These models enhanced work-life balance and empowered psychiatrists to stay in their roles longer, particularly in post-pandemic environments (De Vries et al., 2023; Smallwood et al., 2023).

- **Improve Training and Team Collaboration:** Administrative efforts that fostered clear team roles, structured onboarding, and leadership development were shown to enhance coordination, improve job satisfaction, and reduce early-career turnover (Rowland et al., 2018; Wang et al., 2023).
  - *Provide Interdisciplinary and Leadership Training:* Hospitals with collaborative team-based training and defined leadership roles helped develop provider leadership capacity and reported greater provider engagement and cohesion. They also supported retention by reducing provider isolation, clarifying expectations, and fostering mutual trust and resilience across psychiatric teams–key factors in minimizing turnover in high-stress psychiatric environments (Zajac et al., 2021).
  - *Enhance Onboarding and Role Clarity:* Clear onboarding procedures, such as orientation programs and defined role expectations, improved job satisfaction by reinforcing a sense of purpose within teams. These practices also reduced stress and organizational conflict during

workforce integration, ultimately reducing early-career attrition (Appleton et al., 2023).

- **Implement Financial and Policy Incentives:** Financial strategies and policy alignment, including reimbursement reforms and legislative tools like loan forgiveness, improved workforce equity by reducing geographic and compensation disparities. These measures were strongly associated with improved psychiatrist distribution and retention (Henning-Smith et al., 2024; Zhu et al., 2023).
    - *Improve Reimbursement Structures:* Higher Medicaid and Medicare reimbursement rates supported psychiatrist pay equity and enabled competitive hiring in low-resource hospitals. These improvements directly contributed to rural recruitment by reducing departures driven by financial dissatisfaction or relocation to higher-paying roles (Buerhaus et al., 2023; Zhu et al., 2023).
    - *Enact Legislative Staffing Policies:* Loan forgiveness and state-based incentive programs, particularly those tied to rural service obligations, were among the most effective strategies for attracting and retaining psychiatrists in underserved regions. These policies helped anchor providers in hard-to-staff areas and reduced reliance on repeated recruitment cycles (Buerhaus et al., 2023).
- **Enhance Telepsychiatry Access:** Telepsychiatry served as a dual solution for expanding access and enhancing provider flexibility by enabling remote psychiatric care and reducing reliance on in-person providers. When

supported by administrative readiness–through infrastructure, training, and clinical support–it improved service coverage and provider satisfaction (Gardner et al., 2020; Singh et al., 2022).

- *Expand Digital Service Use:* Virtual platforms supported continuous care delivery in facilities lacking on-site psychiatrists, reduced the burden on in-person staff, and enabled flexible engagement from remote providers. Hospitals using telepsychiatry reported improved patient access and greater staff retention through more balanced workload distribution (Gardner et al., 2020; Singh et al., 2022).
- *Train Providers in Telehealth Tools:* Structured training ensured clinical quality and built provider confidence with digital care models. This reduced stress, disengagement, and turnover caused by technical challenges while improving satisfaction and adoption of telepsychiatry (Torous et al., 2020).

Interpretation of the Findings

Expand Psychiatrist Recruitment

This theme focuses on system-wide administrative strategies to increase psychiatrist workforce capacity, especially in rural and underserved areas. Psychiatrist shortages in these regions were linked to geographic isolation, lack of local training programs, and inadequate financial incentives (Chan et al., 2020; Dahal et al., 2023). Studies emphasized the importance of early recruitment interventions, including medical school exposure and residency placement in underserved regions (Sullivan et al., 2021; Talley, 2023). Additionally, administrators were shown to play a critical role in

developing academic partnerships, coordinating service-linked fellowships, and aligning incentive programs with workforce development strategies (Henning-Smith et al., 2024). The use of PMHNPs as flexible workforce stabilizers further illustrated administrative adaptability in preserving psychiatrist-led care while alleviating service gaps (Bruza-Augatis et al., 2024; Cai et al., 2022). This theme aligns closely with the ITEM framework by demonstrating how coordinated planning, structured incentives, and adaptable team composition can improve recruitment outcomes across systems.

Strengthen Residency and Fellowship Pathways

Studies consistently found that psychiatrists were more likely to practice long-term in areas where they trained, making residency and fellowship location a key administrative lever (Henning-Smith et al., 2024; Talley, 2023). Talley (2023) emphasized that service obligation fellowships offered in underserved regions resulted in longer-lasting placements. Henning-Smith et al. (2024) highlighted the importance of partnerships between hospital systems and academic institutions to create region-specific programs. These programs not only addressed geographic disparities but also allowed hospitals to develop training pipelines tailored to local population needs. The ITEM framework supported these findings by underscoring the importance of strategic role planning and structural integration in high-performing teams.

Build Workforce Pipeline Programs

Studies revealed that interest in psychiatry often developed early, and administrative strategies such as high school outreach, academic mentorships, and shadowing opportunities were shown to increase student interest in psychiatric careers (Dahal et al., 2023; Sullivan et al., 2021). These programs also aligned with rural and

community health values, improving long-term commitment to underserved settings. In addition, institutions that secured funding for early exposure and education reported fewer recruitment delays. By integrating recruitment into the early stages of training, administrators supported long-term sustainability. These practices aligned with the ITEM principle of early role formation and long-term team commitment.

Leverage PMHNPs as a Stopgap

When psychiatrist recruitment efforts failed, many hospitals strategically integrated PMHNPs as temporary workforce solutions to help mitigate the psychiatrist shortage (Bruza-Augatis et al., 2024; Cai et al., 2022). Donohue et al. (2024) found that PMHNPs filled vital roles in HRSA-funded and Medicare-supported care settings, especially in areas where psychiatrists were chronically understaffed. These providers helped alleviate the workload of psychiatrists while maintaining service continuity. However, studies cautioned that clearly defined supervisory structures and role boundaries were necessary to avoid undermining psychiatrist-led care. The integration of PMHNPs demonstrated administrative responsiveness and flexibility, which are core components of the ITEM framework's emphasis on adaptable team structure and role clarity.

Strengthen Retention and Reduce Turnover

This theme addresses how administrative systems could promote psychiatrist well-being and reduce attrition. Retention was identified not simply as an HR issue but as a systemic challenge that required organizational commitment (Mahmoud et al., 2023; Summers et al., 2020). Hospitals that developed robust wellness infrastructure, offered flexible scheduling, and fostered emotional support systems experienced higher retention

rates (Frogner & Dill, 2022). Retention was also shown to be foundational for recruitment, as hospitals with high turnover struggled to attract new staff. The ITEM framework reinforced these findings, highlighting that emotionally safe and stable organizational environments promote team effectiveness, loyalty, and reduced turnover.

Offer Wellness and Burnout Prevention Programs

Mahmoud et al. (2023) found that systemic burnout interventions, such as protected time for rest, wellness check-ins, and peer support networks, led to significant reductions in emotional fatigue. Frogner and Dill (2022) and Summers et al. (2020) reported that hospitals with institutionalized wellness and burnout prevention programs experienced better workforce satisfaction and stronger engagement. These broader organizational initiatives also helped reduce professional disengagement and emotional exhaustion, which are both prevalent and harmful in psychiatric care settings. Administrators who normalized mental health support within organizational culture were better positioned to sustain psychiatrist retention. These outcomes supported the ITEM framework's emphasis on psychological safety and team responsiveness.

Increase Flexible Work Models

Studies revealed that flexibility in work schedules and location contributed to higher psychiatrist satisfaction and long-term workforce participation (De Vries et al., 2023; Smallwood et al., 2023). De Vries et al. (2023) emphasized that psychiatrists were more likely to stay when offered hybrid or remote options post-COVID. Smallwood et al. (2023) found that institutions with rigid scheduling were more likely to face chronic turnover. Flexible scheduling allowed providers to balance family responsibilities, reduce burnout, and remain engaged in care delivery. These administrative adaptations aligned

with the ITEM's recommendation for supporting role autonomy and environmental control.

Improve Training and Team Collaboration

This theme focuses on how structured onboarding, interdisciplinary training, and clearly defined team roles contributed to psychiatrist retention and workforce cohesion. Studies consistently noted that poor onboarding, ambiguous responsibilities, and lack of team integration increased early-career attrition (Appleton et al., 2023; Wang et al., 2023). Effective training programs improved care coordination, job satisfaction, and role stability. The ITEM framework supports this theme by emphasizing the importance of role clarity, team cohesion, and mutual trust in high-functioning health systems.

Provide Interdisciplinary and Leadership Training

Zajac et al. (2021) found that interdisciplinary leadership training enhanced communication, collaboration, and problem-solving across psychiatric teams. Rowland et al. (2018) emphasized that structured leadership development helped reduce hierarchical barriers and built organizational loyalty. These programs empowered psychiatrists to assume leadership responsibilities and provided them with the skills to manage complex care environments. Hospitals that embedded leadership curricula within administrative strategies reported greater provider engagement and lower turnover. These practices directly reflected the ITEM's focus on trust-building and shared responsibility.

Enhance Onboarding and Role Clarity

Studies showed that onboarding strategies that included role shadowing, structured orientation, and team integration significantly reduced staff stress and resignation risk (Appleton et al., 2023; Wang et al., 2023). Appleton et al. (2023)

reported that providers who experienced mentorship-based onboarding were more confident and better aligned with team goals. Wang et al. (2023) found that unclear role expectations led to disorganization and communication breakdowns. These findings emphasized the importance of onboarding as a dynamic, ongoing administrative process. These outcomes directly aligned with the ITEM framework's emphasis on clarity, cohesion, and structured integration.

Implement Financial and Policy Incentives

This theme examines how equitable pay structures and policy-level interventions supported both psychiatrist recruitment and retention. Hospitals located in underserved regions were often unable to offer competitive salaries due to structural funding gaps (Zhu et al., 2023). Studies showed that financial strategies such as loan repayment, increased Medicaid reimbursement, and rural bonuses effectively improved workforce distribution (Buerhaus et al., 2023; Henning-Smith et al., 2024). However, successful implementation of these policies required administrative oversight to ensure provider enrollment and follow-through. The ITEM framework supported these insights by identifying equitable compensation and administrative coordination as central to sustainable health systems.

Improve Reimbursement Structures

Buerhaus et al. (2023) and Zhu et al. (2023) found that improved Medicaid and Medicare reimbursement enabled hospitals to offer competitive compensation and retain psychiatrists. These funding streams supported not only salaries but also infrastructure for leadership training and wellness initiatives. Hospitals with inadequate reimbursement were more likely to cut support programs and face workforce instability. Competitive

reimbursement was also linked to increased job satisfaction and longer service durations. These findings underscored the ITEM's connection between financial stability and role fulfillment.

Enact Legislative Staffing Policies

Loan repayment programs, rural service incentives, and training grants were among the most successful legislative tools for addressing workforce gaps (Arredondo et al., 2023; Henning-Smith et al., 2024). These programs worked best when tied to professional development opportunities and aligned with provider mission values. Administrators played a key role in ensuring access, managing compliance, and integrating these incentives into recruitment plans. Legislative support not only addressed gaps but also promoted retention through career advancement and compensation alignment. These insights reflected the ITEM's focus on structural equity and long-term team investment.

Enhance Telepsychiatry Access

This theme emphasizes the importance of telepsychiatry in extending care to underserved populations while supporting psychiatrist flexibility and retention. Studies found that hospitals implementing telepsychiatry were able to maintain continuity of care, reduce emergency room burden, and allow psychiatrists to serve patients remotely (Gardner et al., 2020; Singh et al., 2022). However, successful implementation depended on administrative readiness, including broadband infrastructure, digital training, and workflow adaptation (Ramesh et al., 2023; Torous et al., 2020). These administrative strategies aligned with the ITEM's principles of technological integration, communication efficiency, and team sustainability.

Expand Digital Service Use

Gardner et al. (2020) and Singh et al. (2022) reported that digital psychiatry services improved geographic reach, optimized provider distribution, and reduced on-site provider strain. Telepsychiatry enabled psychiatrists with caregiving duties or location constraints to maintain practice continuity. Hospitals that invested in digital privacy protocols, interdepartmental coordination, and scheduling systems experienced smoother integration and improved provider satisfaction. These efforts mirrored the ITEM's focus on infrastructure reliability and organizational responsiveness.

Train Providers in Telehealth Tools

Torous et al. (2020) and Ramesh et al. (2023) demonstrated that hospitals offering formal digital training experienced better adoption and lower turnover. Structured onboarding that included telepsychiatry modules, troubleshooting simulations, and team-based communication improved psychiatrist confidence and digital care quality. Hospitals without such support saw increased provider frustration, delays, and attrition. These outcomes confirmed that administrative commitment to training, aligned with the ITEM's emphasis on role clarity and resource adequacy, was essential for telepsychiatry success.

Conclusion

The findings of this integrative review offer a multidimensional perspective on the national psychiatrist shortage, revealing how healthcare administrators can leverage targeted, evidence-based strategies to address recruitment, retention, training, policy, and access disparities. Each theme and subtheme collectively demonstrate that psychiatrist understaffing is not simply a clinical labor gap, it is a systems-level issue rooted in

administrative design, funding inequities, infrastructure deficits, and workforce misalignment. By examining the literature through the lens of the ITEM, the analysis confirms that organizational support, role clarity, shared goals, and structured communication are foundational to successful staffing solutions.

Part 4: Recommendation for Professional Practice and Implications for Social Change

Introduction

This section presents four strategic, evidence-informed recommendations to address psychiatrist understaffing in psychiatric hospitals, particularly in rural and underserved communities. These recommendations synthesize findings from the literature and thematic analysis of peer-reviewed studies, as detailed in Part 2 and Appendix D. They are grounded in the key themes and subthemes identified through the integrative review and visually represented in the final thematic matrix (see Appendix D) and the concept/thematic map (see Appendix E). Each strategy reflects a comprehensive, administrative response to psychiatrist workforce instability, combining actionable insights from healthcare team research and grounded in the ITEM. The role of thematic development is elaborated in the next section.

This thematic foundation is further supported by the theoretical lens used to guide this review. The ITEM framework evaluates how organizational inputs (e.g., leadership, resources), team processes (e.g., communication, trust), and outputs (e.g., performance, satisfaction) influence health team functioning. Psychiatrist shortages threaten team stability, making the ITEM especially relevant. As emphasized in recent studies, effective implementation of solutions depends on shared cognition, leadership adaptability, and role integration–all key to workforce resilience (McGuier et al., 2024; Paganin et al., 2023; Zajac et al., 2021).

Concept/Thematic Map Discussion

The concept/thematic map in Appendix E provides a visual synthesis of the five major themes and subthemes that emerged from the integrative review. Each theme was

developed through iterative coding of the literature, supported by evidence appraised in Appendix D and refined into Table 2 and Table 3. These themes directly shaped the recommendations in this section. For example, the theme "Expand Psychiatrist Recruitment" is represented in Recommendation 1, while "Reduce Burnout and Improve Retention" aligns with Recommendation 2. The map highlights how administrative strategies cluster around workforce development, retention, training, and leadership. By organizing the evidence into a thematic structure, the concept map clarifies how the final strategies address both system-level barriers and team-level needs in psychiatric hospitals.

Recommendations for Professional Practice

Recommendation 1: Expand Pipeline Development and Regionally Aligned Training Models

To build a sustainable psychiatric workforce, it is critical to align training pipelines with regional workforce needs. Programs such as the Rural Psychiatry Track and community-based residency placements have shown that placing residents in rural areas for extended periods results in higher post-training retention in those same areas (Chan et al., 2020). Efforts must also begin upstream by creating partnerships between medical schools and rural communities, ensuring early mentorship, exposure to psychiatry, and incentive-based recruitment. Some programs include dedicated loan repayment or rural-specific fellowship grants to reduce the financial burden that often dissuades psychiatrists from underserved placements (Talley, 2023).

This approach aligns with the ITEM's emphasis on task design and organizational input, ensuring that pipeline programs are not only clinically robust but strategically

located. Zajac et al. (2021) highlighted how structured entry pathways support team consistency and implementation success. McGuier et al. (2024) further showed that training design and task clarity directly contribute to sustained engagement and lower turnover across healthcare teams. Ultimately, as supported by these findings, a comprehensive pipeline approach cultivates familiarity, community integration, and long-term workforce stability. Embedding pre-clinical psychiatry exposure and rural summer externships has shown promise in building early commitment to underserved practice (Chan et al., 2020). To retain psychiatrists trained through these pipelines, organizations must foster emotionally sustainable and supportive environments.

Recommendation 2: Improve Retention Through Organizational Support and Emotional Sustainability

High turnover among psychiatrists is frequently driven by burnout, lack of institutional support, and insufficient team-based resources. Administrators can reduce attrition by embedding retention programs that promote clinician well-being, such as flexible scheduling, reflective supervision, and institutional recognition (Mahmoud et al., 2021; Summers et al., 2020). Additionally, several studies recommend implementing resilience-building workshops, peer support systems, and behavioral health check-ins to create a workplace culture that actively prevents emotional exhaustion (Nöthel et al., 2023). Offering protected time for professional development and manageable caseloads has also been associated with increased retention in psychiatric settings.

The ITEM proposes that emotional and behavioral processes–including psychological safety, trust, and mutual support–are key to retention. Paganin et al. (2023) found that strong leadership feedback loops and shared goals promote team cohesion and

reduce stress-related turnover. Nöthel et al. (2023) demonstrated that team environments marked by adaptive leadership and interpersonal respect were significantly more likely to retain staff. These findings affirm that retention is not only a workforce management issue, but a team systems design issue embedded within the ITEM. Translating these dynamics into consistent, team-based practices is essential to maintaining retention efforts.

To further support retention beyond structural adjustments, team-based emotional support mechanisms can be integrated into routine practice. Retention efforts can also include emotional personal protective equipment (PPE) debriefs and pulse-check surveys, both of which normalize stress communication and flag burnout before escalation (Nöthel et al., 2023). Emotional PPE debriefs are brief, structured sessions held after emotionally intense clinical encounters, offering healthcare staff a psychologically safe space to process stress, validate emotional responses, and receive peer or supervisory support. These debriefs function as "mental armor," helping to normalize emotional workload and reduce burnout risk by promoting shared reflection and timely intervention (Nöthel et al., 2023). To fully reinforce retention strategies, organizations must also prioritize interdisciplinary team training and role integration, which are explored next.

Recommendation 3: Strengthen Interdisciplinary Team Training and Role Integration

Role confusion in psychiatric care settings often leads to inefficiencies and stress (McGuier et al., 2024). Clarifying interdisciplinary roles—particularly among psychiatrists, PMHNPs, and physician associates—and training them in collaborative protocols can improve service delivery and reduce duplicative effort (Zajac et al., 2021).

Specific strategies include team-based onboarding modules, case-based role delineation workshops, and use of shared care plans (McGuier et al., 2024; Zajac et al., 2021). Shadowing programs across roles and simulation-based communication exercises have also been shown to increase clarity and mutual respect in psychiatric settings (McGuier et al., 2024).

The ITEM emphasizes team process alignment, including communication protocols and joint decision-making. McGuier et al. (2024) noted that shared mental models and role clarity were critical predictors of implementation fidelity. Adaptive training modules, such as simulation-based learning and structured shadowing, were particularly effective in building trust and clarifying boundaries. Zajac et al. (2021) confirmed that structured onboarding and consistent feedback are essential for team integration in complex care environments. Ultimately, improved interdisciplinary role integration supports more efficient workflows, minimizes communication breakdowns, and enhances the overall quality of psychiatric care. Quarterly role clarification sessions and interprofessional tabletop exercises have been used effectively in psychiatric hospitals to reinforce boundaries and expectations (McGuier et al., 2024; Zajac et al., 2021). Effective role integration must be supported by leadership models that embrace adaptability and long-term coordination.

Recommendation 4: Leverage Adaptive Leadership and Workforce Coordination to Support Sustainability

Psychiatrist shortages are ultimately a systems-level failure in workforce planning and leadership agility. Effective leaders must respond dynamically by integrating PMHNPs, cross-training staff, and coordinating care teams flexibly to match need and

acuity. Administrators can implement regular interdisciplinary huddles, build dashboards to track staffing load, and establish shared decision-making protocols to better align workforce capacity with patient demand (McGuier et al., 2024; Zajac et al., 2021). Rotational leadership models and mentorship pairings also support ongoing growth and distributed leadership in psychiatric teams (Paganin et al., 2023).

In the ITEM, leadership behaviors serve as a foundational input to adaptive processes. Sott et al. (2025) developed a conceptual framework showing that adaptive leadership behaviors are crucial for guiding teams through crisis and reform. Similarly, Paganin et al. (2023) demonstrated that leadership coordination had a direct impact on reducing staff fatigue and enhancing psychological empowerment. By designing staffing strategies that embrace shared authority and process transparency, administrators can better support both providers and patients (Paganin et al., 2023). This includes investing in middle-level leadership training and succession planning to ensure team resilience under changing demands (Sott et al., 2025). Emerging strategies such as micro-leadership rotations and digital capacity trackers have enabled more fluid team coordination during psychiatrist shortages (Paganin et al., 2023). Taken as a whole, these leadership strategies complete a comprehensive framework to stabilize, strengthen, and sustain the psychiatric workforce.

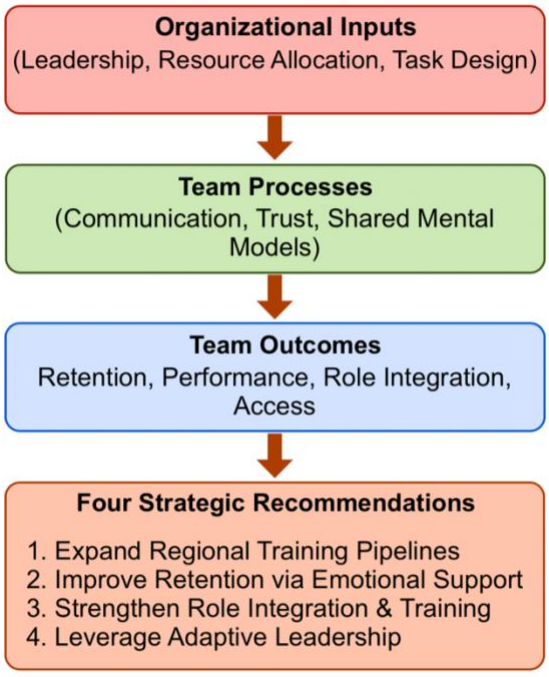
Theoretical Integration Using the ITEM

These recommendations reflect an evidence-based synthesis grounded in the ITEM, which emphasizes the interdependence of organizational inputs, team processes, and team outcomes. The ITEM provided the conceptual infrastructure for linking administrative strategies to performance outcomes in psychiatric hospitals. The model's

core components–leadership support, communication quality, shared mental models, and role integration–enabled a systematic interpretation of findings across diverse settings. This framework also helped distinguish how each strategy leverages or improves key team dynamics such as trust, collaboration, and adaptive leadership, ultimately guiding targeted reforms to address psychiatrist understaffing (see Figure 2).

Figure 2

Using the Integrated Team Effectiveness Model (ITEM) to Address Psychiatrist Understaffing



Note. This model illustrates how organizational inputs and team processes within ITEM drive team outcomes, culminating in the study's four strategic recommendations.

Implications for Social Change

Psychiatrist understaffing disproportionately affects vulnerable populations, including rural residents, low-income communities, and historically marginalized groups.

These disparities are intensified by social determinants of health such as lack of transportation, limited broadband access, and insurance barriers. The four ITEM-based strategies identified in this review–expanding training pipelines, enhancing retention, strengthening team integration, and leveraging adaptive leadership–can reduce these inequities by improving access to psychiatric care and supporting a more stable and diverse behavioral health workforce. By fostering equitable workforce distribution and resilient team-based care models, these recommendations support meaningful social change by enhancing mental health access and organizational responsiveness in underserved communities.

Limitations

This study was limited by the scope and availability of peer-reviewed literature published within the last five years. While a rigorous screening and appraisal process was applied, some relevant studies may have been excluded due to publication lag or limited access. In addition, this review focused solely on administrative strategies within psychiatric hospitals and did not evaluate clinical treatment models or broader mental health policy reforms.

Conclusion

This section outlined four integrated, theory-informed strategies to reduce psychiatrist understaffing: (a) expanding regional training pipelines, (b) improving retention through emotional support systems, (c) strengthening interdisciplinary team integration, and (d) leveraging adaptive leadership to coordinate sustainable care models. These strategies reflect a shift from fragmentary solutions to systemic team redesign using the ITEM. By grounding interventions in team science, psychiatric hospitals can

promote clinician well-being, improve service access, and build more equitable behavioral health systems–particularly in communities that have long faced structural disadvantages.

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Appendix A: DHA Practice-Based Problem Literature Review Matrix

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
Aggarwal et al. (2022)	Psychiatry workforce needs	Addressing psychiatrist shortages in U.S.	Workforce data and trend analysis	Identified critical psychiatrist shortages	Psychiatrist shortage impacts access nationwide	Future research should explore innovative strategies to address mental health workforce shortages.	Administrative focus on staffing models	Yes
Anderson et al. (2021)*	Adaptive teamwork in healthcare	Exploring adaptive teamwork impact	Qualitative study with healthcare teams	ITEM model supports team adaptability	Adaptive teamwork improves care outcomes	Expand research on adaptive team models for healthcare	Use adaptable team frameworks to improve care in diverse settings	Yes
Andrilla et al. (2018)	Supply variation in mental health	Assessing geographic mental health supply	Regional mental health provider analysis	Severe provider gaps in rural areas	Rural areas face significant shortages	Redistributio n strategies for providers	Efforts to address rural mental health deficits	Yes
Bonilla et al. (2021)	Behavioral health workforce model	Examining workforce at HRSA-funded centers	HRSA workforce data review	Staffing deficits linked to service access	HRSA centers require better staffing	Policies for staffing support	HRSA staffing policy adjustments	Yes
Boniol et al. (2022)	Global health workforce equity	Analyzing global workforce distribution disparities	Global workforce review and projections	Global workforce inequity highlighted	Workforce gaps hinder global health equity	Solutions for equitable global workforce	Equity in workforce distribution needed	Yes

Bruza et al. (2024)	Psychiatric workforce analysis	Assessing role of physician assistants in psychiatry	Analysis of healthcare assistant roles	PAs filling psychiatry role gaps	Need for more psychiatric PAs	Increased training of psychiatric PAs	Increase psychiatric PA roles.	Yes
Cai et al. (2022)	Mental health service delivery trends	Trends in service delivery by NPs vs. MDs	Medicare claims data analysis	Shift to NPs in Medicare mental health services	NPs increasingly essential in Medicare services	Support for NP integration in mental health	NPs support service delivery expansion	Yes
Cross (2018)*	Team-based primary care framework	Team-based care factors in primary settings	Scoping review of team-based care	Factors affecting team success in primary care	Successful team-based primary care is complex	Research needed on primary care team structures	Foster structured team-based care in primary care environments	Yes
Donohue et al. (2024)	Financial burden in mental health access	Role of cash market burden on access	Health insurance and cash burden analysis	Burden of cost limits mental health access	High out-of-pocket costs deter treatment	Policies addressing financial access burdens	Address out-of-pocket costs to expand access	Yes
Henning-Smith et al. (2024)	Workforce in rural mental health	Understanding rural practice decisions	Rural workforce trends analysis	Shortage worsens rural mental health care	Incentives needed for rural providers	Approaches to attract rural professionals	Implement rural workforce incentives	Yes
Hoffmann et al. (2022)	Pediatric mental health disparities	Identifying disparities in youth mental health	Pediatric health disparities data analysis	Youth disparities increase due to access limits	Policy needed for youth health equity	Incentives for youth mental health policies	Address youth mental health disparities	Yes
Jones et al. (2023)	Healthcare bed planning	Determining optimal psychiatric bed levels	Hospital bed needs assessment	Shortages indicate need for more psychiatric beds	Benchmarks show need for more psychiatric beds	Assess optimal bed allocations for psychiatry	Guidelines for psychiatric bed availability	Yes
Kalb et al. (2019)	ER visit trends in youth mental health	Examining youth ER mental health visit trends	Youth ER visits data analysis	Increased ER visits reveal outpatient gap	Youth care gaps highlighted by ER trends	Investigate factors influencing	Expand youth outpatient services	Yes

						youth ER visits		
Katayama et al. (2023)	Geospatial workforce in mental health	Mapping mental health workforce disparities	Spatial workforce analysis	Critical shortage areas in U.S.	Severe shortages impact access	Solutions for workforce redistribution	Redistribution policies for psychiatrists	Yes
Ku et al. (2020)	Mental health shortages impact	Exploring shortages and suicide rates	County-level shortage data review	Higher suicide in shortage regions	Mental health services correlate with shortage rates	New models for distribution in mental health	Redistribute mental health resources	Yes
Leach et al. (2017)*	Primary care team effectiveness	Impact of multidisciplinary teams in primary care	Qualitative study in primary care teams	Multidisciplinary teams support underserved populations	Team-based care effective for underserved populations	Explore multidisciplinary team efficacy in primary care	Utilize multidisciplinary teams to support underserved populations	Yes
McBain et al. (2019)	Distribution of child psychiatrists	Distribution and growth of child psychiatry	Analysis of workforce trends in child psychiatry	Child psychiatrist shortage remains critical	Expansion of child psychiatry workforce needed	Address gaps in child psychiatry access	Expand child psychiatry resources	Yes
McBain et al. (2022)	Psychiatric bed shortages	Estimating psychiatric bed shortages	National psychiatric bed demand estimation	High psychiatric bed need remains	Acute psychiatric bed shortage remains	New models for meeting psychiatric demand	Increase psychiatric bed supply	Yes
Miller et al. (2020)	Psychiatric service finance post-COVID	Effect of financing shifts post-COVID	Financial impact analysis on psychiatric services	Service financing gaps affect accessibility	Service accessibility worsened by COVID	Policies for sustainable funding in psychiatry	Funding access in mental health critical	Yes
Mongelli et al. (2020)**	Challenges in underserved mental health	Meeting mental health needs in underserved areas	Review of mental health service data	Resource gaps hinder underserved care	More support for underserved mental health needed	Examine scalable models for underserved mental health services	Increase support for mental health in underserved communities	Yes

Morales et al. (2020)	Rural mental health access	Addressing rural mental health disparities	Review of rural health data disparities	Rural shortages limit access severely	Address rural mental health access gaps	Research on rural mental health supports	Focus on rural mental health gaps	Yes
Mundt et al. (2022)	Psychiatric bed availability	Psychiatric bed availability and mental health outcomes	Analysis of bed occupancy and mental health data	Correlation between bed shortages and mental health outcomes	Insufficient psychiatric beds exacerbate mental health issues	Need for more data on optimal psychiatric bed numbers	Increase bed availability in underserved areas	Yes
O'Reilly et al. (2022)	Psychiatric bed planning	Examining psychiatric bed distribution models	Review of psychiatric bed planning data	Regional bed shortages worsen service access	Need for equitable distribution of psychiatric beds	Future models to enhance psychiatric bed allocation	Implementation of bed allocation strategies	Yes
Oh et al. (2022)	Medicare trends in psychiatry	Trends in Medicare participation among psychiatrists	Medicare claims data review	Decreasing psychiatrist participation in Medicare	Limited access for Medicare patients	Policies to encourage Medicare psychiatrist participation	Increase Medicare acceptance among psychiatrists	Yes
Rameez, S., & Nasir, A. (2023)	Barriers to mental health in primary care (post-COVID)	Barriers to mental health treatment in primary care in low- and middle-income countries	Systematic review of primary care practices	COVID-19 exacerbated existing barriers in accessing mental health services	Addressing barriers to mental health care is essential	Future research should explore scalable solutions for mental health access in primary care, especially in resource-limited settings	Develop strategies to reduce treatment barriers in primary care, with a focus on resource-constrained areas	Yes
Ramesh et al. (2023)	Broadband access and psychiatry	Impact of broadband access on	County-level broadband and	Broadband and psychiatrist	Lack of broadband limits	More research on rural	Expand broadband in	Yes

		mental health services	psychiatry data review	shortages affect rural care	psychiatrist access	broadband and psychiatrist access	underserved areas	
Rice et al. (2023)**	Youth mental health post-COVID	Behavioral health needs of youth post-COVID	Review of pediatric mental health service data	COVID has intensified mental health service gaps through increased demand in youth mental health	COVID-related demand strains youth mental health services	Future research on post-COVID youth mental health impact	Enhance youth mental health resources to meet post-COVID demands	Yes
Rowland et al. (2018)*	Quality improvement in health teams	Evaluating team dynamics in quality improvement	Scoping review of quality improvement teams	Factors in team dynamics affect project success	Effective team dynamics enhance project outcomes	Investigate team dynamics in healthcare quality projects	Implement team dynamic strategies to optimize healthcare projects	Yes
Shim & Starks (2021)	Syndemic theory in mental health	COVID-19 and racism's impact on mental health	Review of COVID and structural racism data	Intersectional issues exacerbate mental health issues	Pandemic and racism worsen mental health disparities	Research on syndemic impacts on mental health	Policies addressing structural health inequities	Yes
Wang et al. (2023)*	Healthcare teamwork in resource-limited areas	Interventions for team functioning in low-resource areas	Qualitative study on healthcare teams in resource-limited areas	Team challenges in low-resource settings	Team function affects care quality in limited-resource settings	Research on interventions for teams in limited-resource areas	Develop team support structures in resource-limited settings	Yes
Zajac et al. (2021)*	Team effectiveness in healthcare	Overcoming teamwork challenges in healthcare	Review of evidence-based teamwork challenges	Evidence-based guidance on healthcare teamwork	Guidelines enhance team effectiveness	Further study on evidence-based guidance for healthcare teamwork	Apply team effectiveness models to boost care quality	Yes

Appendix B: DHA Review Question Search Log

Total 92 articles

Database or location name	Search terms	Results	Notes
NIH	Workforce turnover AND retention AND implementation scholarly articles 2019-2024	7	Wakerman, Pascoe, Onnis, Noya, Veginadu, Hainey, Zemel
NIH	Rural health AND hospitalist AND telemedicine AND scholarly articles 2019-2024	4	Gutierrez (2020 & 2021), Moeckli (Guiterrez also an author)
NIH	Psychiatrist shortage AND financial AND scholarly articles 2019-2024	3	Gardner (telehealth solutions), Miller ($), Sullivan (funding programs)
NIH	Rural retention AND telehealth AND scholarly articles 2019-2024	3	Butzner, Lira, Toll
MEDLINE	Psychiatric AND workforce AND Aggarwal AND scholarly articles 2019-2024	3	Aggarwal, Pheister, Summers
MEDLINE	Health workforce AND medically underserved area AND rural health services AND scholarly articles 2019-2024 (general)	4	Dahal (rural area medical education incentives), Esu (recruitment, retention generally to rural areas), Elma (general physician distribution to rural areas), Russell (rural area education; financial incentives).
MEDLINE	Psychiatric workforce AND workforce shortages AND scholarly articles 2019-2024 (psych)	3	Talley, Adams, Zhu, Arrendondo
MEDLINE	Nurse practitioner AND mental health service delivery AND scholarly articles 2019-2024	6	Yang, Cai, Delaney, Johnson, Fowler, Finley (discussion paper, maybe remove)
MEDLINE	Turnover AND mental health scholarly articles 2019-2024	4	Wu, Sklar, Fukui, Young
Google Scholar	Psychiatric bed shortage AND psychiatric services AND beds AND scholarly articles 2019-2024	4	Drake, Pinals, McBain & O'Reilly (both used in problem articles because had both aspects)

Database or location name	Search terms	Results	Notes
Google Scholar	Mental health services AND access to healthcare AND scholarly articles 2019-2024	2	Jindal, Skovira
NIH	Retaining health care workers AND COVID-19 AND scholarly articles 2019-2024	9	De Vries x2, Poon (global), Frogner (general workforce), Smallwood, Westerhaus (burnout focus; ethics personal narrative), Lee (understanding stress factors), Puri (coping strategies), Cavalcante (policy/management interventions)
NIH	Nurse practitioner AND psychiatrist shortage scholarly articles 2019-2024	2	O'Reilly, Richmond (both authors showing up again)
Google Scholar	Mental health nursing practitioners AND Muench AND scholarly articles 2019-2024	3	Muench (NPs), Oh (financial), Kepley
Google Scholar	Psychiatry AND residency training AND rural AND United States AND scholarly articles 2019-2024	12	Killough, Aggarwal (I-IV)[one has Brenner as first author], Chan, Guerrero, Hawes, Bojdani, Cowan, Rana, Summers (again), Domino
Google Scholar	Telepsychiatry AND mental health workforce AND implementation AND training AND rural AND access to care AND burnout AND job satisfaction AND scholarly articles 2019-2024	5	Appleton, Mahmoud_ensuring, Mahmoud_evaluating, Mahmoud_overcoming, Mahmoud_planning
NIH	Rural health services AND psychiatry AND education AND Meyer AND scholarly articles 2019-2024 AND RN workload best practices nursing homes AND/OR long term care	1	Meyer

Appendix C: DHA Appraisal Results Log

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Noya et al. (2022). Strategies to facilitate improved recruitment, development, and retention of the rural workforce.	Level III, High Quality	Rural workforce, research domain: recruitment and retention strategies	Highlights barriers and solutions for rural healthcare workforce retention.	Survey and case data. Quantitative	Focuses broadly on rural healthcare
O'Reilly et al. (2019). Observed outcomes: An approach to calculate the optimum number of psychiatric beds.	Level III, High Quality	Psychiatric bed shortages, research domain: workforce gaps	Calculates optimal psychiatric bed numbers based on workforce availability.	Bed capacity metrics. Mixed methods	Limited generalizability
Richmond et al. (2021). American Association for Emergency Psychiatry recommendations to address psychiatric staff shortages in emergency settings.	Level III, High Quality	Emergency psychiatry, research domain: workforce optimization	Recommends optimizing clinician roles to address staffing shortages.	Staffing optimization metrics. Mixed methods	Focus on emergency settings
McBain et al. (2022). Estimating psychiatric bed shortages in the U.S.	Level III, High Quality	Psychiatric staffing levels tied to bed shortages	Addresses bed shortages and links them to psychiatrist staffing deficits.	Psychiatric bed utilization data. Mixed methods	Focused on U.S. settings

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Young et al. (2022). Turnover and retention strategies among mental health workers: COVID-19 challenges.	Level III, High Quality	Retention strategies amidst COVID-19 challenges	Identifies strategies to mitigate turnover exacerbated by the pandemic.	Turnover and retention rates. Qualitative	Focused on pandemic-era challenges
De Vries et al. (2023). The race to retain healthcare workers: A systematic review on factors that impact retention of nurses and physicians in hospitals.	Level III, High Quality	Comprehensive review on healthcare retention strategies. Research domain: workforce management	Examines retention strategies applicable across mental health settings and examines interventions that address burnout in healthcare settings.	Systematic review outcomes/ Systematic review of organizational factors affecting turnover. Mixed methods	Broad focus on healthcare retention, not psychiatry-specific
Summers-Gabr (2020). Rural–urban mental health disparities in the United States during COVID-19.	Level IV, High Quality	Education-related inequities in rural mental health	Highlights disparities in mental health education access during the pandemic.	Educational access metrics. Qualitative	Limited to rural settings
Summers et al. (2020). Well-being, burnout, and depression among North American psychiatrists: The state of our profession.	Level III, High Quality	Prevalence and effects of burnout. Psychiatrist burnout, research domain: workforce well-being	Identifies key factors contributing to burnout in psychiatry. Identifies high rates of burnout and depression among psychiatrists.	Burnout prevalence metrics. Survey-based metrics. Quantitative	Broad psychiatry focus. Regional focus on North America

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Smallwood et al. (2023). Burn-out in the health workforce during the COVID-19 pandemic: Opportunities for workplace and leadership approaches to improve well-being.	Level IV, High Quality	Burnout in healthcare workers, research domain: workforce resilience	Proposes leadership strategies to mitigate burnout during crises.	Case studies. Qualitative	Broad healthcare scope
Frogner & Dill (2022). Tracking turnover among health care workers during the COVID-19 pandemic: A cross-sectional study.	Level III, High Quality	COVID-19-related turnover, research domain: workforce stability	Links pandemic stressors to increased turnover among healthcare workers.	Workforce turnover data. Quantitative	Focuses broadly on healthcare
Yang et al. (2017). Nurse practitioner independent practice authority and mental health service delivery in U.S. community health centers.	Level III, High Quality	NP practice authority, research domain: workforce augmentation	Demonstrates how NP authority improves access in underserved areas.	Medicaid participation trends. Quantitative	Focus on NPs, not psychiatrists
Cai et al. (2022). Trends in mental health care delivery by psychiatrists and nurse practitioners.	Level III, High Quality	Psychiatrist workload, research domain: workforce gap solutions	Highlights growing reliance on NPs in mental health care delivery.	Medicare claims analysis. Quantitative	Data limited to Medicare patients

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Delaney & Vanderhoef (2019). The psychiatric mental health advanced practice registered nurse workforce: Charting the future.	Level III, High Quality	NP workforce growth, research domain: workforce retention	Addresses retention challenges for PMHNPs in underserved settings.	Workforce growth data. Qualitative	NP-focused, limited psychiatrist data
Talley et al. (2023). Addressing psychiatric workforce shortages: The role of advanced practice psychiatric nurses and physician assistants.	Level IV, High Quality	Telepsychiatry, research domain: community mental health. Role of PMHNPs, research domain: workforce collaboration	Explores challenges and solutions for telepsychiatry in community mental health settings. Emphasizes the importance of collaboration and policy reforms.	Policy analysis. Community health outcomes. Qualitative	Focus on NPs, less on psychiatrists. Regional focus
Buerhaus et al. (2023). Toward a stronger post-pandemic nursing workforce.	Level V, Good Quality	Workforce recovery, research domain: post-COVID workforce resilience	Highlights systemic challenges in nursing, with implications for psychiatry.	Policy discussion. Qualitative	Broad healthcare focus
Dahal et al. (2023). The effect of rural underserved opportunities program participation on medical graduates' decision to work in rural areas.	Level III, High Quality	Educational programs for rural practice	Evaluates rural programs' impact on graduate practice in underserved areas.	Graduate placement rates. Quantitative	Focused on medical graduates

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Elma et al. (2022). Medical education interventions influencing physician distribution into underserved communities: A scoping review.	Level V, High Quality	Effectiveness of targeted education strategies	Analyzes the role of education interventions in increasing rural workforce participation.	Participation metrics. Mixed methods	Generalized focus on underserved communities
Torous et al. (2020). Digital mental health and COVID-19: Using technology today to accelerate the curve on access and quality tomorrow.	Level V, Good Quality	Training and equity challenges in digital health	Discusses equity and training-related barriers in adopting digital mental health tools.	Training outcomes metrics. Qualitative	COVID-specific context
Russell et al. (2021). Interventions for health workforce retention in rural and remote areas: A systematic review.	Level III, High Quality	Workforce retention in rural areas, research domain: operational performance	Reviews evidence-based retention strategies for rural health workers.	Policy analysis and intervention outcomes. Quantitative	Broad scope, not psychiatry-specific
Chan et al. (2020). Starting rural psychiatric residencies: A case report and lessons learned.	Level V, Good Quality	Educational programs addressing rural psychiatry shortages. Rural residency programs, research domain: workforce distribution	Explores the implementation and outcomes of rural psychiatry residency programs. Explores strategies for establishing rural residencies to address shortages.	Residency training outcomes. Residency funding metrics. Mixed methods	Focused on case-specific insights, so limits Case-study limits generalizability

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Henning-Smith et al. (2024). Decisions to practice in rural areas among mental health care professionals.	Level III, High Quality	Recruitment/retention in rural areas. Mental health workforce retention, research domain: rural staffing	Explores factors influencing decisions to practice in rural settings. Identifies financial incentives and loan forgiveness as key strategies.	Workforce distribution metrics. Quantitative analysis	Focus on rural areas may limit broader applicability. Focuses broadly on mental health
Oh et al. (2022). Trends in participation in Medicare among psychiatrists and psychiatric mental health nurse practitioners.	Level III, High Quality	Financial barriers in healthcare access	Highlights financial barriers to mental health care due to Medicare trends.	Participation rates in Medicare. Quantitative	Limited focus on Medicare
Sullivan et al. (2021). Addressing national workforce shortages by funding child psychiatry access programs.	Level III, Good Quality	Challenges in funding access programs	Examines sustainability challenges in funding access programs.	Funding allocation metrics. Mixed methods	Child psychiatry-specific
Zhu et al. (2023). Medicaid reimbursement for psychiatric services: Comparisons across states and with Medicare.	Level III, High Quality	Financial disparities in Medicaid and Medicare	Examines state-level disparities in reimbursement rates for psychiatric services.	Medicaid reimbursement rates. Quantitative	Focused on U.S. Medicaid data

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Arredondo et al. (2023). Current programs and incentives to overcome rural physician shortages in the United States: A narrative review.	Level III, High Quality	Physician shortage programs, research domain: financial incentives	Evaluates loan repayment and J-1 visa waivers for rural recruitment.	Program participation data. Qualitative	Focus on physicians, not psychiatrists
Gardner et al. (2020). Remote telepsychiatry workforce: A solution to psychiatry's workforce issues.	Level V, High Quality	Proposes telepsychiatry as a scalable solution. Research domain: scalable workforce solutions	Proposes remote telepsychiatry as a strategy to mitigate psychiatrist shortages in underserved areas.	Telepsychiatry usage metrics. Case study data. Quantitative	Regional focus. Focused on remote solutions
Appleton et al. (2023). Implementation strategies for telemental health: A systematic review.	Level III, High Quality	Systematic review of telehealth solutions. Telepsychiatry, research domain: implementation strategies	Reviews implementation strategies for scaling telehealth adoption in underserved communities/to improve telepsychiatry adoption.	Implementation success metrics/Implementation framework analysis. Mixed methods	Broad telehealth focus
Bojdani et al. (2020). COVID-19 pandemic: impact on psychiatric care in the United States.	Level V, High Quality	Pandemic effects on psychiatry, research domain: workforce adaptations	Explores workforce strain and increased telepsychiatry demand during COVID-19.	Pandemic response metrics. Qualitative, Mixed methods	COVID-19 focus may limit broader applicability

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Singh et al. (2022). Telemedicine during COVID-19 crisis and in post-pandemic/post-vaccine world: historical overview, current utilization, and innovative practices to increase utilization.	Level V, High Quality	Workforce challenges tied to telemedicine costs. Telemedicine trends, research domain: digital health solutions	Analyzes workforce challenges and financial implications of telemedicine implementation. Analyzes trends in telemedicine use and proposes strategies for sustainability.	Telemedicine adoption rates. Utilization data. Mixed methods	Pandemic-specific focus. Limited psychiatry-specific insights
Mahmoud et al. (2021). Evaluating a multicomponent strategy to address burnout, job engagement, and job satisfaction among telepsychiatrists.	Level III, High Quality	Prevention strategies in telepsychiatry. Telepsychiatry workforce, research domain: workforce well-being	Explores strategies to mitigate/prevent burnout in telepsychiatrists.	Burnout prevention metrics. Mixed methods	Focused on telepsychiatry

Appendix D: DHA Thematic Analysis Results

Author(s) and date	Data extracted	Initial codes	Preliminary themes
Noya, F., Carr, S., Freeman, K., Thompson, S., & Baker, J. (2022)	Barriers and solutions for rural healthcare workforce retention	Increase financial incentives for psychiatrist retention in rural areas.	- Offer Recruitment Incentives - Improve Reimbursement Models - Expand Psychiatrist Workforce
O'Reilly, R., Allison, S., & Bastiampiallai, T. (2019).	Optimal psychiatric bed numbers based on workforce availability.	Improve workforce planning based on optimal bed capacity models.	- Expand Flexible Work Options - Reduce Burnout - Fund Rural Training Programs
Richmond, J. S., Dragatsi, D., Stiebel, V., Rozel, J. S., & Rasimas, J. J. (2021).	Staffing optimization strategies for emergency psychiatry settings.	Redefine psychiatric staffing models to maximize efficiency.	- Expand Flexible Work Options - Reduce Burnout - Provide Leadership and Team Training
McBain, R. K., Cantor, J. H., & Eberhart, N. K. (2022).	Links between psychiatric bed shortages and psychiatrist staffing deficits.	Expand psychiatrist recruitment efforts to meet workforce gaps.	- Expand Psychiatrist Workforce - Strengthen Pipeline Programs
Young, D. L. (2022).	Turnover mitigation strategies amidst COVID-19 challenges.	Enhance retention strategies targeting pandemic-related turnover.	- Reduce Burnout
De Vries, N., Lavreysen, O., Boone, A., Bouman, J., Szemik, S., Baranski, K., Godderis, L., & De Winter, P. (2023).	Comprehensive review of healthcare retention strategies.	Implement systemic retention policies across mental health settings.	- Reduce Burnout - Expand Flexible Work Options - Address Rural Access Barriers
Summers-Gabr, N. M. (2020).	Mental health disparities in rural vs. urban areas during COVID-19.	Expand mental health access in rural areas through strategic interventions.	- Expand Psychiatrist Workforce - Address Rural Access Barriers

Author(s) and date	Data extracted	Initial codes	Preliminary themes
Summers, R. F., Gorrindo, T., Hwang, S., Aggarwal, R., & Guille, C. (2020).	Psychiatrist burnout rates and workforce well-being.	Develop burnout prevention programs for psychiatric professionals.	- Support Staff Wellness - Reduce Burnout - Provide Leadership and Team Training
Smallwood, N., et al. (2023).	Leadership strategies to mitigate burnout in healthcare.	Introduce leadership-based workforce well-being initiatives.	- Reduce Burnout - Provide Leadership and Team Training
Frogner, B. K., & Dill, J. S. (2022).	Pandemic-related workforce turnover in healthcare.	Address pandemic-induced turnover with long-term workforce stability plans.	- Expand Psychiatrist Workforce - Expand Flexible Work Options
Rowland et al. (2018)	Team dynamics and quality improvement in healthcare settings	Role clarity, team collaboration, structured team processes	- Improve Onboarding and Role Clarity - Provide Leadership and Team Training
Yang, B. K., Trinkoff, A. M., Zito, J. M., Burcu, M., Safer, D. J., Storr, C. L., Johantgen, M. E., & Idzik, S. (2017).	Expanding NP authority to improve mental health access.	Broaden NP independent practice authority for psychiatric care.	- Expand Psychiatrist Workforce - Provide Leadership and Team Training - Improve Onboarding and Role Clarity
Cai, A., Mehrotra, A., Busch, A. B., Huskamp, H. A., Barnett, M. L., & Germack, H. D. (2022).	Reliance on NPs in psychiatric care delivery.	Optimize role integration between psychiatrists and NPs.	- Expand Psychiatrist Workforce - Improve Reimbursement Models - Provide Leadership and Team Training
Delaney, K. R., & Vanderhoef, D. (2019).	Retention challenges for PMHNPs in underserved settings.	Develop structured retention programs for psychiatric nurse practitioners.	- Expand Psychiatrist Workforce - Reduce Burnout

Author(s) and date	Data extracted	Initial codes	Preliminary themes
Talley, R. M. (2023).	Telepsychiatry expansion and workforce augmentation strategies.	Leverage telepsychiatry to supplement psychiatrist shortages.	- Train in Telehealth Tools - Expand Telepsychiatry Services - Address Rural Access Barriers - Fund Rural Training Programs ~(pre-work EDU)
Buerhaus, P., Fraher, E., Frogner, B., Buntin, M., O'Reilly-Jacob, M., & Clarke, S. (2023).	Workforce recovery post-COVID and staffing strategies.	Strengthen workforce resilience through post-pandemic recovery policies.	- Expand Psychiatrist Workforce - Provide Leadership and Team Training - Enact Staffing Policy Incentives
Dahal, A., Kardonsky, K., Cunningham, M., Evans, D. V., & Keys, T. (2023).	Medical education programs and rural workforce placement.	Expand rural-focused medical education to boost psychiatrist recruitment.	- Fund Rural Training Programs ~(pre-work EDU) - Expand Psychiatrist Workforce - Strengthen Pipeline Programs
Elma, A., Nasser, M., Yang, L., Chang, I., Bakker, D., & Grierson, L. (2022).	Effectiveness of physician distribution interventions in underserved areas.	Enhance physician distribution programs for equitable mental health access.	- Address Rural Access Barriers - Enact Staffing Policy Incentives
Torous, J., Jän Myrick, K., Rauseo-Ricupero, N., & Firth, J. (2020).	Digital health barriers and training needs in psychiatry.	Increase digital health training and support for psychiatric professionals.	- Train in Telehealth Tools ~ ~(post-hire training) - Provide Leadership and Team Training
Russell, D. J., Zhao, Y., Guthridge, S., Ramjan, M., & Jones, M. P. (2021).	Retention strategies for rural healthcare workers.	Adopt evidence-based workforce retention strategies in rural settings.	- Expand Psychiatrist Workforce - Reduce Burnout - Offer Recruitment Incentives

Author(s) and date	Data extracted	Initial codes	Preliminary themes
Chan, C. H., Gouthro, R., Krall, E., & Lehrmann, J. (2020).	Rural psychiatric residency programs as a staffing solution.	Establish sustainable rural psychiatric residency programs.	- Strengthen Pipeline Programs~ - Fund Rural Training Programs ~ ~(pre-work EDU) - Expand Psychiatrist Workforce
Henning-Smith, C., Fritsma, T., Olson, A. P. J., Woldegerima, S., & MacDougall, H. (2024).	Factors influencing mental health professionals' decision to work in rural areas.	Develop targeted recruitment and incentive programs for rural mental health workforce.	- Offer Recruitment Incentives - Expand Psychiatrist Workforce
Oh S., McDowell A., Benson N.M., Cook B.L., Fung V. (2022).	Trends in Medicare participation among psychiatrists and PMHNPs.	Analyze Medicare reimbursement policies to incentivize psychiatrist retention.	- Improve Reimbursement Models - Enact Staffing Policy Incentives
Sullivan, K., George, P., & Horowitz, K. (2021).	Funding child psychiatry access programs to address workforce shortages.	Increase federal and state funding for child psychiatry workforce development.	- Expand Psychiatrist Workforce - Fund Rural Training Programs ~ ~(pre-work EDU)
Zhu, J. M., Renfro, S., Watson, K., Deshmukh, A., & McConnell, K. J. (2023).	Medicaid reimbursement disparities for psychiatric services across states.	Standardize Medicaid reimbursement rates for psychiatric services.	- Improve Reimbursement Models - Enact Staffing Policy Incentives
Arredondo, K., Touchett, H. N., Khan, S., Vincenti, M., & Watts, B. V. (2023).	Incentive programs and initiatives to mitigate rural physician shortages.	Enhance financial incentives and loan forgiveness programs for rural psychiatrists.	- Offer Recruitment Incentives - Expand Psychiatrist Workforce
Gardner, J. S., Plaven, B. E., Yellowlees, P., & Shore, J. H. (2020).	Remote telepsychiatry as a workforce solution for psychiatric shortages.	Expand remote telepsychiatry to supplement psychiatrist shortages.	- Expand Telepsychiatry Services - Train in Telehealth Tools - Address Rural Access Barriers

Author(s) and date	Data extracted	Initial codes	Preliminary themes
Appleton, R., Barnett, P., Vera San Juan, N., Tuudah, E., Lyons, N., Parker, J., Roxburgh, E., Spyridonidis, S., Tamworth, M., Worden, M., Yilmaz, M., Sevdalis, N., Lloyd-Evans, B., Needle, J. J., & Johnson, S. (2023).	Implementation strategies for telemental health expansion.	Develop structured implementation models for telemental health adoption.	- Expand Telepsychiatry Services - Train in Telehealth Tools - Address Rural Access Barriers
Bojdani, E., Rajagopalan, A., Chen, A., Gearin, P., Olcott, W., Shankar, V., Cloutier, A., Solomon, H., Naqvi, N. Z., Batty, N., Festin, F. E. D., Tahera, D., Chang, G., & DeLisi, L. E. (2020).	Impact of COVID-19 on psychiatric care services in the U.S.	Strengthen psychiatric service resilience during public health crises.	- Expand Telepsychiatry Workforce - Reduce Burnout - Expand Flexible Work Options
Singh, J., Albertson, A., & Sillerud, B. (2022).	Historical overview and innovations to sustain telemedicine post-COVID.	Integrate long-term telemedicine solutions to sustain psychiatric care access.	- Expand Telepsychiatry Services - Train in Telehealth Tools - Address Rural Access Barriers
Mahmoud, H., Naal, H., & Mitchell, B. (2021).	Strategies to mitigate burnout among telepsychiatrists.	Implement targeted interventions to reduce burnout in telepsychiatry.	- Support Staff Wellness - Provide Leadership and Team Training - Reduce Burnout
Wang et al. (2023)	Factors influencing the functioning of healthcare teams in low-resource settings	Interdisciplinary team readiness, communication, training in constrained environments.	- Provide Leadership and Team Training ~(post-hire training) - Improve Onboarding and Role Clarity

Appendix E: Final Concept/Thematic Map