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Physician-led Mental Health Interventions To Reduce Opioid Related Mortality And Morbidity In Underserved Populations In The US

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Abstract

Background: Opioid - related morbidity and mortality disproportionately affect underserved populations in the United States, reflecting gaps in access to coordinated mental health and substance use care. While integrated care models have gained attention, the specific role of physician - led mental health interventions in mitigating opioid - related harm across underserved settings has not been comprehensively synthesized. **Methodology:** This mixed-methods scoping review followed PRISMA-ScR guidelines to examine physician-led mental health interventions and opioid outcomes in underserved US populations. We systematically searched electronic databases and grey literature for interventional, observational, and implementation studies published 2000–2025. Data were extracted on intervention types, physician roles, and clinical outcomes, followed by a narrative synthesis. **Results:** Physician-led integrated care significantly reduced opioid misuse, overdoses, and hospitalizations while improving treatment retention and mental health symptoms. Longitudinal data showed trends toward reduced mortality. These interventions mitigated access disparities in underserved regions by addressing specialist shortages. Despite implementation challenges like reimbursement and workforce constraints, team-based models and integrated workflows proved essential for sustainable delivery and reduced healthcare utilization. **Conclusion:** Physician-led integrated care improves access, coordination, and outcomes for underserved populations, addressing workforce shortages and promoting sustainable responses to the opioid crisis.

Keywords: *mental health, physician-led, substance use, opioid*

Introduction

The opioid epidemic remains one of the most persistent and devastating public health crises in the United States, accounting for more than 100,000 overdose deaths annually in recent years, with opioids implicated in the majority of cases [1][2]. While the crisis affects individuals across all socioeconomic strata, its burden is disproportionately concentrated among underserved populations, including racial and ethnic minorities, rural communities, individuals experiencing homelessness, and those with limited access to healthcare services [3–5]. These disparities are driven by structural inequities such as poverty, fragmented healthcare systems, inadequate mental health resources, and longstanding mistrust of medical institutions, all of which amplify vulnerability to opioid-related morbidity and mortality [6][7].

Mental health disorders, particularly depression, anxiety, post-traumatic stress disorder, and severe mental illness, are strongly associated with opioid misuse and overdose risk [8][9]. Co- occurring mental health conditions increase the likelihood of initiating opioid use, transitioning to opioid use disorder (OUD), and experiencing relapse or fatal overdose [10]. Despite this well-established relationship, mental health care remains siloed from substance use treatment in many settings, especially in underserved communities where psychiatric services are scarce and wait times are prolonged [11][12]. As a result, individuals often receive episodic, crisis-driven care rather than sustained, preventive mental health interventions that could mitigate opioid-related harm.

Physicians occupy a uniquely influential position in addressing this gap through physician-led mental health interventions that integrate behavioural health care into routine medical practice. These interventions encompass a broad range of strategies, including screening and early identification of mental health disorders, brief psychotherapeutic interventions, collaborative care models, medication-assisted treatment for OUD combined with psychiatric management, and longitudinal follow-up within primary care or community-based settings [13–15]. Evidence suggests that physician-led models, particularly when embedded in primary care, improve treatment engagement, reduce stigma, and enhance continuity of care compared with referral-based approaches alone [16].

In underserved populations, physician leadership is especially critical due to workforce shortages and limited availability of mental health specialists. Primary care physicians and hospital-based clinicians often serve as the first—and sometimes only—point of contact for individuals with both mental health needs and opioid exposure [17]. When equipped with appropriate training, institutional support, and multidisciplinary collaboration, physicians can deliver scalable mental health interventions that address upstream psychological drivers of opioid misuse while simultaneously managing physical comorbidities [18]. Importantly, physician-led approaches may also foster trust, improve adherence, and reduce disparities by providing culturally responsive care within familiar healthcare environments [19].

This growing body of evidence underscores the need to systematically examine physician-led mental health interventions as a strategy to reduce opioid-related morbidity and mortality in underserved US populations. Understanding the effectiveness, implementation challenges, and equity implications of these interventions is essential for informing policy, optimizing clinical practice, and advancing comprehensive, patient-centered solutions to the opioid crisis [20]. Finally, in line with best practices for scientific integrity and the responsible integration of digital tools in research, we acknowledge the TITAN Guidelines 2025 for transparency in the reporting of artificial intelligence while noting that no generative AI tools were used in the preparation of this work [21].

Methodology

This study employed a mixed – methods scoping review and narrative synthesis to evaluate physician – led mental health interventions aimed at reducing opioid – related morbidity and mortality among underserved populations in the United States. A scoping approach was selected to capture the breadth and heterogeneity of existing evidence, given the diversity of intervention models, care settings, outcome measures, and population characteristics described in the literature [1][2]. The review followed established methodological guidance for scoping reviews, A thorough literature search was conducted across multiple electronic databases, including PubMed/MEDLINE, Embase, PsycINFO, CINAHL, and Web of Science, from January 2000 to March 2025. Grey literature was also searched using Google Scholar, government and institutional websites (e.g., CDC, SAMHSA, HRSA), and reference lists of relevant studies to identify policy reports and implementation studies not indexed in traditional databases [4]. Search terms combined controlled vocabulary and free – text keywords related to opioids (e.g., "opioid use disorder," "overdose," "opioid-related mortality"), mental health interventions (e.g., "collaborative care," "integrated behavioral health," "psychiatric management"), physician leadership (e.g., "physician- led," "primary care- based"), and underserved populations (e.g., "health disparities," "rural," "minority populations") [5]. Eligible studies included randomized controlled trials, quasi – experimental studies, cohort studies, cross – sectional analyses, and high – quality implementation or program evaluation reports conducted in US settings. Studies were included if they examined physician – led or physician – integrated mental health interventions targeting individuals with opioid exposure or opioid use disorder and reported outcomes related to opioid use, overdose, treatment engagement, mental health outcomes, or healthcare utilization. Articles focusing exclusively on non – physician–led interventions or conducted outside the United States were excluded.

Data Extraction and Synthesis

Two reviewers independently screened titles and abstracts for eligibility, followed by full – text review of potentially relevant articles; disagreements were resolved through discussion and consensus. The screening and selection process is detailed in the PRISMA flow diagram (Figure 1). Data were extracted using a standardized form capturing study characteristics (year, setting, population), intervention components, physician roles, mental health modalities employed, outcome measures, and key findings [6]. Particular attention was given to how interventions were adapted for underserved populations, including considerations of access, cultural responsiveness, and structural barriers to care.

Given the heterogeneity of study designs and outcome measures, quantitative meta – analysis was not performed. Instead, a narrative synthesis approach was used to summarize findings across studies, identify recurring intervention models, and explore patterns of effectiveness and implementation challenges [7]. Outcomes were grouped into domains, including opioid – related morbidity and mortality, mental health symptom burden, treatment retention, healthcare utilization, and equity – related impacts. Where available, contextual factors such as workforce constraints, reimbursement structures, and policy environments were examined to assess scalability and sustainability [8].

To enhance rigor, the methodological quality and risk of bias of included interventional studies were appraised using appropriate tools based on study design, including the Cochrane Risk of Bias tool and the ROBINS – I framework [9][10]. While studies were not excluded based on quality alone, appraisal findings were used to contextualize the strength of the evidence and to inform interpretation of the results. This integrative methodological approach enabled a comprehensive assessment of physician – led mental health interventions and their potential role in mitigating opioid – related harm in underserved US populations.

Results

The database and grey literature search yielded a total of 1,247 records. After removal of duplicates, 935 titles and abstracts were screened, of which 118 articles underwent full - text review. Following application of inclusion and exclusion criteria, 30 studies were included in the final synthesis. The study selection process is summarized in the PRISMA flow diagram (Figure 1).

Figure 1. PRISMA flow diagram illustrating the study selection process for physician-led mental health interventions addressing opioid-related morbidity and mortality in underserved U.S populations.

Study Selection and Characteristics:

Table 1: Characteristics of Studies Included in the Scoping Review (n = 30)

Characteristic	Description
Publication period	2004–2024
Geographic setting	United States (urban, suburban, rural, and mixed settings)
Study design	Randomized controlled trials (n = 8); quasi-experimental studies (n = 9); prospective or retrospective cohort studies (n = 7); implementation or program evaluation reports (n = 6)
Healthcare settings	Primary care clinics; community health centers; hospital-based outpatient programs; federally qualified health centers (FQHCs); correctional and transitional care settings
Study populations	Adults with opioid exposure or opioid use disorder; selected studies included adolescents and young adults at elevated risk of opioid misuse
Underserved populations represented	Racial and ethnic minority groups; rural populations; persons experiencing homelessness; uninsured or underinsured individuals; patients with co-occurring mental health disorders
Mental health conditions addressed	Depression; anxiety disorders; post-traumatic stress disorder; serious mental illness; co-occurring psychiatric conditions
Physician role in intervention	Clinical leadership; care coordination; mental health screening and diagnosis; psychiatric medication management; supervision within multidisciplinary teams
Intervention models	Integrated behavioral health in primary care; collaborative care models; physician-delivered screening and brief psychotherapeutic interventions; combined psychiatric management with medication-assisted treatment
Comparator or usual care	Standard primary care; referral-based mental health services; non- integrated substance use treatment; historical or pre-intervention controls
Primary outcome domains reported	Opioid use and misuse; overdose events or opioid-related hospitalizations; treatment engagement and retention; mental health symptom burden; healthcare utilization
Follow-up duration	Short-term (≤6 months) to long-term (>12 months), depending on study design
Funding sources	Federal agencies (e.g., NIH, CDC, SAMHSA); state or local health departments; institutional or foundation support

Table 2: Summary of Physician-Led Mental Health Intervention Models and Physician Roles Across Included Studies (n = 30)

Intervention Model	Key Components	Physician Role	Care Setting	Representative Outcomes Assessed
Integrated behavioral health in primary care	Routine mental health screening; on-site counseling; coordinated treatment plans; longitudinal follow-up	Clinical lead; diagnosis; treatment planning; coordination with behavioral health team	Primary care clinics; FQHCs	Mental health symptom reduction; opioid misuse; healthcare utilization
Collaborative care model	Care manager support; psychiatric consultation; stepped care; measurement-based treatment	Team oversight; medication management; supervision of care managers	Primary care; community health centers	Treatment engagement; symptom improvement; retention in care
Physician-delivered screening and brief intervention	Screening (PHQ-9, GAD-7); brief psychotherapy; motivational interviewing	Direct delivery of screening and brief mental health interventions	Primary care; hospital outpatient clinics	Early identification; reduced opioid escalation; improved adherence
Medication-assisted treatment with psychiatric management	Buprenorphine or methadone; psychiatric assessment; relapse prevention	Prescribing MAT; psychiatric evaluation; longitudinal monitoring	Primary care; addiction clinics; transitional care	Treatment retention; relapse reduction; overdose-related outcomes
Trauma-informed care–based interventions	Trauma screening; supportive counseling; referral coordination	Identification of trauma; integration into care planning	Community clinics; homeless health services	Reduced psychological distress; improved engagement
Transitional or correctional care–based interventions	Mental health assessment at transition; linkage to community care	Care continuity coordination; initiation of treatment	Correctional facilities; re-entry programs	Continuity of care; reduced acute care utilization

Included studies spanned publication years from 2004 to 2024 and represented a wide range of US healthcare settings, including primary care clinics, community health centers, hospital - based programs, federally qualified health centers, and correctional or transitional care environments.

Study designs included randomized controlled trials, quasi - experimental studies, prospective and retrospective cohort studies, and implementation or program evaluation

reports. Most studies focused on adult populations, though several included adolescents and young adults at elevated risk of opioid misuse. Underserved populations examined across studies included individuals from racial and ethnic minority groups, rural residents, persons experiencing homelessness, uninsured or underinsured populations, and individuals with co - occurring mental health disorders.

A summary of key study characteristics, including population demographics, care settings, intervention types, and primary outcomes, is presented in Table 1. Physician - led interventions varied in structure and intensity but consistently involved physicians in leadership, delivery, or coordination of mental health care. Common intervention models included integrated behavioral health within primary care, collaborative care frameworks, physician - delivered screening and brief psychotherapeutic interventions, and combined psychiatric management with medication - assisted treatment for opioid use disorder. Details of intervention components and physician roles across included studies are outlined in Table 2.

Intervention Outcomes and Impact on Opioid-Related Morbidity and Mortality:
Across studies, physician - led mental health interventions were associated with favorable outcomes related to opioid use, mental health symptom burden, and healthcare utilization. Several studies reported significant reductions in opioid misuse, overdose events, or opioid - related hospitalizations following implementation of integrated mental health care models. Programs that combined physician - led psychiatric management with medication - assisted treatment demonstrated improved treatment retention and reduced relapse rates compared with usual care. Trends toward reduced opioid - related mortality were observed in longitudinal cohort studies, although causal inference was limited by study design heterogeneity. Mental health outcomes also improved across most intervention models. Reductions in depressive and anxiety symptoms were consistently reported, particularly in collaborative care and integrated primary care settings. Improvements in mental health were frequently linked to downstream benefits, including decreased opioid craving, improved adherence to treatment plans, and reduced emergency department utilization. Several studies noted that early identification and management of mental health conditions by physicians played a critical role in preventing escalation of opioid misuse.

In underserved populations, physician - led interventions were associated with improved engagement in care and reductions in disparities in access to and continuity of treatment. Studies conducted in rural and resource - limited settings demonstrated that physician involvement helped mitigate specialist shortages. They facilitated the timely initiation of both mental health treatment and opioid use disorder management. Implementation challenges, including workforce constraints, reimbursement limitations, and variability in institutional support, were commonly reported; however, multiple studies highlighted strategies that enhanced sustainability, such as team - based care models and integration within existing clinical workflows (Figure 2).

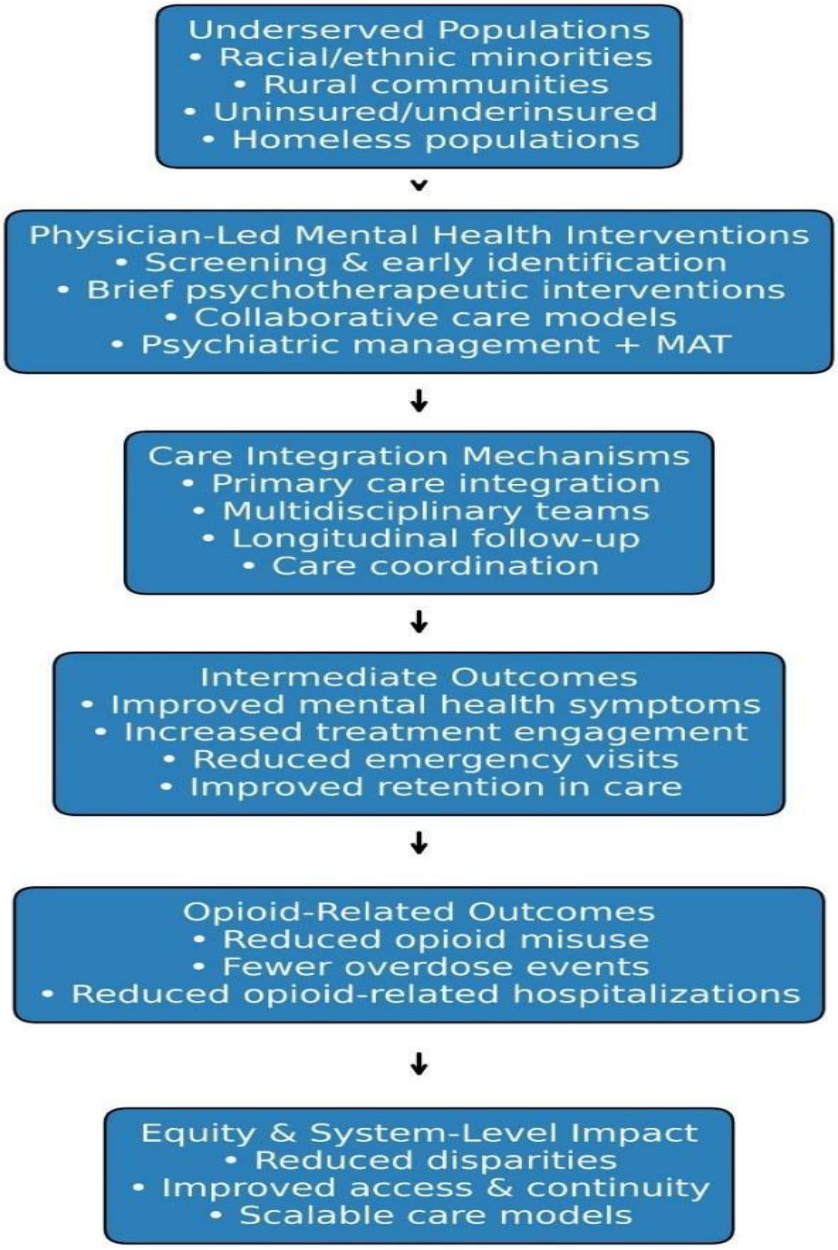

Figure 2. Conceptual framework illustrating pathways through which physician-led mental health interventions influence opioid-related morbidity and mortality among underserved populations in the United States.

Risk - of- bias assessments indicated variable methodological quality across studies, with randomized trials generally demonstrating lower risk of bias compared with observational and implementation studies. Nonetheless, the overall body of evidence supported a consistent direction of effect favoring physician - led mental health interventions in reducing opioid - related morbidity and improving mental health outcomes. A synthesis of reported outcomes and equity -related impacts is summarized in Table 3.

Table 3: Summary of Opioid-Related Outcomes, Mental Health Outcomes, and Equity-Related Impacts of Physician-Led Mental Health Interventions

Outcome Domain	**Reported Outcomes**	**Direction of Effect**	**Notes on Underserved Populations / Equity Implications**
Opioid misuse and use patterns	Reduced non-medical opioid use, decreased opioid prescribing intensity, improved adherence to medication- assisted treatment	Favorable in most studies	Greater impact observed in primary care and community health center settings serving uninsured, minority, and rural populations
Opioid-related morbidity	Fewer overdose events, reduced opioid-related emergency department visits and hospitalizations	Favorable trend	Benefits more pronounced where mental health screening and follow-up were physician-led and longitudinal
Opioid-related mortality	Reduced overdose mortality reported in select longitudinal cohorts	Inconsistent / limited evidence	Mortality outcomes infrequently reported; limited by short follow-up and observational designs
Mental health symptom burden	Reduced depressive symptoms, anxiety severity, PTSD symptoms	Consistently favorable	Improvements linked to integrated care and collaborative care models in underserved populations
Treatment engagement and retention	Increased initiation and retention in OUD treatment, improved continuity of care	Favorable	Physician involvement reduced drop-out rates in resource-limited and rural settings
Healthcare utilization	Reduced emergency department visits; increased outpatient follow-up	Favorable	Shift from crisis-driven to preventive care observed in integrated models
Access to care	Improved access to mental health and addiction services	Favorable	Physician-led models mitigated specialist shortages in underserved settings
Health equity and disparities	Reduced disparities in treatment engagement and continuity	Favorable but context-dependent	Equity gains strongest when interventions were embedded in safety-net systems
Implementation sustainability	Variable sustainability across settings	Mixed	Sustainability influenced by reimbursement models, workforce support, and institutional infrastructure
Cultural responsiveness	Limited but growing incorporation of culturally tailored approaches	Variable	Reporting inconsistent; highlights need for equity-focused implementation frameworks

Discussion

Interpretation of Findings and Implications for Clinical Practice:

This review highlights physician - led mental health interventions as a critical and underutilized strategy for addressing opioid-related morbidity and mortality in underserved populations in the United States. Rather than merely reinforcing existing evidence that mental health comorbidities are prevalent among individuals with opioid use disorder, the findings underscore how physician leadership functions as a structural intervention —reshaping access, continuity, and integration of care in settings where traditional referral - based models often fail [23][24]. Physician involvement appears to facilitate earlier identification of psychological distress, more timely initiation of treatment, and sustained engagement, particularly in populations facing socioeconomic and geographic barriers.

One of the most salient implications of these findings is the central role of physicians in bridging the long - standing divide between mental health care and substance use treatment. In underserved settings, physicians often operate within fragmented systems that lack sufficient behavioural health specialists. Yet, the reviewed studies suggest that physician -l ed models can partially compensate for these gaps through integrated care approaches [25]. These models shift the locus of mental health intervention upstream toward prevention, stabilization, and relapse mitigation rather than relying predominantly on crisis-driven encounters [26]. Importantly, physician leadership does not imply unilateral care delivery but rather coordination, oversight, and accountability within multidisciplinary teams, which may explain the consistent improvements in engagement and treatment retention observed across diverse settings. From a clinical standpoint, the findings also reinforce the importance of equipping physicians with competencies beyond pharmacologic management. Training in brief psychotherapeutic techniques, trauma- informed care, and collaborative decision- making was frequently associated with better patient-centered outcomes, even when interventions were delivered within time- constrained primary care environments [27]. This has particular relevance for underserved populations, where mistrust of healthcare institutions and prior experiences of stigma may deter individuals from seeking specialty mental health or addiction services [28]. Physician - led interventions embedded within familiar care settings may therefore function as trust - building mechanisms, enhancing adherence and reducing disengagement from care. Additionally, the review suggests that physician - led mental health interventions may exert indirect effects on opioid - related outcomes by addressing upstream determinants of risk, such as untreated depression, anxiety, and trauma. Improvements in mental health symptom burden were consistently linked to reductions in healthcare utilization patterns associated with overdose risk, including emergency department visits and hospitalizations [29]. While causality cannot be definitively established, these associations align with conceptual models that frame opioid misuse as a maladaptive coping response to psychological distress in structurally vulnerable contexts [30]. As such, physician - led mental health care may serve as a harm - reduction strategy even in the absence of immediate changes in opioid prescribing or use patterns.

Policy, Implementation, and Future Research Directions:

The findings of this review carry important implications for health policy and system - level reform. Despite growing national emphasis on integrated care, reimbursement structures and regulatory frameworks continue to privilege siloed models of mental health and substance use treatment [30]. Physician - led interventions, particularly

those implemented in primary care and community - based settings, often rely on temporary funding streams, pilot grants, or institutional champions rather than stable, scalable financing mechanisms [29]. Policy efforts that expand reimbursement for collaborative care, behavioural health integration, and physician time spent on mental health coordination are, therefore, essential to sustaining and scaling effective interventions.

Workforce considerations also emerge as a critical policy issue. While physician - led models may mitigate shortages of mental health specialists, they simultaneously raise concerns about physician burnout and role overload, particularly in under - resourced settings [3]. Successful implementation depends not on expanding physician responsibilities indiscriminately, but on redistributing care through team - based models that leverage nurses, social workers, community health workers, and peer support specialists under physician supervision [14]. Policies that support inter-professional training and task - sharing may enhance both effectiveness and sustainability while preserving physician capacity.

From an equity perspective, the review highlights the potential of physician - led mental health interventions to reduce disparities in opioid - related outcomes, but also cautions against assuming uniform effectiveness across populations. Structural determinants such as housing instability, incarceration, and insurance discontinuity were frequently cited as barriers to sustained engagement, even within integrated care models [15]. This suggests that physician - led interventions are most effective when embedded within broader social and policy interventions that address housing, criminal justice involvement, and access to insurance coverage [10]. Future policies should therefore prioritize cross – sector collaboration rather than positioning healthcare systems as the sole locus of intervention.

Several gaps in the existing evidence base warrant attention. First, relatively few studies explicitly examined opioid - related mortality as a primary outcome, reflecting both methodological challenges and limited access to longitudinal data [20]. Greater linkage between clinical data, public health surveillance systems, and mortality registries could strengthen future evaluations. Second, there remains substantial heterogeneity in how "physician- led" interventions are defined and operationalized, complicating comparison across studies [18]. Development of standardized frameworks or taxonomies may enhance interpretability and replication.

Finally, future research should more explicitly incorporate implementation science and equity - focused methodologies. While many studies reported positive outcomes, fewer examined why interventions succeeded or failed across different contexts, or how structural racism and policy environments shaped effectiveness [9]. Participatory research approaches that engage underserved communities in intervention design and evaluation may yield more culturally responsive and durable models of care [30]. As the opioid crisis continues to evolve, physician - led mental health interventions should be viewed not as static solutions but as adaptable strategies within a dynamic public health landscape.

Limitations:

Several limitations should be considered when interpreting the findings of this review. First, as a scoping review with narrative synthesis, the study was designed to map the breadth of existing evidence rather than to quantify pooled effects. The heterogeneity of study designs, intervention models, outcome measures, and follow - up durations precluded formal meta - analysis and limits the ability to draw causal inferences regarding the magnitude of effect of physician - led mental health interventions on opioid - related outcomes.

Second, the included studies demonstrated variable methodological quality, with many relying on observational or implementation - based designs that are susceptible to confounding, selection bias, and incomplete reporting of outcomes. Although risk - of- bias

assessments were conducted to contextualize the strength of the evidence, studies were not excluded solely on quality grounds, which may have influenced the overall interpretation of the findings. Additionally, opioid - related mortality was infrequently reported as a primary outcome, reflecting both data limitations and the challenges of long - term follow - up in underserved populations. Third, publication and reporting biases may be present, as studies demonstrating positive outcomes are more likely to be published and identified through database searches. While efforts were made to include grey literature and program evaluation reports, some relevant interventions —particularly those implemented at the local or community level —may not have been captured. Furthermore, the definition of "physician - led" interventions varied across studies, potentially limiting comparability and introducing conceptual heterogeneity. Finally, although this review focused on underserved populations, the degree to which interventions were culturally tailored or addressed structural determinants of health was inconsistently reported. As a result, the findings may not be uniformly generalizable across all underserved groups or geographic contexts. Future research should prioritize standardized reporting, longer follow - up periods, and equity - focused evaluation frameworks to assess better the sustainability and population - level impact of physician - led mental health interventions on opioid - related morbidity and mortality.

Conclusion

Physician - led mental health interventions represent a promising and pragmatic strategy for reducing opioid - related morbidity and mortality in underserved populations in the United States. By integrating mental health care into routine clinical settings, these approaches address critical gaps in access, continuity, and coordination of care that disproportionately affect structurally marginalized communities. The evidence synthesized in this review suggests that physician leadership, particularly within integrated and collaborative care models can facilitate earlier identification of psychological distress, improve engagement with treatment, and support sustained management of both mental health conditions and opioid use disorder. Beyond individual- level outcomes, physician - led interventions have important system - level implications. These models demonstrate the potential to mitigate workforce shortages, reduce reliance on crisis - driven care, and promote more equitable delivery of evidence - based treatment across diverse healthcare settings. When supported by multidisciplinary teams and appropriate institutional infrastructure, physician - led approaches can function as scalable mechanisms for translating clinical guidelines into real - world practice, particularly in resource - limited environments where specialty mental health services are scarce. However, continued investment in physician - led, integrated mental health care will be essential to advancing equitable and sustainable responses to the opioid crisis.

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