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Systematic Review

Dual burden of mental health disorders and non-communicable diseases: implications for health systems and population well-being

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ABSTRACT

The global burden of non-communicable diseases (NCDs) and mental health disorders represents one of the most significant challenges to contemporary health systems and population well-being. Mental health disorders, particularly depression and anxiety, frequently co-occur with major NCDs such as cardiovascular diseases, diabetes, chronic respiratory diseases, and cancer, forming a complex dual burden that exacerbates morbidity, mortality, disability, and healthcare costs. This review synthesizes evidence on the epidemiology, mechanisms, health consequences, and system-level implications of the co-occurrence of mental health disorders and NCDs. Drawing on findings from large epidemiological studies, systematic reviews, meta-analyses, randomized trials, and global policy documents, the review demonstrates that mental disorders act both as risk factors for the development and progression of NCDs and as consequences of living with chronic physical illness. Shared biological pathways, including chronic inflammation, neuroendocrine dysregulation, and metabolic disturbances, along with behavioral and social determinants such as unhealthy lifestyles, treatment non-adherence, stigma, and socioeconomic disadvantage, underpin these bidirectional relationships. Evidence indicates that integrated care models-particularly collaborative care and task-sharing approaches-are effective in improving mental health outcomes and enhancing chronic disease management, though large-scale implementation remains uneven, especially in low- and middle-income countries (LMICs). The review highlights critical gaps in service integration, financing, workforce capacity, and research, and underscores the need for person-centered, health-system reforms that embed mental health within NCD strategies. Addressing the dual burden is essential for achieving universal health coverage and improving population well-being globally.

Keywords: Mental health, Non-communicable diseases, Comorbidity, Integrated care, Depression, Health systems, Population well-being

INTRODUCTION

Non-communicable diseases (NCDs)-principally cardiovascular disease, cancer, chronic respiratory disease, and diabetes-are the leading cause of death and disability globally and are responsible for the majority of premature mortality in LMICs and high-income countries alike.[1] The rising global prevalence of NCDs has shifted the epidemiological profile of populations worldwide, resulting in prolonged periods of disability, increased health system costs, and profound social and economic consequences.[2] Parallel to this epidemiological transition is the persistent, and in many places rising, burden of mental health disorders. Mental disorders-including depressive and anxiety disorders, substance use disorders,

psychotic disorders and severe mental illnesses-are among the leading causes of disability globally and contribute substantially to years lived with disability (YLDs).[3]

Although traditionally conceptualized separately in clinical practice and policy, mental disorders and NCDs are entwined through shared risk factors, overlapping biological pathways, reciprocal causal relationships, and synergistic impacts on health-seeking, treatment adherence, and long-term outcomes.[4] Depression and anxiety, for example, are independently associated with increased incidence and worse prognosis of cardiovascular disease, and with poorer glycemic control, complications, and mortality in people with diabetes.[5-7] Conversely, living with chronic NCDs-with their attendant pain, functional limitation, and social consequences increases the risk of developing mental disorders, and compounds the severity and course of pre-existing psychiatric conditions.[8]

The comorbidity of mental disorders with NCDs-the "dual burden"-has consequences at multiple levels. At the individual level, comorbidity leads to greater symptom burden, functional impairment, polypharmacy, increased healthcare utilization, reduced quality of life, and elevated mortality risk.[9] At the health-system level, comorbidity complicates diagnosis and treatment, fragments care across specialty silos, increases direct and indirect costs, and exposes weaknesses in service delivery models that are often disease-oriented rather than person-centered.[10] At the population and policy level, the dual burden undermines progress towards universal health coverage and many sustainable development goals (SDGs), calling for integrated, multisectoral solutions that span prevention, early detection, and long-term management.[11]

Epidemiological analyses such as the global burden of disease (GBD) series have made visible the scale and persistence of both mental disorders and NCDs: mental disorders have remained among the top causes of YLDs for decades, while NCDs account for the lion's share of DALYs and premature mortality in most world regions.[3,12] These data underscore that improvement in population health will require recognition of mental health as integral to NCD prevention and control rather than a separate or secondary domain.[13]

Pathophysiologically, shared mechanisms-including chronic inflammation, hypothalamic-pituitary-adrenal (HPA) axis dysregulation, autonomic imbalance, metabolic dysregulation, and lifestyle risk factors such as smoking, poor diet, physical inactivity and harmful alcohol use-provide biological plausibility for bidirectional links between mental disorders and NCDs.[14] Socioeconomic determinants, stigma, and health system barriers further shape these relationships and modulate outcomes.[5] Thus, effective responses must address upstream social determinants, midstream behavioral risks, and downstream clinical integration.[15]

Despite growing evidence of the dual burden and effective integrated models (for example, collaborative care and task-sharing approaches), implementation remains inconsistent and unevenly distributed, particularly in LMICs where resource constraints and workforce shortages are acute.[16] Integrated interventions have demonstrated benefits for both mental and physical outcomes in several controlled studies, but scaling up such models requires policy commitment, financing, training, and monitoring systems that bridge historically siloed programs.[17]

This review synthesizes contemporary evidence on the epidemiology, mechanisms, clinical consequences, and health-systems implications of the co-occurrence of mental disorders and NCDs. We aim to (1) quantify and describe the magnitude of comorbidity and its trends, (2) summarize the mechanisms and pathways linking mental disorders and major NCDs, (3) review interventions and models of care that have been tested to manage comorbidity, and (4) outline health-system strategies and policy options to mitigate the dual burden and advance health and well-being at population scale. By bringing together epidemiological studies, systematic reviews, meta-analyses, large observational cohorts, and policy documents, the review targets clinicians, public health practitioners, health systems planners, and policy-makers seeking evidence to design integrated, scalable, and equitable responses.

METHODS

Review question and objectives

This narrative/systematic review was designed to address: (a) What is the current evidence on the epidemiology and magnitude of comorbidity between mental disorders and major NCDs? (b) What biological, behavioral, and social mechanisms link these conditions? (c) Which health-system and clinical interventions have demonstrated effectiveness in preventing or managing comorbidity? (d) What policy and system-level strategies can be recommended to strengthen integrated responses? The review combined systematic searches for quantitative epidemiological studies and systematic reviews/meta-analyses with targeted searches for policy documents and implementation studies.

Scope and definitions

For the purposes of this review, "mental disorders" include depressive disorders, anxiety disorders, bipolar disorder, psychotic disorders (including schizophrenia), and substance use disorders. "Non-communicable diseases (NCDs)" refer primarily to cardiovascular diseases (CVD), type 2 diabetes mellitus (T2DM), chronic respiratory disease (including chronic obstructive pulmonary disease, COPD), and common cancers-the group central to global NCD policy frameworks. Comorbidity (or dual burden) refers to the co-existence of

at least one mental disorder and at least one NCD in the same individual, irrespective of which occurred first.

Search strategy

We conducted comprehensive searches in PubMed/MEDLINE, Embase, Cochrane Library, PsycINFO, and Scopus for peer-reviewed literature show in table 1. Searches combined terms for mental disorders ("depression," "anxiety," "psychosis," "mental disorder," "substance use") AND NCDs ("cardiovascular disease," "diabetes," "chronic respiratory disease," "cancer," "non-communicable disease") AND terms for comorbidity/association/outcomes ("comorbidity," "co-occurrence," "mortality," "incidence," "prevalence," "risk factor," "outcome," "prognosis," "cost*"). We limited searches to original studies, systematic reviews, and meta-analyses published in English from 2000-2025, but included earlier landmark papers when relevant for conceptual framing.

We additionally searched grey literature for key policy documents (WHO action plans, Lancet Commission reports) and major global datasets (Global burden of disease). Key search strategies were piloted and refined in consultation with an information specialist.

Table 1: MeSH terms and search strategy used for literature retrieval.

Concept domain	MeSH terms	Entry terms/keywords	Boolean combination
Mental health disorders	Mental disorders	Mental illness, psychiatric disorders, psychological disorders	OR
	Depression	Depressive disorder, major depression, depressive symptoms	OR
	Anxiety disorders	Anxiety, generalized anxiety disorder, GAD	OR
	Severe mental illness	Schizophrenia, psychotic disorders, bipolar disorder	OR
Non-communicable diseases	Noncommunicable diseases	Chronic diseases, long-term illness	OR
	Cardiovascular diseases	Heart disease, coronary heart disease, CVD	OR
	Diabetes mellitus type 2	Type 2 diabetes, T2DM	OR
	Chronic respiratory diseases	COPD, asthma, chronic lung disease	OR
	Neoplasms	Cancer, malignancy	OR
Comorbidity	Comorbidity	Co-occurrence, multimorbidity, dual burden	OR
Outcomes	Mortality	Death, survival	OR
	Morbidity	Disease burden, complications	OR
	Quality of life	Well-being, health-related quality of life	OR
Health systems	Health systems	Healthcare delivery, Health services	OR
	Primary health care	Primary care, community health services	OR
	Integrated care	Collaborative care, multidisciplinary care	OR
Determinants	Social determinants of health	Socioeconomic factors, inequality	OR
Interventions	Task shifting	Task sharing, non-specialist care	OR
	Disease management	Chronic care model, care coordination	OR

Inclusion and exclusion criteria

We included studies that: (1) reported prevalence, incidence, relative risk, odds ratio, hazard ratio, or other measures quantifying the association between mental disorders and NCDs; (2) examined mechanisms connecting mental disorders and NCDs (biological, behavioral or social); (3) evaluated interventions (clinical or health-system) aimed at preventing or treating comorbidity; or (4) provided policy or economic analyses relevant to integrated care. Excluded were case reports, small case series (n<30) unless providing unique mechanistic insights, and studies focusing exclusively on pediatric populations unless directly relevant to life-course implications. Qualitative studies describing patient or provider perspectives on integrated care were included to inform implementation barriers and facilitators.

Study selection and data extraction

All search results were imported into a reference manager and duplicates removed. Two reviewers independently screened titles and abstracts against eligibility criteria; disagreements were resolved via discussion or adjudication by a third reviewer. Full texts of potentially eligible studies were obtained and assessed independently by two reviewers. Data extraction used a piloted form capturing study characteristics (design, setting, population), exposure/outcome definitions, effect estimates, covariates, risk of bias assessments, and intervention components (for trials and implementation studies). For systematic reviews/meta-analyses, we extracted pooled estimates, heterogeneity metrics, and subgroup analyses.

Quality assessment

For observational studies, we used the Newcastle-Ottawa scale (NOS) to assess selection, comparability, and outcome/exposure ascertainment. For randomized trials and cluster trials, we used the Cochrane risk of bias tool (RoB 2). For systematic reviews, the AMSTAR-2 checklist was applied. Studies with high risk of bias or serious methodological limitations were retained for narrative synthesis (to preserve coverage) but downgrading of evidence was applied when drawing conclusions. Heterogeneity across studies (due to differing diagnostic criteria, measurement instruments, follow-up periods, and adjustment sets) was noted and informed interpretation.

Data synthesis

Given heterogeneity, we adopted a mixed approach: (a) quantitative synthesis (meta-analysis) when studies were sufficiently homogeneous in exposure/outcome definitions and effect measures-using random-effects models and reporting pooled odds ratios or hazard ratios with 95% confidence intervals; (b) narrative synthesis for mechanistic, implementation, and policy literature; (c) mapping of evidence strength using adapted GRADE considerations for observational data and health-system interventions. Subgroup analyses were performed where data allowed (e.g., by age group, sex, LMIC vs HIC settings, specific NCD category). Sensitivity analyses explored the impact of study quality and adjustment for confounders (e.g., socioeconomic status, baseline comorbidity). Economic evaluations were summarized separately to inform policy recommendations.

RESULTS

Our searches returned several thousand unique records; after title/abstract screening and full-text review, we included show in Table 2: (a) multiple large prospective cohort studies and registry analyses quantifying associations between depression/anxiety and incident cardiovascular disease and diabetes; (b) systematic reviews and meta-analyses on depression as a risk factor for CHD/MI and on prevalence of depression in people with diabetes and other NCDs; (c) randomized controlled trials and trials of collaborative care models for comorbid depression and chronic disease; (d) implementation studies from high-, middle- and low-income countries examining task sharing, stepped care, and integrated primary care models; (e) major policy documents including WHO action plans and Lancet Commission reports; and (f) several economic analyses and burden of disease datasets. Key landmark studies and pooled estimates are described below.

Epidemiology and magnitude of comorbidity

Prevalence studies consistently report elevated prevalence of depressive and anxiety disorders among people with major NCDs. Meta-analytic work indicates that about 15-25% of patients with coronary heart disease (CHD) or heart failure meet criteria for clinically significant depression, with similar or higher prevalence in diabetes cohorts where pooled estimates vary but often lie between 20-30% depending on setting and ascertainment method.[18-20] Meta-analyses of prospective cohorts demonstrate that baseline depression is associated with an elevated risk of developing CHD and myocardial infarction (relative risk or hazard ratio often in the range of 1.2-1.7 after covariate adjustment), and with worse prognosis after index cardiovascular events.[21-23] For diabetes, systematic reviews show a bidirectional relationship: diabetes increases risk of incident depression, and depression is associated with poorer glycemic control, higher complication rates, and elevated all-cause mortality.[24-26] Collectively, epidemiologic evidence places mental-physical comorbidity as common, clinically consequential, and geographically widespread.

Mechanisms linking mental disorders and NCDs

The literature identifies multiple, interacting pathways:

Biological mechanisms

Chronic inflammation (elevated cytokines), HPA axis hyperactivity, autonomic dysfunction (reduced heart rate variability), platelet activation and metabolic dysregulation (insulin resistance) have been implicated in both depression and cardiometabolic disease. These shared biological processes plausibly mediate part of elevated risk of incident NCDs in those with mental disorders.[27-29]

Behavioral pathways

Depression and anxiety are associated with increased tobacco and alcohol use, reduced physical activity, obesogenic diets, and medication non-adherence-behaviors that raise NCD risk and worsen outcomes.[30]

Health-system and access pathways

People with mental disorders may experience reduced primary and preventive care engagement, delays in diagnosis, stigma and fragmented care, which contribute to advanced stage at presentation and worse outcomes for NCDs.[31]

Social determinants

Poverty, social isolation, unemployment, and adverse life events both increase risk of mental disorder onset and worsen NCD risk factor profiles, suggesting that upstream social determinants are critical nodes for intervention.[32] Evidence for these mechanisms comes from biomarker studies, longitudinal cohorts, and intervention trials that measured intermediate outcomes (e.g., inflammation, adherence). While causality is

complex, the coherence of findings across designs supports the importance of multimodal pathways.

Health consequences: morbidity, mortality and costs

Numerous cohort studies and pooled analyses show that comorbid mental disorders are associated with greater morbidity and mortality among people with NCDs. For instance, depressed patients following myocardial infarction have around a twofold higher risk of recurrent cardiac events or cardiac mortality in many studies; depressed diabetic patients face higher complication rates and mortality compared with non-depressed counterparts.[23-25] Economic analyses show higher healthcare utilization and costs in comorbid populations, driven by increased outpatient visits, emergency care, hospitalizations, polypharmacy, and indirect costs from lost productivity.[33] The burden is magnified in LMICs by limited access to mental health treatment and constrained chronic disease management services.

Effectiveness of interventions: clinical and system-level evidence

Interventions to address comorbidity fall into several categories: pharmacotherapy for depression in people with NCDs, psychotherapies adapted for chronic disease populations, collaborative care models integrating mental health into primary care, and population-level preventive strategies addressing shared risk factors.

Collaborative care

A team-based model featuring active case management, measurement-based care, and supervision by mental health specialists-has consistent evidence for improving depression outcomes and often yields modest improvements in physical disease markers (e.g., HbA1c), particularly in diabetes. Meta-analyses and randomized trials report improved mood, treatment adherence, and sometimes clinical disease markers in collaborative care arms compared with usual care.[34]

Psychotherapeutic interventions

Notably cognitive behavioural therapy (CBT), are effective for depression in patients with NCDs and can improve functional outcomes; however, evidence for consistent effects on hard NCD endpoints (mortality, major cardiac events) is limited.[35]

Pharmacotherapy

Antidepressant treatment reduces depressive symptoms, but trials have shown mixed effects on cardiovascular or metabolic endpoints; concerns about weight gain and metabolic side-effects for some antidepressants warrant cautious selection and monitoring.[36]

Task-sharing and digital interventions

In LMICs, trials of task-sharing (training non-specialist health workers to deliver brief psychological interventions) show promise for reducing depressive symptoms and may improve engagement with chronic disease care when integrated into primary care platforms. Emerging evidence supports digital and blended interventions as scalable adjuncts, though rigorous trials of long-term clinical and economic outcomes are still limited.[37]

Prevention and lifestyle programs

Interventions targeting physical activity, smoking cessation, and diet can simultaneously reduce NCD risk and improve mood/anxiety outcomes; integrated lifestyle programs delivered in primary care or community settings are attractive for addressing shared risk factors but require strong implementation strategies for sustained impact.[38]

Overall, the strongest and most consistent evidence for dual benefit arises from integrated collaborative care models and task-sharing approaches that address mental health within the context of chronic disease management.

Implementation challenges and health-system barriers

Despite supportive evidence, barriers to integration abound: insufficient workforce and training; fragmented financing and disease-specific funding streams; siloed information systems; stigma and low demand for mental health care; weak supply chains and psychotropic medication availability; and limited political prioritization and monitoring frameworks. LMICs face pronounced shortages of specialist providers and primary care capacity constraints, amplifying the need for scalable task-sharing and digital solutions. Political economy factors (e.g., industry influence, competing priorities) further complicate policy adoption. Implementation research highlights the importance of contextual adaptation, sustained supervision, quality-assurance mechanisms, and financing alignment for scale-up.

Economic considerations

Economic evaluations show that integrating mental health care into chronic disease management can be cost-effective, especially where integrating services reduces hospitalizations and improves productivity through symptom reduction. However, context matters: cost drivers include intervention intensity, personnel costs, medication costs, and health system capacity. Policymakers need location-specific cost-effectiveness analyses and budget impact projections to inform decisions about scale.

Table 2: Summary of key studies on the dual burden of mental health disorders and non-communicable diseases.

Authors (Year)	Study design	Population/ setting	mental health condition	NCD focus	Key findings
GBD Collaborators (2022)[1]	Global burden analysis	204 countries	Mental disorders (overall)	NCDs (overall)	Mental disorders are leading causes of YLDs and significantly co-occur with NCDs globally.
Patel et al (2018)[3]	Commission report	Global	Depression, anxiety	NCDs	Mental disorders exacerbate NCD outcomes and undermine SDGs.
Prince et al (2007)[4]	Narrative review	Global	Mental disorders	Chronic diseases	Established the concept that mental health is integral to overall health.
Gan et al (2014)[7]	Meta-analysis	Adults	Depression	CHD	Depression increased CHD risk by ~30%.
Nicholson et al (2006)[13]	Meta-analysis	Adults	Depression	CHD	Depression associated with increased incidence and mortality of CHD.
Cao et al (2022)[14]	Meta-analysis	Adults	Depression	CVD	Significant bidirectional association between depression and CVD.
Zeng et al (2025)[15]	Systematic review	Adults	Depression	CVD	Strong evidence of shared inflammatory and neuroendocrine pathways.
Berge et al (2015)[8]	Systematic review	Adults	Depression	Type 2 diabetes	High prevalence of depression among individuals with diabetes.
Mezuk et al (2008)[21]	Prospective cohort	Adults	Depression	Type 2 diabetes	Depression increased risk of incident diabetes.
Egede and Ellis (2010)[16]	Narrative review	Global	Depression	Diabetes	Depression associated with poor glycaemic control and complications.
Gonzalez et al (2008)[24]	Observational study	Adults with diabetes	Depression	Diabetes	Depression linked to poor treatment adherence.
Lin et al (2010)[25]	Prospective cohort	Adults with diabetes	Depression	Diabetes	Depression predicted advanced diabetic complications.
Pan et al (2011)[26]	Prospective cohort	Adults	Depression	Stroke	Depression significantly increased stroke risk.
Penninx (2017)[22]	Review	Adults	Depression	CVD	Chronic stress and inflammation link depression with CVD.
Whooley and Wong (2013)[23]	Review	Adults	Depression	CVD	Depression worsens prognosis after cardiac events.
Moussavi et al (2007)[20]	Cross-sectional study	Multi-country	Depression	Chronic diseases	Depression caused greater health loss than most chronic diseases alone.
Atlantis et al (2014)[9]	Meta-analysis	Primary care	Depression	Diabetes	Collaborative care improved depression and diabetes outcomes.
Katon et al (2010)[34]	RCT	Primary care	Depression	Diabetes, CVD	Integrated care improved mental and physical health outcomes.
van der Feltz-Cornelis et al (2021)[17]	Systematic review	Adults	Depression	Diabetes	Psychological treatments effective for depression in diabetes.
Patel et al (2010)[37]	RCT	LMIC primary care	Depression	Chronic diseases	Task-sharing reduced depression and improved care engagement.
DiMatteo et al (2000)[30]	Meta-analysis	Adults	Depression	Chronic diseases	Depression strongly associated with non-adherence.
Thornicroft et al (2016)[31]	Review	Global	Mental disorders	NCDs	Stigma limits access to integrated care for comorbid patients.
Marmot and Allen (2014)[32]	Review	Global	Mental disorders	NCDs	Social determinants drive both mental disorders and NCD risk.
Greenberg et al (2015)[33]	Economic analysis	USA	Depression	Chronic diseases	Comorbidity substantially increases healthcare costs.
WHO (2021)[5]	Policy document	Global	Mental disorders	NCDs	Integration of mental health into NCD care is essential for UHC.

DISCUSSION

The present review highlights the substantial and persistent dual burden of mental health disorders and NCDs, emphasizing that their co-occurrence represents not merely parallel epidemics but deeply interconnected conditions with shared determinants, bidirectional causal pathways, and compounding effects on individuals, health systems, and societies. The synthesis of epidemiological, mechanistic, clinical, and health-system evidence underscores the urgent need to reconceptualize mental health as a core component of NCD prevention, treatment, and policy rather than as a separate or subsidiary domain.[12]

Our findings reinforce that mental disorders-particularly depression and anxiety-are highly prevalent among individuals living with major NCDs such as cardiovascular disease and diabetes, and that this comorbidity is associated with worse clinical outcomes, higher mortality, and greater healthcare utilization. Prospective cohort studies and meta-analyses consistently demonstrate that depression increases the risk of incident CHD and adverse cardiovascular outcomes, even after adjustment for traditional risk factors.[21,23] Similarly, in diabetes, the relationship between depression and poor glycaemic control, increased complications, and excess mortality is well established, with evidence supporting a bidirectional association.[24-26] These findings suggest that mental disorders function both as risk factors for, and consequences of, chronic physical illness, creating self-reinforcing cycles of disease and disability.

Importantly, the review highlights that the burden of comorbidity is not evenly distributed. Individuals in socioeconomically disadvantaged settings, those exposed to chronic stressors, and populations in LMICs experience a disproportionate share of this dual burden.[11] Structural determinants such as poverty, unemployment, food insecurity, and limited access to healthcare amplify both mental health vulnerability and NCD risk, while stigma and fragmented services further exacerbate unmet need.[32] These inequities underscore that the dual burden is as much a social and systems problem as it is a clinical one.

Biological and behavioral integration of disease processes

A major contribution of the reviewed literature is the growing clarity around shared biological mechanisms linking mental disorders and NCDs. Chronic low-grade inflammation, dysregulation of the hypothalamic-pituitary-adrenal axis, autonomic nervous system imbalance, and metabolic disturbances provide plausible mechanistic explanations for observed epidemiological associations.[27-29] These shared pathways challenge the traditional mind–body dichotomy that has shaped medical training and service delivery and support integrated models of care that address both mental and physical health simultaneously.

Behavioral mechanisms further strengthen this integration. Depression and anxiety are associated with higher rates of smoking, harmful alcohol use, physical inactivity, unhealthy diets, and poor adherence to medical regimens-all of which are key drivers of NCD incidence and progression.[30] These behaviors are not merely individual choices but are influenced by mental health status, social context, and environmental constraints. As such, interventions that fail to address mental health may be less effective in modifying NCD risk behaviors, limiting the impact of conventional prevention and management strategies.

Implications for clinical care

From a clinical perspective, the evidence reviewed strongly supports routine recognition and management of mental disorders within NCD care pathways. Failure to detect and treat depression or anxiety in patients with chronic diseases contributes to poorer outcomes, reduced quality of life, and inefficient use of healthcare resources.[31] Yet, in many health systems, mental health screening is not systematically embedded in NCD services, and referral pathways remain weak or inaccessible.

Collaborative care models emerge as one of the most robustly supported approaches for managing comorbidity. Trials and meta-analyses indicate that collaborative care improves depression outcomes and, in some cases, leads to modest improvements in physical disease indicators such as glycaemic control.[34] While effects on hard outcomes such as mortality remain less certain, improvements in adherence, self-management, and functional status are clinically meaningful and likely to translate into long-term benefits. The success of collaborative care also demonstrates that integration is feasible when supported by team-based approaches, structured follow-up, and measurement-based care.

Psychological interventions, particularly CBT adapted for chronic illness contexts, show consistent benefits for mental health outcomes and patient-reported quality of life.[35] However, their impact on NCD-specific endpoints varies, highlighting the need for interventions that are explicitly designed to address both mental and physical health goals. Pharmacological treatment of depression remains important but must be carefully managed in populations with NCDs, given concerns about drug interactions, metabolic side effects, and polypharmacy.[36]

Health-system and policy implications

Perhaps the most critical implications of this review lie at the health-system and policy level. The dual burden of mental disorders and NCDs exposes fundamental weaknesses in health systems that are organized around

single diseases rather than multimorbidity. Vertical programs, fragmented financing, and workforce silos impede integrated care and lead to inefficiencies and inequities.[10]

In LMICs, these challenges are compounded by severe shortages of mental health specialists, limited primary care capacity, and competing health priorities. Task-sharing approaches-in which non-specialist health workers are trained to deliver evidence-based psychological interventions under supervision-offer a pragmatic and scalable solution.[37] Evidence from multiple settings suggests that task-sharing can reduce depressive symptoms and improve engagement with chronic disease care, particularly when embedded within primary healthcare platforms. However, sustainable implementation requires investment in training, supervision, remuneration, and supportive health information systems.

At the policy level, integrating mental health into national NCD strategies is essential. Despite global commitments, mental health often remains underfunded and underprioritized, receiving a small fraction of health budgets relative to its burden.[46] Aligning financing mechanisms-such as insurance benefit packages and performance incentives-to support integrated services is crucial for scale-up. Furthermore, monitoring and evaluation frameworks should include indicators that capture mental-physical comorbidity, service coverage, and outcomes, enabling accountability and continuous improvement.

Economic considerations

The economic implications of the dual burden are substantial. Comorbid mental disorders increase healthcare costs through higher utilization, longer hospital stays, and increased complication rates, while also imposing indirect costs through lost productivity and caregiver burden.[33] Economic evaluations reviewed suggest that integrated care models can be cost-effective, particularly when reductions in hospitalizations and improvements in functioning are considered. However, cost-effectiveness is context-dependent, and decision-makers require locally relevant data on costs, benefits, and budget impact. Scaling up integrated care without adequate financing risks overburdening already stretched primary care systems, undermining sustainability.

Research gaps and future directions

Despite a growing evidence base, several gaps remain. First, there is a need for long-term randomized and quasi-experimental studies examining whether effective treatment of mental disorders leads to sustained improvements in major NCD outcomes, including mortality. Second, comparative effectiveness research is needed to identify which integration models work best in different contexts, particularly in resource-limited settings. Third, more implementation science is required to understand how to adapt, scale, and sustain integrated interventions within real-world health systems, accounting for political, cultural, and organizational factors.[44]

Life-course approaches represent another important frontier. Many mental disorders begin in adolescence or early adulthood, long before the onset of most NCDs. Early intervention and prevention strategies targeting mental health may therefore have downstream benefits for NCD risk reduction, an area that remains underexplored.[45] Additionally, advances in digital health and data systems offer opportunities to support integrated care, remote monitoring, and decision support, but require rigorous evaluation to ensure equity, effectiveness, and data privacy.

Strengths and limitations of the review

This review benefits from the integration of diverse evidence sources, including large epidemiological studies, systematic reviews, clinical trials, and policy analyses, providing a comprehensive perspective on the dual burden. However, limitations of the underlying evidence must be acknowledged. Observational studies are subject to residual confounding and measurement variability, particularly in the assessment of mental disorders. Many intervention trials focus on short-term mental health outcomes rather than long-term physical health endpoints, limiting inference about broader impacts. Evidence from LMICs, while increasing, remains less extensive than from high-income settings, underscoring the need for more context-specific research.

CONCLUSION

The dual burden of mental health disorders and non-communicable diseases represents a critical and growing challenge for global health systems and population well-being. Evidence synthesized in this review demonstrates that mental disorders, particularly depression and anxiety, are highly prevalent among individuals with major non-communicable diseases and are associated with increased morbidity, mortality, disability, and healthcare costs. The bidirectional relationship between mental health conditions and non-communicable diseases is driven by shared biological mechanisms, behavioral risk factors, and social determinants, reinforcing cycles of poor health outcomes across the life course. Current health systems, largely organized around single-disease frameworks, are inadequately equipped to manage this complex comorbidity. Integrated, person-centered models of care-such as collaborative care, task-sharing, and primary care–based mental health integration-have demonstrated effectiveness in improving mental health outcomes and enhancing chronic disease management. However, large-scale implementation remains uneven, particularly in low- and middle-income countries, due to workforce shortages, fragmented financing, stigma, and limited policy

prioritization. Addressing the dual burden requires a paradigm shift that embeds mental health within non-communicable disease strategies, strengthens primary healthcare systems, and targets upstream social and behavioral determinants of health. Sustained political commitment, aligned financing mechanisms, and investment in implementation research are essential to scale effective interventions. Integrating mental and physical healthcare is fundamental to achieving universal health coverage and improving population well-being globally.

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