Cardiovascular Disease and Mental Health in Intellectual Disabilities: A Vicious Cycle of Risk and Care Gaps

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Abstract: *Background*: Cardiovascular diseases (CVDs) are the primary reason for demise and disability worldwide, with a particularly severe problem in low- and middle-income nations. Among individuals with intellectual disabilities (ID), the coexistence of cognitive impairments, mental health conditions, and barriers to medical care significantly increases health risks.

Objective: This review discovers the bidirectional connection between cardiovascular disease and mental health disorders in individuals with ID. It aims to classify risk factors, examine care disparities, and evaluate the need for targeted interventions.

Methods: A descriptive review methodology was employed. A total of 1,182 articles were initially retrieved from PubMed, Scopus, and PsycINFO using a focused keyword strategy encompassing CVD, mental health, and intellectual disability. After applying inclusion criteria centered on disability relevance and peer-reviewed content, 914 articles were shortlisted. From these, 173 studies were selected based on quality and contextual suitability.

Results: The review identified a consistent pattern of underrepresentation of individuals with ID in cardiovascular and psychiatric research despite their increased rates of congenital heart defects, lifestyle-related risk factors, and untreated mental health issues. Diagnostic overshadowing, resource constraints for caregivers, and a lack of appropriately adapted therapies further aggravate their vulnerability. Evidence suggests that caregiver-supported and community-based interventions, when customized for this population, can improve health outcomes.

Conclusion: The interplay between cardiovascular disease and mental health in people with ID constitutes a complex clinical and public health challenge. A disability-sensitive research and care framework is urgently needed. Future approaches should focus on early screening, tailored interventions, integrated care models, and inclusive health policies to adequately support this marginalized population.

Keywords: Cardiovascular disease, intellectual disability, mental health, depression, anxiety.

1. INTRODUCTION

Intellectual disability (ID) presents a unique and critical lens through which to examine the intertwined epidemics of cardiovascular disease (CVD) and mental health disorders. While CVD remains the leading cause of mortality and morbidity globally, accounting for a significant portion of deaths worldwide, individuals with ID face a disproportionately higher burden [1]. Saxena *et al.* [1] show that this increased vulnerability stems from a complex interplay of socio-economic factors, limited access to quality healthcare, and specific lifestyle challenges often associated with ID. For instance, common risk factors like hypertension and diabetes are prevalent within the general population, impacting substantial percentages, and their

uncontrolled nature significantly contributes to cardiovascular dysfunction. However, the recognition of the strong bidirectional relationship between cardiovascular and mental health is particularly pertinent for individuals with ID. Mental health surveys consistently show high rates of depressive and anxiety disorders among the general population. For those with ID, these conditions often go undiagnosed or undertreated, further escalating CVD risk, according to News-Medical, 2023 [2]. Furthermore, chronic psychological stress, a well-established precursor to CVD, can significantly impair cardiovascular health and is often exacerbated by the daily challenges faced by individuals with ID. This underscores the urgent need for targeted interventions that address the multifaceted health needs of this often-underserved population.

These interactions are further intensified in individuals with intellectual disabilities (ID), a group that has historically been sidelined in health research and

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policy. Intellectual disability, according to Coviello K [3], defined by limits in equal intellectual functioning and adaptive behavior, affects about 1-3% of the Indian population [3]. These individuals are at heightened risk for both physical and mental illnesses due to genetic vulnerabilities, poor lifestyle management, and restricted healthcare access. Studies show by Rojer [4] that individuals with ID are more expected to grow in situations such as obesity, hypertension, and metabolic syndrome, all of which elevate CVD risk [4].

Despite these elevated risks, mental illness in persons with ID is often under diagnosed or misdiagnosed due to communication boundaries and a phenomenon known as diagnostic overwhelming—where psychiatric indications are wrongly attributed to cognitive impairment[5,6]. As a result, this population often receives inadequate or delayed treatment for mental health conditions. Approximately 40-60% of people with ID and chronic physical illnesses also experience psychiatric distress, although this may be underestimated due to diagnostic challenges [7,8].

Furthermore, this population has difficulty expressing emotional or psychological discomfort, particularly in clinical settings that lack neurodiverse-friendly diagnostic tools. When untreated, mental health issues like depression and anxiety may lead to deteriorating heart health through behavioral pathways (e.g., non-adherence to medication) and biological mechanisms like inflammation and autonomic dysfunction. Conversely, the problem of handling CVD can intensify psychological distress, creating a vicious cycle of comorbidity [9]. Specific syndromic conditions like Down syndrome, DiGeorge syndrome, and Williams syndrome illustrate the genetic overlap between neurodevelopmental and cardiac abnormalities [10,11]. Post-surgical experiences among individuals with these syndromes often include adjustment disorders, generalized anxiety, or depressive episodes. However, cardiac rehabilitation programs are rarely equipped to address the psychological needs of this group, contributing to poorer health consequences and superiority of life [12,13]. Living with both ID and CVD significantly affects quality of life (QOL), particularly when psychiatric disorders are also present. Mental health conditions reduce functional capacity and social participation, especially in institutional settings where individuals face isolation and under-stimulation. Symptoms like agitation or aggression are often misinterpreted as behavioral problems rather than indicators of emotional distress, leading to further neglect [14,15]. Among mental health conditions, anxiety is common but often overlooked. It may present non-verbally—through restlessness or aggression—and is often triggered by hospital environments, invasive procedures, or an inability to understand the disease process [16,17]. Persistent anxiety contributes to autonomic imbalance, heightened blood pressure, and inflammation, further increasing CVD risk [18]. Depression is similarly under-recognized in individuals with ID. It often manifests through non-specific symptoms like sleep disturbances or irritability, complicating diagnosis. Untreated depression leads to poor adherence, increased hospitalizations, and higher death rates in CVD patients. A systematic review by Zambrano *et al.* [19] confirms that modified psychological treatments involving caregivers and adapted to cognitive levels can significantly benefit individuals with co-occurring depression and CVD [19]. Hypertension poses another major risk, especially in syndromic populations such as those with Fragile X or Prader-Willi syndrome. This condition is often under diagnosed due to irregular screenings and misinterpreted behavioral cues. Medications like antipsychotics and anticonvulsants may worsen metabolic profiles, contributing to cardiovascular decline.

Subgroups such as women and adolescents with ID are particularly vulnerable. Women with ID face dual disadvantages—biological and social—leading to delayed diagnoses and reduced mental health support. A review by Susinski *et al.* [20] showed that while 75% of women with CVD reported reduced stress after intervention, only 30% saw improvements in depression and anxiety. Women with ID experience longer hospital stays and higher post-MI mortality rates, as noted by Golubnitschaja O [21], often due to cultural taboos and inadequate support [21]. Youth with ID also face compounded risks due to behavioral comorbidities such as autism and ADHD, poor diet, and medication effects. Studies recommend depression nearly doubles the risk of early-onset CVD in this group. Failure to transition to adult care exacerbates these risks, underscoring the need for early prevention and long-term management [22,23].

Research Questions

1. What is the nature of the connection between cardiovascular disease and mental health in individuals with intellectual disabilities?

2. What are the unique risk factors and diagnostic challenges faced by this population?

3. How do existing healthcare systems and caregiver structures impact access to appropriate mental and cardiac care?

4. What evidence-based interventions have shown effectiveness in addressing this comorbidity among individuals with intellectual disabilities?

These questions shaped this review's literature selection, synthesis strategy, and analytical framework.

2. MATERIALS AND METHODS

2.1. Problem Description and Scope

Cardiovascular diseases (CVDs) affect public health significantly in India. Furthermore, the impact is better for people with intellectual disabilities (ID). Even though CVD is rising among the general public, those with ID have their own distinct problems and risk factors. Because of impaired awareness, trouble with communication, other neurological conditions, and dependency, diagnosis, prevention, and treatment of heart conditions are more challenging. Patients with Down syndrome, Di George syndrome, and Williams syndrome often present with both cardiac and cognitive impairments, necessitating integrated, multidisciplinary care [24]. Group efforts focused on Comprehensive Primary Health Care have made it possible to identify more people with hypertension and diabetes. Yet, they do not specifically help people with ID, so they should receive unique and targeted help. At the same time, those with intellectual disability deal with unfairness across the healthcare system, as they may not have the funds, cannot get the right care from health professionals, and do not have good specialized facilities, resulting in higher mortality from CVD. The lack of policies that consider gender and disability has increased the number of people not receiving treatment. As a result, the study analyzes the biological link between mental health and CVD and also looks at the obstacles that prevent care access for people with intellectual disabilities [25].

2.1.1. Health Workers Facing Challenges Regarding CVD and Mental Health

2.1.1.1. Barriers to Managing CVD and Mental Health

In addressing CVD and Mental health issues, health workers identify many barriers. Foremost include:

(A) Lack of Knowledge and Training: Many health workers feel they lack sufficient knowledge about mental health conditions and their intersection with CVD. This gap in training hinders effective management and communication with patients [26,27].

(B) Patient Engagement: A Stigma linked with mental health conditions discourages patients from seeking primary care. Health workers note that this stigma is linked with poor patient participation and hence complicates the management of both CVD and Mental health [28,29].

(C) Resource Constraints: Limited resources, including time, staffing, and equipment, are significant barriers. For instance, primary care physicians often report time constraints that prevent them from addressing mental health issues alongside CVD management [30,31].

(D) Limited Training in Intellectual Disability: A key barrier reported by health workers is the lack of training specific to intellectual disabilities, particularly in recognizing mental health symptoms that present atypically in this population. Diagnostic overshadowing—where mental distress is misattributed to intellectual impairment—frequently leads to missed diagnoses and inadequate care. Health workers express discomfort in interacting with patients with ID due to communication challenges, reliance on caregiver reporting, and the absence of adapted screening tools for both CVD and mental health assessments [32,33].

2.1.1.2. Facilitators of Effective Care

Despite the challenges, health workers identify several facilitators that improve care delivery. For example, Integrated care models linking collaboration between main care physicians, mental health specialists, and allied health professionals are highly effective. Such models improve communication and ensure comprehensive patient care [34,35], while the status of patient-centered communication buildsbelief and encourages adherence to treatment plans. This approach is particularly effective in addressing mental health stigma and improving CVD outcomes [36]. Training for health practitioners, particularly in mental health and CVD management, is critical. Training enhances their confidence and ability to address complex patient needs [37,38].

2.1.1.3. The Role of Health Literacy

Considering Health Literacy in Cardiovascular Disease Management: A Qualitative Study on Healthcare Professionals' and Patients' Perspectives, 2025 explains that health workers highpoint health

literacy status in managing CVD and mental health. Patients with low health literacy often struggle to comprehend their circumstances and follow treatment plans. Health workers suggest that adjusted situational communication strategies and educational resources can effectively address such issues, as noted by Daily Topic Hub [39].

2.1.1.4. The Impact of Stigma

Stigma remains a significant barrier both at the patient and systemic levels. Health workers report that stigma discourages patients from seeking mental health care and can lead to inadequate treatment of CVD in this population. Normalizing mental health discussions and reducing stigma is critical to improving care [40,41].

2.1.2. The Vicious Cycle between Cardiovascular Diseases and Mental Health

Coordinated care is less common for people with intellectual disabilities, as they are apt to experience both heart and mental health problems at asimilarperiod. Developing an illness is more likely for people with ID, and when combined with heart disease, these conditions may be more challenging than in people without ID. Changes in thinking may make it hard for a person to handle their well-being, stick to doing medicine, and join cardiac rehabilitation, while mental anguish is usually ignored and not well managed due to lacking openness.

(A) Mental Health Disorders and CVD Risk

Having anxiety and depression increases the hazard of CVD. Research using information from the Canadian Community Health Survey indicates that individuals with mental illness are furtherexpected than others to have had a heart disease or a stroke, as reported by ACLS [42]. A similar study demonstrated that mood and anxiety disorders on their own amplifieda person'shazard of heart disease and stroke, with odds ratios between 1.5 and 2.3.

(B) CVD and Mental Health Comorbidity

Patients with CVDs are more prone to depression and anxiety. An analysis of patients at the tertiary care center found that 51.25% have depressive symptoms and 48.75% deal with anxiety disorder [43]. The presence of mental health disorders with CVD may lead to worse health outcomes due to complications in treating heart disease.

(C) Common Pathophysiological Mechanisms

Being healthy mentally and physically are connected as they both rely on the same actions and factors. Following the research, individuals with depression are expected to have issues with the endothelium, an elevated immune response, and an imbalance in the autonomic nervous system, all of which might underwrite the expansion and development of heart diseases [44]. Both anxiety and depression upsurge the risk of a person emergingfrom heart disease. These conditions involve a slower heartbeat, a rise in blood clotting, more inflammation, hormone imbalance, and issues like not exercising and smoking cigarettes [45].

(D) Bidirectional Relationship

There is a bidirectional association between cardiovascular disease and mental health. Psychiatric illness like depression and anxiety predisposes a person to CVD, while CVD exaggerates or provokes psychiatric symptoms [46]. Stress response, medication side effects, and behavioral issues enable this interaction.

(E) Shared Risk Factors

Being economically disadvantaged, dealing with long-term stress, and living an unhealthy way are the 3foremosthazardissues for disorders of the heart and mind. Having these conditions in common, CVD and Mental health problems, results in a worsening condition for an individual, as it makes each condition develop and advance even more [47].

2.1.3. Economic Burden on Households

2.1.3.1. Direct Financial Burden of CVD on Households

(A) Out-of-Pocket Expenditure (OOPE) and Catastrophic Health Expenditure

Low-income regions often face the problem of people spending too much out of pocket for CVD care, which could become a catastrophic health expense. Results from several studies by Sui X [48] and Rijal *et al*. [49] have proven that several patients suffering from CVD or stroke in China, India, and Tanzania have CHE. Health expenses exceed 10% of their total household spending in this condition. In India, spending on heart problems from a person's pocket makes up almost 30% of the total annual expenses and mostly impacts low-income families, pushing them to borrow money [49].

(B) Cost of Medications and Hospitalization

Cardiology treatment and hospital stays are very costly for people. For example, in Brazil in 2025, total costs resulting from heart disease, mainly from healthcare charges and problems caused by lost productivity, were estimated to reach 22.4 billion reais, which is about 6.9 billion USD. As the costs of treating CVD can be so high, families in South Asia often take out cards and sell possessions [50].

(C) Disproportionate Impact on Low-Income Households

The financial impact of CVD disproportionately affects low-income households. Poorer households endure a greater financial burden than their income, according to a study in India that indicated the share of OOPP for diabetes treatment decreased as income increased. Similarly, it was discovered that socioeconomically disadvantaged communities in Brazil were disproportionately affected by the financial cost of heart failure and hypertension [51].

2.1.3.2. Indirect Costs and Productivity Losses

(A) Loss of Productivity and Income

Losing people from CVD at a young age results in lost productivity. A research team from Australia estimated that there were 51,659 employed years lost and a cost of $2.69 billion to the country through the current value of revenue misplaced because of deaths from CVD in 2003 [52]. For low-income countries where a big part of the labor force works in simple jobs, heart disease is often a reason for losing household wages and jobs.

(B) Impact on Caregivers and Families

The indirect CVD burden is aggravated in families with members who have intellectual disabilities. Members of such families tend to be full-time caregivers and thus incur lost wages and limited job prospects. Where this is so, the expense of comorbid condition management—particularly where augmented by communication impairment, behavioral issues, or lifelong dependency—puts an inordinately high burden on household resources and emotional health. This care burden is seldom recognized in healthcare financing or social protection programs, resulting in lifetime cumulative losses [53].

(C) Intergenerational Poverty

The financial cost of CVD can lock future generations into poverty traps. Families who go into debt or sell assets to pay for treatment may find it hard to invest in education, health, or other productive pursuits, locking in subsequent generations in poverty [54].

2.1.3.3. Coping Mechanisms and Financial Strategies

(A) Borrowing and Selling Assets

Families in LMICs often borrow or sell their possessions to obtain reimbursement for CVD treatment. For instance, most OOPE for hospital care in India was obtained by borrowing, especially for poorer households [55]. In South Asia, borrowing and selling assets are the most prevalent coping strategies to deal with out-of-pocket expenditures or financial strain for CVD and other NCDs [56].

(B) Reduced Household Expenditures on Essential Goods

In financing CVD and NCD, most households cut down on their principal and necessary items like food, education, and medical care. This may have severe long-term implications on the well-being and health status of the household [57].

(C) Reliance on Informal Care

Within most LMICs, informal care by family members or community networks is used to cope with CVD. Although this keeps direct medical expenses low, it has indirect costs regarding lost productivity and caregivers' wages [58].

2.1.3.4. Socio-Economic Inequalities and CVD Burden

(A) Advanced Occurrence of CVD Risk Factors in Disadvantaged Populations

Researches in the US specify that people from low-income groups are further expected to suffer from hazardous aspects like cigarette use, inoperativeness, and eating unhealthily, which are related to cardiovascular disease. Such risk factors may be predisposed by individuals' stress and lack of resources to boost their health. Being obese, having diabetes, or suffering from hypertension generally goes along with having a low SES. During that period, lower-earning and less-educated individuals in India experienced a greater increase in CVD risks, as outlined by Ski *et al.* [59].

(B) Social Determinants of Health

Community issues, income, and educational levels have a major impact on CVD in society. The author indicates that US patients with weak social determinants of health often face fatal financial consequences due to treating cardiovascular diseases. A lack of clean water, education, and healthy foods in low- and middle-income nations increases the risks for CVD and leads to further health imbalances [60].

(C) Disparities in Access to Care

Socio-economic disparities also influence CVD's access to healthcare services. In India, the affluent are more likely to avail themselves of the private sector for care. Meanwhile, lower-income people turn to the public sector, which is usually understaffed and underfunded, to bring high-quality repair. In Brazil, the risk of death in CVD patients among underprivileged populations is directly associated with pre-existing inequalities [61].

(D) Intellectual Disability and Intersectional Disadvantage

People with intellectual disabilities who are part of poor or rural families experience double marginalization. They tend to be left out of universal health schemes and, in some cases, may not even be registered on formal health databases. This restricts their coverage under both cardiovascular as well as psychiatric treatment, worsening outcomes and reinforcing cycles of health inequity. Public health efforts need to focus on disability-inclusive data collection and program design in order to address this compounded exposure.

2.2. Generation of the Search String

Based on the study aim, the second step was to build a broad search string covering the topics of cardiovascular diseases (CVD) and mental health in people with intellectual disabilities (ID). Only peer-reviewed articles were considered, focusing on CVD and mental health, intellectual disability, syndromic intellectual disability with cardiovascular risk, mental disorders in those with cognitive impairment, depression and anxiety in ID, and cardiovascular anomalies in Down syndrome, DiGeorge syndrome, and Williams syndrome. Reviews of articles in the electronic databases PubMed, Scopus, Web of Science, and PsycINFO helped create a keyword map. The studies chosen were meant to explore what makes

individuals with ID and CVD or other mental illnesses more vulnerable to certain risks, challenges, and diagnoses. Words were selected that represent intellectual disabilities of various kinds, as well as their links with psychiatric and cardiovascular conditions. As seen in Table **2**, the selected list of disorders centers on their contribution to mental and cardiovascular issues.

To ensure methodological rigor, a structured multi-phase process was followed in accordance with systematic review standards. An initial pool of 1,182 articles was retrieved through database searches in PubMed, Scopus, PsycINFO, and Web of Science, using a comprehensive keyword strategy focused on cardiovascular disease, mental health, and intellectual disability. After the removal of duplicates, 914 unique records remained.

Titles and abstracts were screened independently by 2 reviewers using predefined enclosure criteria. These criteria emphasized peer-reviewed, English-language articles with an explicit focus on individuals with intellectual disabilities and their experiences related to cardiovascular and/or mental health. Full-text screening of 173 shortlisted studies was conducted for relevance and methodological soundness.

A combination of the Critical Appraisal Skills Programme (CASP) list and an improved form of the ROBIS tool (Risk of Bias in Systematic Reviews) was used for quality appraisal. Research was assessed on aspects such as clarity of objectives, study design suitability, and outcome reporting completeness. Disagreements during screening or appraisal were resolved through consensus.

Due to the collection of study designs and outcomes, a descriptive synthesis approach was adopted. Findings were grouped thematically into key domains: prevalence, psychosocial burden, intervention models, caregiver perspectives, and systemic healthcare barriers. These categories informed the structure of the discussion and visual data presentation.

Systematic Review Compliance

This figure depicts the intricate and detrimental feedback loops between cardiovascular disease, mental health disorders, and intellectual disability. Each component exacerbates the others, creating a vicious cycle. For individuals with intellectual disabilities,
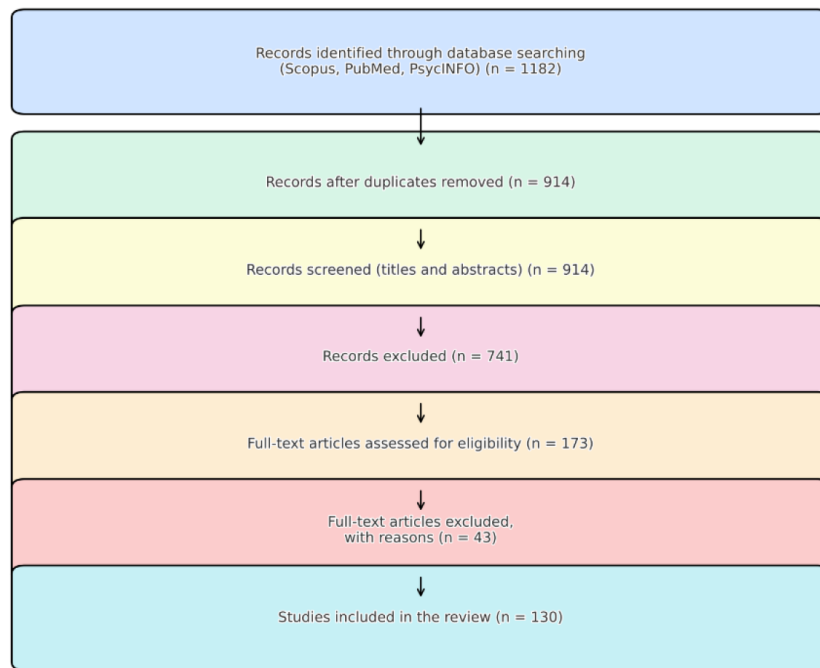
Figure 1: The Vicious Cycle: Interplay of Cardiovascular Disease, Mental Health, and Intellectual Disability.

Table 1:   Key Findings on the Relation between CVD and Mental Health and Intellectual Disabilities

Condition	Association with CVD	Citation
Post-Traumatic Stress Disorder	Increased risk of Cardiovascular, particularly after acute cardiovascular events	[62,63]
Bipolar Disorder	Reduced risk of coronary artery disease and heart failure	[64,65]
Depression	Increased risk of Coronary Heart Disease, Coronary Artery Disease, and Stroke	[66,67]
Mood Instability	Causal association with Coronary Artery Disease, Myocardial Infarction, heart failure, and stroke	[68]
Anxiety	Increased risk of Coronary Heart Disease, Coronary Artery Disease, and Stroke	[69-71]
Attention Deficit and Hyperactive Disorder	Increased risk of atrial fibrillation, heart failure, and ischemic stroke	[72,73]
Schizrenia	Upsurges the risk of heart failure and stroke	[74,75]
Down Syndrome	Common congenital heart defects (e.g., AV septal defects); high risk of depression	[76,77]
DiGeorge Syndrome (22q11.2 deletion)	Conotruncal cardiac anomalies; comorbid anxiety and schizophrenia	[78,79]

barriers to healthcare, lifestyle factors, and diagnostic overshadowing further amplify this complexity, leading to poorer health outcomes and significant care gaps.

The number of articles discovered in every search was high, requiring the development of more criteria for inclusion and exclusion. The study only considered the most relevant journal articles found in electronic databases. Similarly, the symphony could only feature music written in English. Because no peer review process applies to books, book chapters, reviews, and other grey literature, these publications are not included in the search results. From this systematic analysis, electing to view studies from peer-reviewed journals only on electronic databases can result in more bias based on language and publishing in English. Therefore, fugitive literature does not receive attention during systematic reviews because its methodology and quality may be too unknown to assess. The Journal highlighted articles that were specifically about people with intellectual disabilities.

Table 2:   Key Insights from Health Workers' Perspectives

Theme	Description	Citation
Impact of Stigma	Stigma discourages patients from seeking care and affects treatment adherence.	[80,81]
Role of Health Literacy	Tailored communication strategies can address low health literacy.	[82] ("Considering health literacy in cardiovascular disease management: a qualitative study on healthcare professionals' and patients' perspectives," 2022)
Facilitators of Care	Collaborative care models and patient-centered communication improve outcomes.	[83-85]
Barriers to Care	Lack of training, stigma, and resource constraints hinder effective management.	[86-88]

Table 3:   Mental Health and Outcome and their Key Findings

Mental Health Outcome	Key Findings	Citation
Depression	Associated with increased morbidity and suboptimal cardiovascular health.	[89] ("Association of Depression and Poor Mental Health with Cardiovascular Disease and Suboptimal Cardiovascular Health Among Young Adults in the United States," 2024)
Quality of Life	An important reduction in Quality of Life due to anxiety and depression.	("Anxiety and Depression as Predictors of Quality of Life in Cardiovascular Patients," 2021) [90]
Anxiety	Higher prevalence in CVD patients, linked to anxiety of disease progression.	[91,92]
Social Support	Higher social support is associated with lower anxiety and depression levels.	[93,94]
Psychological Interventions	A moderate reduction in anxiety and depression, improvement in Health-Related Quality of Life.	[95-97]
Stress Management	Effective in dipping stress, depression, and anxiety in CVD patients.	[98,99]
Mental Health in Intellectual Disability with CVD	Individuals with ID experience elevated rates of untreated depression and anxiety post-cardiac events, worsened by communication barriers.	[100,101]

The research involved syndromes linked to mental and heart problems, as well as the health services available for special-needs individuals. Keywords related to intellectual disability, developmental disorder, special population, and neuro developmental syndrome were included when searching for CVD and psychiatric research.

2.3. Literature Exploration

2.3.1. Ethical Considerations

This review is based entirely on available literature and did not includedirect human subject participation or access to separate patient data. Therefore, ethical approval and informed consent were not required as per institutional and international guidelines for systematic reviews.

3. INTERPRETATION OF FINDINGS AND DISCUSSIONS

3.1. Reviewed Articles

3.2. CVD Impacting Mental Health

Mental health treatment significantly improves cardiovascular outcomes, particularly in patients with pre-existing psychiatric conditions. In individuals with intellectual disabilities (ID), this relationship is further complicated by barriers to access and diagnostic challenges. 2024 research by Carmin *et al*. revealed that patients who acknowledged both psychotherapy and antidepressants post-discharge from hospitalization for ischemic heart disease or heart failure were up to 75% less expected to be re-hospitalized and 66% less expected to die from any cause. However,

Table 4:   Key Themes and Their Characteristics Uncovered in the Literature Review and the Number of Articles from the Total 683 Reviewed Possessing the Themes

Sr. No.	Themes	Condensed Key Search Strings
1	Severity of Mental Health in CVD	Mental health impact in CVD patients; long-term outcomes; intervention efficacy; prevalence and treatment of psychological issues in CVD.
2	Cycle Between CVD and Mental Health	Bidirectional CVD-mental health link; behavioral therapy; psychological intervention outcomes; managing CVD via mental wellness.
3	Health Workers' Perspectives	Health professionals' views on CVD-mental health integration, barriers, stigma, and care delivery challenges.
4	Specific Mental Health Outcomes from CVD	Role of anxiety, depression in CVD; influence of psychosocial factors; effect of lifestyle and support systems.
5	Mental Health Interventions Impact on CVD	Effectiveness of psychological treatments on CVD outcomes across diverse populations; cultural adaptations.
6	Economic Burden of CVD in LMICs	The financial influence of CVD on families in low- and middle-income countries; socio-economic challenges.
7	CVD and Mental Health in Intellectual Disabilities	CVD and depression in ID; Down syndrome; post-cardiac mental distress in intellectually disabled populations.
8	General Cardiovascular-Mental Health Link	Interaction between heart disease and psychological health; emotional well-being in CVD; anxiety and depression linkage.
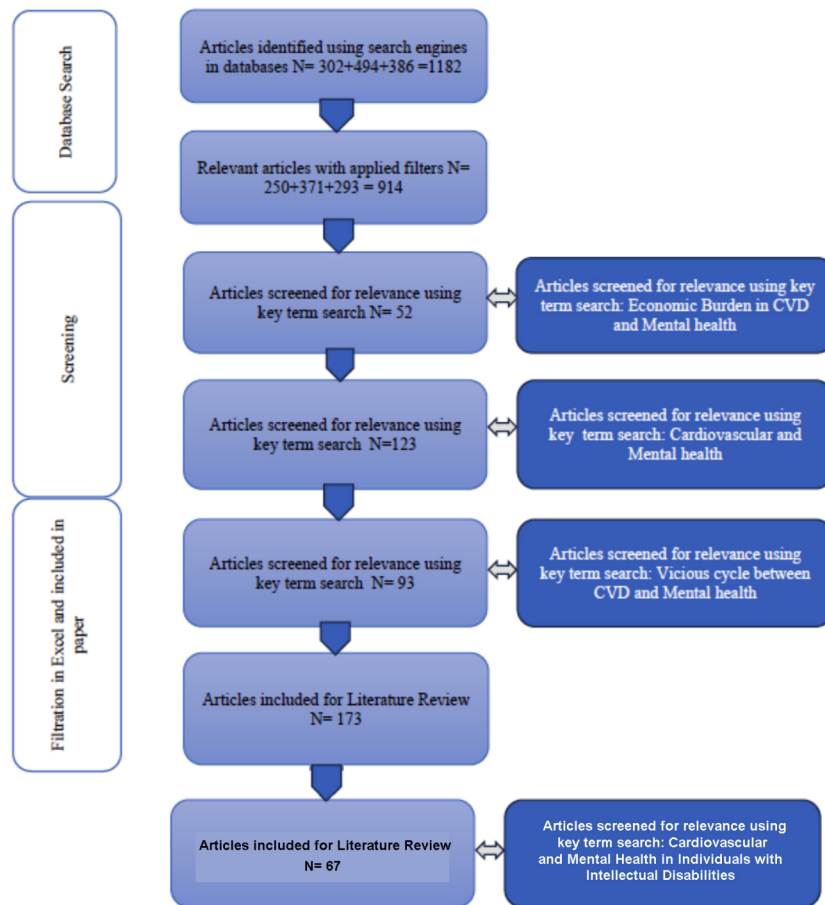
Figure 2: PRISMA Chart.

individuals with ID are often excluded from such interventions, and their re-hospitalization and mortality rates remain disproportionately high (Figure **2**). Lack of adapted psychological care and poor treatment adherence due to cognitive limitations are major contributing factors. Tailoring therapeutic strategies for
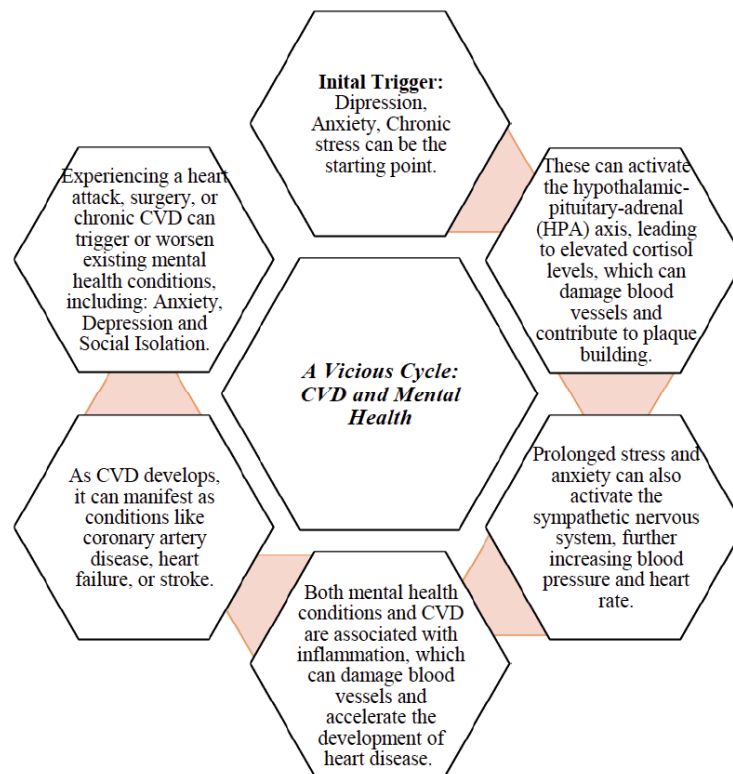
Figure 3: Integrated Care Model for Individuals with Intellectual Disabilities: Bridging Physical and Mental Health.

patients with ID—such as simplified psychoeducation, caregiver involvement, and accessible follow-up—can bridge this care gap and reduce overall cardiovascular burden.

3.3. Vicious Cycle Timeline: CVD and Mental Health

The causal cycle between cardiovascular illness and mental well-being is intensified in patients with intellectual disabilities. The cognitive impairment decreases patients' awareness or expression of symptoms, which conserves diagnosis time (Figure **3**). Concomitantly, the experience of chronic physical illness raises psychiatric risk. Such co-occurring disorders form a feedback loop: left untreated, depression or anxiety worsens CVD risk, while left uncontrolled, CVD aggravates mental well-being. In individuals with ID, already experiencing social exclusion, communication difficulties, and dependency on carers, this cycle produces greater mortality and disability than in the general population.

3.4. Insights at the National Scale

Only a small number of Indians (34.5%) have normal blood pressure, and there are large differences in CVH between cities and rural areas and across socio-economic levels [102]. Early occurrence of heart disease adds to the problems in South Asia, as it affects those who support their families financially and also upsets their economy due to a lack of health insurance [103]. Traditional foods eaten in south India may help reduce the risk of diabetes and hypertension. Eating a lot of meat and fried food increases a person's chances of having cardiovascular problems [104]. According to research, treating high blood pressure in rural India by considering each person's quick CVD risk is less expensive than the common methods [105]. It has become government policy in India to use strategies that improve society, provide financial support for healthcare, and introduce public health insurance to handle CVD [106] more effectively. Even though community health workers can assist with hypertension, it is unclear what their effect is on diabetes and smoking [107]. Women have a superioramount of demises from CVD than men; they also have to stay hospitalized for longer than men. Because of these findings, it is shown that women have differing heart problems and need gender-focused treatments, as noted by Libby *et al.* [108].

3.5. Urban Area Insights

The incidence of diabetes, as well as risk issues such as hypercholesterolemia and low levels of HDL cholesterol, is extremely high among the middle class

in urban areas, with a majority of the population unaware or poorly controlling these conditions. In addition, the youth are not immune enough, and a considerable number of youth suffer from high blood pressure, which alerts them to problems like CVD issues [109]. If we look at the insights, the earlier genetic tendency and low-grade inflammation that run in families for some time make diseases like CVD even more complex [110]. These risk factors must be addressed through adequate healthcare delivery, lifestyle changes, and targeted public health interventions, which are crucial for extenuating the CVD disease burden [111]. It is crucial to note that data from national, urban, and rural surveys rarely include disaggregated analyses for individuals with intellectual disabilities. As a result, the health inequities faced by this population remain invisible in health policy and epidemiological planning. There is a pressing need to integrate ID-specific indicators into future public health surveillance to understand better and address their disproportionate CVD and mental health burden.

3.6. Semi-Urban Area Insights

The Chennai Urban Population Study (CUPS) revealed a significant increase in coronary artery disease (CAD) prevalence in urban India, with anoccurrence rate of 11% in the total people, a tenfold growth since 1970. Among diabetic subjects, the prevalence of CAD was notably higher at 21.4%, compared to 14.9% in those with impaired glucose tolerance (IGT) and 9.1% in those with standard/normal glucose tolerance (NGT), indicating that CAD risk increases even at the stage of IGT. It is crucial to note that data from national, urban, and rural surveys rarely include disaggregated analyses for individuals with intellectual disabilities. As a result, the health inequities faced by this population remain invisible in health policy and epidemiological planning. There is a pressing need to integrate ID-specific indicators into future public health surveillance to understand better and address their disproportionate CVD and mental health burden.

3.7. Rural Area Insights

People in rural regions often suffer from high blood pressure and diabetes, as 6.7% are affected by hypertension and 3.7% by diabetes, according to Kumar and Mohammadnezhad[112]. Areas that have low socio-economic status appear to have more people at high hazard of coronary heart disease [113]. The results discovered that not smoking (among 76.7% of participants), having high levels of physical activity

(among 67.5%), and fasting plasma glucose (among 65.8%) were achieved quite often, but only 4.2% of the participants managed to consume the recommended quantity of fruits and vegetables. The percentage of people with reasonable, moderate, and poor cardiovascular health was not the same everywhere, and rural areas had higher rates of good CVH (10.4%) than metropolitan cities (3.9%) and smaller cities (7.8%), as highlighted by Koudirat *et al.* [114]. It was reported that infections became less common, but cases of CVD significantly increased from 2004 to 2014. In comparison, the number of CVD cases went from 7.34 to 13.48 per 1,000, and the number of infectious disease cases slightly decreased from 29.57 to 28.05 per 1,000 between the two time periods [115]. Disaggregated analysis for persons with intellectual disabilities is rarely included in national, urban, or rural survey results. These health challenges are often excluded from planning policies and analyses. ID-specific monitoring ought to be incorporated into future public health systems so that their high rates of heart illnesses and mental disorders can be addressed.

3.8. Interventions and Their Effectiveness

While numerous interventions have confirmed effectiveness in refining mental health and cardiovascular results in the general population, very few are designed or validated for individuals with intellectual disabilities. This population requires tailored therapeutic approaches that consider communication needs, cognitive comprehension levels, caregiver dynamics, and sensory sensitivities. Below are selected interventions, many of which have the potential to be modified for the ID population with appropriate support mechanisms.

(A) Psychological Interventions

It has been discovered that psychological therapies such as mindfulness-based stress decrease and cognitive-behavioral therapy (CBT) help people with CVD experience less anxiety and sadness. Psychological treatments have been found to increase HRQoL and improve mental health outcomes [116,117]. Although the effects of psychological actions like cognitive behavioral therapy and mindfulness-based stress decrease can differ, some studies suggest that treatments for anxiety and hypertension may improve outcomes more than treatments for depression [118]. For these interventions to be effective with ID individuals, visual aids, streamlined modules, and behavioral reinforcement must be used

frequently with the assistance of caregivers or support staff.

(B) Role of Social Support and Stress Management

Good mental health outcomes in the face of CVD can be achieved by having social support. Connecting with people is necessary since a lack of social ties often leads to more anxiety and depression [119,120]. Patients with CVD find that using rest, focusing on work, changing negative habits of thinking, and dealing with stress improve their mental well-being. As a result, people's general well-being has improved [121]. For individuals with ID, feeling isolated and having caregivers under stress are important signs of mental and heart issues, so having social support is more necessary to prevent these problems.

(C) Medication Management

Antidepressants may be effective in the treatment of depression in CVD patients but require careful monitoring for possible interactions with cardiovascular drugs [122,123]. Medication compliance in the ID population is determined by caregiver functioning, patient understanding, and tolerance to side effects. Frequent psychiatric reviews and reduced dosage schedules are advised.

(D) Lifestyle Modifications

Facilitating healthy lifestyle modification, including exercise, a balanced diet, and quitting smoking, improves mental and cardiovascular health [124]. Facilitating lifestyle change in people with ID involves organized routines, assistive devices, and supervised activities—often conducted through community health workers or family members.

3.9. Interventions to Reduce the Economic Burden of CVD

(A) Cost-Effective Interventions

There are some affordable methods to decrease the economic problem of CVD in these countries. Usually, public health programs focus on restricting tobacco and salt and encourage everyone to exercise and eat healthily [125].

(B) Pharmacological interventions with generic statins and antihypertensive medications have also been verified to be cost-effective in minimizing CVD risk issues in LMICs [126].

(C) Financial Protection Mechanisms, such as health insurance and prepayment schemes, may decrease the cost burden of OOPE for CVD care. In India, for instance, risk-targeted insurance plans like the Rashtriya Swasthya Bima Yojana (RSBY) have decreased financial burdens on poor households [127]. For persons with intellectual disabilities and their families, the cost burden is added. Not only are patient out-of-pocket costs for care high, but long-term reliance and caregiver dropout from the workforce also increase poverty traps. Health financing systems such as India's RSBY should specifically include disability-adjusted benefits and guarantee coverage of psychiatric and rehabilitative care.

(D) Extended cost-effectiveness analysis (ECEA) was suggested as a means of assessing the distributional effects of health policies and ensuring interventions are fair and cost-protective [128].

(E) Community-Based Approaches

Many studies have found that community-based approaches and telehealth services help improve the management of heart failure in LMICs, as supported by Jana and Chattopadhyay [129]. Describe how effective therapies for CVD benefit people's health, lifestyle, and savings on healthcare.

(F) Addressing Social Causes of Health

Interventions to improve health factors such as living conditions, income, and education are crucial for CVD relief. The case presents evidence that having access to better health and educational facilities may reduce problems associated with behavior and mental issues caused by CVD risk factors [130].

3.10. Strategies to Improve Care

(A) Enhancing Training and Education

Health workers need to specialize in CVD management and mental health. This involves training in communication skills, cultural competency, and evidence-based tools for CVD risk assessment and management [131]. Training sessions for health workers need to be carefully crafted to meet the particular demands of vulnerable communities, including migrants and refugees, who usually face huge hurdles in accessing proper healthcare [132]. This is particularly crucial for empowering frontline health workers with the skills needed to detect and

control CVD and psychiatric comorbidities in people with ID—who usually have to be diagnosed with uncommon symptoms.

(B) Improving Communication and Collaboration

Effective communication among primary care professionals, mental health professionals, and patients is important. Frequent interdisciplinary meetings and joint electronic health records can facilitate this [133,134]. Patient-centered communication styles, including empathic conversation and shared decision-making, can improve trust and better follow-through on treatment plans [135,136].

(C) Addressing Resource Constraints

Increasing staff numbers and ensuring that sufficient resources, including mental health screening instruments and educational materials, are available can facilitate the ability of health workers to cope with the demands of providing care for patients with complex needs [137,138]. Putting into practice policies that strategically reward collaborative care models and offer strong financial incentives for resource-intensive interventions is a multifaceted solution to addressing the multifaceted burdens placed on health workers [139].

(D) Reducing Stigma and Promoting Health Literacy

Educational programs and public health campaigns can assist in diminishing the stigma of mental health disorders. Health workers are shifting their focus towards promoting patients to access care, and stigmatization decreases towards mental health care [140]. Tailored health literacy interventions, such as simplified educational materials and visual aids, can improve patients' understanding of their conditions and treatment plans [141] (Considering health literacy in cardiovascular disease management: a qualitative study on healthcare professionals' and patients' perspectives, 2011). Health literacy efforts must include ID-specific materials, such as pictorial booklets, audio instructions, and caregiver-friendly explanations. Reducing stigma around ID and psychiatric illness in rural areas is critical to enabling care-seeking.

3.11. Increased Morbidity and Mortality

Individuals with depression and anxiety in cardiovascular care tend to stay in the hospital longer, have a less favorable outcome, and pay more for their healthcare [142,143]. Researchers found that after

experiencing depression post-myocardial infarction, there is twice to nearly twice-and-a-half times greater risk of demise from the heart and all causes [144]. The study noted that cardiovascular disease patients who took part in stress management exercises reported less anxiety, stress, and sadness when associated with the control group. The subjects' mental health improved dramatically during the 1.5- and 3-month checkups. The strategy involved using Cognitive Distortion Detection Techniques and relaxation in weekly 8-session interventions. The research points out that mental health care should be included in routine CVD treatment to improve patients' health. In cases of intellectual disabilities, it is common for psychiatrists to identify other mental illnesses late. Also, after heart surgeries, psychological rehabilitation is seldom offered. This makes it more likely that a person will die, their caregivers will become tired, and they will be in an institution for a long time. We need a framework that specifically targets mental health for people with disabilities so that these outcomes are reduced.

3.12. Need for Social Support

Overall scores on the anxiety, sadness, illness progression, dread, and social support scales were 7.50, 8.38, 35.19, and 36.34 points in individuals with coronary heart disease (CHD), respectively. $P < 0.05$ indicated that these values were statistically significant. Furthermore, multivariate regression analysis showed that patients' postoperative anxiety and despair levels were significantly influenced by social support and the degree of illness progression. Moreover, anxiety and depression levels among CHD patients were positively correlated with fear of illness development and negatively correlated with social support components [145]. For persons with ID, social support is even more crucial. Research has established that family support, routine organization, and social integration decrease post-cardiac interventions' depressive and anxiety symptoms. In their absence, distress becomes amplified, which complicates cardiovascular prognosis. Community-based support networks and respite care for caregivers should be assured.

4. CONCLUSION

CVD and mental health connect in various ways, and this relationship often has a severe impact on health outcomes—especially for people with ID. Evidence from this review proves that people living with ID, who are already likely to have behavioral concerns, are also at an advanced hazard for CVD and additional

psychiatric disorders. Even though many publications discuss depression, anxiety, and adverse heart issues in general people, there are still very rare studies for those with disabilities. Because of this gap, clinical practice, decision-making, and health care for everyone are negatively affected. Individuals with ID have a distinctive risk factor group that enhances their cardiovascular susceptibility. These are syndromic disorders like Down syndrome, Williams syndrome, and 22q11.2 deletion syndrome, with congenital cardiac malformations being typical. Lifestyle-related and drug-induced risk factors like obesity, metabolic syndrome, and dyslipidemia also are common in individuals with ID. Combining this with poor access to preventive health, low health literacy, and poor diagnostic facilities, these risk factors make a situation ripe for the development and exacerbation of CVD.

Equally concerning is the under diagnosis of psychiatric conditions in individuals with ID. Diagnostic overshadowing, in which emotional or psychiatric symptoms are inaccurately assumed to reflect cognitive impairment, often leads to delayed or missed diagnosis of depression and anxiety. Untreated mental health situations not only lower quality of life but also function as independent risk factors for poor cardiac outcomes. Cognitive deficits also cloud clinical communication, with impaired individuals having a hard time describing symptoms of chest pain, weakness, or emotional distress, further contributing to the delay in intervention.

Clinical evidence points out the effectiveness of mental health treatment in enhancing cardiovascular outcomes. To illustrate, research has provided evidence that patients undergoing a combination of antidepressant medication and psychotherapy exhibit notable declines in re-hospitalization, emergency department visits, and all-cause mortality. These interventions are not commonly geared or modified for individuals with ID; however, their use is ineffective or impossible for this population. Typical cognitive-behavioral therapy (CBT) modules, for example, tend to utilize abstract thinking and verbal expression—abilities that may be unavailable to those with moderate to severe intellectual deficits.

Psychological therapies must be tailored to overcome these constraints. These include visual aids, plain language, repetition-based training, and therapy sessions with caregiver support. Furthermore, the presence of caregivers is not only helpful—it is crucial. Caregivers act as intermediaries for compliance with treatment, emotional stability, and reinforcement of health behavior. Any long-term intervention must, therefore, take a triadic approach, blending the healthcare practitioner, the person with ID, and their major caregiver.

Another such primary concern is the financial cost of comorbid CVD and mental illness on disabled member households. In most LMICs, direct expenditure, such as hospitalization and medicines, is augmented by indirect costs like unemployment of caregivers, transportation costs, and long-term care. Lacking proper financial protection mechanisms, such households fall prey to catastrophic expenditure on health, asset depletion, and poverty intergenerationally. Health insurance programs such as India's Rashtriya Swasthya Bima Yojana (RSBY) need to broaden their mandate to include mental health care, disability support, and ID-population-specified cardiac rehabilitation.

The policy implications of these findings are serious. National health databases first need to break down data by disability, which will allow for focused surveillance of disease patterns in this high-risk group. Second, primary care systems need to be reorganized to incorporate systematic screening protocols for both mental health and cardiovascular risk in people with cognitive impairments. This involves arming community health workers with instruments and training to identify deviant symptoms and respond compassionately to neurodiverse communication patterns. Third, interdisciplinary collaboration among cardiologists, psychiatrists, developmental experts, and social workers must become normative practice, especially in rural and low-resource environments.

Also, community-level interventions have promising results when framed to incorporate psychosocial and behavioral interventions. Interventions that incorporate coaching on diet, stress reduction, and low-cost physical activity, combined with mental health services, can significantly enhance mental and cardiac health. Digital solutions, like streamlined mobile therapy or remote monitoring programs, can provide scalable options if properly adapted to meet the needs of those with restricted literacy or understanding.

In addition, research must go beyond demonstrating efficacy under controlled conditions and evaluate real-world implementation, sustainability, and cost-effectiveness of these interventions in ID populations. Longitudinal research evaluating behavioral, biochemical, and psychosocial outcomes over

extended time frames is required to establish an evidence base powerful enough to influence national policy and clinical practice guidelines. Notably, such research must take inclusive approaches—using streamlined consent procedures, caregiver participation, and flexible outcome measures—to accurately capture the needs and realities of people with ID.

While positive psychological strengths like emotional vitality, optimism, and resilience have been demonstrated to ward off CVD within the general population, it is unknown how these constructs function within intellectually disabled people. Subsequent research will need to determine if and how interventions in positive psychology can be adapted to improve well-being, decrease stress reactivity, and counter cardiovascular risk among individuals with cognitive impairments. Interventions from digital mental health technologies, including gamified cell phone applications and caregiver-facilitated modules, must be pilot-tested for usability and acceptability among individuals with IDs.

The interdependence between mental health and cardiovascular disease cannot be addressed without acknowledging and including the intellectual disability community. They represent a segment of the population that is medically complex, socially vulnerable, and systematically underserved. Closing this gap will necessitate a paradigm shift from care models in silos to inclusive, integrated systems with priority given to equity, access, and sustainability.

Michelle Obama once said, "Whether an illness affects your heart, arm, or brain, it's still an illness, and there shouldn't be any distinction." In the case of intellectual disabilities, this phrase is even more pressing. An individual with ID is not simply coping with a cognitive condition; they may be coping with undiagnosed depression, uncontrolled high blood pressure, and social isolation—all simultaneously. It is time to conceptualize CVD and mental illness not as convergent issues but as intertwined ones that require an integrated, disability-aware response.

5. FURTHER DISCUSSION

5.1. Future Directions and Research Implications

The association between mental health and cardiovascular disease is an active area of research, with several future directions identified:

(A) Mechanistic Studies

Discovering the ID-specific pathophysiological mechanisms behind the CVD–mental health association is also required. These mechanisms include changes in genetic markers (e.g., those in Down syndrome), autonomic dysregulation, neuroinflammation, and syndromic risk factors that enhance both cardiac and psychiatric risk. Harmonizing epigenomics, proteomics, and neuroimaging information will provide insights into how these mechanisms are distinct from those seen in neurotypical groups [146,147].

(B) Intervention Development

Intervention development should focus on adapted psychological therapies, reduced-complexity communication strategies, and caregiver-mediated delivery formats. Lifestyle interventions like formalized exercise programs, dietary adjustments, and mindfulness practices need to be cognitively accessible and behaviorally reinforced. Research needs to evaluate the real-world application of the adapted models in clinical and community-based settings [148].

(C) Population-Specific Studies

Large-scale investigations of syndromic ID populations (i.e., Down syndrome, DiGeorge syndrome) and institutional care populations are imperative. They are known to have increased congenital heart disease, restricted mental health services, and special caregiving circumstances. Longitudinal studies should measure outcomes like quality of life, hospitalization, and caregiver burden over the lifespan [149].

(D) Bibliometric and Epidemiological Research

Present bibliometric studies do not have disability-specific tagging. Subsequent research should use disability-disaggregated measures to examine the CVD and mental health literature. The cognitive status variable should be included in epidemiological studies, and validated psychiatric screening instruments in ID populations should be used to facilitate better estimation of comorbidity prevalence and intervention deficits [150,151].

5.2. Suggestions for Practical Enhancement

Several practical enhancements are proposed to strengthen this review's real-world relevance. First, incorporating anonymized clinical case vignettes could help illustrate how cardiovascular and mental health
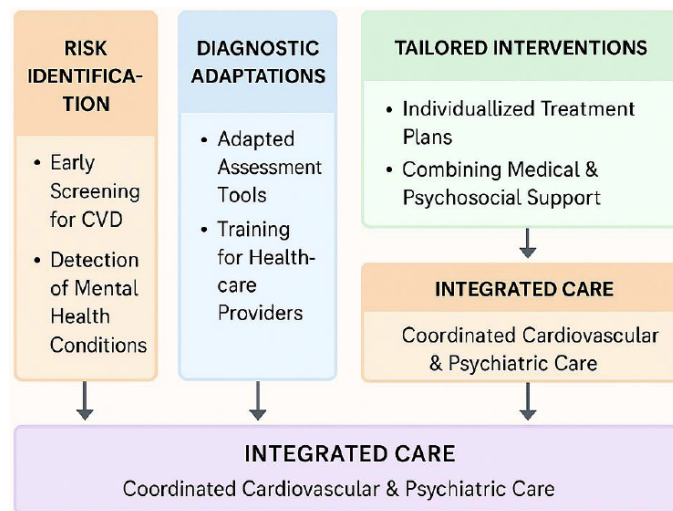
Figure 4: Integrated Intervention Pathway for Cardiovascular and Mental Health Management in Individuals with Intellectual Disabilities.

issues manifest uniquely in individuals with intellectual disabilities. These examples can highlight diagnostic delays, communication barriers, and treatment dilemmas faced in day-to-day clinical settings.

Second, a visual summary in the form of figure mapping intervention pathways—specifically adapted for individuals with intellectual disabilities—would offer a clear, at-a-glance representation of integrated care strategies. Such a model could demonstrate how tailored mental health support, caregiver involvement, and accessible cardiac care intersect in managing this vulnerable group (Figure **4**).

Lastly, deeper attention to gender and age differences is warranted. The experience of cardiovascular and psychological distress can vary significantly across life stages and between males and females with intellectual disabilities. Enhanced stratification in future research and interventions will be essential to ensure that care models are both equitable and effective.

5.3. Gender- and Age-Specific Considerations

The intersection of gender and age with cardiovascular and mental health outcomes in individuals with intellectual disabilities warrants focused attention. Males with ID have shown a higher incidence of undiagnosed hypertension and behavioral disorders, while females often face under-diagnosis of mood disorders due to communication barriers and diagnostic overshadowing. Additionally, hormonal changes during adolescence and menopause may exacerbate mental health symptoms and cardiac risk in females.

Age-related vulnerabilities are also pronounced. In children and adolescents with ID, early-onset behavioral dysregulation and congenital heart defects often coexist, demanding age-appropriate, family-centered interventions. Among older adults, polypharmacy, limited mobility, and social isolation compound both cardiac and psychological risks. Tailoring interventions by age and gender is essential to promote equitable care and to recognize biological and social determinants of health unique to these subgroups.

5.4. Factors/Mechanisms Linked with Mental Health

Several biological, psychological, and social factors mediate the relationship between cardiovascular illness and mental health. Important mechanisms consist of:

(A) Biological Mechanisms

Inflammation and changes in the ANSinitiate depression and anxiety and can lead to adverse events affecting the heart [152,153]. Hypothalamic-Pituitary-Adrenal (HPA) Axis Dysfunction: Long-term stress and some mental illnesses, by interfering with the HPA axis, cause the body to produce more cortisol, which harms your cardiovascular system [154, 155]. Depression may result in platelets becoming more active, which is related to blood clotting and heart attacks [156]. People with intellectual disability, specifically those with syndromes and conditions, may already have certain inflammatory and nervous system effects, making them more vulnerable to heart-related issues from depression and stress. In Down syndrome, a rise in certain inflammatory chemicals and early improper

functioning of the immune system may lead to cardiac problems. The approach requires investigation in groups of patients with ID to identify specific targets for treatment.

(B) Psychological Mechanisms

Research has found that the more severe a person's CAD is, the lower their Health-Related Quality of Life and, hence, their corporal functioning and energy are negatively affected [157]. Cognitive Impairment: Those with anxiety and depression often experience difficulties making choices and following cardiovascular treatments due to cognitive impairment [158]. In individuals with ID, it is common for both a decreased quality of life and cognitive problems to exist, but such problems are seldom checked regularly using simple measurements. Consequently, problems with diagnosing and treating diseases arise. Moreover, problems with regulating emotions, poor understanding of their needs, and making unhealthy lifestyle choices make it harder to treat cardiovascular diseases in people with SMI.

(C) Social and Behavioural Mechanisms

People who choose unhealthy habits, including smoking, eating unhealthily, and not exercising, are usually affected by mental disorders and are at an advanced hazard of heart problems [159,160]. According to Camin *et al*. [161], together cardiovascular disease and mental illness are often linked to the risk of social isolation [161]. Due to reasons such as institutional living, not being aware of their health, or relying on their surroundings, people with ID could become more exposed to lifestyle risks. It is common for people with big cognitive deficits and those in group or care homes to become isolated. Interventions must address changes in the caregiver or environment and behavioral changes for the children.

5.5. Impact of Mental Health on Cardiovascular Outcomes

Mental health illnesses had an intense influence on cardiovascular consequences, including:

(A) Psychological Well-Being

Individuals with greater psychological well-being have a reduced chance of cardiometabolic disease [162]. Patients with heart problems who have positive psychological traits experience developments in their health-related quality of life. Many aspects of mental well-being in people with ID rely on routine, familiarity, caring caregivers, and their environment. Programs that support a person's feelings and independence should be adapted and often included in their daily schedule. It seems that having positive experiences with people and receiving praise from caregivers can decrease unhealthy behaviors and, as a result, improve heart function.

(B) Disparities in Access to Care

Socio-economic inequities also influence the availability of CVD healthcare services. In India, wealthy individuals are more likely to avail of private-sector treatment. At the same time, poor individuals rely on the public sector, which often lacks sufficient resources and capacity to provide good quality care [163,164]. Because of unequal access to medical care, poor sectors in Brazil have increased morbidity and mortality associated with CVD, as discussed by Boehm and Nabel *et al.* (2003)[165].Disparities of access are also exacerbated among individuals with ID, who experience barriers not just due to income but also due to provider training, stigma, and discrimination. In rural, low-resource settings, people with ID are more likely to be undocumented and thus beyond the reach of screening or health insurance programs. Universal registration of disability and inclusive models of care must address this gap [166].

(C) The Role of Social Elements of Health

Social factors such as the condition of neighborhoods, a person's earnings, and their level of education largely influence how much CVD affects people. A study from the US found that individuals who faced financial challenges or other social hardships were more likely to have financial difficulties due to their CVD drugs [167]. Education and local resources affect the well-being of individuals with ID through factors such as receiving care from a trained caregiver, residing in a good institution, and having sufficient transportation [168]. Easy access to combined health services, supported jobs, and inclusive housing could greatly protect people with disabilities from heart problems and mental health issues [169]. Strategies designed by different sectors should address the conjunction of disability and poverty to prevent chronic health decline.

GRAPHS AND FIGURES

Figure **5** presents a comprehensive framework for integrated care, emphasizing the interconnectedness of
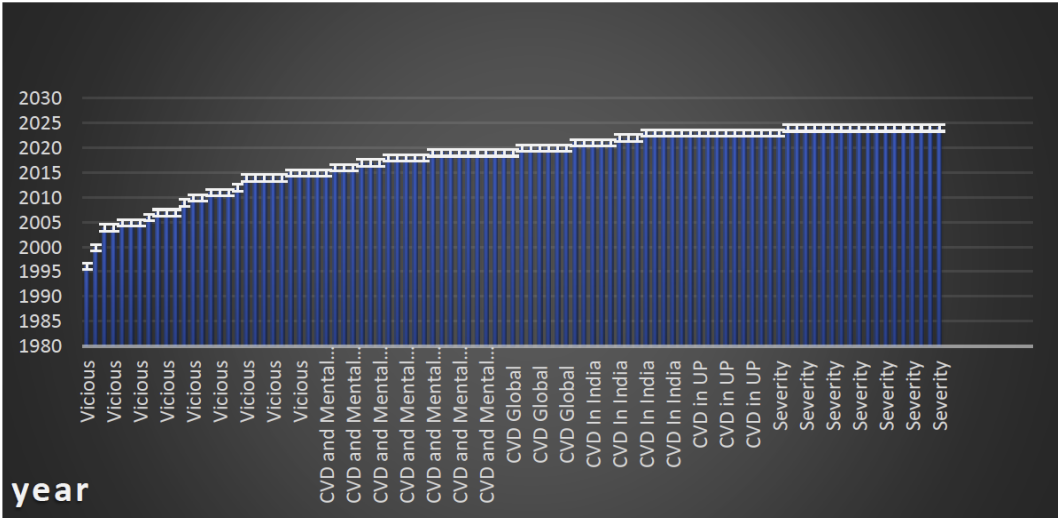
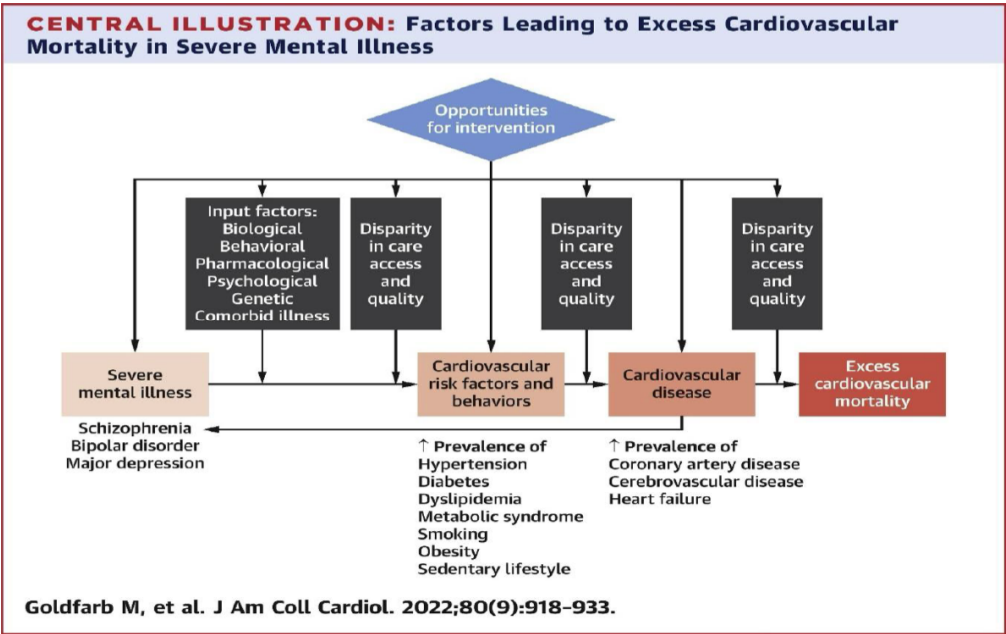**Graphs 1:** Year-wise secured articles related to CVD, Mental Health, and Vicious cycle.

Figure 5: Comprehensive framework for addressing cardiovascular and mental health in intellectual disability.

physical and mental health for individuals with intellectual disabilities. It highlights the importance of early screening, tailored interventions, and multidisciplinary collaboration. The model promotes a person-centered approach, ensuring that support systems, accessible healthcare, and educational initiatives are in place to mitigate risks and improve overall well-being. This framework advocates for proactive strategies to break the cycle of health disparities often faced by this population.

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