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Integrated Lifespan Mental Health Care in Low- and Middle-Income Countries: A Narrative Review

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Abstract

Low- and middle-income countries face a persistent mismatch between high psychosocial need, limited specialist capacity, delayed detection, fragmented follow-up, and rising burdens across the life course. This narrative review examines integrated lifespan mental health care as a practical framework for strengthening assessment, treatment, rehabilitation, safety, and prevention across clinical and community settings. The review synthesizes evidence and clinical lessons across child and adolescent disorders, autism spectrum disorder, attention deficit hyperactivity disorder, depression, bipolar disorder, psychosis, substance-use disorders, perinatal distress, neurocognitive impairment, stroke, Parkinson's disease, epilepsy-related presentations, medication safety, and service quality improvement. Across these domains, several priorities emerge: early recognition in general practice, culturally acceptable screening, stepped psychological and pharmacological interventions, family and caregiver involvement, structured risk formulation, neurocognitive and neurological vigilance, metabolic monitoring, continuity after discharge, and quality-improvement methods that protect patients and staff. The review argues that effective lifespan care in resource-constrained systems requires more than specialist expansion alone. It depends on coordinated pathways linking primary care, psychiatry, psychology, neurology, maternal health, addiction services, rehabilitation, and community support. Integrated lifespan models can improve access, clinical safety, adherence, functional recovery, and equity when adapted to local workforce, cultural, economic, and health-system realities.

Keywords: Task-sharing; Family engagement; Cognitive screening; Treatment adherence; Clinical governance

1. Introduction

Mental, neurological, and substance-use disorders are among the most important public health challenges of the twenty-first century. They contribute substantially to disability, premature mortality, impaired educational and occupational functioning, reduced quality of life, family burden, stigma, and economic loss [1], [2]. Their impact is particularly severe in low- and middle-income countries (LMICs), where mental health needs are high but specialist workforce, psychological therapies, neuropsychiatric services, psychotropic medicines, rehabilitation systems, and long-term follow-up pathways are often limited [2], [3]. In many such settings, the treatment gap is not only a problem of insufficient psychiatric beds or too few psychiatrists. It reflects a deeper mismatch between population need and the organisation of care across primary care, community services, specialist psychiatry, psychology, neurology, maternal health, addiction services, and public health systems [3], [4].

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A lifespan perspective is essential because mental health difficulties do not begin and end within adult psychiatric clinics. Neurodevelopmental disorders, childhood depression, attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), childhood-onset psychosis, behavioural problems, learning difficulties, and adolescent distress may compromise education, family functioning, social development, and long-term health [5], [6], [7], [8]. At the other end of life, stroke, Parkinson's disease, dementia, epilepsy-related syndromes, traumatic brain injury, chronic medical illness, and medication-related complications may present with depression, anxiety, cognitive impairment, psychosis-like symptoms, behavioural disturbance, or functional decline [9], [10], [11], [12]. Between these stages, adults may experience recurrent depression, bipolar disorder, psychosis, substance-use disorders, perinatal mental health problems, suicidal behaviour, trauma-related symptoms, and psychiatric consequences of social adversity [13], [14], [15], [16], [17]. Therefore, mental health systems in LMICs require models that are not limited to diagnosis and prescription, but that link early identification, psychological care, rational pharmacotherapy, neurocognitive assessment, family support, rehabilitation, safety planning, and continuity of care.

Primary care and general practice are central to this agenda. In many LMICs, primary care clinicians are the first, and sometimes the only, formal health professionals contacted by people with depressive symptoms, anxiety, substance use, medically unexplained symptoms, suicidal ideation, cognitive complaints, or behavioural change [18], [19]. Depression is especially important because it is common, disabling, frequently comorbid with physical illness, and often missed when patients present with somatic symptoms rather than explicitly reporting sadness or anhedonia [18]. Structured screening tools such as the Patient Health Questionnaire can support detection, but screening alone is insufficient unless it is followed by clinical assessment, suicide-risk evaluation, stepped care, access to psychotherapy or behavioural activation, appropriate antidepressant prescribing, and timely referral when psychosis, bipolarity, severe disability, substance use, diagnostic uncertainty, or safety concerns are present [18], [19], [20]. Thus, integration of mental health into primary care should not mean shifting responsibility to unsupported generalists; it should mean supervised, coordinated, and clinically governed care.

Psychotherapy and psychosocial interventions are equally important components of integrated lifespan care. In resource-constrained systems, brief, structured, and culturally acceptable interventions may be more feasible than specialist long-term psychotherapy for every patient. Psychoeducation, family work, motivational interviewing, cognitive behavioural strategies, interpersonal approaches, behavioural activation, caregiver coaching, relapse-prevention planning, and parent-mediated interventions can all contribute to improved engagement and functioning when adapted to local realities [7], [15], [17], [21]. However, the effectiveness of psychosocial interventions depends on more than the intervention label. Attendance, fidelity, family participation, therapeutic alliance, supervision, literacy, transport costs, stigma, and follow-up systems influence whether psychological care is actually delivered and sustained [7], [15], [17]. This is particularly important in ASD, first-episode psychosis, alcohol-use disorder, perinatal depression, and chronic severe mental illness, where family and community context often shape adherence, recovery, and risk.

Psychopharmacology remains indispensable, but it must be safe, rational, and context-aware. Antidepressants, antipsychotics, mood stabilisers, stimulants, non-stimulant ADHD medications, anticonvulsants, and dopamine agonists can be clinically valuable when diagnosis is accurate, medicines are available, doses are adequate, side effects are monitored, and follow-up is reliable [20] ,[22], [23], [24], [25], [26]. In LMICs, these conditions cannot be assumed. Medicines may be unavailable, unaffordable, inconsistently supplied, or used without sufficient monitoring. Antipsychotic treatment, for example, requires attention to weight, waist circumference, glucose metabolism, and cardiometabolic risk [27]. Antidepressant use requires diagnostic caution, especially where bipolar depression, neurological illness, chronic pain, substance use, or medication-induced symptoms may complicate the clinical picture [20], [22]. Treatment of bipolar depression requires awareness of phase-specific evidence and safety issues, including careful titration and monitoring when agents such as lamotrigine are used [23]. Similarly, pharmacological approaches in ADHD, ASD, Parkinson's disease, post-stroke syndromes, and epilepsy-related presentations require careful differentiation between core symptoms, comorbid psychiatric disorders, neurological disease, and medication adverse effects [8], [9], [10], [11], [12], [24], [25], [26].

Neuropsychiatry provides another reason for integrated care. Psychiatric symptoms may arise from primary mental disorders, neurological illness, systemic disease, intoxication, withdrawal, endocrine disturbance, infection, brain injury, or medication effects. Stroke survivors may experience depression, anxiety, cognitive impairment, emotional dysregulation, psychosis, pathological affect, or reduced quality of life [9]. Road traffic accidents and traumatic brain injury may lead to executive dysfunction, slowed information processing, irritability, impulsivity, depression, anxiety, and impaired occupational functioning [10]. Children with chronic medical conditions such as sickle cell disease may experience neurocognitive deficits affecting memory, attention, executive function, school performance, and quality of life [11]. Nonconvulsive status epilepticus and delirium-like states may mimic or complicate psychiatric presentations and require urgent diagnostic vigilance [12]. For this reason, psychiatric assessment should include not only mental

status examination, but also brief neurological screening, cognitive assessment, medication review, medical red flags, and structured risk formulation [28].

Public mental health and service quality are also fundamental. Many adverse outcomes in mental health care are driven not only by illness severity, but by weak systems: delayed presentation, poor mental health literacy, stigma, limited staff training, unsafe environments, fragmented discharge planning, medicine interruptions, inadequate follow-up, and lack of community linkage [3], [4], [16], [29]. Psychiatric services also carry distinctive safety risks, including suicide, self-harm, aggression, coercion, diagnostic overshadowing, medication-related harm, staff injury, and unsafe transitions between inpatient, outpatient, emergency, primary-care, and community settings [29], [30]. Quality-improvement methods, including Plan-Do-Study-Act cycles, structured handover, safety bundles, metabolic monitoring, audit-and-feedback, and staff engagement, offer practical mechanisms for improving care even where resources are constrained [29], [30]. Such methods are especially relevant when mental health systems must protect both patient dignity and staff safety while expanding access.

Integrated lifespan mental health care therefore represents a practical framework for LMICs. It brings together psychiatry, psychotherapy, neuropsychiatry, primary care, rehabilitation, maternal health, addiction care, family support, and public mental health into coordinated pathways. This review aims to synthesize evidence and clinical lessons relevant to integrated lifespan mental health care in LMICs, with emphasis on early recognition, primary-care integration, stepped psychological and pharmacological treatment, neuropsychiatric vigilance, family and caregiver engagement, continuity of care, quality improvement, safety, and public mental health governance.

2. Materials and Methods

2.1. Review design

This manuscript was designed as a narrative review and evidence synthesis. A narrative approach was selected because the topic is broad, clinically complex, and multidisciplinary, covering psychiatry, psychotherapy, neuropsychiatry, primary care, addiction medicine, maternal mental health, child and adolescent mental health, psychopharmacology, quality improvement, and public mental health. The aim was not to answer a narrowly defined intervention question or to pool effect sizes, but to synthesize clinically relevant evidence across heterogeneous populations, diagnoses, settings, and service-delivery models. The review was informed by established principles for preparing high-quality narrative reviews, including clear scope, transparent source selection, balanced interpretation, critical synthesis, and clinically meaningful organization of evidence [31], [32].

2.2. Evidence sources

The evidence base consisted of two complementary sources. First, a core set of author-provided manuscripts and peer-reviewed publications was reviewed. These publications covered major domains relevant to integrated lifespan mental health care, including depression in general practice, antidepressant prescribing, ADHD, autism spectrum disorder, child depression, childhood psychosis, bipolar depression, first-episode psychosis, substance-use disorders, alcohol-use disorder, prenatal depression, induced delusional disorder, psychiatric readmission, stroke, Parkinson's disease, nonconvulsive status epilepticus, neurocognitive impairment, antipsychotic metabolic monitoring, psychiatric safety, quality improvement, and mental health service strengthening. Second, additional international literature was considered where necessary to support the conceptual framework, strengthen clinical interpretation, and position the discussion within global mental health, primary care psychiatry, public mental health, and health-system strengthening.

2.3. Literature identification strategy

A targeted literature identification strategy was used rather than a formal systematic search. Relevant literature was identified from the author-provided manuscript collection, reference lists of included publications, international guidelines, global mental health reports, clinical practice recommendations, and selected peer-reviewed articles. Search concepts included combinations of the following terms: "lifespan mental health," "low- and middle-income countries," "primary care psychiatry," "public mental health," "integrated mental health care," "depression," "antidepressants," "psychotherapy," "psychosis," "first-episode psychosis," "psychoeducation," "substance-use disorders," "alcohol-use disorder," "motivational interviewing," "autism spectrum disorder," "attention deficit hyperactivity disorder," "child psychiatry," "perinatal depression," "neuropsychiatry," "stroke," "Parkinson's disease," "nonconvulsive status epilepticus," "cognitive impairment," "antipsychotic metabolic monitoring," "psychiatric readmission," "quality improvement," "patient safety," and "task-sharing."

2.4. Eligibility and selection approach

Sources were considered eligible if they addressed at least one of the following areas: mental health assessment, psychological or psychosocial intervention, psychopharmacological treatment, neurodevelopmental disorders, severe mental illness, addiction, perinatal mental health, neuropsychiatric comorbidity, cognitive impairment, medication safety, psychiatric rehabilitation, primary-care integration, public mental health, quality improvement, patient safety, or service delivery in low-resource, transitional, or low- and middle-income settings. Priority was given to peer-reviewed articles, clinical trials, observational studies, case reports with clear clinical relevance, narrative and systematic reviews, international guidelines, and major global health reports.

Studies were not excluded solely because they originated from settings outside the target geographical focus, provided that the findings were clinically transferable to low-resource or transitional mental health systems. This was important because integrated lifespan mental health care is not a single-country model; it is a practical service framework that must draw on evidence from diverse settings while remaining sensitive to local workforce, culture, financing, infrastructure, and care pathways.

2.5. Data extraction and thematic organization

Information was extracted narratively rather than using a quantitative extraction table. The following elements were considered: clinical population, condition or service problem, setting, intervention or assessment approach, main findings, implementation barriers, implications for integrated care, and relevance to low- and middle-income countries. Evidence was then organized into thematic domains: primary care and general practice; child and adolescent mental health; autism and neurodevelopmental care; depression and bipolar disorder; psychosis and severe mental illness; substance-use disorders and harm reduction; perinatal and adolescent female mental health; neuropsychiatry and cognitive screening; psychopharmacology and medication safety; psychotherapy and psychosocial interventions; structured psychiatric assessment and risk formulation; quality improvement and clinical governance; and public mental health system strengthening.

2.6. Synthesis approach

The synthesis was interpretive and clinically oriented. Findings were compared across diagnostic groups, age groups, care settings, and service-delivery models to identify recurring principles for integrated lifespan mental health care. Particular attention was given to early detection, stepped care, continuity after discharge, family and caregiver involvement, psychological intervention, rational prescribing, neurological vigilance, metabolic monitoring, risk assessment, task-sharing, community linkage, patient safety, and quality improvement. Because the included evidence was heterogeneous in design, population, intervention, outcome, and setting, no meta-analysis was attempted.

2.7. Ethical considerations

This review used previously published literature and author-provided scholarly manuscripts. No new human participants or animals were recruited, contacted, assessed, or exposed to any intervention for the purpose of this manuscript. Therefore, formal ethics committee approval and informed consent were not required for this narrative review. The ethical responsibility of the authors was to interpret the literature accurately, avoid overstatement of findings, acknowledge limitations, and preserve scientific integrity in the synthesis of evidence.

2.8. Methodological limitations

The narrative design allowed broad clinical and conceptual synthesis but has inherent limitations. The review did not use a fully systematic search strategy, formal risk-of-bias assessment, or quantitative pooling of results. Some included studies were single-site, exploratory, observational, case-based, or conducted in specific health-system contexts. Therefore, the findings should not be interpreted as universal evidence of effectiveness. Instead, they should be understood as a clinically informed synthesis intended to guide integrated, locally adaptable, and context-sensitive mental health care in low- and middle-income countries.

3. Results and Discussion

3.1. Conceptual foundation of integrated lifespan mental health care

Integrated lifespan mental health care may be understood as a coordinated model of assessment, treatment, rehabilitation, prevention, and service governance that follows mental health needs across developmental stages and clinical settings. Its central premise is that psychiatric morbidity does not occur in isolated diagnostic compartments.

Mental disorders are shaped by age, neurodevelopment, family context, physical illness, neurological disease, pregnancy, substance use, culture, stigma, poverty, health-system capacity, medicine availability, and continuity of care [1], [2], [3]. In low- and middle-income countries, these interacting factors are particularly important because many people enter care late, present through primary care or emergency services rather than specialist psychiatry, and experience repeated interruptions in treatment, follow-up, or rehabilitation [3], [4].

A lifespan approach is clinically necessary because the same health system must respond to very different but connected forms of need. In childhood and adolescence, services must detect developmental delay, autism spectrum disorder, attention deficit hyperactivity disorder, childhood depression, emerging psychosis, school impairment, family stress, and early behavioural difficulties [5], [6], [7], [8]. In adulthood, services must manage depression, bipolar disorder, psychosis, substance-use disorders, perinatal mental health problems, trauma-related symptoms, suicide risk, occupational impairment, and social adversity [13], [14], [15], [16], [17]. In later life and in medically complex patients, services must recognise depression, anxiety, cognitive impairment, delirium-like states, post-stroke psychiatric syndromes, Parkinson's disease-related psychiatric symptoms, epilepsy-related presentations, traumatic brain injury, medication effects, and chronic disease-related cognitive decline [9], [10], [11], [12], [22], [25], [26]. These domains cannot be managed safely if psychiatry, psychology, neurology, primary care, maternal health, addiction care, and rehabilitation operate as disconnected systems.

The first implication is that integrated care must begin with early recognition. Many patients in low-resource settings do not initially identify their distress as a mental health problem. They may present with somatic complaints, sleep disturbance, pain, fatigue, irritability, poor concentration, alcohol-related harm, behavioural disturbance, family conflict, academic decline, or functional deterioration [13], [18], [19]. Therefore, integrated lifespan care requires primary care workers, general practitioners, nurses, psychologists, psychiatrists, and community workers to share a basic clinical language for identifying common and severe mental disorders. Screening tools may help, but screening is only useful when connected to assessment, diagnosis, risk formulation, stepped intervention, follow-up, and referral capacity [18], [19], [20].

The second implication is that care must be biopsychosocial in practice, not only in language. Pharmacological treatment remains essential for many conditions, including depression, bipolar disorder, psychosis, ADHD, Parkinson's disease-related symptoms, epilepsy-related syndromes, and severe behavioural disturbance [14], [20], [22], [23], [24], [25], [26]. However, medication alone cannot address stigma, poor engagement, family burden, school exclusion, unemployment, poverty, relapse triggers, caregiver stress, trauma, substance use, or unsafe transitions of care. Psychotherapy and psychosocial interventions, including psychoeducation, motivational interviewing, behavioural activation, cognitive behavioural strategies, interpersonal approaches, family work, caregiver coaching, and relapse-prevention planning, are therefore central components of integrated care [15], [17], [21]. Their value lies not only in symptom reduction, but also in strengthening adherence, insight, functioning, self-management, family collaboration, and continuity.

The third implication is that integrated care must include neuropsychiatric vigilance. Psychiatric symptoms can reflect primary mental illness, but they can also arise from stroke, epilepsy, traumatic brain injury, Parkinson's disease, delirium, chronic medical illness, medication adverse effects, intoxication, or withdrawal [9], [10], [11], [12], [22], [25], [26]. In low-resource systems, diagnostic error may occur when behavioural symptoms are treated as purely psychiatric without sufficient attention to neurological and medical red flags. For this reason, the mental status examination should be linked with brief neurological screening, cognitive assessment, physical-health review, medication review, and structured risk formulation [28]. This does not require every patient to undergo advanced investigation. It requires disciplined clinical reasoning and clear thresholds for referral, urgent assessment, or escalation.

The fourth implication is that integrated lifespan care must be system-oriented. Poor outcomes often reflect weak pathways rather than poor clinical intention. A patient may receive the correct diagnosis during admission but relapse because of poor discharge planning, medication interruption, lack of family engagement, stigma, unemployment, substance use, transport barriers, or failure to attend follow-up [16], [29]. Psychiatric readmission, self-harm, aggression, coercion, diagnostic delay, metabolic complications, and staff injury are not only individual clinical events; they are also indicators of system reliability [29], [30]. Quality-improvement methods, including Plan-Do-Study-Act cycles, safety bundles, structured handover, audit-and-feedback, and routine monitoring of outcomes, provide practical tools for strengthening care under constraint [29], [30].

The proposed conceptual foundation is therefore based on six linked principles. First, mental health care should start early and close to where people seek help. Second, assessment should integrate psychiatric, psychological, neurological, developmental, physical-health, family, and risk dimensions. Third, treatment should be stepped, combining psychosocial and pharmacological interventions according to severity, preference, safety, and feasibility. Fourth,

families and caregivers should be involved where appropriate, while respecting confidentiality, consent, autonomy, and safeguarding. Fifth, continuity of care should be treated as a core intervention rather than an administrative afterthought. Sixth, services should use quality improvement and public mental health governance to make care safer, more equitable, and more sustainable. This framework is particularly relevant for low- and middle-income countries, where improving mental health outcomes depends not only on expanding specialist services, but also on coordinating the services that already exist.

3.2. Primary care and general practice as the first mental health platform

Primary care is the most realistic entry point for integrated lifespan mental health care in many low- and middle-income countries. General practitioners, clinical officers, nurses, and other frontline clinicians often encounter mental health problems before specialist psychiatric services do [18], [19]. Patients may attend primary care because of headache, body pain, gastrointestinal symptoms, insomnia, fatigue, dizziness, palpitations, reduced functioning, alcohol-related complications, family concerns, poor school performance, or unexplained medical symptoms. Without mental health training and simple assessment pathways, these presentations may be treated repeatedly as isolated physical complaints while the underlying depression, anxiety, substance use, cognitive impairment, trauma, or psychosis remains undetected [18], [19].

Depression illustrates the importance of primary care integration. It is common, disabling, associated with suicide risk, and frequently comorbid with chronic physical illness [13], [18]. In general practice, depression may present through low mood and loss of interest, but it may also be hidden behind pain, poor sleep, fatigue, poor concentration, irritability, reduced libido, appetite changes, or medically unexplained symptoms [18], [20]. Because many patients do not initially request psychiatric care, primary care clinicians need practical skills in detection, differential diagnosis, risk assessment, and initial management. Brief screening tools such as PHQ-2 and PHQ-9 can support early recognition, but they should not replace clinical judgement [13], [19]. A high score should lead to assessment of symptom duration, functional impairment, suicide risk, bipolar symptoms, psychosis, substance use, medical causes, medication effects, pregnancy-related factors, and psychosocial stressors.

Stepped care is particularly suitable for primary care. Mild depressive symptoms may respond to psychoeducation, behavioural activation, sleep restoration, problem-solving support, exercise advice, family support, and close review [13]. Moderate depression may require structured psychotherapy, antidepressant treatment, or both, depending on severity, patient preference, availability, safety, and comorbidity [13], [18], [20]. Severe depression, psychotic depression, bipolar depression, high suicide risk, marked functional impairment, treatment resistance, or diagnostic uncertainty should trigger referral or specialist consultation [13], [20]. This stepped model is clinically safer than either undertreating depression as ordinary sadness or overmedicalising all distress without adequate formulation.

Antidepressant prescribing in primary care requires particular caution. Antidepressants are clinically valuable when properly indicated, adequately dosed, and monitored, but inappropriate prescribing may occur when diagnosis is incomplete or follow-up is weak [18], [20], [22]. Clinicians should consider the possibility of bipolar disorder before initiating antidepressant treatment, especially where there is a history of elevated mood, reduced need for sleep, impulsivity, episodic overactivity, family history of bipolar disorder, antidepressant-induced activation, or recurrent depressive episodes with atypical features [14], [20]. In medically complex patients, antidepressant selection must also consider neurological illness, chronic pain, drug interactions, sedation, falls, sexual dysfunction, gastrointestinal effects, adherence, affordability, and medicine availability [20], [22]. Therefore, antidepressant stewardship should be part of primary care mental health integration.

Primary care is also important for substance-use disorders. Patients with alcohol or drug-related harm may present with injuries, sleep disturbance, gastrointestinal complaints, hypertension, liver disease, family conflict, occupational problems, anxiety, depression, psychosis, or repeated admissions [16], [17]. In many settings, stigma and low mental health literacy delay formal help-seeking, while health-system barriers such as staff attitudes, medicine shortages, and weak referral pathways further reduce engagement [16]. Primary care can improve outcomes by normalising screening, using non-judgemental communication, providing brief advice, identifying withdrawal risk, assessing comorbidity, involving family when appropriate, and linking patients to psychiatric, psychological, addiction, or community services.

Primary care clinicians also have an important role in recognising severe mental illness and neuropsychiatric presentations. Early psychosis, mania, severe depression, delirium, epilepsy-related behavioural changes, post-stroke depression, traumatic brain injury, and medication-induced syndromes may initially appear outside specialist psychiatry [9], [10], [12], [15], [28]. A practical integrated assessment should include mental status examination, orientation and attention testing, suicide and violence risk questions, substance-use screening, medication review, brief

neurological observations, and identification of red flags such as acute confusion, fluctuating consciousness, new seizures, focal neurological signs, fever, severe headache, recent head injury, or sudden behavioural change [12], [28]. These elements help primary care teams decide when to manage locally, review closely, refer routinely, or escalate urgently.

For low- and middle-income countries, the goal is not to turn every primary care worker into a psychiatrist. The goal is to build a supported system in which frontline clinicians can detect common conditions, manage low-risk presentations, provide brief psychosocial support, prescribe safely within competence, identify danger signs, and refer appropriately [4], [19]. This requires training, supervision, simple protocols, access to essential psychotropic medicines, referral pathways, patient education materials, and feedback loops between primary care and specialist services. When these elements are present, primary care becomes not merely a gateway to psychiatry, but the first active platform of integrated lifespan mental health care.

3.3. Child and adolescent mental health

Child and adolescent mental health is a central component of integrated lifespan care because many adult psychiatric, neurodevelopmental, educational, social, and functional difficulties have roots in early life. In low- and middle-income countries, child mental health services are frequently underdeveloped, concentrated in urban centres, and poorly integrated with primary care, schools, paediatrics, social services, and community systems [3], [4]. This creates a pattern in which children are often brought for care only after academic failure, severe behavioural disturbance, family exhaustion, self-harm, psychosis, substance use, or social breakdown has already occurred. An integrated lifespan model must therefore treat child and adolescent mental health not as a specialist luxury, but as a public health necessity.

Attention deficit hyperactivity disorder is a useful example. ADHD is associated with inattention, hyperactivity, impulsivity, school difficulties, peer problems, family stress, emotional dysregulation, and later impairment in occupational and social functioning [5]. In many low-resource settings, the disorder may be misunderstood as deliberate disobedience, poor parenting, lack of discipline, intellectual weakness, or moral failure. Such interpretations delay assessment and increase punishment, stigma, school exclusion, and family conflict. Diagnosis should therefore include developmental history, school reports, parent observations, functional impairment, comorbidity, sleep, learning difficulties, epilepsy, substance exposure in older adolescents, and psychosocial adversity [5]. A narrow checklist approach is insufficient because ADHD commonly overlaps with anxiety, depression, autism spectrum disorder, conduct problems, trauma-related symptoms, and learning disorders.

Treatment of ADHD in resource-constrained settings requires pragmatism without abandoning clinical standards. Pharmacological treatment can be effective, but access to stimulant and non-stimulant medications may be limited by cost, availability, regulatory restrictions, and follow-up capacity [5], [23], [24]. Omega-3 fatty acids have been discussed as an adjunctive or alternative option where families are reluctant to use conventional medication or where access is constrained, but such approaches should be framed cautiously and not presented as equivalent to established first-line treatments when these are available [23]. Similarly, exploratory local evidence on fluoxetine and neurocognitive functioning in children with ADHD suggests possible improvement in attention, executive function, and memory, but this evidence should be interpreted carefully because small, non-definitive studies cannot replace larger controlled trials or established guideline-based care [24]. The broader lesson is that LMICs need locally feasible ADHD pathways that combine psychoeducation, parent guidance, school collaboration, behavioural strategies, careful medication decisions, and follow-up.

Child depression also deserves special attention. Depression in children and adolescents may not resemble the classical adult presentation. Instead of clearly verbalised sadness, young patients may present with irritability, withdrawal, poor school performance, somatic complaints, behavioural change, sleep disturbance, appetite change, loss of interest, low self-esteem, concentration difficulties, or recurrent thoughts of death [7]. These symptoms may be mistaken for laziness, puberty-related moodiness, family conflict, physical illness, or disciplinary problems. In the case-based literature from Zambia, child depression was highlighted as a condition that may be diagnosed late because its presentation differs from adult depressive states and may be hidden behind physical symptoms, behavioural disturbance, or academic deterioration [7]. This has important implications for primary care, schools, paediatric clinics, and families: early detection requires active questioning, collateral history, functional assessment, and direct but sensitive assessment of self-harm or suicidal ideation.

The management of child and adolescent depression should be stepped and developmentally appropriate. Mild presentations may benefit from psychoeducation, family support, behavioural activation, sleep and routine restoration, problem-solving, school support, and close follow-up. Moderate to severe depression may require structured

psychotherapy, specialist assessment, medication when indicated, and careful risk management [7], [13]. Antidepressant use in young people requires diagnostic caution, monitoring for activation or emerging bipolarity, assessment of suicide risk, and involvement of caregivers where clinically and ethically appropriate [13], [18], [20]. A child or adolescent with psychotic symptoms, severe functional decline, persistent suicidality, suspected bipolar disorder, abuse, severe neglect, substance use, or marked neurodevelopmental complexity should be referred for specialist care whenever possible.

Childhood-onset psychosis and schizophrenia represent a smaller but highly disabling group of disorders. Child schizophrenia affects brain, emotional, cognitive, behavioural, and social functioning and may present with disordered thinking, hallucinations, delusions, inappropriate affect, disorganised behaviour, negative symptoms, decline in school functioning, and deterioration in social relationships [6]. Its diagnosis requires particular caution because psychosis-like symptoms in children may arise from epilepsy, delirium, intoxication, trauma, autism spectrum disorder, mood disorders, severe anxiety, cultural or spiritual interpretations, imaginative play, or developmental communication difficulties [6], [12], [28]. Therefore, assessment should combine psychiatric interview, developmental history, family history, school history, neurological review, substance-use screening in adolescents, risk assessment, and collateral information.

Treatment of childhood psychosis should be multidisciplinary and longitudinal. Antipsychotic medication may be necessary when psychotic symptoms are clear, persistent, impairing, and dangerous, but medication alone is never sufficient. Children and adolescents with psychosis require psychoeducation, family work, school liaison, relapse monitoring, side-effect monitoring, protection from abuse or exploitation, cognitive and functional assessment, and rehabilitation planning [6]. In LMICs, where specialist child psychiatry may be scarce, services should develop simple referral thresholds: new hallucinations or delusions with functional deterioration, catatonic features, severe aggression, self-neglect, suicidal risk, marked school decline, neurological red flags, or safeguarding concerns should trigger urgent specialist review.

The family is central in child and adolescent mental health. Children depend on caregivers for attendance, medication adherence, routine, communication with schools, safety planning, emotional support, and access to treatment. However, families may also experience shame, confusion, burnout, stigma, financial strain, and conflicting explanatory models. Integrated care should therefore include caregiver education, collaborative formulation, and realistic home-based strategies. The aim is not to blame parents, but to help them understand symptoms, reduce criticism, support routines, improve communication, identify relapse signs, and engage with services. Where family conflict, neglect, abuse, coercion, or safeguarding risk is present, the clinician's responsibility is to balance family involvement with child protection, confidentiality, and the young person's developing autonomy.

Schools should also be viewed as part of the mental health system. Teachers may be the first to notice inattention, social communication difficulties, bullying, academic decline, withdrawal, aggression, developmental delay, or emotional distress. In many low-resource settings, however, schools lack access to educational psychologists, counsellors, special-needs support, or clear referral pathways. Integrated lifespan care should therefore promote school-health collaboration, teacher education, anti-stigma work, simple referral mechanisms, and practical classroom accommodations. For ADHD, autism, depression, and early psychosis, school functioning is both an outcome and a treatment target.

Child and adolescent mental health therefore illustrates the core message of this review: integrated care must begin early, involve families and schools, remain developmentally informed, and combine psychological, pharmacological, educational, neurological, and social perspectives. If LMIC mental health systems wait until childhood difficulties become adult disability, they will continue to treat late consequences rather than prevent avoidable suffering.

3.4. Autism spectrum disorder and neurodevelopmental care across the lifespan

Autism spectrum disorder is a lifelong neurodevelopmental condition that affects social communication, interaction, behaviour, sensory processing, adaptive functioning, family life, education, employment, and community participation [8], [21]. Although autism is often discussed as a childhood disorder, it remains clinically relevant across adolescence and adulthood. The support needs of autistic individuals may change over time, but difficulties with communication, social understanding, rigidity, sensory sensitivity, anxiety, emotional regulation, and adaptive functioning may persist throughout life [8]. An integrated lifespan approach is therefore essential.

In many low- and middle-income countries, autism is under-recognised, diagnosed late, or misunderstood. Families may first seek help for delayed speech, poor eye contact, limited social reciprocity, repetitive behaviour, aggression, sleep

difficulties, feeding problems, school exclusion, or caregiver exhaustion. In some settings, autism may be interpreted through moral, spiritual, disciplinary, or cultural explanations before a developmental formulation is considered. Delayed diagnosis can deprive children of early communication support, caregiver coaching, educational adaptation, and social inclusion. At the same time, overdiagnosis or poorly explained diagnosis can also harm families if it creates fear without providing practical guidance. Assessment should therefore be careful, developmental, functional, and family-centred.

Brief parent-mediated intervention is especially relevant for low-resource settings because it extends therapeutic strategies into daily routines. A study of children with autism spectrum disorder receiving brief parent-mediated intervention reported significant improvement in functional language and social communication, although overall autism severity did not significantly change [21]. Improvement was associated with older child age, caregiver attendance, and parent fidelity in understanding and applying intervention strategies [21]. This is clinically important because it shows that caregiver participation is not a decorative addition to treatment; it is part of the mechanism through which intervention may work. For services with few speech therapists, occupational therapists, psychologists, or child psychiatrists, structured caregiver coaching can be a practical way to increase therapeutic intensity without relying exclusively on specialist clinic time.

However, parent-mediated care should be implemented honestly. It should not mean transferring professional responsibility onto families without support. Caregivers need demonstration, rehearsal, feedback, realistic goals, culturally understandable language, and follow-up. Interventions should focus on functional outcomes such as communication, joint attention, social reciprocity, daily routines, emotional regulation, play, adaptive skills, and reduction of distress. Families should be taught how to use everyday moments therapeutically: feeding, bathing, dressing, play, school preparation, shopping, and family interaction. This approach is particularly suitable for LMICs because it uses the child's natural environment and strengthens caregiver confidence.

Autism care must also avoid becoming medication-centred. Pharmacological treatment does not treat the core developmental features of autism. Medication may be appropriate for specific comorbid conditions or target symptoms such as severe irritability, aggression, self-injury, sleep disturbance, anxiety, depression, obsessive-compulsive symptoms, epilepsy, catatonia, or psychosis-like presentations, but it should follow careful assessment and monitoring [8]. In low-resource settings, there is a risk that behavioural distress may be treated mainly with sedating medication because psychosocial, educational, sensory, and communication supports are unavailable. Such practice may reduce visible behaviour temporarily while worsening functioning, cognition, metabolic health, or family understanding. Integrated care should therefore prioritise communication support, environmental adaptation, caregiver training, school inclusion, behavioural strategies, and careful use of medication only when clearly indicated.

Adult autism is an important but often neglected area. Many adults with autism remain undiagnosed or are misdiagnosed with personality disorder, psychosis, anxiety disorder, obsessive-compulsive disorder, intellectual disability, or treatment-resistant depression [8]. Adult presentation may include social isolation, employment difficulty, sensory distress, rigid routines, relationship problems, anxiety, depression, self-harm, aggression, catatonic features, or psychosis-like symptoms [8]. Some individuals may have learned to mask autistic traits, making diagnosis more difficult. Others may present only when environmental demands exceed coping capacity. Adult autism care therefore requires clinicians to ask developmental questions even when the patient is older: early communication, peer relationships, school functioning, restricted interests, sensory sensitivities, repetitive behaviour, and lifelong social difficulties.

Comorbidity is a major challenge in autism across the lifespan. Anxiety, depression, ADHD, obsessive-compulsive symptoms, bipolar symptoms, epilepsy, sleep problems, self-harm, aggression, and psychosis-like experiences may complicate assessment and management [8]. Clinicians should avoid two opposite errors: attributing all distress to autism and missing treatable psychiatric disorder, or ignoring autism and treating only the visible mood, anxiety, behavioural, or psychotic symptoms. A balanced formulation asks what is developmental, what is psychiatric, what is neurological, what is environmental, what is communicative, and what is risk-related. This is why integrated assessment is essential.

School and vocational systems are central to autism care. Children may need classroom adaptation, communication support, structured routines, anti-bullying protection, and teacher education. Adolescents may need transition planning, sexuality education, social skills support, and preparation for adult services. Adults may need vocational guidance, workplace accommodations, supported employment, social support, and assistance with independent living. In LMICs, where formal disability services may be limited, families often carry most of the burden. Public mental health planning should therefore include autism awareness, teacher training, caregiver support, accessible assessment, inclusive education, and community-based rehabilitation.

The lifespan autism pathway should have several practical elements. First, primary care and paediatric services should identify early developmental concerns and refer for assessment. Second, diagnosis should be linked to action, not merely labelling. Third, caregiver coaching should be treated as a core intervention. Fourth, schools should be engaged as therapeutic partners. Fifth, adolescents should not be lost during transition to adult services. Sixth, adults with suspected autism should have access to developmentally informed assessment. Seventh, medication should be used cautiously and only for clearly defined comorbidities or target symptoms. Finally, services should measure outcomes that matter to families and patients: communication, participation, distress reduction, caregiver confidence, school attendance, adaptive functioning, and quality of life.

Autism and neurodevelopmental care therefore strengthen the argument for integrated lifespan mental health systems. They show that good mental health care is not only crisis response or medication provision. It is developmental, relational, educational, rehabilitative, family-centred, and long-term.

3.5. Depression, bipolar disorder, and antidepressant stewardship

Depression is one of the most important clinical and public mental health priorities within integrated lifespan care. It is common, disabling, recurrent, frequently comorbid with physical illness, and strongly associated with impaired functioning, reduced quality of life, suicide risk, family burden, and economic loss [1], [2], [13], [18]. In low- and middle-income countries, depression may remain undetected for long periods because patients often present through primary care with somatic symptoms, fatigue, sleep disturbance, pain, poor concentration, irritability, reduced productivity, or interpersonal difficulty rather than directly reporting sadness or hopelessness [13], [18], [19]. This makes depression not only a psychiatric problem but also a general practice, occupational health, maternal health, neurological, and public health problem.

Integrated depression care should begin with recognition that depression is heterogeneous. Mild, moderate, severe, psychotic, recurrent, treatment-resistant, perinatal, adolescent, medically comorbid, post-stroke, substance-related, and bipolar depressive presentations require different levels of intervention [9], [13], [14], [17], [18], [22]. A single diagnosis of “depression” is therefore not enough. Clinicians must consider duration, severity, functional impairment, suicide risk, psychotic features, substance use, trauma, pregnancy, neurological illness, chronic pain, medical comorbidity, medication effects, and previous manic or hypomanic symptoms. This is particularly important in primary care, where antidepressants may be initiated before a full psychiatric history has been established [18], [20].

A stepped-care model remains the most practical approach in resource-constrained settings. Mild depressive symptoms may be managed initially with psychoeducation, behavioural activation, sleep and routine restoration, problem-solving support, social reconnection, exercise advice, reduction of alcohol or substance use, and planned review [13]. Moderate depression may require structured psychotherapy, antidepressant treatment, or combined treatment depending on patient preference, clinical severity, safety, availability, and previous response [13], [18], [20]. Severe depression, psychotic depression, high suicide risk, bipolar depression, marked functional decline, treatment resistance, or diagnostic uncertainty should prompt specialist consultation or referral where possible [13], [14], [20]. The purpose of stepped care is not to ration treatment, but to match intervention intensity to clinical need while preserving safety.

Psychotherapy and psychosocial care should be treated as core depression interventions, not optional extras. Cognitive behavioural strategies, interpersonal approaches, behavioural activation, psychoeducation, problem-solving, family support, and relapse-prevention planning may improve outcomes when delivered with fidelity and cultural sensitivity [13], [15], [17]. In LMICs, brief and structured psychological interventions are especially valuable because specialist psychotherapy resources are often limited. However, psychological care must be realistic. Patients may face transport barriers, stigma, financial constraints, low literacy, unstable housing, family stress, or work demands that interfere with attendance. Therefore, depression care should include flexible follow-up, caregiver involvement when appropriate, simple educational materials, and integration with primary care and community services.

Antidepressants are essential medicines, but their use requires stewardship. Antidepressant stewardship means prescribing the right medication, for the right patient, at the right dose, for the right duration, with adequate monitoring and diagnostic review. Under-treatment is common when doses are too low, duration is too short, or follow-up is weak [18], [20]. Over-treatment or inappropriate treatment may also occur when normal distress, bipolar depression, substance-related mood symptoms, medication-induced symptoms, grief, personality-related distress, or neurological disease is treated as uncomplicated unipolar depression. Both errors matter. Inadequate treatment prolongs suffering, while careless prescribing may cause adverse effects, poor adherence, activation, emotional blunting, drug interactions, or worsening of undiagnosed bipolar disorder.

Before initiating antidepressants, clinicians should assess for bipolarity. Bipolar depression is clinically important because depressive episodes often dominate the course of bipolar disorder, and the condition may be misdiagnosed as recurrent unipolar depression [14]. Red flags include previous periods of elevated or irritable mood, reduced need for sleep, increased energy, impulsivity, overspending, sexual disinhibition, overactivity, antidepressant-induced agitation or switching, family history of bipolar disorder, psychotic depression, early age of onset, recurrent episodes, and atypical depressive features. In such cases, antidepressant monotherapy may be inappropriate or risky. Mood stabilisers and specialist review should be considered according to clinical severity, availability, and safety [14].

Lamotrigine has been discussed as a clinically relevant option in bipolar depression, particularly because depressive polarity is often disabling and recurrent [14]. Its role illustrates the broader principle that psychopharmacology should be phase-specific and diagnosis-specific. Treatment of bipolar depression is not simply the treatment of "depressive symptoms"; it requires attention to polarity, switching risk, previous mania or hypomania, suicide risk, adherence, comorbidity, pregnancy potential, drug interactions, and patient education. In settings where medication options are limited, these principles become even more important, not less. Rational prescribing must protect patients from both undertreatment and avoidable harm.

Depression in neurological and medical settings further supports the need for integrated care. Stroke, Parkinson's disease, chronic pain, epilepsy, traumatic brain injury, sickle cell disease, and other chronic conditions may be associated with depressive symptoms, cognitive impairment, anxiety, fatigue, sleep disturbance, and reduced functioning [9], [10], [11], [12], [22], [25], [26]. Neurologists and general physicians may prescribe antidepressants for depression, neuropathic pain, migraine prevention, anxiety symptoms, or other indications [22]. This cross-specialty use is clinically legitimate but requires shared safety principles: diagnostic clarity, review of drug interactions, monitoring for sedation or falls, attention to cognition, assessment of suicide risk, and communication with mental health services when symptoms are complex or severe.

Perinatal and adolescent depression require particular sensitivity. Teenage pregnancy, social stress, low support, poverty, interrupted education, stigma, and relationship instability may increase vulnerability to prenatal depression [17]. In such cases, depression care should not focus only on symptom reduction. It should also address safety, antenatal care, social support, family involvement, educational disruption, intimate-partner violence where present, infant outcomes, and continuity after delivery. For adolescents, depressive symptoms may be hidden behind irritability, school decline, somatic complaints, withdrawal, or risk-taking [7]. Therefore, integrated depression care must be developmentally informed and linked with maternal health, youth services, schools, families, and primary care.

The public health implication is clear: depression care in LMICs cannot depend solely on specialist psychiatric clinics. Primary care must detect and manage common presentations; psychology and counselling services must provide feasible psychosocial interventions; psychiatrists must support diagnostic complexity and severe illness; neurological and medical services must identify comorbid depression; maternal health services must screen and respond to perinatal distress; and community systems must reduce stigma and support continuity. Antidepressants are important, but they are only one part of a larger system of depression care.

3.6. Psychosis, severe mental illness, and continuity of care

Psychosis and severe mental illness represent some of the highest-priority conditions for integrated lifespan mental health systems. Schizophrenia, first-episode psychosis, bipolar disorder with psychotic features, severe depression with psychotic symptoms, substance-induced psychosis, delirium, epilepsy-related psychiatric presentations, and rare syndromes such as induced delusional disorder may all present with disturbances in thought, perception, mood, behaviour, insight, and functioning [6], [12], [15], [28], [33], [34]. These conditions are associated with distress, family burden, stigma, impaired social and occupational functioning, risk of relapse, unsafe behaviour, vulnerability, and repeated use of emergency or inpatient services [15], [29], [35]. In LMICs, delayed pathways to care, cultural interpretations, stigma, limited access to specialist assessment, and medication discontinuity may worsen outcomes [3], [4], [16].

First-episode psychosis is a critical point for intervention. Early identification and sustained treatment may influence symptom control, relapse risk, adherence, functioning, and long-term recovery [15]. However, early psychosis is often missed or misinterpreted. Families may initially seek help from informal providers, religious leaders, traditional healers, general clinics, emergency services, or police rather than specialist mental health services. Such pathways should not be dismissed with arrogance; they reflect the real social ecology of illness. Integrated care must therefore improve mental health literacy, reduce stigma, build respectful referral links, and help families recognise warning signs such as

hallucinations, delusional beliefs, disorganised behaviour, social withdrawal, deterioration in self-care, aggression, insomnia, suspiciousness, decline in school or work functioning, and marked personality change.

Management of psychosis requires both pharmacological and psychosocial care. Antipsychotic medication remains central when psychotic symptoms are persistent, distressing, impairing, or associated with risk. However, medication alone is rarely enough. Patients and families need explanation of diagnosis, expected course, medication benefits and adverse effects, relapse signs, substance-use risks, sleep protection, stress management, crisis planning, and follow-up arrangements [15]. Psychoeducation is therefore a core intervention, although its effect depends on timing, quality, engagement, family participation, and the strength of usual care. In a randomized trial among treatment-naïve first-episode psychosis patients, psychoeducation did not show a statistically significant additional effect over treatment as usual on adherence, symptoms, or functioning at 12 weeks; improvement appeared more strongly related to socioeconomic and motivational factors [15]. This finding is important because it reminds clinicians that psychosocial interventions are not magic labels. They must be implemented with sufficient intensity, fidelity, relevance, and system support.

Adherence is one of the central challenges in severe mental illness. Non-adherence may reflect poor insight, side effects, stigma, lack of family support, substance use, poverty, transport barriers, medicine shortages, poor therapeutic alliance, cultural beliefs, or inadequate explanation of treatment [15], [16], [35]. A narrow view that blames the patient is clinically weak and ethically insufficient. Integrated care should instead ask why adherence is difficult and what can be changed. Practical responses include shared decision-making, side-effect management, simplified regimens, family psychoeducation, appointment reminders, community follow-up, medicine availability, early post-discharge contact, relapse plans, and respectful communication. Adherence improves when treatment makes sense to the patient and is logistically possible.

Readmission is another major marker of system performance. Psychiatric readmission may occur because of illness severity, medication discontinuation, substance use, stress, poverty, unemployment, family conflict, poor discharge planning, weak follow-up, or lack of community support [35]. A study of mentally ill adults at Chainama Hills College Hospital found that no single socio-demographic factor was strongly associated with readmission, although single and unemployed patients were more frequently readmitted, younger patients were readmitted more often than older patients, and stress showed some association with readmission [35]. These findings support the view that readmission is rarely explained by one variable. It is usually the final common pathway of clinical vulnerability and system weakness.

Continuity of care should therefore be regarded as a therapeutic intervention. Discharge from hospital is not the end of treatment; it is a high-risk transition. Patients leaving inpatient care may face stigma, family tension, medication side effects, financial difficulty, social isolation, substance exposure, poor sleep, unresolved symptoms, and uncertainty about follow-up. A safe transition should include a clear diagnosis or working formulation, medication plan, side-effect advice, risk assessment, relapse signs, crisis contacts, family meeting where appropriate, follow-up date, referral letter, and plan for missed appointments [28], [29], [30]. In resource-limited settings, even simple interventions such as structured discharge summaries, phone calls, appointment reminders, and family education may reduce avoidable deterioration.

Severe mental illness also requires physical-health monitoring. People with psychosis and bipolar disorder often face increased cardiometabolic risk due to illness factors, lifestyle, poverty, reduced access to care, and medication adverse effects [27]. Antipsychotic treatment requires monitoring of weight, body mass index, waist circumference, glucose metabolism, blood pressure, and other relevant physical-health parameters where feasible [27]. In LMICs, metabolic monitoring may be neglected because of staff shortages, laboratory costs, or fragmentation between psychiatric and general medical services. Integrated care must make physical-health monitoring routine rather than exceptional. Failure to do so risks replacing psychiatric relapse with preventable cardiometabolic harm.

The interface between psychosis and neuropsychiatry is also important. Delirium, nonconvulsive status epilepticus, intoxication, withdrawal, stroke, traumatic brain injury, autoimmune or infectious conditions, endocrine disorders, and medication reactions may present with hallucinations, delusions, agitation, confusion, or behavioural disturbance [9], [10], [12], [28]. A patient with psychosis-like symptoms therefore requires more than a rapid psychiatric label. Acute onset, fluctuating consciousness, disorientation, new seizures, focal neurological signs, fever, severe headache, recent head injury, abnormal vital signs, or sudden cognitive change should trigger urgent medical or neurological evaluation [12], [28]. Integrated care protects patients by keeping diagnostic safety at the centre of psychiatric practice.

Rare conditions such as induced delusional disorder or Folie à deux demonstrate the importance of cultural, family, forensic, and safeguarding awareness. In the documented Zambian case, a shared delusional belief developed within an

isolated family context and was associated with severe neglect, death of a child, and forensic consequences [33], [34]. Such cases are uncommon, but they teach a broader lesson. Psychosis is not only a symptom cluster inside one individual; it may affect families, children, communities, legal systems, and public safety. Assessment should therefore include family dynamics, dependence, isolation, coercion, cultural or religious meanings, risk to dependants, safeguarding concerns, and need for multidisciplinary intervention [33], [34].

Severe mental illness care in LMICs must also be recovery-oriented. Recovery does not mean only symptom remission. It includes dignity, safety, functional improvement, social participation, family reintegration, education, work, housing stability, protection from abuse, and hope. This requires collaboration between psychiatry, psychology, nursing, social work, occupational therapy, primary care, families, community leaders, and public health systems. Where resources are limited, the temptation is to reduce care to admission, sedation, discharge, and readmission. Integrated lifespan care must resist this pattern. It should aim for early detection, safe treatment, continuity, rehabilitation, relapse prevention, physical-health monitoring, and social recovery.

Psychosis and severe mental illness therefore show why integrated systems are essential. The patient needs medication, but also explanation, family engagement, risk formulation, side-effect monitoring, physical-health care, substance-use support, safeguarding, discharge planning, and long-term follow-up. The service needs beds, but also community pathways, primary-care links, quality improvement, staff safety, and clinical governance. Without integration, severe mental illness becomes a cycle of crisis and containment. With integration, it can become a pathway toward stability, recovery, and safer public mental health.

3.7. Substance-use disorders, motivational interviewing, and harm reduction

Substance-use disorders are a major clinical and public mental health priority in low- and middle-income countries because they sit at the intersection of psychiatry, general medicine, family life, injury prevention, infectious disease, poverty, violence, occupational functioning, and public safety. Alcohol and other substance-related problems may present through intoxication, withdrawal, mood symptoms, anxiety, psychosis, cognitive impairment, self-harm, aggression, family disruption, occupational decline, road traffic injuries, liver disease, cardiovascular complications, or repeated psychiatric admission [16], [35], [36]. In many settings, however, substance use is treated either as a purely moral problem or as a narrow psychiatric diagnosis. Both positions are inadequate. Integrated lifespan care requires a more balanced approach that recognises substance use as a behavioural, neurobiological, psychological, social, and public health condition.

The treatment gap for substance-use disorders is often widened by stigma. Patients may delay help-seeking because they fear blame, humiliation, legal consequences, family rejection, or being labelled as irresponsible. Families may seek help only after severe conflict, violence, psychosis, medical complications, or repeated relapse. Health workers may also hold negative attitudes toward patients with alcohol or drug-related problems, which can reduce empathy, weaken therapeutic alliance, and discourage follow-up [16]. A study from Chainama Hills College Hospital found that health-seeking behaviour among individuals with substance-use disorders was shaped by health-system, socio-cultural, socioeconomic, and individual-level factors, including stigma, limited awareness, staff attitudes, poor availability of medicines and supplies, and delays in entering formal care [16]. These findings are important because they show that poor engagement is not simply a patient weakness; it is also produced by the way services are organised and experienced.

Alcohol-use disorder is particularly important because it is common, disabling, recurrent, and strongly linked with psychiatric comorbidity. Patients with harmful alcohol use may present to primary care, emergency units, medical wards, psychiatric services, police, social welfare systems, or family meetings before they ever present to an addiction specialist. This makes alcohol screening a core responsibility across the health system. Primary care and psychiatric services should normalise brief alcohol assessment, including quantity and frequency of use, binge pattern, withdrawal symptoms, failed attempts to cut down, medical complications, violence, injury, occupational impairment, family concerns, legal problems, and comorbid depression, anxiety, psychosis, or suicidal ideation [16], [36]. Screening should be conducted in a non-judgemental manner because shame and defensiveness can easily close the therapeutic conversation.

Harm reduction is a useful framework for integrated care. In many real-world settings, immediate abstinence may be clinically ideal but not immediately achievable. A harm-reduction approach does not abandon abstinence; rather, it creates a realistic pathway toward safer behaviour, reduced risk, better engagement, and eventual recovery where possible. For alcohol-use disorder, harm reduction may include reducing total consumption, avoiding drinking before driving or work, reducing binge episodes, improving nutrition and sleep, managing withdrawal safely, treating

comorbid depression or psychosis, involving family supports, preventing violence, and linking patients to continuing care. In psychiatric settings, harm reduction is particularly relevant because alcohol misuse may worsen medication adherence, relapse, aggression, self-harm risk, and readmission [35], [36].

Motivational interviewing is one of the most widely used psychosocial approaches for substance-use disorders. It is a collaborative and patient-centred method designed to explore ambivalence, strengthen intrinsic motivation, and support behaviour change without confrontation. This is clinically valuable because many patients with alcohol-use disorder do not present in a stable state of readiness to change. They may minimise the problem, feel ashamed, fear withdrawal, depend socially or economically on drinking environments, or believe that treatment will require immediate and total abstinence. Motivational interviewing allows clinicians to begin where the patient is, while still guiding the conversation toward change, safety, and responsibility [36].

However, motivational interviewing should not be romanticised. Evidence from low-resource psychiatric settings suggests that its effect may depend heavily on context, intervention dose, staff training, baseline treatment quality, follow-up systems, and patient characteristics. In a randomized controlled trial among hospitalized patients with alcohol-use disorder in Lusaka, motivational interviewing plus treatment as usual did not show a statistically significant added benefit over treatment as usual alone, although substantial short-term harm reduction occurred overall. In that study, the median Alcohol Use Disorders Identification Test score decreased from 25 to 11, and 84.5% of participants achieved harm reduction, but the difference between motivational interviewing plus treatment as usual and treatment as usual alone was not significant [36]. This finding should not be interpreted as evidence that motivational interviewing is useless. Rather, it shows that brief psychosocial interventions must be embedded within a wider therapeutic system and compared against the actual strength of usual care.

This has several practical implications. First, inpatient admission can create a therapeutic window for alcohol-use disorder because patients are temporarily removed from alcohol exposure, medically observable, and often more aware of the consequences of drinking [36]. Second, usual care itself may produce meaningful short-term improvement when it includes containment, withdrawal management, psychoeducation, medication, nursing support, peer interaction, family contact, and a structured ward environment. Third, brief interventions may require reinforcement after discharge to produce sustained behavioural change. Fourth, outcome measurement should not be limited to abstinence alone; reductions in risk category, binge frequency, medical complications, violence, self-harm, and readmission are also clinically meaningful.

Substance-use disorders also highlight the importance of integrated psychiatric assessment. Alcohol and drug use can mimic, precipitate, or worsen depression, anxiety, psychosis, cognitive impairment, sleep disturbance, impulsivity, aggression, and suicidality. Conversely, untreated mental disorders can drive substance use as a form of self-medication. Assessment should therefore avoid premature diagnostic closure. A patient presenting with psychosis may have schizophrenia, bipolar disorder, substance-induced psychosis, delirium, epilepsy-related symptoms, or a combination of these factors [12], [28]. A patient presenting with depression may have primary depressive disorder, alcohol-induced mood symptoms, bipolar depression, grief, trauma, or chronic medical illness [13], [14], [18]. Integrated care requires careful history of substance use, temporal relationship between symptoms and intoxication or withdrawal, collateral information, medical examination, risk assessment, and review after stabilization.

Family involvement is often essential but must be handled carefully. Families may provide critical information about drinking patterns, relapse triggers, violence, finances, occupational decline, medication adherence, and risk to dependants. They may also provide emotional support and practical help during recovery. At the same time, some families are affected by fear, resentment, burnout, coercion, domestic violence, or enabling patterns. Clinicians should therefore involve relatives where appropriate while assessing safety, consent, confidentiality, and the possibility of harm. Family meetings should focus on clear information, relapse signs, crisis planning, supportive communication, boundaries, and linkage to community resources.

Continuity of care is a major weakness in substance-use treatment. Detoxification, inpatient stabilization, or a brief counselling session may reduce immediate risk, but relapse is common when patients return to the same environment without follow-up, medication access, psychological support, family planning, occupational rehabilitation, or community linkage. The readmission literature reinforces this concern: relapse and readmission are often shaped by medication discontinuity, stress, unemployment, poverty, poor discharge planning, weak follow-up, and inadequate community support [35]. For substance-use disorders, discharge planning should include relapse-prevention advice, follow-up appointment, crisis contact, family education, plan for cravings, avoidance of high-risk settings, management of withdrawal risk, and referral to psychosocial or community support.

Primary care has a major role in long-term management. Specialist psychiatric and addiction services are scarce in many LMICs, and patients cannot rely solely on tertiary hospitals for ongoing recovery. Primary care can provide screening, brief advice, monitoring of medical complications, relapse detection, medication review, family support, and referral for complex cases [4], [16], [19]. Integration with HIV care, maternal health, emergency care, occupational health, and non-communicable disease services is also important because substance-use disorders frequently coexist with medical and social vulnerability. This approach reduces the false separation between addiction treatment and general health care.

Public mental health strategies are equally necessary. Clinical services alone cannot solve alcohol and drug-related harm if communities remain saturated with stigma, unemployment, violence, unsafe drinking environments, poor mental health literacy, and weak regulatory systems. Public mental health responses should include education, anti-stigma campaigns, early identification, school-based prevention, workplace interventions, injury prevention, community referral pathways, support for families, and policies that reduce harmful consumption patterns. These measures should be culturally sensitive but firm. Compassion for the patient should not mean tolerance of preventable harm to children, partners, communities, or road users.

Substance-use disorders therefore demonstrate why integrated lifespan mental health care must combine clinical treatment, psychotherapy, family work, primary care, public health, and service continuity. Motivational interviewing and other brief psychosocial interventions are useful tools, but they are not substitutes for functioning systems. The strongest model is one in which patients are identified early, treated without humiliation, assessed for comorbidity and risk, supported through realistic behaviour change, linked to follow-up, and protected from the revolving door of relapse and readmission.

3.8. Perinatal and adolescent female mental health

Perinatal and adolescent female mental health is a critical part of integrated lifespan care because pregnancy, childbirth, adolescence, family relationships, poverty, gender-based vulnerability, and social expectations can interact strongly with mental health. In low- and middle-income countries, psychological distress during pregnancy and adolescence is often under-recognised, normalised, or treated as a private family matter rather than a clinical and public health concern [3], [4], [17]. This creates a dangerous gap: young women may remain unsupported despite depression, anxiety, trauma, suicidal ideation, intimate-partner conflict, educational disruption, poverty, stigma, or lack of family support.

Teenage pregnancy is a particularly important public mental health issue. It may occur in the context of limited sexual education, poverty, coercion, unstable relationships, school interruption, family rejection, stigma, or poor access to reproductive health services. Pregnancy during adolescence may also intensify pre-existing emotional difficulties, especially when the young woman has limited autonomy, weak social support, financial insecurity, or fear of judgement. A comparative study of teenage pregnant women in urban and rural settings in Lusaka Province identified social and contextual determinants of prenatal depression, including education, household income, relationship factors, social support, and abortion attempts [17]. These findings reinforce the view that perinatal mental health is not only a matter of individual symptoms; it is closely linked to social position, family support, reproductive vulnerability, and access to care.

Depression during pregnancy has consequences beyond maternal mood. It may affect antenatal attendance, nutrition, sleep, self-care, substance use, adherence to medical advice, relationship stability, risk of self-harm, birth preparedness, bonding, infant care, and longer-term child development. In many LMIC settings, however, antenatal care may focus primarily on physical health, obstetric risk, infectious disease screening, nutrition, and delivery planning. These are essential, but incomplete. Integrated maternal care should include routine attention to mood, anxiety, trauma, safety, substance use, social support, suicidal ideation, and severe mental illness. Mental health screening should not be performed as an isolated formality; it should be linked to clear referral pathways, counselling options, family support, crisis response, and follow-up.

Adolescent girls may present depression differently from adult patients. Irritability, withdrawal, school decline, somatic complaints, sleep disturbance, relationship conflict, risk-taking, self-harm, poor concentration, and emotional outbursts may be more visible than verbalised sadness [7], [13]. In pregnant adolescents, these symptoms may be misattributed to "normal pregnancy," immaturity, disobedience, or family conflict. Clinicians should therefore ask directly but respectfully about mood, fear, hopelessness, suicidal thoughts, coercion, violence, substance use, family rejection, and practical needs. The assessment should be developmentally sensitive and should recognise that adolescents may not disclose distress in front of parents, partners, or other authority figures.

Primary care and antenatal services are central platforms for perinatal mental health integration. Many young pregnant women will not attend a psychiatric clinic, but they may attend antenatal care, general practice, community health services, school-linked services, or emergency units. These settings should therefore be able to identify common mental health problems, provide basic psychoeducation, assess risk, and refer appropriately [4], [13], [19]. Simple tools may support detection, but clinical judgement remains essential. A high screening score should lead to assessment of functional impairment, suicide risk, intimate-partner violence, substance use, psychotic symptoms, bipolarity, medical illness, and available support.

Psychological and psychosocial interventions are particularly important in perinatal and adolescent female mental health. Many presentations are shaped by interpersonal stress, social isolation, fear, stigma, financial pressure, and disrupted life plans. Counselling, problem-solving support, behavioural activation, interpersonal approaches, family meetings, parenting preparation, safety planning, and peer or community support may be highly relevant [13], [17]. For adolescents, support should also address school continuation where possible, future planning, communication with caregivers, relationship safety, and prevention of repeated unplanned pregnancy. Psychological care should be practical and respectful, avoiding moralistic judgement.

Medication may be necessary for moderate to severe depression, severe anxiety, bipolar disorder, psychosis, or high-risk presentations, but prescribing during pregnancy and adolescence requires careful risk-benefit assessment [13], [18], [20]. The clinician must consider illness severity, suicide risk, previous response, gestational stage, breastfeeding plans, medication safety, access to follow-up, and the consequences of untreated illness. In bipolar disorder, misdiagnosis as unipolar depression may lead to inappropriate antidepressant monotherapy, which may worsen instability or increase switching risk [14]. Therefore, assessment for previous mania, hypomania, psychosis, family history of bipolar disorder, and antidepressant-induced activation remains essential.

Severe perinatal mental illness requires urgent attention. Psychosis, mania, severe depression with suicidal ideation, catatonic features, severe self-neglect, thoughts of harming the baby, marked confusion, or inability to care for oneself should trigger specialist referral or emergency intervention where available. In low-resource settings, the lack of specialised mother-baby psychiatric services means that general psychiatry, obstetrics, primary care, nursing, and family systems must work together. This requires clear communication, safety planning, and protection of both maternal dignity and infant safety. Where hospital admission is needed, arrangements should consider the welfare of the baby, breastfeeding, family support, and safeguarding.

Family involvement is often helpful, but it must not be automatic or uncritical. Families can provide transport, emotional support, childcare, financial assistance, medication supervision, and protection from isolation. However, some young women experience family rejection, coercion, violence, blame, or pressure regarding pregnancy decisions. Clinicians should therefore assess whether family involvement is safe and wanted. Involving a partner may be useful when the relationship is supportive, but dangerous when there is abuse, coercion, or intimidation. Confidentiality, consent, adolescent autonomy, safeguarding, and cultural sensitivity must be balanced carefully.

Public mental health approaches are essential. Perinatal and adolescent female mental health cannot be solved only by treating individual patients after distress has become severe. Prevention requires school-based education, reproductive health services, stigma reduction, access to contraception, gender-sensitive counselling, protection from violence, family education, poverty reduction, and community awareness. Health systems should also train antenatal staff, primary care workers, teachers, and community health workers to recognise distress and respond without blame. In LMICs, such training may be one of the most cost-effective ways to reduce delayed care.

Perinatal mental health also has intergenerational significance. Supporting a distressed pregnant adolescent or young mother may improve not only her own functioning, but also infant care, bonding, family stability, and future developmental outcomes. This makes maternal mental health a strategic investment in child health and public mental health. Integrated lifespan care therefore begins before birth: it supports the mother, protects the infant, strengthens the family, and reduces the risk that untreated distress will become chronic psychiatric, social, or developmental disadvantage.

Perinatal and adolescent female mental health therefore illustrates the moral and clinical seriousness of integrated care. A young pregnant woman with depression is not only an obstetric patient, not only a psychiatric patient, and not only a social case. She is a person whose needs cross maternal health, psychology, psychiatry, primary care, family systems, safeguarding, education, and public health. An integrated model offers the best chance of recognising distress early, responding humanely, protecting safety, and supporting recovery across generations.

3.9. Neuropsychiatry, neurological comorbidity, and cognitive screening

Neuropsychiatry is a central pillar of integrated lifespan mental health care because psychiatric symptoms do not always arise from primary psychiatric disorders alone. Depression, anxiety, psychosis, agitation, behavioural change, cognitive impairment, poor concentration, impulsivity, sleep disturbance, emotional dysregulation, and functional decline may reflect psychiatric illness, neurological disease, systemic medical illness, medication effects, intoxication, withdrawal, delirium, traumatic brain injury, epilepsy-related syndromes, or chronic disease-related neurocognitive impairment [9], [10], [11], [12], [22], [25], [26], [28]. In low- and middle-income countries, where access to specialist neurology, neuroimaging, electroencephalography, neuropsychology, and laboratory investigation may be limited, careful clinical reasoning becomes even more important.

The traditional separation between psychiatry and neurology is often unhelpful in routine clinical practice. Patients do not present according to disciplinary boundaries. A person with stroke may present with depression, emotional lability, apathy, anxiety, cognitive impairment, irritability, or psychosis-like symptoms [9]. A patient with Parkinson's disease may experience motor symptoms, but also depression, anxiety, sleep disturbance, cognitive impairment, impulse-control problems, hallucinations, or medication-related psychiatric complications [25], [26]. A patient after a road traffic accident may present with memory problems, executive dysfunction, poor frustration tolerance, depression, anxiety, impulsivity, or occupational decline [10]. A child with sickle cell disease may struggle with attention, memory, school performance, and quality of life because of neurocognitive vulnerability [11]. These examples show why integrated mental health care must include neurological and cognitive awareness.

Stroke provides a clear example of the need for neuropsychiatric integration. The neuropsychiatric consequences of stroke may include depression, anxiety, cognitive deficits, emotional dysregulation, fatigue, personality change, reduced motivation, and impaired quality of life [9]. These symptoms may be mistaken for poor effort, family conflict, ordinary sadness, or irreversible disability. In reality, they may be treatable or at least modifiable through early recognition, psychoeducation, rehabilitation, antidepressant treatment when indicated, psychological support, caregiver education, and management of vascular risk factors. Stroke care should therefore include routine attention to mood, cognition, behaviour, sleep, caregiver burden, and functional participation, not only motor recovery.

Traumatic brain injury and road traffic accidents are also important public mental health concerns. Neurocognitive deficits among adult road traffic accident victims may affect attention, memory, processing speed, executive function, planning, emotional regulation, and daily functioning [10]. These deficits may reduce occupational performance, increase family stress, impair adherence to treatment, and worsen vulnerability to depression, anxiety, substance use, irritability, and impulsive behaviour. In LMICs, road traffic injuries are often managed as acute surgical, orthopaedic, or emergency problems, while long-term cognitive and psychological consequences receive less attention. Integrated care should therefore include post-injury mental health screening, cognitive assessment, rehabilitation referral, psychoeducation, and occupational or social reintegration planning where possible.

Children with chronic medical conditions also require neuropsychiatric vigilance. Sickle cell disease, for example, may be associated with neurocognitive deficits that affect attention, memory, executive functioning, school achievement, and quality of life [11]. When such children perform poorly at school, they may be mislabelled as lazy, disobedient, intellectually weak, or poorly disciplined. A neurodevelopmental and neurocognitive formulation is more clinically responsible. Children with chronic medical illness should be assessed not only for physical symptoms but also for learning difficulties, attention problems, emotional distress, school absenteeism, family burden, and social participation. This links paediatrics, psychiatry, psychology, neurology, schools, and rehabilitation.

Epilepsy-related psychiatric presentations require particular caution. Nonconvulsive status epilepticus may present with altered behaviour, confusion, fluctuating responsiveness, impaired awareness, speech disturbance, hallucination-like experiences, agitation, or apparent psychiatric symptoms [12]. If clinicians treat such presentations as purely psychiatric, urgent neurological care may be delayed. This is especially dangerous in settings where diagnostic resources are scarce and clinical observation must guide escalation. Red flags such as acute onset, fluctuating consciousness, unexplained confusion, automatisms, new seizures, abnormal movements, postictal states, focal neurological signs, recent head injury, fever, or sudden cognitive change should prompt urgent medical or neurological evaluation [12], [28].

Parkinson's disease further illustrates the bidirectional relationship between neurology and psychiatry. Motor symptoms are only part of the clinical picture. Depression, anxiety, sleep problems, cognitive impairment, apathy, hallucinations, and medication-related behavioural effects can substantially affect quality of life [25], [26]. Dopaminergic treatment, including pramipexole, may improve motor and selected non-motor symptoms, but it also

requires careful monitoring for psychiatric adverse effects, impulse-control symptoms, hallucinations, sleepiness, and interactions with other medicines [25], [26]. General practitioners, neurologists, psychiatrists, and caregivers must therefore communicate clearly when patients with Parkinson's disease develop mood, behavioural, cognitive, or psychotic symptoms.

Cognitive screening should become a routine part of integrated lifespan mental health care. It does not need to be complicated or expensive. Orientation, attention, immediate recall, delayed recall, executive function, language, visuospatial ability, functional capacity, medication use, and collateral history can provide valuable clinical information. Brief cognitive screening is particularly important in older adults, post-stroke patients, traumatic brain injury, epilepsy, Parkinson's disease, chronic medical illness, suspected delirium, severe depression, psychosis, substance-use disorders, and patients with poor treatment adherence [9], [10], [11], [12], [25], [26], [28]. Without cognitive assessment, clinicians may misinterpret forgetfulness, disorganisation, poor adherence, or reduced motivation as oppositional behaviour or lack of insight.

The mental status examination should therefore be broadened into an integrated clinical assessment. A high-quality assessment should include psychiatric symptoms, neurological red flags, cognition, physical health, medication exposure, substance use, risk to self and others, safeguarding, functional impairment, and family context [28]. This is particularly important in primary care and emergency settings, where the first clinician may need to decide whether the patient requires urgent medical assessment, psychiatric admission, outpatient follow-up, neurological referral, or psychosocial support. Integrated assessment reduces both under-recognition and over-pathologising.

Medication review is part of neuropsychiatric safety. Antidepressants, antipsychotics, anticonvulsants, sedatives, anticholinergic medicines, dopamine agonists, steroids, antiretrovirals, anti-epileptic drugs, and other commonly used medicines may affect mood, cognition, sleep, behaviour, motor function, and seizure threshold [20], [22], [25], [26], [27]. In older adults and medically complex patients, polypharmacy increases the risk of sedation, falls, confusion, delirium, adherence problems, and drug interactions. In low-resource settings, patients may also use traditional medicines, over-the-counter preparations, or borrowed medication, which makes careful history-taking essential.

Neuropsychiatric integration also has rehabilitation implications. Many patients do not recover fully through symptom reduction alone. A post-stroke patient may need cognitive rehabilitation, family education, occupational therapy, mobility support, and depression treatment. A child with sickle cell disease-related cognitive impairment may need school support and psychoeducation. A patient after traumatic brain injury may need vocational planning and family coaching. A person with Parkinson's disease may need psychological support and caregiver education. Rehabilitation should therefore be understood broadly: it includes functional recovery, participation, communication, independence, safety, and quality of life.

For LMICs, the practical message is not that every clinic must become a specialist neuropsychiatry centre. The message is that every mental health system should build basic neuropsychiatric competence. This includes training clinicians to recognise red flags, perform brief cognitive screening, review medication, identify neurological comorbidity, refer appropriately, and avoid premature diagnostic closure. Such competence is inexpensive compared with the cost of missed delirium, untreated epilepsy, unrecognised brain injury, neglected post-stroke depression, or medication-induced behavioural change.

Neuropsychiatry therefore strengthens the central argument of integrated lifespan care. A mental health system that ignores the brain risks unsafe simplification. A neurological service that ignores emotion, cognition, behaviour, and family burden risks incomplete care. The best model is clinically traditional but systemically modern: careful history, disciplined examination, collateral information, cautious diagnosis, rational investigation, appropriate referral, and compassionate follow-up across the lifespan.

3.10. Psychopharmacology and medication safety in resource-constrained systems

Psychopharmacology remains one of the most powerful tools in mental health care, but it is also one of the areas where unsafe practice can produce avoidable harm. Antidepressants, antipsychotics, mood stabilisers, stimulants, non-stimulant ADHD medicines, anticonvulsants, sedatives, and dopamine agonists can reduce suffering and improve functioning when used appropriately [13], [14], [18], [20], [23], [24], [25], [26], [27]. However, medication safety depends on accurate diagnosis, adequate dosing, informed consent, side-effect monitoring, physical-health surveillance, follow-up, adherence support, and medicine availability. In low- and middle-income countries, each of these conditions may be challenged by limited workforce, cost, supply interruptions, weak laboratory access, stigma, and fragmented care.

A rational prescribing culture begins with diagnostic discipline. Medication should not be used as a substitute for assessment. Depressive symptoms require evaluation for bipolar disorder, psychosis, substance use, grief, trauma, medical illness, neurological disease, medication effects, and suicide risk [13], [14], [18], [20], [22]. Psychotic symptoms require evaluation for schizophrenia, bipolar disorder, substance-induced psychosis, delirium, epilepsy-related presentations, neurological disease, and acute medical causes [6], [12], [15], [28]. Behavioural disturbance in autism, intellectual disability, dementia, or traumatic brain injury requires careful formulation before sedating medication is used [8], [10], [21]. Without diagnostic discipline, prescribing may suppress symptoms temporarily while missing the true clinical problem.

Antidepressant safety is a major concern because antidepressants are widely used across primary care, psychiatry, and neurology [18], [20], [22]. Appropriate antidepressant prescribing requires assessment of severity, duration, previous response, adherence, suicide risk, bipolarity, medical comorbidity, pregnancy status, drug interactions, and patient preference [13], [18], [20]. Under-treatment may occur when doses are too low, duration is too short, or follow-up is absent. Inappropriate treatment may occur when bipolar depression, substance-related mood symptoms, medication-induced symptoms, or neurological illness is treated as uncomplicated unipolar depression [14], [20], [22]. Antidepressant stewardship should therefore include diagnostic review, patient education, planned follow-up, monitoring for activation or adverse effects, and clear decisions about continuation or discontinuation.

Bipolar depression requires particular caution. The role of lamotrigine in bipolar depression illustrates the need for diagnosis-specific and phase-specific treatment [14]. Unlike unipolar depression, bipolar depression must be managed with attention to switching risk, previous manic or hypomanic episodes, psychotic symptoms, suicide risk, adherence, comorbidity, and long-term relapse prevention [14]. In LMICs, where access to specialist psychiatric review may be delayed, clinicians should be trained to recognise red flags for bipolarity before starting antidepressant monotherapy. This is a safety issue, not merely a diagnostic refinement.

Antipsychotics are essential in the treatment of schizophrenia, acute psychosis, bipolar disorder, severe agitation, and selected severe behavioural presentations, but their use requires careful monitoring. Antipsychotic-related metabolic risk is particularly important because weight gain, impaired glucose metabolism, dyslipidaemia, hypertension, and cardiovascular risk may develop silently [27]. A study on early diagnosis of glucose metabolism impairment among patients receiving antipsychotic medication in Zambia highlighted the importance of screening and monitoring in outpatient psychiatric care [27]. This is clinically significant because psychiatric symptom control should not be achieved at the cost of preventable physical morbidity.

Metabolic monitoring should be made routine and feasible. Ideally, services should monitor weight, body mass index, waist circumference, blood pressure, fasting glucose or other available glucose measures, lipid profile where possible, family history, lifestyle risk, and medication history [27]. In resource-constrained settings, laboratory monitoring may not always be available, but this should not justify doing nothing. Weight, waist circumference, blood pressure, diabetes symptoms, family history, diet, physical activity, and smoking can still be assessed. Simple monitoring charts, nursing-led checks, patient-held records, and periodic audit can improve safety even without advanced infrastructure.

Medication adherence should be understood as a shared clinical task. Patients may stop medicines because of side effects, lack of insight, stigma, cost, poor explanation, cultural beliefs, substance use, pregnancy concerns, sexual dysfunction, sedation, weight gain, transport barriers, or medicine shortages [15], [16], [35]. Blaming patients for non-adherence is poor medicine. Clinicians should explain the purpose of medication, expected benefits, common adverse effects, what to do if side effects occur, how long treatment may be needed, and why abrupt discontinuation may be risky. Where appropriate, families can support adherence, but this must be balanced with consent, confidentiality, and autonomy.

Medication availability is itself a safety issue. Intermittent supply can cause relapse, withdrawal symptoms, emergency presentations, avoidable readmission, and loss of trust in services. Inconsistent availability may also force clinicians to switch medicines for administrative rather than clinical reasons. Integrated mental health systems therefore require essential psychotropic medicine lists, reliable procurement, stock monitoring, rational prescribing policies, and communication between pharmacy, clinicians, and service managers. Medication safety is not only the responsibility of the prescriber; it is a system function.

Special populations require additional caution. Children and adolescents need developmental assessment, caregiver involvement, school input, and careful monitoring of growth, appetite, sleep, activation, extrapyramidal symptoms, and emotional change [5], [6], [7], [23], [24]. Pregnant and breastfeeding women require risk-benefit discussion that considers both medication exposure and the risks of untreated illness [13], [17], [18], [20]. Older adults and

neurologically impaired patients require attention to falls, cognition, sedation, anticholinergic burden, renal or hepatic impairment, and polypharmacy [9], [12], [22], [25], [26]. Patients with substance-use disorders require attention to interactions, overdose risk, adherence, withdrawal, and relapse triggers [16], [36].

ADHD pharmacotherapy illustrates the need for balanced pragmatism. Evidence-based medication can be valuable, but access may be limited by regulation, cost, availability, or concerns about misuse [5]. Adjunctive or alternative approaches such as omega-3 fatty acids have been discussed, and exploratory evidence has examined fluoxetine in relation to neurocognitive functioning among children with ADHD [23], [24]. Such evidence should be interpreted cautiously and should not displace established treatments where these are available. However, it highlights the reality that LMIC clinicians often work with constrained options and must combine psychoeducation, behavioural strategies, school support, caregiver guidance, and carefully selected medication.

Dopaminergic medication in Parkinson's disease and neuropsychiatric practice also requires careful monitoring. Pramipexole may have roles in motor and non-motor symptoms, but dopaminergic treatment can be associated with psychiatric and behavioural adverse effects, including hallucinations, impulse-control symptoms, sleepiness, and mood or behavioural change [25], [26]. When such symptoms emerge, they should not automatically be treated as new primary psychiatric illness. The medication regimen, disease stage, cognitive status, sleep, and neurological condition must be reviewed. This is another example of why psychiatry and neurology must communicate rather than work in isolation.

Medication safety should be embedded in clinical governance. Services should use prescribing protocols, medication review forms, side-effect checklists, metabolic monitoring charts, audit-and-feedback, incident reporting, and quality-improvement cycles [29], [30]. In inpatient settings, medication safety should include reconciliation on admission, review before discharge, clear discharge prescriptions, explanation to patients and families, and communication with outpatient or primary-care teams. In outpatient settings, safety should include monitoring appointments, adherence review, side-effect assessment, and physical-health checks.

Psychopharmacology in LMICs should therefore be neither nihilistic nor careless. It is wrong to deny patients effective medication because systems are constrained. It is equally wrong to prescribe without diagnosis, monitoring, explanation, or follow-up. The ethical position is rational, patient-centred, evidence-informed, and feasible prescribing. Good psychopharmacology combines clinical judgement, respect for patient experience, attention to physical health, and awareness of the health-system realities that shape treatment.

Medication is most effective when it is part of integrated care. Antidepressants work best when diagnosis is reviewed and psychosocial needs are addressed. Antipsychotics are safer when metabolic monitoring and psychoeducation are routine. ADHD treatment is stronger when schools and families are involved. Parkinson's disease treatment is safer when psychiatric symptoms are interpreted neurologically as well as psychologically. Perinatal prescribing is safer when maternal, fetal, infant, and family needs are considered together. Medication safety is therefore not a separate chapter from integrated care; it is one of its strongest tests.

3.11. Psychotherapy, psychosocial interventions, and family-centred care

Psychotherapy and psychosocial interventions are essential to integrated lifespan mental health care because medication alone cannot address the social, emotional, behavioural, relational, and functional dimensions of mental illness. In low- and middle-income countries, the challenge is not only to identify which psychological interventions are effective, but also to deliver them in forms that are feasible, acceptable, affordable, and sustainable within real health systems [3], [4].

Brief, structured, and culturally adaptable interventions are particularly important. Psychoeducation, behavioural activation, problem-solving support, motivational interviewing, cognitive behavioural strategies, interpersonal approaches, caregiver coaching, and relapse-prevention planning can be delivered across primary care, psychiatric outpatient services, inpatient wards, maternal health services, schools, and community settings [13], [15], [17], [21], [36]. These interventions are valuable because they improve understanding, engagement, adherence, coping, family communication, and early recognition of relapse.

Family-centred care is especially important in LMICs, where families often provide transport, supervision, emotional support, medication monitoring, financial assistance, and crisis response. In autism spectrum disorder, parent-mediated intervention can improve functional language and social communication when caregivers attend sessions and apply strategies with fidelity [21]. In first-episode psychosis, psychoeducation can help families understand symptoms,

medication, relapse signs, and the need for continuity, although intervention effects depend on quality, context, and system support [15]. In substance-use disorders, family involvement may support harm reduction and relapse prevention, provided that safety, consent, domestic violence, and coercion are carefully assessed [16], [36].

Psychosocial care should not be presented as a soft or optional component of treatment. It is a clinical intervention that requires structure, supervision, fidelity, and follow-up. A poorly delivered counselling session may offer reassurance but little durable benefit. By contrast, a focused session that clarifies the problem, strengthens motivation, identifies risk, teaches coping strategies, involves appropriate supports, and arranges follow-up can be highly therapeutic even when specialist psychotherapy is unavailable.

At the same time, psychotherapy must be realistic. Many patients face stigma, poverty, long travel distances, low literacy, unstable employment, medication shortages, family conflict, and competing survival priorities. Therefore, integrated systems should use stepped psychosocial care: simple psychoeducation and support for low-risk presentations; structured brief interventions for mild to moderate conditions; family and caregiver work where appropriate; and specialist psychotherapy or psychiatric referral for severe, complex, high-risk, or treatment-resistant presentations.

The strongest model is not psychotherapy versus medication, but psychotherapy with medication when indicated, family support when safe, and primary-care or community follow-up when feasible. In this sense, psychosocial care is the human bridge between diagnosis and recovery.

3.12. Integrated psychiatric assessment, risk formulation, and diagnostic safety

Integrated lifespan mental health care depends on high-quality assessment. Without disciplined assessment, services may overprescribe, miss neurological disease, underestimate suicide risk, overlook substance use, ignore safeguarding concerns, or misinterpret social adversity as purely individual pathology. Assessment is therefore not a preliminary administrative step; it is the foundation of safe treatment.

A contemporary psychiatric assessment should combine mental status examination, developmental history, medical and neurological review, cognitive screening, medication history, substance-use assessment, family context, functional impairment, and risk formulation [28]. This is especially important in LMICs, where diagnostic resources may be limited and the first clinician may need to make decisions without immediate access to specialist investigations. Good clinical judgement becomes a safety tool.

Diagnostic safety requires avoiding premature closure. Depression may be unipolar, bipolar, substance-related, post-stroke, perinatal, grief-related, medication-induced, or associated with chronic medical illness [9], [13], [14], [17], [18], [22]. Psychosis may reflect schizophrenia, bipolar disorder, severe depression, substance use, delirium, epilepsy-related states, traumatic brain injury, or rare shared psychotic conditions [6], [12], [15], [28], [33], [34]. Behavioural disturbance in children may reflect ADHD, autism, depression, trauma, learning difficulties, epilepsy, family adversity, or emerging psychosis [5], [6], [7], [8]. The clinician must therefore ask not only “what diagnosis fits?” but also “what else could this be?”

Risk formulation should be structured but not mechanical. Suicide risk, self-harm, violence, neglect, exploitation, substance-related harm, vulnerability, safeguarding, medication toxicity, and relapse risk should be considered according to presentation [28], [29], [30]. In perinatal and adolescent female mental health, risk assessment must include suicidal ideation, coercion, intimate-partner violence, family rejection, and infant safety [17]. In psychosis, it should include self-neglect, command hallucinations, persecutory beliefs, aggression, family risk, and capacity for treatment adherence [15], [33], [34]. In substance-use disorders, it should include withdrawal, intoxication, overdose, violence, driving risk, and relapse triggers [16], [36].

Diagnostic safety also depends on communication. A careful assessment is weakened if the discharge plan is unclear, the family receives no explanation, the primary-care clinician is not informed, or follow-up is not arranged. Structured handover, clear referral notes, medication plans, crisis contacts, and relapse-warning advice are simple but powerful interventions [28], [29], [35].

Integrated assessment therefore protects both patients and systems. It improves diagnostic accuracy, reduces avoidable harm, supports rational prescribing, strengthens referral decisions, and gives families and frontline workers a clearer plan. In resource-constrained settings, this disciplined clinical method may be one of the most cost-effective safety interventions available.

3.13. Quality improvement, clinical governance, and service safety

Quality improvement and clinical governance are essential for transforming integrated lifespan mental health care from an aspiration into a reliable service model. Many poor outcomes in mental health care arise not only from illness severity, but from weak systems: delayed detection, fragmented referrals, medication interruptions, inadequate documentation, unsafe environments, poor discharge planning, limited staff training, and failure to learn from incidents [29], [30], [35], [37].

Quality improvement offers practical tools for strengthening care even when resources are limited. Plan-Do-Study-Act cycles, audit-and-feedback, safety bundles, structured handover, medication reconciliation, metabolic monitoring charts, follow-up registers, and incident-review meetings can improve reliability without requiring major infrastructure change [29], [30]. These approaches are particularly relevant to psychiatric services, where risks include suicide, self-harm, aggression, absconding, coercion, diagnostic overshadowing, medication-related harm, staff injury, and unsafe transitions between inpatient and community care.

Clinical governance should also protect staff. Mental health workers in low-resource systems may face overcrowding, high clinical risk, limited security, emotional burden, burnout, and moral distress. A service that protects patients but neglects staff will not remain safe for long. Staff training, de-escalation skills, supervision, clear escalation pathways, occupational safety, and leadership support are therefore part of patient safety, not separate administrative concerns [29], [30], [37].

The broader service-improvement literature highlights recurring barriers to quality mental health care: inadequate funding, workforce shortages, stigma, limited training, weak infrastructure, poor integration with primary care, and insufficient community-based services [37]. These barriers are not unique to one country. They are common across many LMIC and transitional settings, making service improvement a central public mental health priority rather than a local operational issue.

Technology may help, but it should be used carefully. Telemedicine, digital follow-up, appointment reminders, electronic registers, and decision-support tools can improve access and continuity, especially in remote or underserved areas [37]. However, digital solutions cannot compensate for poor clinical governance, weak referral systems, lack of trained staff, or absence of emergency pathways. Technology is useful when it strengthens relationships, supervision, follow-up, and access; it is unsafe when it becomes a substitute for clinical responsibility.

Clinical governance also requires measurement. Services should monitor indicators such as follow-up attendance, readmission, adverse events, metabolic screening, medication availability, waiting time, missed appointments, relapse after discharge, patient complaints, staff injuries, and patient-reported outcomes. These data should not be collected only for reporting. They should be reviewed by clinical teams and used to change practice.

Quality improvement therefore connects the whole manuscript. It supports primary-care integration, safer prescribing, neuropsychiatric vigilance, family engagement, substance-use follow-up, perinatal safety, and continuity after discharge. In LMICs, where resources are constrained, the most realistic improvement strategy is not perfection, but disciplined incremental change: identify the gap, test a small change, measure the result, learn, and scale what works.

3.14. Proposed integrated lifespan care framework for LMICs

Based on the synthesis presented in this review, integrated lifespan mental health care in low- and middle-income countries can be organised around six practical pillars. These pillars are not intended as a rigid protocol, but as a flexible framework that can be adapted to local workforce, financing, culture, infrastructure, medicine availability, and referral pathways.

The first pillar is early detection close to where people seek help. Primary care, schools, antenatal services, emergency units, paediatric clinics, neurology services, and community health platforms should be able to identify common warning signs of depression, psychosis, substance-use disorders, neurodevelopmental difficulties, cognitive impairment, perinatal distress, and neurological red flags [4], [13], [18], [19]. Screening tools may support this process, but they should always be linked to clinical assessment, risk evaluation, and follow-up.

The second pillar is integrated assessment. Mental health assessment should combine psychiatric symptoms, developmental history, neurological findings, cognition, physical health, medication exposure, substance use, family context, functional impairment, and risk formulation [9], [10], [11], [12], [28]. This approach reduces premature

diagnostic closure and helps clinicians distinguish primary psychiatric disorders from neurological, medical, substance-related, medication-induced, developmental, and psychosocial presentations.

The third pillar is stepped psychosocial and pharmacological care. Mild and low-risk presentations may be managed with psychoeducation, behavioural activation, problem-solving, family support, and planned review. Moderate or persistent presentations may require structured psychological intervention, medication, or combined treatment. Severe, complex, high-risk, psychotic, neuropsychiatric, treatment-resistant, or diagnostically uncertain presentations require specialist consultation or referral where available [13], [14], [15], [20], [27]. This model protects access while preserving safety.

The fourth pillar is family and caregiver engagement. Families frequently provide transport, supervision, emotional support, medication monitoring, crisis response, and practical care. In autism, psychosis, substance-use disorders, child and adolescent mental health, perinatal care, and severe mental illness, caregiver involvement may improve engagement and continuity [15], [16], [17], [21], [36]. However, family involvement must always respect consent, confidentiality, autonomy, safeguarding, and the possibility of coercion, neglect, or violence.

The fifth pillar is continuity, rehabilitation, and relapse prevention. Discharge from hospital, completion of a brief intervention, or prescription of medication should not be treated as the end of care. Patients need clear follow-up plans, relapse-warning education, medication review, physical-health monitoring, crisis contacts, and community linkage [29], [35]. Rehabilitation should address functioning, school participation, work, family reintegration, cognition, daily living, and quality of life.

The sixth pillar is quality improvement and public mental health governance. Integrated care requires systems that learn. Services should monitor safety incidents, readmission, medication supply, metabolic screening, missed appointments, follow-up attendance, staff injury, patient experience, and treatment outcomes [29], [30], [37]. Quality improvement methods such as Plan-Do-Study-Act cycles, audit-and-feedback, structured handover, and safety bundles can make care more reliable even where resources are constrained.

Together, these six pillars create a practical model for lifespan mental health care in LMICs. The framework does not depend only on increasing the number of psychiatrists, although specialist expansion remains important. Its strength is that it connects existing platforms, like primary care, psychiatry, psychology, neurology, maternal health, paediatrics, addiction care, rehabilitation, families, and communities, into a safer and more coherent pathway.

3.15. Implications for Thailand and comparable LMIC settings

Although this review draws on evidence from diverse low-resource and transitional settings, the framework has direct relevance for Thailand and comparable LMIC contexts. Thailand has made important progress in health-system development, but mental health services, like those in many countries, still face pressures related to rising psychosocial need, urban-rural inequity, stigma, workforce distribution, ageing, substance-related harm, neurodevelopmental demand, perinatal distress, and the need for stronger integration between general health and mental health care [2], [3], [4], [37].

For Thailand, the most practical implication is the need to strengthen mental health care outside specialist psychiatric hospitals. Primary care and general practice should be supported to detect depression, anxiety, substance-use disorders, suicide risk, cognitive impairment, and early psychosis. Antenatal and adolescent health services should be better equipped to identify perinatal depression, coercion, self-harm risk, and social vulnerability. Paediatric and school-linked services should have clearer pathways for ADHD, autism spectrum disorder, depression, behavioural difficulties, and emerging psychosis [5], [6], [7], [8], [17], [21].

The second implication is the importance of family-centred and culturally acceptable care. In Thailand and many Asian settings, family structures, interdependence, respect for authority, stigma, religious beliefs, and community expectations may strongly influence help-seeking, adherence, disclosure, and recovery. Integrated care should therefore include family psychoeducation, caregiver coaching, relapse-prevention planning, and culturally sensitive communication, while still protecting confidentiality, consent, and safeguarding.

The third implication is the need for neuropsychiatric vigilance. Ageing populations, stroke, Parkinson's disease, epilepsy-related presentations, road traffic injuries, chronic medical illness, and medication effects all require clinicians to assess cognition, neurological red flags, functional change, and physical health alongside psychiatric symptoms [9],

[10], [11], [12], [25], [26], [28]. This is especially important where patients move between general practice, neurology, psychiatry, emergency care, and rehabilitation.

The fourth implication is the need for quality improvement. Thailand and comparable systems can benefit from routine metabolic monitoring for antipsychotic treatment, structured discharge planning, follow-up registers, medication safety reviews, incident learning, telemedicine-supported follow-up, and audit-and-feedback [27], [29], [30], [37]. Such measures are not glamorous, but they are often the difference between fragmented care and reliable care.

The framework proposed in this review should therefore be adapted rather than copied. Each country should define its own workforce model, referral pathways, community resources, digital capacity, financing mechanisms, cultural considerations, and governance structures. The central principle remains the same: patients should not be forced to navigate disconnected systems when their needs are developmental, psychological, psychiatric, neurological, social, and public health-related at the same time.

3.16. Limitations of the review

This review has several limitations. First, it is a narrative review rather than a systematic review or meta-analysis. The literature was selected and synthesised thematically to support a broad clinical and public mental health framework, rather than through a fully reproducible systematic search, formal risk-of-bias assessment, or quantitative pooling of outcomes [31], [32].

Second, the evidence base is heterogeneous. The included literature covers different populations, diagnoses, age groups, interventions, countries, service settings, and study designs. Some sources are clinical trials or observational studies, while others are case reports, narrative reviews, quality improvement studies, or service-development papers. This breadth is appropriate for a lifespan review, but it limits the ability to make narrow causal claims.

Third, some evidence comes from single-site studies or specific clinical settings. Findings from Zambia, Ukraine, Thailand, or other settings may not transfer automatically to all LMICs. Health systems differ in financing, workforce, legislation, medicine availability, referral pathways, cultural beliefs, family structures, and community resources. The framework should therefore be locally adapted before implementation.

Fourth, several areas require stronger evidence. These include scalable psychotherapy models, long-term outcomes of parent-mediated autism interventions, sustained alcohol harm reduction after discharge, perinatal mental health pathways for adolescents, metabolic monitoring implementation, neurocognitive rehabilitation, and quality improvement in psychiatric services. Future research should include pragmatic trials, implementation studies, cost-effectiveness analyses, and service-user perspectives.

Finally, the review does not claim that integrated lifespan care is easy to implement. Integration can fail when it is reduced to rhetoric without workforce support, supervision, funding, medicines, referral pathways, data systems, and accountability. The value of the proposed framework lies in providing a practical direction, not a finished solution.

4. Conclusion

Integrated lifespan mental health care offers a practical and clinically coherent framework for strengthening mental health systems in low- and middle-income countries. The central message of this review is that mental health care should not be organised around isolated diagnoses, isolated professions, or isolated institutions. Patients present across the lifespan with overlapping psychiatric, psychological, developmental, neurological, medical, family, social, and public health needs. Services must therefore be designed to respond to this complexity.

The review highlights several priorities: early recognition in primary care and community settings; developmentally informed child and adolescent care; family-centred autism and neurodevelopmental support; stepped treatment for depression and bipolar disorder; continuity for psychosis and severe mental illness; harm reduction for substance-use disorders; perinatal and adolescent female mental health support; neuropsychiatric and cognitive vigilance; rational psychopharmacology; structured risk formulation; and quality improvement for safer services.

The proposed framework is intentionally pragmatic. It does not assume that every LMIC can immediately build a fully resourced specialist mental health system. Instead, it argues for better coordination of existing platforms: primary care, psychiatry, psychology, neurology, maternal health, paediatrics, addiction services, rehabilitation, families, and

community supports. This approach can improve access, safety, adherence, functional recovery, equity, and continuity when adapted to local realities.

For Thailand and comparable settings, the framework provides a useful direction for service planning, clinical governance, training, and future research. The strongest mental health systems will be those that combine traditional clinical discipline with modern integrated care: careful assessment, humane communication, rational prescribing, psychosocial support, family engagement, physical-health monitoring, risk awareness, and continuous improvement. Integrated lifespan care is therefore not merely a service model; it is a public mental health commitment to treating people as whole persons across the course of life.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no financial or non-financial conflicts of interest related to this manuscript.

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