


REVIEW ARTICLE OPEN ACCESS

Integrated Physical-Mental Healthcare Services in Specialist Settings to Improve Outcomes for Older People Living With Mental Health Diagnoses: A Systematic Review

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ABSTRACT

Background: Many older people are now living with co-occurring physical and mental health disorders, but these often managed separately. The aim of this systematic review was to explore integrated physical-mental health care services available internationally for older people living with mental health diagnoses, and whether these result in improved health outcomes.

Methods: Medline, Embase, CINAHL, PsycINFO and Scopus were searched with a predefined search strategy (PROSPERO: CRD42022383824), generating 6210 articles. Studies were included where an integrated physical-mental health care service model was utilised in a population of older people (aged >60 years) with a mental health diagnosis (including dementia or cognitive impairment) and at least one concomitant physical health condition requiring physical health care input. All studies were assessed for risk of bias (ROB 2.0, ROBINS-I) and results were synthesised narratively.

Results: Nine studies were included across inpatient ($n = 6$, 1262 patients) and community ($n = 3$, 466 patients) settings. Studies were rated as low-moderate risk of bias. These covered joint physical-mental health wards, liaison services, embedded physicians in mental health wards, and joint multidisciplinary teams. Services with greater integration (e.g., joint wards) had more benefits for patients and carers. There were few benefits to traditional outcomes (e.g., hospital admissions, mortality), but greater care quality, carer satisfaction, and improved mood and engagement were demonstrated.

Conclusions: Multidisciplinary integrated care resulted in improvement of a range of health outcomes for older people with combined physical and mental health needs. Larger and more robust studies are needed to explore the development of these service models further, with cost-effectiveness analyses.

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Summary

- Older people often have combined physical and mental health needs, but mental and physical healthcare is provided separately in most countries.
- There were only nine published examples of fully integrated physical-mental healthcare services for older people across inpatient and community care settings worldwide.
- Services included joint physical-mental health wards, liaison services, joint multidisciplinary teams, and embedded physical health support.
- Greater care quality, carer satisfaction, and improved mood and engagement were demonstrated.

1 | Introduction

One in five adults aged over 60 years are living with a mental or neurological disorder, accounting for 17.4% of years lived with disability amongst older people. Given the ageing population, the prevalence of these conditions is only projected to rise further. Depression and dementia are two of the commonest conditions of ageing affecting 5% and 7% of older people, respectively [1]. Around 20% of people currently aged 65 years and over are projected to experience mental health issues, with 5% experiencing severe mental illness (SMI) [2]. There is variation in how the term 'SMI' has been described in existing literature resulting in a lack of standardisation and clarity regarding its definition across contexts [3]. For the purposes of this review, the term SMI will reflect those with a diagnosed mental health condition (e.g., depression, schizophrenia, bipolar disorder) that requires secondary care or specialist input.

People of all ages with SMI experience reduced life expectancy compared to the general population, known as the 'stolen years' [4–6]. This is largely due to poorer physical health [4]. Much of this risk is modifiable, and could be reduced with improved access and uptake of care for physical health conditions [4]. However, integration of physical and mental health care has focused on younger adults [5], medical wards [7], or collaborative care in the community [8]. The challenges faced by older adults are distinct from younger populations, with greater frailty, comorbidity, polypharmacy, poorer cognitive and physical function, and higher social care needs [5]. This is further compounded by social isolation, loneliness, and complex social care needs [9]. There remains significant inequity in physical care provided to older people with complex physical and mental health needs. High rates of physical comorbidity in older people with mental health problems has been shown to negatively impact wellbeing [10], and self-reported health [11]. Furthermore, care costs are up to 10 times higher for older people living with combined physical and mental health needs [12].

Despite this complexity, health services have failed to keep pace with the changing demographics and needs of older people

receiving specialist mental health care worldwide [5, 13–17]. Mental and physical health services are fragmented, often provided on different hospital sites with distinct funding, resource allocation, and information systems. This fragmentation has reduced access to physical health provision for people receiving specialist mental health care [5, 14]. This leads to potentially preventable admissions to acute trusts, with increased length of stay, higher care costs, and poorer outcomes for patients [5, 7].

In a review of integrated care for older people with SMI and medical comorbidities, three broad care models were identified: (1) psychosocial skills training, (2) integrated illness self-management, and (3) collaborative care [17]. The review identified fewer interventions and services developed specifically for this population that integrated aspects of both physical and mental health care. The review predominantly focused on a younger SMI population (>50 years) accessing community-based services with no examples of inpatient or specialist/secondary care level physical-mental health service integration.

Therefore, the aim of this systematic review was to summarise the available international evidence on integrated physical-mental health services designed to meet the needs of older people (>60 years) with dementia and/or mental illness. In some healthcare systems, older people with dementia and behavioural or psychological needs are predominantly cared for by mental health services and so we included this group in addition to functional mental health disorders (e.g., depression, bipolar disorder, schizophrenia). This review builds on that conducted by Bartels et al. by considering and drawing on comparisons between inpatient and community services, and focusses on those with more complex health needs requiring secondary/specialist care for physical and/or mental health needs. In addition, we aimed to summarise the current evidence gaps and areas for future health service research for older people with complex physical and mental health needs.

2 | Methods

2.1 | Search Strategy

The protocol was registered prospectively on PROSPERO (CRD42022383824). A PRISMA checklist for the review is included in the Supplementary material, including changes from the original protocol. Five electronic databases (Medline, Embase, CINAHL, PsycINFO, and Scopus) were searched from 2000 to February 2024 with a predefined search strategy developed in conjunction with a librarian (Supporting Information S1). The search was restricted to humans and English Language. The reference lists of included articles were also searched alongside PubMed related articles features to identify any similar or citing literature, and references from reports conducted by the British Geriatrics Society and Royal College of Psychiatrists on integrated physical-mental health care. Unpublished service models in these reports were not included due to limited information.

2.2 | Eligibility

Inclusion criteria were as follows:

1. integrated physical-mental health care service;
2. older people (aged >60 years) with a mental health diagnosis (including dementia/cognitive impairment) and at least one concomitant physical health condition;
3. the integrated physical-mental health service had to address both physical and mental health care needs simultaneously or provide dedicated physical health care to patients receiving specialist mental health care, with liaison between the two services.

This review focussed on older people with complex physical and mental health needs requiring secondary care or specialist input from either physical health clinicians (e.g., geriatricians), psychiatrists (e.g., old age psychiatrists, clinical psychologists), or specialist nurses. We excluded studies that only implemented integrated care guidelines or systems but without input from both specialists in mental and physical health (e.g., delivered solely by general practitioners or non-specialised nurses in primary care). We excluded interventions that involved solely liaison psychiatry services with no physical health integration. We did not restrict the search to a specific care or service design and considered any aspect of integrated care for example, multidisciplinary team (MDT) meetings, joint clinics, joint physical-mental health care wards, or inpatient liaison. We considered any comparator intervention or alternative service against which the integrated care model was evaluated. Any study design was also considered, including randomised controlled (RCT), non-randomised controlled, and non-controlled intervention studies, alongside retrospective analyses of existing integrated services.

2.3 | Screening, Data Extraction and Synthesis

Duplicates were removed in Endnote, and screening was conducted initially on title and abstract in Rayyan [18] independently by two reviewers (B.H. and B.D.). Following this, suitable studies were reviewed independently at full text by two reviewers (B.H. and B.D.). All disagreements were arbitrated by a third reviewer (L.B.). Data were then extracted by one reviewer (B.H.) into Excel and checked by a second reviewer (B.D.) on the following: title, author, year, study design, setting, geographical location, case-mix/population, age/sex/ethnicity distribution, mental health diagnoses, physical health comorbidities, description of service model tests, the main outcomes and findings of each study, and any other outcomes. Due to limited studies identified, and significant heterogeneity, a meta-analysis was precluded and a narrative synthesis was conducted. Study characteristics and key outcomes were summarised (Tables 1 and 2).

2.4 | Risk of Bias Assessment

Risk of bias was assessed using the ROB-2 [19] tool for randomised studies and the ROBINS-I [20] tool for non-randomised

intervention studies. Risk of bias was assessed by two reviewers independently (B.H. and B.D.). Disagreements were arbitrated by a third reviewer (L.B.). Assessments were summarised in risk of bias charts.

3 | Results

A total number of 11,761 records were identified, of which 6210 remained after deduplication. Of these, 6022 reports were excluded based on their title and abstracts, and 188 reports were assessed at full text for eligibility. After full text screening, 179 reports were excluded leaving a final number of 9 studies to be included in the review. Figure 1 summarises the flow of studies through the review.

3.1 | Characteristics of Included Studies

Nine studies met the inclusion criteria for the review, the key characteristics are summarised in Table 1. Studies were published between 2002 and 2023 (55.5% published after 2010), with the majority from the US [21–23] and UK [7, 24, 25], followed by Australia [26], Canada [27], and the Netherlands [28]. Of the included studies, four were randomised controlled trials (RCT) [7, 22, 27, 28], one controlled pilot study [23], and four were retrospective reviews of integrated services [21, 24–26]. The majority (66.6%) of studies evaluated integrated inpatient services [7, 21, 24–27], with the remainder evaluating community-based interventions [22, 23, 28].

3.2 | Risk of Bias

Three studies [21, 24, 26] in this review provided insufficient information, four [22, 23, 27, 28] were rated as low, and two [7, 25] as moderate risk of bias across the majority of the domains. Figure 2 summarises the risk of bias for each study.

4 | Results

4.1 | Inpatient

Of the six inpatient integrated care models, two evaluated joint medical and psychiatry units for older people with input from both medical and psychiatry teams co-located in acute medical trusts [7, 24], one evaluated a combined physical and mental health liaison service in an acute hospital trust [27], and three were in predominantly mental health settings with physical health expertise embedded [21, 25, 26]. The majority were smaller units within a larger hospital facility (18–32 beds) [7, 21, 24–26], and one was a liaison service across a larger teaching hospital [27].

4.1.1 | Inpatient Psychiatry Units

Three studies evaluated integrated physical healthcare to inpatient psychiatry units (~25-bed capacity) [21, 25, 26]. Inpatient

TABLE 1 | Summary characteristics of included studies.

Study	Year	Location	Study design	Participants	Sex		Age group	Setting	Mental health conditions	Physical health conditions	Intervention type
					distribution						
Inpatient settings											
Cole et al. (2002)	2002	Canada	RCT	227 patients Usual care (114), intervention (13)	Usual care M = 57 F = 57 Intervention M = 47 F = 66	Over 65 <i>Usual care</i> Mean = 82 years <i>Intervention</i> Mean = 82.7 years	400-bed university-affiliated primary acute care facility	Depression, delirium	Not specified	Subjects in the intervention group were seen by a geriatric specialist consultant and followed in hospital for up to 8 weeks by an intervention nurse who liaised with the consultant, attending physicians, family, and the primary care nurses	
Goh et al. (2015)	2015	Australia	Retrospective audit	165 admissions	60% F 40% M	Over 65, median 84, mean 77.90 ± 7.88	20 bed inpatient psychiatric unit	Dementia (<i>n</i> = 56), mood disorder (<i>n</i> = 54), psychotic disorder (<i>n</i> = 47), other mental illness (<i>n</i> = 11)	Cardiorespiratory, vascular, renal, ophthalmology, ENT, genitourinary, MSK, neurological, hypertension, diabetes, falls, wound management	Employment of a medical doctor as part of the treating team	
Goldberg et al. (2013)	2013	United Kingdom	RCT	600 patients <i>MMHU</i> (310) <i>Standard care</i> (290)	<i>MMHU</i> (F = 170, M = 140) <i>Standard care</i> (F = 142, M = 148)	Over 65, median 85	Specialist medical and mental health unit	Identified as 'confused' on admission, cognitive impairment, delirium, dementia	Not specified	Specialist mental health care unit (MMHU) versus standard medical care units	

(Continues)

TABLE 1 | (Continued)

Study	Year	Location	Study design	Participants	Sex		Age group	Setting	Mental health conditions	Physical health conditions	Intervention type
					distribution						
Hanna et al. (2008)	2008	United Kingdom	Retrospective audit	48 admissions	F = 29 M = 19	Mean 81 years Range 66–96 years	Joint older medical-psychiatric unit	Cognitive impairment or dementia (<i>n</i> = 22), delirium (<i>n</i> = 13), depression (<i>n</i> = 10), bipolar disorder, paranoid ideas, other	Cerebrovascular disease (<i>n</i> = 17), UTI (<i>n</i> = 13), pneumonia (<i>n</i> = 9), falls (<i>n</i> = 8), fracture, hyponatremia, cellulitis, collapse, other physical health	Creation of a joint older medical-psychiatry inpatient unit with direct geriatric and psychiatric consultant input	
Inventor et al. (2005)	2005	United States of America	Retrospective review	N/A	Not specified	Over 65	18-bed geriatric psychiatry inpatient unit	Not specified	Not specified	Health professionals trained in both mental and physical health care of older people. The unit has input from both general medical and psychiatric doctors and nurses, as well as a wider multidisciplinary team	
Swann et al. (2023)	2023	United Kingdom	Retrospective cohort service evaluation	222 admissions	Comparator (M = 52% F = 48%) Intervention (M = 43% F = 57%)	Comparator 74.5 (median) Intervention 76.0 (median)	Two older adult psychiatric wards, 22 + 32 bed	Dementia (C = 32%, I = 36%), psychosis (C = 20%, I = 15%), mood (C = 44%, I = 35%), other (C = 4%, I = 14%)	Not specified	Introduction of a liaison geriatrician on older adult psychiatric wards	

(Continues)

TABLE 1 | (Continued)

Study	Year	Location	Study design	Participants	Sex		Age group	Setting	Mental health conditions	Physical health conditions	Intervention type
					distribution	Sex					
Community settings											
Bartels et al. (2004)	2004	United States of America	Pilot study	24 participants ST + HM (12) HM (12)	F = 17 M = 7	ST + HM (F = 9, M = 3)	Over 60, mean 66.5 (5.7) ST + HM Mean age 65 (4.6) HM only Mean age 67.9 (6.4)	Community support programme for older people with SMI	Schizophrenia (n = 13), schizoaffective depression (n = 3), major bipolar disorder (n = 2), psychotic disorder (n = 2)	Not specified	Group skills training (ST) and health management (HM) versus health management alone
Boorsma et al. (2001)	2011	Netherlands	RCT	340 residents with physical or cognitive disabilities	Control group (M = 23.9%) Intervention group (M = 25.9%)	Control group Mean 85.5 Intervention group Mean 85.8	10 residential care facilities	Cognitive impairment, clinical depression	Asthma, COPD, Myocardial infarction, Cerebrovascular accident, Diabetes, Arthritis, Cancer, Hypertension, Chronic somatic diseases	Implementation of multidisciplinary care model	
Gellis, Kenaley and Have (2014)	2014	United Kingdom	RCT	102 participants that are medically frail, older housebound patients	Usual care (F = 68.6%) Integrated care (F = 62.7%)	Over 65, Mean 79 years Usual care Mean 78.3 years Integrated care Mean 80.1 years	Hospital-affiliated home healthcare setting	Depression	Heart failure, COPD, hypertension, diabetes mellitus, osteoarthritis	Three-month intervention of integrated telehealth chronic illness and depression care	

Abbreviations: C, comparator; COPD, chronic obstructive pulmonary disease; ENT, ear, nose and throat conditions; F, female; HM, health management; I, intervention; M, male; MSK, musculoskeletal; MMHU, medical mental health unit; N/A, not applicable; RCT, randomised controlled trial; SMI, significant mental illness; ST, group skills training; UTI, urinary tract infection.

TABLE 2 | Main outcomes measured and key findings from included studies.

Study	Design	Service design	Main outcomes	Main findings
Inpatient settings				
Cole et al. (2002)	RCT	Delirium detection and management service	<i>Primary:</i> Time to and rate of improvement in cognitive status (MMSE) <i>Secondary:</i> Time to and rate of improvement in Delirium index, Barthel index, length of stay, rate of discharge to community, living arrangements after discharge (level of dependency), or survival.	<ul style="list-style-type: none"> No differences in any of the primary or secondary outcomes for the integrated delirium detection and management service compared to control. No differences in those with or without a diagnosis of dementia, less comorbidity, or prevalent delirium.
Goh et al. (2015)	Audit	Medical resident embedded in a mental health unit	Number and type of medical comorbidities New medical diagnoses No. medical resident contacts and assessments Time to assessment Medical interventions Emergency medical transfers Geriatrician reviews Non-psychiatric drug changes	<ul style="list-style-type: none"> The number of medical resident contacts increased from 24% to 53% after introduction of an embedded medical resident. No differences seen in emergency medical transfers or geriatrician reviews. No difference in interventions except a reduction in manual feeding after introduction of the medical resident.
Goldberg et al. (2013)	RCT	Joint physical-mental health unit (acute hospital)	<i>Primary:</i> Days spent at home, discharge destination (home or residential care), length of stay, mortality in hospital, 90-day survival, readmission rates. <i>Secondary:</i> Carer satisfaction (overall care, feeding and nutrition, management of medical issues, communication, dignity and respect, meeting patients' needs, discharge arrangements, carer preparation for discharge, timing of discharge), health status outcomes, carer strain, and carers' psychological wellbeing at 90 days.	<ul style="list-style-type: none"> No differences in any of the primary outcomes between the joint physical-mental health unit and standard care. Carers were more satisfied with: overall care ($p = 0.004$), feeding and nutrition ($p = 0.02$), dignity and respect ($p = 0.05$), meeting patients' needs ($p < 0.001$), discharge arrangements ($p = 0.005$), preparation for discharge ($p = 0.04$). No differences in other secondary outcomes. Inpatient falls were more frequent (30 vs. 17) but non-significant. No differences on subgroup analyses: Delirium at baseline, admissions from care homes, length of stay >5 days, standard

(Continues)

TABLE 2 | (Continued)

Study	Design	Service design	Main outcomes	Main findings
Hanna et al. (2008)	Audit	Joint physical-mental health unit (acute hospital)	Demographics of patients seen on the unit Length of stay Deaths and discharge destination of the cohort (no comparator)	<p>care general or geriatric wards considered separately.</p> <ul style="list-style-type: none"> • Mean length of stay 44 days (range: 5–159 days). • Ten deaths in the cohort of 50 patients (21%). • 55% (21/38) discharged to long-term nursing home care, 40% (15/38) discharged home, 5% (2/38) transferred to local psychiatric hospital.
Inventor et al. (2005)	Retrospective review	Physical health integrated to mental health unit	No clear outcome data collected.	<ul style="list-style-type: none"> • Description of service provided and evolution over time. • No clear outcomes reported.
Swann et al. (2023)	Retrospective cohort service evaluation	Introduction of a liaison geriatrician on older adult psychiatric wards	<p><i>Primary outcome:</i> Emergency transfers</p> <p><i>Secondary outcomes:</i> Geriatrician consultations, other speciality consultations, length of stay, patient satisfaction rating, changes in non-psychiatric drugs, changes in discharge destination, falls</p> <p>Also qualitatively interviewed medical staff to examine views on this service development</p>	<ul style="list-style-type: none"> • No difference in emergency transfers, discharge destination, non-psychiatric drug changes and overall patient experience on the ward. • Significant increase in geriatrician consultations ($p = 0.003$) and decrease in speciality consultations ($p < 0.001$), with small effect sizes. • Length of stay was significantly shorter in the intervention group ($p = 0.002$). • Number of falls reduced in the intervention group ($p = 0.006$), but there was no reduction in falls leading to admission ($p = 0.123$). • Semi structured interviews with staff highlighted the main challenges of managing physical healthcare on an inpatient psychiatry ward being complexity and co-morbidity, polypharmacy, and a lack of senior medical input.

(Continues)

TABLE 2 | (Continued)

Study	Design	Service design	Main outcomes	Main findings
Community settings				
Bartels et al. (2004)	Non-randomised controlled study	Enhanced skills training and health management combined	Number of sessions completed Independent living skills survey Social behaviour schedule Brief psychiatric rating scale (BPRS) Scale for the assessment of negative symptoms (SANS) GDS MMSE	<ul style="list-style-type: none"> • 100% of those surveyed recommended the geriatrician liaison service (all rated 'reasonably' or 'very' satisfied on a 5-point Likert scale). • Costs for length of stay were lower in the intervention group.
Boorsma et al. (2011)	RCT	Multidisciplinary care model in residential homes	<p><i>Primary outcome:</i> Sum score of 32 risk-adjusted quality of care indicators, health-related quality of life</p> <p><i>Secondary outcomes:</i> 32 individual risk-adjusted quality of care indicators, activities of daily living, quality of care (QUOTE-elderly instrument), hospital admissions, mortality</p> <p><i>Process outcomes:</i> Percentage of residents with completed assessments, no. MDT meetings held, no. of agree medical/nursing/social actions, opinions of participating professionals (via interviews)</p>	<ul style="list-style-type: none"> • Higher sum score of 32 risk-adjusted quality indicators (mean difference -6.7, 95% confidence interval -8.69 to -4.71, $p = 0.009$). • Self-reported quality of life was not different to control. • Integrated services had higher scores on 30/32 risk-adjusted indicators. No differences in other secondary outcomes on intention to treat analysis. • Staff and primary care physicians felt their expertise improved (52.9% and 54.5%), had more knowledge about

(Continues)

TABLE 2 | (Continued)

Study	Design	Service design	Main outcomes	Main findings
Gellis, Kenaley, and Have (2014)	RCT	Integrated telehealth for chronic disease and depression management	HAM-D PHQ-9 SF-12 PCS, SF-12 MCS SPSI-R Patient satisfaction questionnaire Episodes of care, ED visits, hospital admissions	resident's health (52.9% and 63.6%), cooperation improved (58.8% and 81.8%), 55% of primary care physicians felt quality of care improved and 73% felt a new model of care was needed. <ul style="list-style-type: none"> • Lower depression scores on PHQ-9 (13.6 vs. 7.4 at 3 months, 14.1 vs. 7.9 at 6 months) and HAM-D (18.6 vs. 9.8 at 3 months, 17.4 vs. 10.4 at 6 months) • No differences in physical health status (SF-12 PCS) or care satisfaction • Higher SF-12 MCS scores in the integrated care group (53.6 vs. 42.8 at 3 months, 52.1 vs. 40.3 at 6 months) • Improved problem-solving skills in the integrated care group (14.6 vs. 8.4) • Fewer visits to the ED (0.6 vs. 1.4), but no differences in hospital days or care episodes

Abbreviations: ED = emergency department, EOL = end-of-life, GDS = geriatric depression scale, HAM-D = Hamilton depression rating scale, MMSE = mini-mental state examination, PHQ9 = patient health questionnaire 9, RCT = randomised controlled trial, SF-PC and SF-MCS = 12-item short-form survey 12 physical component and mental component subscales, SPSI-R = social problem-solving inventory revised.

et al. conducted a retrospective review of an 18-bed psychiatric unit, with dual-trained health professionals in mental and physical health care [21]. This was primarily a psychiatric unit, but over time a renewed focus on physical health was required due to rising levels of physical health comorbidity amongst patients, with re-training and up-skilling of practitioners [21]. The unit has input from both general medical and psychiatric doctors and nurses, as well as a wider MDT (occupational therapists, social workers, dieticians) [21]. The service uses a comprehensive geriatric approach, including adaptations to the environment, health education for families and carers, patient safety considerations, reducing polypharmacy, behaviour and pain management, nutrition, and physical exercise. Care is focussed towards improving function, quality of life, and preventing frailty using an MDT approach.

In contrast, Goh et al. [26] embedded a medical resident into the inpatient psychiatry unit (50% full time equivalent). The resident provided physical health and medications reviews on admission, and reviewed new physical health problems that arose during the admission [26]. A case note audit was conducted to compare care pre- and post-addition of the medical resident [26].

Informed by the methodology of Goh et al., Swann et al. [25] performed a retrospective cohort service evaluation accessed from electronic health records and examined the impact of having a geriatrician embedded on two inpatient psychiatric wards in the same trust. The geriatrician on one psychiatric ward (32-bed) offered advice for one hour every fortnight [25]. This was delivered through videoconferencing due to the COVID-19 pandemic restrictions but had previously been in person [25]. The geriatrician on the second psychiatric ward (22-bed) delivered a 4 h in person session to the ward, offering support for audits and research [25]. Accompanied by a trainee, they saw patients individually and participated in the dementia ward round to discuss their findings with the team [25]. The geriatricians on both wards could also be contacted between sessions if support was required [25].

4.1.2 | Joint Medical-Psychiatry Units

Two studies evaluated joint medical-psychiatry units, in a district general (~700 bed hospital), and a large teaching hospital

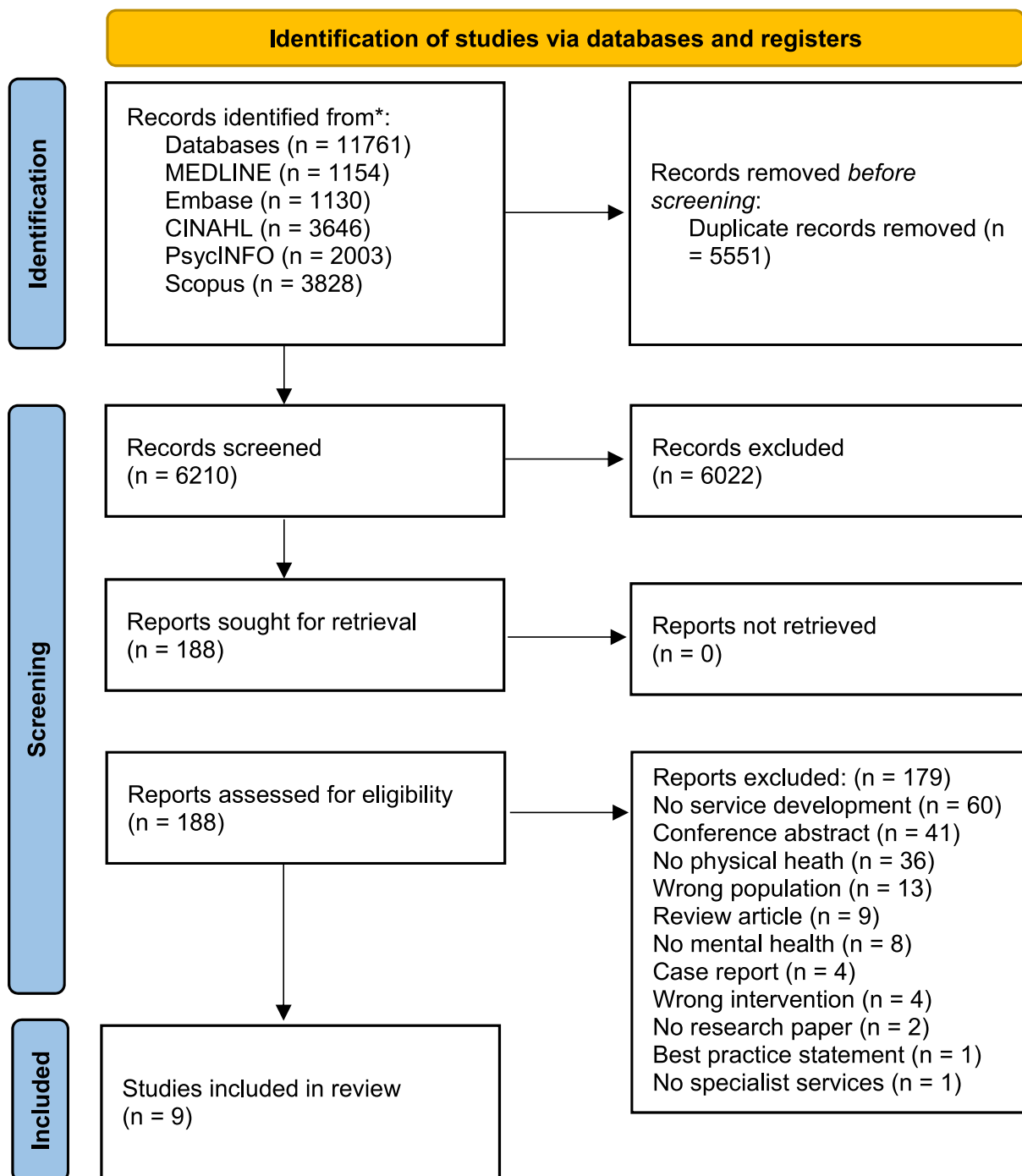


FIGURE 1 | PRISMA flow diagram for studies included in the review.

(TEAM trial), respectively [7, 24]. Units had input from senior consultants in geriatric medicine and old age psychiatry, in addition to junior medical and nursing staff dual trained in psychiatry and general medicine. Units were multidisciplinary, with input from healthcare assistants, occupational, speech and language, and physiotherapists, social worker and a psychologist. In one unit, referrals were screened by a dual-trained clinical nurse specialist, and patients received a joint MDT assessment [24]. In the TEAM trial, the consultants had specialist interests in dementia and delirium, staff underwent additional training in recognition and management of delirium and dementia, therapeutic and diversionary activities were provided, the environment was adapted, and family and carers

were actively involved [7]. Hanna et al. undertook a case note audit of 48 patients receiving their service [24], whereas Goldberg et al. conducted a RCT of 600 patients, comparing to standard care (geriatric or general medical wards), with qualitative [29] and economic evaluations [30].

4.1.3 | Liaison Service

One study evaluated an inpatient liaison service for people aged over 65 years who screened positive for delirium on admission and 1 week later [27]. This was a RCT, patients were

	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of interventions	Bias due to deviations from intended interventions	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of reported result	Overall bias
Bartels et al (2004)	?	↓	↓	↓	↓	—	↓	↓
Goh et al (2015)	?	?	?	?	?	?	?	?
Hanna et al (2008)	?	?	?	?	?	?	?	?
Inventor et al (2005)	?	?	?	?	?	?	?	?
Swann et al (2023)	—	↓	—	—	?	—	—	—

	Risk of bias arising from randomization process	Risk of bias due to deviations from intended interventions (effect of assignment on intervention)	Missing outcome data	Risk of bias in measurement of the outcome	Risk of bias in selection of the reported result	Overall risk of bias
Boorsma et al (2011)	—	—	↓	↓	↓	↓
Gellis et al (2014)	↓	↓	↓	↓	—	↓
Goldberg et al (2013)	↓	—	↓	↓	—	—
Cole et al (2002)	↓	↓	↓	↓	↓	↓

FIGURE 2 | Risk of bias tables summarising the risk of bias in non-randomised controlled trials (left) and randomised controlled trials (right) using the ROB-2.0 and ROBINS-I tools respectively. Downward arrow indicates low risk of bias, upward arrow indicates high risk of bias, dash indicates moderate risk of bias, and a question mark indicates a lack of information to make a judgement.

allocated to usual care or an assessment with a geriatric specialist consultant or psychiatrist and nurse follow-up. Usual care was standard hospital service with consultant geriatrician review on request. The assessment determined underlying delirium precipitants and provided a management plan which was subsequently reviewed by a study nurse 5 days/week. The study team (psychiatrists, geriatricians, and study nurse) met after every 8–10 patients to discuss issues with delirium management.

4.1.4 | Outcomes

Two studies in this review provided a descriptive summary of their integrated services with no or limited evaluation of health or service outcomes [21, 24]. In a joint physical-mental health ward for older people, the overall mortality rate was 21%, 55% were discharged to a long term care facility, 40% returned home and 5% were transferred to an inpatient mental health unit [24]. However, there was no comparator/control service so it was unclear whether these outcomes were improved as a result of the integrated service.

The addition of a medical resident in a mental health unit increased the number of contacts and reviews from 24 to 53 [26], but did not reduce emergency transfers, geriatric-specialist reviews, or increase changes to physical health medications. The study identified other benefits (not formally measured) of shared learning, freeing-up psychiatry resource and time, improved links between medical and psychiatry teams, and enhancing capacity and capability for physical health.

The implementation of a geriatrician on two inpatient psychiatric wards showed no differences in emergency transfers, non-psychiatric drug changes, discharge destination, and overall patient experience on the ward [25]. However, there was a decrease in the length of stay and number of falls per month in the intervention period compared to the comparator period [25]. The intervention period was also found to increase the number of geriatrician consultations and decrease the number of speciality consultations on the wards [25]. This study further examined the views that the medical staff had on this service development through semi-structured qualitative interviews which highlighted the main challenges of managing physical healthcare on an inpatient psychiatry ward to be complexity and co-morbidity, polypharmacy, and a lack of senior medical input

[25]. A cost-effectiveness analysis was also conducted in this study which found the costs for the length of stay to be lower in the intervention period [25].

In the TEAM trial [7], there were no differences in days spent at home, mortality, discharge to a care home, or readmission rates. However, mood and engagement improved, with greater staff interactions, and reduced environmental noise levels. Carers were more satisfied with overall care, nutrition, dignity and respect, and discharge arrangements [7, 29]. There were no differences in health status outcomes, carer strain, or carer's psychological wellbeing [7]. The unit was found to be cost-effective using usual criteria (94% probability), however this fell to 59% when accounting for situations of cost savings but fewer improvements in health outcomes [30].

There were no benefits to any of the primary (cognitive status) or secondary (length of stay, discharge destination, mortality and dependency) outcomes from the integrated delirium liaison service [27].

4.2 | Community

Three studies evaluated integrated services in community settings: a home care agency [22], residential and nursing care [28], and community support [23].

4.2.1 | Long-Term Care Facilities

One study evaluated 10 residential homes [28, 31]. The service involved an integrated, MDT assessment to develop an individualised care plan for residents with mental and physical health comorbidities. Patients and carers were included in the individualised care plan and a 6-monthly MDT, and a geriatrician/psychologist review for those with complex care needs [28]. The study was a cluster RCT compared to usual care (family physician review on request).

4.2.2 | Community-Dwelling Services

Gellis, Kenaley, and Have [22] evaluated an integrated telehealth intervention for older adults with depression receiving home care service providing integrated chronic disease management. Participants were aged over 65 years with a diagnosis of chronic obstructive pulmonary disease or heart failure, screened positive for depression, and with a recent hospital admission or needing three or more homecare visits per week. People with cognitive impairment were excluded and participants needed to be able to use the telemonitoring device. This was a RCT comparing a combination of telemonitoring, chronic illness and depression care management, and problem-solving treatment for depression delivered by specialist nurses to standard homecare with psychoeducation.

Bartels et al. undertook a non-randomised, controlled pilot study of enhanced skills training for community dwelling older people living with serious mental illness [23]. The enhanced

skills training was combined with health management to address both physical and mental health needs, delivered by a specialist nurse. Enhanced skills training is a form of rehabilitation to improve social and independent living skills, and to promote health behaviours and independent health management.

4.3 | Outcomes

4.3.1 | Long-Term Care Facilities

Integrated care in residential homes performed better on care quality indicators compared to standard care but no differences to self-reported quality of life [28]. Staff felt expertise, knowledge, quality of care and cooperation had improved following introduction of the integrated service [28]. However, there were no differences in functional ability, number of hospital admissions and health-related quality of life [28].

4.3.2 | Community Dwelling Older People

The integrated telemonitoring service resulted in lower depression scores but with no changes in physical health status [22]. Problem solving skills were higher in those receiving integrated care, but care satisfaction remained comparable between groups [22]. There were fewer emergency department visits in the integrated service, but no differences were seen in number of hospital days or episodes of care [22].

In the combined skills training and health management programme, the majority of outcomes were not statistically different between groups, but care of possessions and social functioning improved in the combined group [23]. More participants were assigned a primary care physician, and all had at least one physical health examination [23].

Tables 1 and 2 summarise the main outcomes and key findings of the included studies, and for the review overall.

5 | Discussion

In this systematic review of integrated physical and mental health services for older people, we only identified nine examples of services which included an integrated physical and mental health component. This reflects a paucity of literature, despite high levels of patient need and recommendations from several high-profile organisations [5, 13, 32, 33]. A surprising number of studies did not report the physical health comorbidities, despite integration of physical and mental health approaches being a key consideration for all of the included studies.

All of the studies identified were published in high income countries, indicating little evidence for integrated care in healthcare systems based in low- and middle-income countries. Lower income countries will experience a shift in population ageing as economic and living standards improve, and some of

the largest increases in age-related diseases are predicted to occur in these countries in the coming decades [34]. The studies included in this review spanned five countries, reflecting differences in healthcare systems. For example, three studies were undertaken in a fully nationalised healthcare system [7, 24, 25], whereas the remainder were published from private or mixed private and public insurance-based systems. In a recent report and review by the King's Fund [35], there was little evidence that one particular healthcare system out-performs another, all having their respective benefits and limitations. Countries are more likely to adapt and improve their existing model of healthcare, rather than drastically changing to a different model [35]. This is likely to impact the design of integrated physical and mental health services which will need to account for the local, as well as national context of the country and system in which they operate. Similarly, there may be contextual factors shaping the implementation and adoption of integrated physical and mental health services reflecting differences in cultural attitudes and stigma to mental health [36]. The impetus for health promotion and prevention of a country will influence the priority to which integrated services are given and the resources that are available to fund this. Few studies in this review conducted cost-effectiveness analyses of their services, but in one study there was indication that there are likely to be cost savings associated with benefits to quality of life [7]. Thus, combined approaches to physical and mental health may reduce resource use by providing more proactive management of mental and physical health, but are likely to be more resource intensive than care currently provided in silos.

Of the services we reviewed, those with the greatest benefits were studies which designed dedicated joint physical and mental health wards or services with higher levels of integration between the two. For example, the NIHR TEAM trial evaluated a dedicated, integrated mental health ward and demonstrated consistent benefits to mood, engagement, and carer satisfaction [7]. Similarly, two integrated community services based in residential homes, and a home care setting demonstrated significant improvements to care quality [28] and mood [22]. Whereas, studies of an embedded medical resident in mental health unit [26], and a delirium detection and management service [27], had limited mental and physical health service integration and showed fewer benefits. One study of a liaison geriatrician initiative did show reductions in the length of stay and number of falls, with 100% of interviewed staff members recommending this service [25]. However, there were no reported benefits to other outcome measures [25]. Those with integrated MDT meetings were also found to have significant benefits for patients [28]. In addition to the level of integration, the training and skill mix of the individuals working in the integrated service is likely to be important. Some of the services included specialist support from consultant geriatricians and psychiatrists [7, 24, 25, 28], but in others the physical health support was provided by less specialised physicians [26], or nurse specialists [22, 23]. This will also have important implications for the level of resources and thus generalisability of these service models in different contexts and settings.

The patient population is an important consideration for the structure and goals of integrated services, particularly the distinction between those with SMI compared to advanced

dementia with behavioural and psychological complications. For example, individuals with SMI are more likely to have cardiovascular comorbidities and metabolic syndrome as a result of long-term antipsychotic use, but may have better levels of cognitive and physical function, particularly after the resolution of their acute mental health episode. Whereas those with advanced dementia are more likely to have significant levels of frailty and higher needs for advanced care planning and palliative care. Therefore, the physical health input needed for these two populations may be distinct, but both could be provided using a form of comprehensive geriatric assessment, which uses a tailored and holistic framework to assess and manage health and social care needs in older people [37].

In this review, the structure and goals of services differed between inpatient and community settings. Inpatient services focussed on physical health liaison, joint wards or integrated teams. Whereas the community services focussed on integrated MDTs, telehealth or skills training. The differences in these service designs reflect the differences in acuity of the physical health problems experienced by patients in the inpatient versus community setting. For example, inpatients have greater acute physical health needs, with physical health care predominantly provided by physicians trained in physical health (e.g., geriatricians, internal medicine residents). In the community setting, physical health care was focussed on managing long-term conditions, empowering patients in disease management and improving access and uptake of preventative services. Integrated community services were more likely to be delivered by specialist nurses trained in both physical and mental healthcare. The joint community MDTs included geriatrician support, but were less likely to have specialist mental health input from old age psychiatry than the inpatient services. Inpatient services could learn from the community-based models by using specialist nurses with dual training to assist with integrated care delivery, and consideration for ongoing, chronic disease management on discharge from hospital.

In general, direct evidence for reduction in hospital admissions/transfers, readmission to hospital, mortality and improved health status were not demonstrated by integrated services. This is likely due to high levels of frailty, cognitive impairment, and advanced underlying diseases in these populations [7]. An important consideration for future studies is the inclusion of important and meaningful clinical outcomes that reflect patients' needs and quality of life towards the end-of-life. Traditional outcome measures (e.g., mortality, hospital admission, health status) are less applicable to this population and may not reflect the benefits conferred by these services for patients.

5.1 | Strengths, Limitations, and Future Work

We conducted a comprehensive search of over 6000 studies using robust systematic review methods in line with PRISMA guidance. Despite this, we only identified nine studies which met the inclusion criteria. As a result of the limited evidence base, we broadened the inclusion criteria to accept people aged over 60 years, and expanded the settings in which services were developed to derive conclusions that may be extrapolated to

mental health settings. This resulted in a heterogeneous mix of service and study designs which could not be meta-analysed, but provided a broad overview of different service models in different clinical settings and contexts. This also made direct comparisons between studies difficult. The level of evidence was sometimes low in the included studies: two were retrospective case note audits [24, 26], and two did not evaluate any outcome measures [21, 24]. Many of the studies included in this review had small sample sizes and were unlikely to be adequately powered to detect changes in many of the outcome measures studied. As identified, few provided cost-effectiveness analyses, and a small number reported qualitative evidence on views and experiences or on contextual factors shaping the implementation of integrated care service models. Where these were examined, there were positive benefits to services [25, 29]. Future work should evaluate integrated physical-mental health services for older people with complex physical and mental health needs using larger sample sizes, with mixed methods evaluations, including cost-effectiveness analyses. Outcome measures should be patient-centred and take into account the level of frailty, multimorbidity and patient priorities in this population.

6 | Conclusion

In conclusion, this systematic review identified a limited evidence base for integrated physical and mental health services designed for older people with complex physical and mental health needs. Despite this, there were significant benefits identified, particularly in those with higher levels of integrated and MDT working. Future studies are needed to build on this work by addressing patient centred priorities and outcomes, and providing cost-effectiveness analyses and consideration for contextual factors that might affect implementation and generalisability of services to different health systems and contexts.

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyses in this study.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.