



A systematic scoping review of interventions to integrate physical and mental healthcare for people with serious mental illness and substance use disorders



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ABSTRACT

Integrated care approaches have been recommended to remove barriers to healthcare and improve the physical health outcomes of people living with serious mental illness (SMI) and/or substance use disorders (SUDs). The aim of this systematic scoping review was to describe empirical investigations of interventions designed to integrate physical, mental, and addiction healthcare for this population. An iterative and systematic search of five electronic databases (Medline (Ovid), PsycINFO, CINAHL, Embase (Ovid) and Scopus) was conducted to identify peer-reviewed articles published between January 2000 and April 2019. Two reviewers independently screened publications in two successive stages of title and abstract screening, followed by full-text screening of eligible publications. Data from each included publication were extracted independently by two reviewers using a standardised spreadsheet. A total of 28 eligible publications were identified, representing 25 unique studies. Over half of the included studies investigated the use of case managers to provide self-management skills or to coordinate mental and physical healthcare ($n = 14$). Other interventions examined the co-location of services ($n = 9$) and the implementation of screening and referral pathways to specialist treatment ($n = 2$). Less than half of the included studies described a framework, theory or model that was underpinning the intervention tested. While some aspects of integrated care have been identified and addressed by interventions, other key dimensions have not been considered, such as shared decision-making. Identification of a comprehensive model of integrated care is recommended to inform the development and evaluation of future interventions for people with SMI/SUDs.

1. Introduction

There is a large evidence base documenting poor physical health and elevated mortality among people with serious mental illness (SMI)

and/or substance use disorders (SUDs) relative to people in the general population. Life expectancy has been estimated to be up to 18 years shorter for people with SMI compared to those without, and this disparity may be even more pronounced among people with SUDs (Chang

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et al., 2010; Plana-Ripoll et al., 2019). Preventable long-term conditions, particularly cardiovascular and respiratory diseases, make the largest contribution to the excess mortality evident among people with SMI/SUDs (Erlangsen et al., 2017; Plana-Ripoll et al., 2019; Walker et al., 2015). In Australia and New Zealand, indigenous people with SMI and/or SUDs (SMI/SUDs) are at increased risk of experiencing poor physical health and mortality compared to non-indigenous people (Phillips et al., 2017; Te Pou o Te Whakaaro Nui, 2017).

Despite a strong tendency for SMI and SUDs to co-occur (Clark et al., 2007), there has been little examination of the health and mortality outcomes of individuals with both conditions. Available research shows that the prevalence of a range of medical disorders (heart disease, asthma, gastrointestinal disorders, skin infections, and acute respiratory disorders) is higher among people with comorbid SMI and SUDs than those with SMI alone (Dickey et al., 2002). People with co-occurring SMI and SUDs also have higher rates of inpatient, emergency department, and hospital-based outpatient psychiatric treatment (Clark et al., 2007).

Poor health and premature mortality experienced by people with SMI/SUDs are associated with tremendous personal, societal, and economic costs. In 2010, mental and substance use disorders were estimated to account for 7.4% of disability-adjusted life years (DALYs) and 22.9% of years lived with disability (YLDs) globally (Whiteford et al., 2013). The disability associated with SMI, SUDs, and comorbid SMI/SUDs results in significant costs for services needed to treat and manage symptoms, as well as personal and societal costs resulting from reduced productivity and unemployment. In Australia, the annual cost of premature death due to comorbid mental and physical health conditions in people with SMI is estimated to be \$15 billion (AUD); in New Zealand, \$3.1 billion (NZD), even before accounting for costs associated with co-occurring substance use (RANZCP, 2016).

A diverse range of factors have been found to increase the risk of physical illness among people with SMI/SUDs, including socioeconomic disadvantage, smoking and alcohol consumption, reduced physical activity and poor nutrition, and the physical health impacts of prescribed psychotropic medications (Te Pou o Te Whakaaro Nui, 2014). However, inequities in the provision of healthcare also play a key role (Lawrence and Kisely, 2010). In addition to facing numerous barriers to accessing healthcare (Ross et al., 2015), people with SMI/SUDs experience higher rates of misdiagnosis (Nash, 2013), receive less routine screening, and are offered fewer preventive and life-prolonging treatments than people without these conditions (De Hert et al., 2011).

Inequities in healthcare provision are due to issues at the individual, provider, and system level (Lawrence and Kisely, 2010; Te Pou o Te Whakaaro Nui, 2017). At an individual level, symptoms of mental illness and its treatment, social isolation, lack of social support, stable housing and employment, and difficulties having health needs understood by others all present barriers to accessing and receiving equitable healthcare (Druss, 2007). At the provider level, time and resource constraints, stigma and discrimination, and diagnostic overshadowing (where symptoms of physical illness are misattributed to a person's mental illness) influence the quality of care provided to people with SMI/SUDs (Nash, 2013; Thornicroft et al., 2007). Finally, systemic issues include the tendency for physical, mental health, and addiction services to be delivered in separate places (silos), differences in training and competencies for different roles across the health care workforce, a lack of clarity regarding which services are responsible for the physical health of people with SMI/SUDs, and chronic under-resourcing of mental health and addiction care (Lawrence and Kisely, 2010).

Integration of care has been proposed as a way to tackle the complex and multifactorial problems contributing to inequities in healthcare provision for people with SMI/SUDs (Bellamy et al., 2016). Several approaches to care integration have been explored including the co-location of physical, mental health, and addiction services (Druss et al., 2017) and the use of case managers to coordinate care between different services (Bartels et al., 2014a). However, there is no current

consensus on how integrated care should be conceptualised which presents difficulties for meaningful evaluation of integrated care approaches. While some conceptualisations are process-oriented, others are health service oriented, and few are person-centred (WHO, 2016).

Singer et al. (2011) developed an integrated care framework that emphasises the importance of seven different domains when it comes to integrating care for people with complex long-term health conditions. These include: consistent and informed coordination *within* a care team; coordination *across* care teams; coordination between care teams and community supports; continuous familiarity with individuals over time, including past medical conditions and treatments; continuous proactive and responsive action between visits; delivery of person centred care; and shared responsibility for decision making and the maintenance of good health. An investigation involving 100 federally qualified health centres and safety net clinics in the US found the framework to be effective at identifying aspects of integrated care that are being delivered well and areas where there is potential for improvement (Derrett et al., 2017).

While studies designed to integrate physical and mental healthcare for people with SMI/SUDs have been conducted, the number and types of interventions that have been investigated empirically among each population is yet to be identified. Previous reviews have been pragmatic in nature, focusing on grey literature and key informant interviews (Rodgers et al., 2018), or have examined interventions specifically designed to improve self-management behaviours (Whiteman et al., 2016). Furthermore, the underlying models of integrated care on which interventions have been based, and the outcomes these interventions have endeavoured to modify, have not been systematically explored.

The aims of this scoping review were to: (1) systematically identify and describe empirical investigations of interventions to integrate physical healthcare with mental health and/or addiction care for people with SMI/SUDs, (2) describe the theories/models/frameworks of integrated care informing the empirical research, and (3) determine the degree to which identified interventions address components of a comprehensive and validated framework of integrated care (Singer et al., 2011). This information will highlight aspects of integrated care that require further investigation in people with SMI/SUDs, with the intention of reducing widening disparities in health and mortality (Walker et al., 2015).

2. Methods

This scoping review was guided by a team of stakeholders with expertise in SMI and addiction, including people with lived experience of these conditions, mental health professionals, other health professionals, and researchers from a range of disciplines. The team advised on the specific research questions to be addressed, appropriate search terms to identify relevant literature, interpretation of findings, and dissemination strategies.

The methodology for this review was based on the framework developed by Arksey and O'Malley (2005), as well as additional recommendations that have been added to this framework (Levac et al., 2010; Peters et al., 2015). Specifically, six steps were followed, including: (1) defining the research question/s; (2) identifying relevant studies; (3) study selection; (4) charting the data; (5) collating, summarising and reporting the results; and (6) consultation. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for scoping reviews checklist was followed to facilitate standardised reporting of review findings (Tricco et al., 2018). A detailed review protocol has previously been published (Richardson et al., 2019).

2.1. Research questions

We endeavoured to answer four research questions. In our scoping review protocol, these questions were focused on examining

interventions to integrate care (of any type) for people with SMI/SUDs (Richardson et al., 2019). However, as a consequence of the number of full texts that were eligible for inclusion ($n = 379$), we narrowed the focus of the questions to interventions endeavouring to integrate physical healthcare with mental healthcare for people with SMI/SUDs. The revised research questions are listed below:

1. What types of interventions have been designed to integrate physical and mental healthcare for people with SMI/SUDs across a broad range of healthcare settings?
2. What outcomes have studies examining interventions to integrate physical and mental healthcare for people with SMI/SUDs sought to modify?
3. Which theories, models or frameworks of integrated care have been used to inform intervention development?
4. Which components of an existing comprehensive and validated framework (Framework for Measuring Integrated Patient Care) (Singer et al., 2011) have been addressed by interventions to integrate physical and mental healthcare for people with SMI/SUDs?

2.2. Data sources and search strategy

An initial search of Medline database was conducted on 17 April 2019. Following feedback from the stakeholder team regarding appropriate search terms, searches of five electronic databases (Medline (Ovid), PsycINFO (Ovid), CINAHL, Embase (Ovid), and Scopus) were conducted on 30 April 2019. Each search was restricted to peer-reviewed articles published in English and to those published between January 2000 and April 2019. A combination of subject headings, related terms and keywords were used with Boolean logic and operators (i.e. 'and', 'or'). While each search was adapted to the specific requirements of each database, intervention terms were entered in the first step (e.g. 'intervention', 'evaluation'), integrated care delivery terms in the second step (e.g. 'care integration', 'collaborative care'), mental illness and substance use terms in the third step (e.g. 'serious mental illness', 'substance use disorder'), and a combination of these terms in the fourth and final step. The complete search strategy used for each database is provided in Supplementary File 1. As a consequence of the high volume of relevant records identified, a 'snowball' technique was adopted in which citations of articles were searched if they appeared relevant to the review.

2.3. Study selection

All records retrieved from the searches were exported to Endnote referencing database. Duplicate records were removed and the number of unique records were identified ($n = 6697$). Following this, title and abstract screening was completed independently by two reviewers (AR and LR). Articles were retained for full text review if the title and/or abstract: (1) referred to an intervention to integrate physical and mental healthcare; (2) the intervention was for people with mental health conditions, people with substance use problems or health professionals responsible for their care; and (3) the intervention was undertaken in the context of a health setting in an Organisation for Economic Co-operation and Development (OECD) country.

Titles and abstracts identifying conference abstracts, theses/dissertations, reviews, editorials, commentaries and case studies were excluded. Studies that examined multiple interventions were also excluded due to variation in delivery and content across different settings of implementation. Reviewers assessed their application of the inclusion criteria for titles and abstracts following review of the first 5% of citations from the database search. No significant disagreements were found and therefore the agreed criteria were applied to all remaining titles and abstracts. Following the completion of independent screening, the two reviewers met to resolve disagreements and discuss any uncertainties related to study selection.

Next, the full texts of all records deemed relevant were obtained. These were independently screened by two reviewers (AR and SD) using inclusion criteria developed in consultation with the stakeholder team. The specific criteria used has previously been reported in our study protocol (Richardson et al., 2019). The only modification to this was in relation to eligible interventions; while our original intention was to include any study describing an intervention with the explicit goal of integrating care among people with SMI/SUDs, this was revised to focus specifically on interventions endeavouring to integrate physical healthcare with mental healthcare in this population.

2.4. Data extraction and charting

A standardised Excel spreadsheet was used to extract relevant information from each study, including: author(s), year of publication, study location, intervention type (and any comparator), underlying theory of integrated care, duration of the intervention, study population, aims of the study, methods, outcomes, key findings, and limitations. This was performed independently by two reviewers (KG and a research assistant), with a comparison of completed extractions performed by a third reviewer (AR). A separate excel spreadsheet was used to complete a framework analysis (Parkinson et al., 2016) of included studies by mapping each intervention description to the dimensions of integrated care specified by Singer et al. (2011). Two reviewers (AR and SD) independently analysed the extent to which each description addressed: (1) coordination within a care team, (2) coordination across care teams, (3) coordination between care teams and community resources, (4) continuous familiarity with individuals over time, (5) continuous proactive and responsive action between visits, (6) person centred care, and (7) shared responsibility.

2.5. Collating, summarising and reporting

Following data extraction, a narrative synthesis of study characteristics was completed. Studies were described in relation to target populations, intervention settings and types, and outcomes of interest. The underlying theory of integrated care associated with each included study was also described. Findings from the framework analysis were used to highlight dimensions of integrated care (Singer et al., 2011) that have been explored most frequently among people with SMI/SUDs to date, in addition to dimensions that have received limited investigation. Complete descriptions of the different dimensions that were used to classify interventions are outlined in Supplementary File 2.

3. Results

A total of 8661 records were identified from all sources. After the removal of duplicates, 6697 records remained. Following title and abstract screening, 84 articles were eligible for full text review. Of these, 28 articles were included, representing 25 unique studies. The complete study selection and exclusion process is presented in Fig. 1.

The general characteristics of the included studies are reported in Table 1. With the exception of one study conducted in Canada (Behroozi et al., 2008) and one in the United Kingdom (UK) (Byng et al., 2004), all studies were conducted in the United States of America (USA). One mixed methods study involved a cross-sectional survey and multiple focus groups to explore individuals' experiences of an intervention (Drainoni et al., 2014), while all other studies employed a quantitative design.

3.1. Target populations

The majority of studies tested interventions developed specifically for people with SMI ($n = 19$), rather than for people with SUDs ($n = 4$) (Burton et al., 2019; Drainoni et al., 2014; Parthasarathy et al., 2003; Weisner et al., 2001) or people with either/both conditions ($n = 2$)

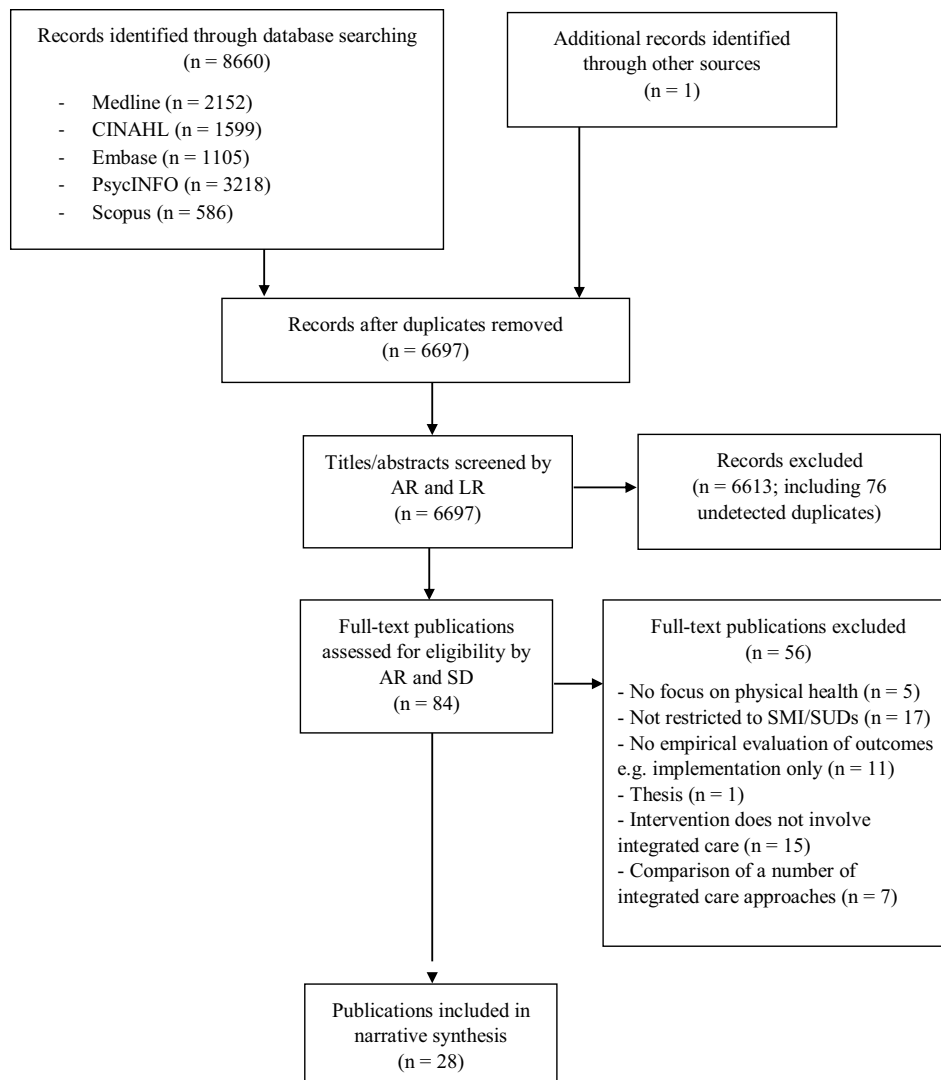


Fig. 1. Study selection and exclusion process (PRISMA flow diagram).

(Gaglioti et al., 2017; McGuire et al., 2009). A number of the interventions for people with SMI aimed to target specific sub-groups of this population, including one intervention for veterans with limited engagement with primary care (Pirraglia et al., 2012), one for individuals with SMI who had no source of primary care (Griswold et al., 2005, 2010), four interventions for people with SMI and cardio-metabolic risk factors (Druss et al., 2017; Frank et al., 2015; Kilbourne et al., 2013; Putz et al., 2015), and five for people with SMI and long-term medical conditions - general conditions (Bartels et al., 2014b; Uga et al., 2017), cancer (Irwin et al., 2019), and poorly controlled diabetes (Chwastiak et al., 2018; Teachout et al., 2011). Interventions specifically for people with SUDs included one intervention targeted to individuals with SUDs and HIV or elevated HIV risk (Drainoni et al., 2014) and one for veterans with SUDs (Burton et al., 2019). Of the two interventions developed for people with SMI or SUDs, one was delivered among a population of homeless veterans (McGuire et al., 2009).

3.2. Intervention settings and types

Almost half of all included studies tested interventions delivered within community mental health centres or clinics (n = 12). Three interventions were delivered in primary care settings alone, with two tested at general practice sites (Byng et al., 2004; Drainoni et al., 2014) and one at a family medicine clinic within an academic health centre

(Gaglioti et al., 2017). A further two studies were implemented in primary care and mental health sites (Kilbourne et al., 2013; Uga et al., 2017) and one intervention was in a primary care clinic co-located and integrated into the mental health outpatient programme of a Veterans Affairs Medical Centre (Pirraglia et al., 2012). One intervention was implemented in a general hospital (Irwin et al., 2019), one in a supported housing residence (Teachout et al., 2011), two in psychiatric inpatient units (Behroozi et al., 2008), and three within residential substance use programmes (Burton et al., 2019; Parthasarathy et al., 2003; Samet et al., 2003; Weisner et al., 2001).

Over half of the included studies investigated the use of case managers to provide self-management skills and/or health management (e.g. monitoring of healthcare needs, coordination and connection with primary care) for people with SMI/SUDs (n = 14). Case managers were typically nurses, with only one study utilising peer health navigators (who had lived experience of SMI) to teach participants skills to access and manage their healthcare (Kelly et al., 2017). Twelve of 14 studies examining the effectiveness of case manager interventions were implemented within mental health or substance use treatment facilities. The exceptions were an intervention employing linked specialist mental health workers to provide chronic disease management for people with SMI across a number of general practices (Byng et al., 2004), and an intervention providing care managers to coordinate multi-disciplinary primary care visits and help people with SMI/SUDs achieve their

Table 1
 Characteristics of studies testing interventions to integrate physical and mental healthcare among people with serious mental illness and/or substance use disorders.

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Bartels et al. (2004)	USA	To investigate pilot study outcomes following a combined skills training (ST) and health management (HM) intervention for older adults (age 60+) with SMI	Pilot study	24 older adults (age 60+) with SMI; 12 in ST + HM group, 12 in HM only	Conceptual model of psychosocial rehabilitation and health care management: intervention designed to simultaneously address psychiatric and health disability	ST - hour-long group skills training sessions conducted twice a week for 1 year, co-led by a nurse case-manager and a case worker. HM - nurse-led assessment and monitoring of health care needs, primary preventive health care, facilitation of health care visits, and communication with health care providers.	ST sessions delivered in an assisted living facility; HM delivered in the office of a mental health centre and in patients' homes	Functioning and symptoms assessed at baseline and 1 year, preventive healthcare use at 2 year follow-up	Compared with HM only, ST + HM was associated with improved social functioning and independent living skills. Both groups demonstrated increased use of preventive health services and had previously undetected medical disorders identified.
Bartels et al. (2014a)	USA	To examine outcomes of a combined psychosocial skills training and preventive health care intervention for older adults with serious mental illness	RCT	183 older adults (age ≥ 50) with SMI; 70 in intervention group, 92 in usual care group	Conceptual model of psychosocial rehabilitation and health care management: intervention designed to simultaneously address psychiatric and health disability	Helping Older People Experience Success (HOPES) - 12 months of weekly skills training classes, twice-monthly community practice trips, and monthly nurse preventive health care visits, followed by 1-year maintenance phase of monthly sessions.	Mental health centres and senior housing settings in the community	Blinded evaluations of functioning, symptoms, and service use at baseline, 1, 2, and 3 years	Compared with usual care, HOPES was associated with improved community living skills and functioning, greater self-efficacy, lower overall psychiatric symptoms, greater preventive health care visits, and a higher rate of completed advance directives.
Bartels et al. (2014b)	USA	To evaluate the feasibility and effectiveness of a self-management programme for psychiatric and general medical illness, that included embedded nurse care management	Pilot RCT	71 middle-aged and older adults (mean age = 60 ± 6.5) with SMI and chronic general medical conditions; 36 in intervention group, 35 in usual care group	Embedded care model: integrating medical providers within the mental health service setting	Integrated Illness Management and Recovery (I-IMR) - 8 months of weekly sessions led by an I-IMR specialist. Sessions integrated conventional psychiatric illness self-management with strategies for self-management of general medical illness. A nurse health care manager facilitated coordination of preventive and ongoing health care.	Two community mental health centres	Blinded evaluations of self-management of psychiatric and general medical illness, participation in psychiatric and general medical encounters, self-reported acute health care utilisation at baseline, 10 and 14 month follow-ups	Compared with usual care, I-IMR was associated with improvements in participant and clinician ratings for psychiatric illness self-management, greater diabetes self-management, and an increased preference for information during primary care encounters.
Behroozi et al. (2008)	Canada	To initiate a protocol involving a family physician (FP) visiting psychiatry inpatient wards daily to conduct medical consultations	Pre/post prospectivestudy	40 psychiatric inpatients admitted to two wards in the months of June 2004 and June 2005 (20 patients for pre- and post-protocol intervals, respectively)	Not specified	Daily FP visits (1 year) - FP consulted on patients referred by psychiatrists and nurses; assessed, diagnosed, and treated common medical problems; referred to other specialists for conditions that required expertise; and facilitated arrangements for follow-up care.	Two inpatient wards in a large urban tertiary care hospital	Length of stay, rate of specialist referrals, staff satisfaction at baseline and 1 year follow-up	Mean length of stay for patients on both wards decreased after initiation of FP consultations protocol. Mean rate of specialist referrals for patients on both wards decreased after initiation of FP consultations. Low response rate to staff survey but high satisfaction with consultations and continuity of care.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Burton et al. (2019)	USA	To integrate a Hepatitis C virus (HCV) screening programme into a Veterans Affairs residential SUDs treatment programme.	Cross-sectional	597 veterans with moderate to severe substance use disorders	Not specified	HCV screening, education, referral to infectious disease clinic, and treatment delivered by a HCV provider. HCV provider attended SUDs treatment meetings and facilitated weekly education group (often co-facilitated with pharmacists and psychologists).	Residential SUDs programme in an urban, academically facilitated medical centre	HCV screening and diagnosis, linkage to care and treatment uptake, treatment completion, sustained virologic response at discharge from programme	97% of admissions to the programme screened for HCV infection, with 100% of positive cases connected to an infectious disease clinic for further evaluation. Of the HCV-positive cases, 78% received pharmacotherapy, with a sustained virologic response rate of 83%. No differences in patients' perception of unmet need, satisfaction or general health between practices. Intervention patients had fewer psychiatric relapses than control patients but no differences in documented processes of care. Intervention practitioners more satisfied.
Byng et al. (2004)	United Kingdom	To determine the effects of Mental Health Link, a quality improvement programme to improve communication between teams and systems of care within general practice	Exploratory cluster RCT	335 patients with SMI; 184 in intervention group and 151 in usual care group 96 general practitioners	'A whole system approach' (not further specified)	Quality improvement intervention focused on appointing and developing the role of a linked specialist mental health worker (including shared care agreements) and planning the chronic disease management systems within the practice.	24 general practices	Patient satisfaction, unmet need, mental health status, processes of mental and physical care, general practitioners' satisfaction with services at 1 year follow-up	
Chwastiak et al. (2018)	USA	To evaluate the feasibility, acceptability, and preliminary effectiveness of a collaborative care model to treat patients with psychosis and poorly controlled diabetes	Pilot RCT	35 adults (18–64 years) with psychosis and poorly controlled Type II diabetes; 14 in intervention group and 15 in usual care group	Collaborative care: an integrated care model based on the principles of the chronic care model	Collaborative care intervention - an initial nurse care manager visit for a comprehensive health assessment and individualised health plan and then 30-min visits for the support of chronic illness self-management (including medication adherence, healthy nutrition, and regular physical activity) every other week for 12 weeks and monthly thereafter for up to six months.	Two community mental health centres	HbA1c levels, blood pressure, BMI, tobacco use, mental health symptoms at baseline and immediately post-intervention (3 months)	Clinically significant reduction in HbA1c levels for those who received the collaborative care intervention but not for usual care participants. Decreases in BMI found for participants in both conditions. No changes in smoking or psychiatric symptoms.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Drainoni et al. (2014)	USA	To identify how HIV-infected substance users and substance users at risk for contracting HIV patients viewed an integrated model of care (FAST PATH programme)	Cross-sectional survey and focus groups	265 patients with active alcohol and drug dependence at high risk of contracting or transmitting HIV enrolled in FAST PATH; 212 patients completed survey; 40 participated in focus groups	Not specified	Facilitated Access to Substance Abuse Prevention And Treatment of HIV (FAST PATH) programme - a comprehensive, multidisciplinary assessment, diagnosis, and treatment plan developed by a physician, nurse, and addiction case manager. Services offered included ongoing primary care, medication assisted treatment when indicated, counselling, and referral to additional substance use treatment services.	Two primary care sites, including an infectious disease clinic and general internal medicine primary care clinic	Patient satisfaction at 6 month follow-up Focus groups held across intervention implementation to explore patient experience of programme	91% of patients who completed the satisfaction survey gave an example of at least one thing they thought was best about FAST PATH, and 88% also offered at least one comment regarding areas for improvement. Focus group themes related to preferences for integrated care and support for a team-based model of care.
Druss et al. (2001)	USA	To compare the delivery of integrated medical care in a mental health clinic with usual care in a general medicine clinic for patients with serious mental disorders	RCT	120 individuals with SMI enrolled in a Veterans Affairs mental health clinic; 59 in integrated care group and 61 in usual medical care group	Not specified	Clinical responsibility for the primary medical care of all patients assumed by psychiatry service, with a medical nurse practitioner responsible for patient education, liaison with mental health providers, and case management over a year-long period.	Integrated care clinic located next to mental health clinic	Service use, physical and mental health status at baseline, 6 month, and 12 month follow-up Satisfaction with medical care at 6 or 12 month follow-up Quality of preventive care and total healthcare costs at 12 month follow-up	Compared with usual care participants, those in the intervention group were more likely to have made a primary care visit and had a greater mean number of primary care visits. They were more likely to have received preventive measures outlined in clinical practice guidelines and had a significantly greater improvement in physical health.
Druss et al. (2010)	USA	To test a population-based medical care management intervention to improve primary medical care in community mental health settings	RCT	407 subjects with SMI at an urban community mental health centre; 205 in intervention group and 202 in usual care group	Case management through the chronic care model	Care Management Programme - strategies to enhance patient engagement, to overcome provider barriers to primary care, and to address system-level barriers to care delivered by two full-time registered nurses over a year-long period.	An urban community mental health centre	Medical and mental health and quality of primary care assessed at baseline and 12 month follow-up Health-related quality of life and sites of service use at baseline, 6 month, and 12 month follow-up	Compared with usual care participants, those in the intervention group received more recommended preventive services, were more likely to have a primary care provider and reported better mental quality of life at 12 months.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Druss et al. (2011) Note. Reports data from Druss et al. (2010)	USA	To assess the 2-year outcomes, costs, and financial sustainability of a medical care management intervention for community mental health settings	RCT	407 subjects with SMI; 205 in intervention group and 202 in usual care group	Case management through the chronic care model	Care Management Programme - strategies to enhance patient engagement, to overcome provider barriers to primary care, and to address system-level barriers to care delivered by two full-time registered nurses over a year-long period.	An urban community mental health centre	Intervention costs, costs to the health system, costs from a managerial perspective (budget impact analysis) at 2 year follow-up	From a health system perspective, the intervention showed a \$932 reduction in total costs, with a 92% probability that the intervention was associated with lower costs than usual care. From the managerial perspective, the intervention would break even if (at least) 58% of clients had some form of insurance.
Druss et al. (2017)	USA	To compare quality and outcomes of care between an integrated behavioural health home and usual care	RCT	447 patients with a SMI and one or more cardiometabolic risk factors; 224 in intervention group and 223 in usual care group	Behavioural health home model: a medical health home based in a community mental health centre	Behavioural Health Home - clinic located within community mental health centre, with care for cardiometabolic risk factors and comorbid medical problems provided by a nurse practitioner and full time nurse care manager over a year-long period.	A community mental health centre	Quality of care, service use, fasting blood levels of glucose, cholesterol, HbA1c, coronary heart disease risk, quality of life, patient activation at baseline, 6, and 12 months	Compared with usual care participants, those in the intervention group experienced improvements in quality of cardiometabolic care, concordance of treatment with the chronic care model, and use of preventive services.
Frank et al. (2015)	USA	To investigate the efficacy of an Integrated Risk Reduction Intervention with the objective of reducing cardiometabolic risk factors in overweight patients with bipolar disorder	RCT	122 obese or overweight patients with bipolar disorder; 61 in intervention group and 61 in usual care group	Not specified	Integrated Risk Reduction treatment and assessment, medical monitoring by a nurse, and a healthy lifestyle programme from a lifestyle coach (initial hour-long session followed by 5–7 monthly sessions followed by quarterly sessions) delivered over 24 months.	Psychiatric clinic	BMI at baseline and each study visit over a 6 month period (phase 1)	Compared with usual care participants, those in the intervention group had a greater rate of decrease in BMI. Changes in c-reactive protein, total cholesterol, and instability of total sleep time contributed to a faster decrease in BMI for intervention participants.
Gaglioti et al. (2017)	USA	To evaluate the clinical effectiveness of an integrated care management programme for adults with chronic mental and physical health needs	Retro-spective cohort study	358 patients with SMI; major depression and a comorbid condition; or DSM IV or V alcohol misuse	Not specified	Care Management - interprofessional care team and access to care managers who worked with patients identifying needs, goal setting, care coordination, and connection to community resources and used motivational enhancement techniques.	Academic health centre	Healthcare utilisation at 6 and 12 months pre and post-programme enrolment	Patients were approximately 60–70% less likely to utilise the emergency room and 50% less likely to be admitted to the hospital after enrolment in the programme compared to before enrolment. The odds of individual attendance at outpatient primary care and mental health visits improved after enrolment.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Griswold et al. (2010) Note. Reports data from Griswold et al. (2005)	USA	To determine whether navigators are effective in helping people with SMI connect to primary care after psychiatric crisis	RCT	175 adults with a DSM-IV-TR defined Axis I disorder, and no ongoing source of routine primary care; 85 in intervention group and 90 in usual care group	Not specified	Care navigators met with participants in the intervention group at study enrollment and routinely at primary care appointments. They engaged in shared decision-making and maintained contact through face-to-face visits and by phone.	An urban Comprehensive Psychiatric Emergency Programme	Connection rates to medical care at 1 year post hospital discharge	Compared with usual care participants, those in the intervention group were more likely to access medical care at 1 year.
Griswold et al. (2005)	USA	To determine whether navigators are effective in helping people with SMI connect to primary care after psychiatric crisis	RCT	101 adults with a DSM-IV-TR defined Axis I disorder, and no ongoing source of routine primary care; 56 in intervention group and 45 in usual care group	Not specified	Care navigators met with participants in the intervention group at study enrollment and routinely at primary care appointments. They engaged in shared decision-making and maintained contact through face-to-face visits and by phone.	An urban Comprehensive Psychiatric Emergency Programme	Connection to primary care at 3 months post hospital discharge	Compared with usual care participants, those in the intervention group were more likely to be linked to primary care at 3 months. Positive predictors of linkage included mental health care visits and success in obtaining health insurance.
Irwin et al. (2019)	USA	To assess the feasibility and acceptability of a person-centred collaborative care trial for people with SMI and cancer	Pre/post prospective study	30 people with SMI and newly diagnosed thoracic, gastrointestinal, breast, or head and neck cancer	Collaborative care model	Bridge Intervention - early identification of patients with SMI; person-centred assessment and care; interdisciplinary team-based care; and increased access to psychiatric expertise.	A general hospital	Intervention feasibility, delivery and acceptability; psychiatric symptoms and quality of life assessed at baseline, 4–6 week follow-up, and 12–14 week follow-up	30/33 eligible patients enrolled in the intervention and 25/29 completed assessments at all time points. Patients reported meeting with the psychiatrist to be helpful. 94% of oncology clinicians perceived the intervention to be useful for patients. Patient psychiatric symptoms improved from baseline to 12 weeks.
Kelly et al. (2017)	USA	To evaluate a peer health navigator intervention integrating behavioural healthcare for individuals with SMI	RCT	151 people with SMI; 76 in intervention group and 75 in usual care group	Model for vulnerable populations	Bridge Intervention - targets factors that negatively impact healthcare access, utilisation, and outcomes among individuals with SMI. Consumers are taught the skills to access and manage their healthcare by peer health navigators (who have lived experience of SMI) over a 6 month period.	A large community mental health agency	Health service utilisation, satisfaction with primary care provider, self-management attitudes and behaviours, routine health screening, and health status at baseline and 6 months	Compared with usual care participants, those in the intervention group showed greater improvement in use of primary care services, quality of the consumer-physician relationship, preference for primary care clinics, detection of chronic health conditions, reductions in pain, and increased confidence in self-management of healthcare.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Kilbourne et al. (2013)	USA	To determine whether an intervention reduced CVD risk factors and improved physical and mental health outcomes in patients with bipolar disorder	RCT	118 patients with an ICD-9 diagnosis of bipolar disorder and ≥ 1 CVD risk factor; 58 in intervention group and 60 in usual care group	Chronic care model enhanced using social cognitive theory to encourage health behaviour change	Life Goals Collaborative Care Intervention - 4 weekly self-management sessions (2h) followed by tailored contacts combining health behaviour change strategies, medical care management, and registry tracking, implemented by a health specialist.	A mental health outpatient clinic and a primary care outpatient clinic	Blood pressure, cholesterol, and physical and mental health-related quality of life at baseline, 6, 12 and 24 months	Compared with usual care participants, those in the intervention group had reduced systolic and diastolic blood pressure as well as reduced manic symptoms but no change in cholesterol or physical quality of life.
McGuire et al. (2009)	USA	To examine whether a clinic integrating primary care and mental health services for homeless veterans with SMI/SUDs would improve health care access and physical health status	Quasi-experiment	260 homeless veterans with SMI or substance abuse; 130 in intervention group and 130 in usual care group	Not specified	Case management and a primary care clinic co-located in a mental health outpatient treatment centre. Providers included a primary care physician and three nurse practitioners who received training in engaging and treating homeless populations.	A mental health outpatient treatment centre	Physical and mental health status at baseline, 6, 12, and 18 months; initial timeliness of access to primary care; 12 month receipt of prevention services following study enrolment; outpatient primary care use in the 18 months after enrolment	Compared with usual care participants, those who received the intervention were enrolled in primary care more quickly, received more prevention services, and had fewer ED visits, but did not differ in inpatient utilisation or in physical health status.
Parthasarathy et al. (2003) Note. Reports data from Weisner et al. (2001)	USA	To examine the impact of integrating primary care and substance abuse treatment on healthcare utilisation and costs compared to independent care	RCT	654 adult patients with substance dependence; 318 in intervention group and 336 in usual care group	Not specified	Integrated Care Intervention - primary care is provided along with substance abuse treatment for 8 weeks, with pharmacotherapy available from chemical dependency facility physicians.	A chemical dependency recovery programme facility	Healthcare utilisation and costs in the 12 months before and 12 months after the intervention	Among patients with substance use-related medical conditions, intervention participants had greater decreases in hospitalisation rates, inpatient days, ER use, and total medical costs.
Pirraglia et al. (2012)	USA	To investigate whether primary care co-located in the mental health setting could improve health service use and cardiovascular risk factor control among veterans with SMI	Pre/post prospective study	97 veterans with SMI who had previously demonstrated limited primary care engagement	Co-location model: placement of primary care services in the mental health setting	A primary care clinic co-located and integrated in a mental health outpatient programme, open 1 session per week and staffed by a single primary care provider and a patient care assistant.	A Veterans Affairs medical centre	Two successive 6-month periods in the year before and in the year following enrolment were examined for primary care and ED use and for goal attainment of blood pressure, fasting blood lipids, BMI, and HbA1c levels	Compared with pre-enrolment, veterans had more primary care visits and improved goal attainment for blood pressure, low-density lipoprotein cholesterol, triglycerides, and BMI post-enrolment. No changes in goal attainment for high-density lipoprotein cholesterol and HbA1c levels were found.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Putz et al. (2015)	USA	To examine the impact of a collaborative care intervention targeting metabolically related health risk in adults with SMI	Prospective study (baseline and follow-up)	147 patients with SMI and at least one of five indicators of metabolic disease risk	Collaborative care approach: a multidisciplinary treatment team, including case management staff, work to coordinate care between medical and mental health providers	Integrated Healthcare Programme (directed by a clinical social worker) - each participant received a comprehensive physical health assessment from a physician or nurse-practitioner, was assigned a medical case manager, and was offered enrolment in individual and group wellness programmes.	An outpatient community mental health centre	Physiological vital indicators (weight, height, systolic and diastolic blood pressure, and smoking) collected at least every 6 months and blood-based markers collected every 6 months	Decreases in weight, cholesterol, and cigarette use from baseline to 6 month follow-up were found.
Samet et al. (2003)	USA	To examine the impact of a multi-disciplinary health evaluation on linkage with primary care among people undergoing residential detoxification	RCT	470 alcohol and drug dependent adults (aged 17 years and over); 235 in intervention group and 235 in usual care group	Not specified; tests a novel 'mixed integrative-distributive' approach	Health Evaluation and Linkage to Primary Care (HELP) - three separate 30 min encounters with a nurse, social worker and physician involving multi-disciplinary assessment, individualised education, and facilitated referral to an offsite primary care clinic.	A residential detoxification unit	Primary care appointment within 12 months; addiction severity, health-related quality of life, utilisation of health services, and HIV risk behaviours at baseline, 6, 12, 18, and 24 months	Linkage to primary medical care occurred for 69% of intervention participants compared to 53% of usual care participants. No other changes in outcomes in response to the intervention were observed.
Tatreau et al. (2016)	USA	To identify associations between screening, diagnosis, and treatment of chronic medical comorbidities and two different modes of inpatient medical care among people with SMI	Cross-sectional retro-spective study	452 patients with SMI taking second-generation antipsychotics and discharged from inpatient psychiatric units; 220 in intervention group and 232 in usual care group	Reverse collocation care model	A primary care team incorporated into an inpatient unit, with the team consisting of a physician assistant backed up by a medical doctor who provides medical care.	Inpatient psychiatric unit of an academic centre	Chart review of demographics, vital signs, laboratory values, diagnoses, and medications with comparative analysis of diagnosis and treatment for hypertension, diabetes mellitus, hyperlipidemia, obesity, and tobacco use disorder over a 10 month period	Compared with usual care participants, those who received reverse collocated medical care had more documented responses to abnormal tests, were more likely to be diagnosed with obesity, tobacco use disorder, and hyperlipidemia, and to be treated for hypertension and hyperlipidemia.
Teachout et al. (2011)	USA	To describe the impact of a residential treatment programme tailored to the needs of individuals with SMI and comorbid diabetes	Prospective study (baseline and follow-up)	13 people with SMI and comorbid diabetes in a supported housing residence	Not specified	Paxton House - clinical staff at the programme partner with nurse practitioners who manage Integrated Health Care Clinics to provide weekly diabetes education classes, nutrition counselling, and exercise instruction. Individual intensive case management is also provided.	A large psychiatric rehabilitation centre	Weekly weights and daily blood glucose measurements from the first 6 months of programme participation; cross-sectional assessment of satisfaction with the diabetes self-management	Participants reported being satisfied with the programme. A decrease in weight and an improvement in fasting blood glucose levels from baseline to 6 month follow-up were found.

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Table 1 (continued)

Author(s)	Country	Aim	Design	Sample	Model of Integrated Care	Intervention	Intervention Setting	Outcome(s)	Main Findings
Uga et al. (2017)	USA	To examine outcomes among patients with comorbid SMI and chronic medical illness receiving care from an integrated medicine and psychiatry clinic	Cross-sectional	116 adults with comorbid chronic medical and psychiatric illness; 64 in intervention group and 52 in usual care group	Not specified	Treatment by dually-trained internist/psychiatrists at the same location.	Academic outpatient clinics for psychiatry and general internal medicine	Quality of life, satisfaction with care, and healthcare utilisation assessed at a clinic appointment among eligible individuals who had been attending the clinics for at least one year	Compared with participants who received care from separate internists and psychiatrists at different locations, those who received the intervention reported being more satisfied with their care. No differences in quality of life were found between the two groups.
Weisner et al. (2001)	USA	To examine differences in treatment outcomes and costs between integrated and independent models of medical and substance abuse care	RCT	592 adults attending a chemical dependency programme; 285 in intervention group and 307 in usual care group	Not specified	Integrated Care Intervention - primary care is provided along with substance abuse treatment for 8 weeks, with pharmacotherapy available from chemical dependency facility physicians.	A chemical dependency recovery programme facility	Abstinence outcomes, treatment utilisation, and costs at baseline and 6 month follow-up	No differences in abstinence were found between participants in the intervention and usual care groups. Among participants with substance abuse-related medical conditions, those in the intervention group were more likely to be abstinent.

Note. BMI = Body Mass Index; CVD = cardiovascular disease; ED = emergency department; HbA1c = Haemoglobin A1C; HIV = human immunodeficiency virus; ICD = International Classification of Diseases; RCT = randomised controlled trial; SMI = serious mental illness; SUDs = substance use disorders; USA = United States of America.

personalised health goals within a family medicine clinic (Gaglioti et al., 2017).

Nine studies examined an intervention designed to co-locate physical and mental health services for people with SMI/SUDs. The majority of these involved the delivery of primary medical care within a community mental health centre (Druss et al., 2001, 2017; McGuire et al., 2009; Pirraglia et al., 2012) or substance use treatment facility (Parthasarathy et al., 2003). Others investigating co-location of services explored the integration of physicians into inpatient psychiatric units (Behroozi et al., 2008; Tatreau et al., 2016), the integration of a psychiatrist and social worker within a general hospital (Irwin et al., 2019), and the provision of treatment from dually trained internists/psychiatrists within psychiatry or medical clinics (Uga et al., 2017). Two studies tested interventions designed to screen and refer people to appropriate treatment for physical or mental health conditions, including for Hepatitis C among people in a residential SUDs treatment programme (Burton et al., 2019) and for SUDs among people with HIV accessing primary care (Drainoni et al., 2014).

3.3. Outcomes

The most frequently investigated outcomes included health service utilisation (n = 13) and indicators of physical health, such as HbA1c levels, blood pressure, cholesterol, and Body Mass Index (n = 12). Psychiatric symptom burden as reported by people with lived experience was examined in six studies (Druss et al., 2001, 2010; Irwin et al., 2019; McGuire et al., 2009; Samet et al., 2003; Weisner et al., 2001), while five studies utilised psychiatrist assessments or patient medical notes to examine changes in mental health and/or addiction symptoms in response to an intervention (Bartels et al., 2004, 2014a; Byng et al., 2004; Chwastiak et al., 2018; Irwin et al., 2019). Three studies investigated reported engagement with self-management strategies (Putz et al., 2015; Samet et al., 2003; Teachout et al., 2011) and one study conducted a blinded evaluation of individuals' self-management with respect to psychiatric and medical conditions (Bartels et al., 2014a). Quality of life, assessed using measures such as the Short Form 36 Health Survey, was a key outcome of interest in six studies (Druss et al., 2010, 2017; Irwin et al., 2019; Kilbourne et al., 2013; Samet et al., 2003; Uga et al., 2017). Other outcomes investigated included individuals' satisfaction with medical care or with the specific intervention being tested (n = 7), participation in routine health screening (n = 2), linkage to specialist or primary care (n = 5), quality of care as indicated by medical records (n = 4), and healthcare and intervention costs (n = 3). Only three studies examined an outcome (staff satisfaction) among healthcare professionals responsible for delivering an intervention (Behroozi et al., 2008; Byng et al., 2004; Irwin et al., 2019).

3.4. Models of integrated care

Less than half of the included studies described a framework, theory or model underpinning the intervention being tested (n = 12). Five interventions were based on a model of collaborative care. Three studies described a collaborative care model informed by principles of the chronic care model, with a focus on chronic illness self-management and increasing individual engagement with primary care (Chwastiak et al., 2018; Druss et al., 2010, 2011; Kilbourne et al., 2013). The other two studies identified a collaborative care model that emphasised interdisciplinary team based and person-centred care (Irwin et al., 2019; Putz et al., 2015). Four studies identified embedded care or co-location models as informing their intervention, whereby primary care services or medical providers are integrated into mental health care settings (Bartels et al., 2014b; Druss et al., 2017; Pirraglia et al., 2012; Tatreau et al., 2016). Two studies (including one pilot study) tested an intervention based on a model of psychiatric medical disability and rehabilitation (Bartels et al., 2004, 2014a). One study was guided by the Model for Vulnerable Populations (Gelberg et al., 2000), which

Table 2
Elements of integrated care reflected in intervention descriptions of included studies.

	Coordinated within care team	Coordinated across care teams	Coordinated between care teams and community resources	Continuous familiarity with individual over time	Continuous proactive and responsive action between visits	Person centred	Shared responsibility
Bartels et al. (2004)	✓	✓	✓	✓		✓	✓
Bartels et al., 2004	✓	✓	✓	✓		✓	✓
Bartels et al., 2004	✓	✓	✓	✓		✓	✓
Behroozi et al. (2008)	✓	✓			✓		
Burton et al. (2019)	✓	✓			✓		
Byng et al. (2004)	✓	✓					
Chwastiak et al. (2018)	✓	✓	✓	✓		✓	✓
Drainoni et al. (2014)	✓	✓	✓	✓		✓	✓
Druss et al. (2001)	✓	✓	✓	✓		✓	✓
Druss et al., (2010), 2011	✓	✓	✓	✓		✓	✓
Druss et al. (2017)	✓	✓	✓	✓		✓	✓
Frank et al. (2015)	✓	✓	✓	✓	✓	✓	✓
Gaglioti et al. (2017)	✓	✓	✓	✓	✓	✓	✓
Griswold et al., (2005), 2010	✓	✓	✓	✓		✓	✓
Irwin et al. (2019)	✓	✓		✓	✓	✓	✓
Kelly et al. (2017)	✓	✓				✓	✓
Kilbourne et al. (2013)	✓	✓	✓	✓		✓	✓
McGuire et al. (2009)	✓	✓					
Parthasarathy et al., (2003), Weisner et al. (2001)	✓	✓					
Pirraglia et al. (2012)	✓	✓			✓		✓
Putz et al. (2015)	✓	✓					
Samet et al. (2003)	✓	✓				✓	
Tatreau et al. (2016)	✓	✓			✓		
Teachout et al. (2011)	✓	✓					
Uga et al. (2017)	✓	✓					✓

identifies a broad range of factors that can serve as barriers or facilitators to healthcare service use among people with SMI/SUDs (Kelly et al., 2017).

3.5. Dimensions of integrated care

Table 2 demonstrates the degree to which interventions addressed each aspect of integrated care, as conceptualised by the Framework for Measuring Integrated Patient Care (Singer et al., 2011).

Only one intervention description included information relating to every component of Singer's integrated care framework (Gaglioti et al., 2017). This intervention involved the implementation of an integrated, inter-professional care management programme for adults with long-term mental health, physical health, and addiction needs (Gaglioti et al., 2017). The authors described coordination within and across the care team responsible for delivering the programme (which included family physicians, two care managers, pharmacists, clinical social workers, substance use counsellors, and a psychologist). Care managers worked with individuals with lived experience to connect them with community resources and a 'patient registry' was maintained to ensure continuous familiarity with individuals over time. Continuous proactive and responsive action between visits was reflected by individuals being able to contact the clinic via phone and electronic messages between appointments. Care managers worked with individuals with lived experience to identify their needs and goals (representing person centred care) and used motivational enhancement techniques to support people towards their health goals (reflecting the sharing of responsibility).

Overall, studies described interventions that coordinated care both within ($n = 21$) and across care teams ($n = 21$). However, the remaining aspects of coordinated care were less consistently incorporated into interventions. Of the 25 unique studies included in this review, only eight described coordination between care teams and community resources, 11 identified continuous familiarity with individuals over time, eight noted continuous proactive and responsive action between visits, 14 indicated the provision of person centred care, and 12 documented shared responsibility for care and the maintenance of good health.

4. Discussion

This review identified 25 empirical studies, reported in 28 articles, testing interventions to integrate physical and mental healthcare for people with SMI and/or SUDs in OECD countries. These studies were almost exclusively conducted in the USA. Despite the tendency for SMI and SUDs to co-occur, the majority of studies were designed exclusively for people with SMI. Interventions included the use of case managers (typically nurses) to coordinate the delivery of mental and physical healthcare, the co-location of mental and physical health services, and screening and referral processes designed to facilitate access to specialist treatment. The theory or model of integrated care underpinning the intervention being tested was often not reported. Several key elements of an established integrated care framework were missing from the majority of interventions, most notably: coordination with community resources, continuity of care, and shared decision-making.

Only four studies tested an intervention aiming to integrate physical and mental healthcare specifically for people with SUDs. This is surprising given the evidence base documenting a high prevalence of physical health problems among people dependent on alcohol or other drugs (Keaney et al., 2011), and an even greater mortality risk than those with other psychiatric diagnoses (Hannerz et al., 2001). It is important to note that a number of studies have investigated the utility of screening for alcohol and drug problems and the administration of brief alcohol interventions within medical or outpatient settings (Babor and Kadden, 2005; Knox et al., 2019). However, the focus of these interventions is not specifically on integrating care or improving the physical health of people with SUDs.

This review also demonstrated that only two studies identified had investigated an intervention designed to integrate physical and mental healthcare for people with either SMI or SUDs (or individuals with both conditions). It is estimated that at least 50% of adults with SMI have a co-occurring substance use disorder (Drake et al., 2007). Among this population, approximately 72% do not receive any substance abuse treatment or mental healthcare (Harris and Edlund, 2005; Watkins et al., 2001). Even for people with comorbid SMI and SUDs who access mental healthcare services, rates of substance abuse treatment are low, suggesting that recommendations to treat these conditions concurrently have not been widely adopted (Harris and Edlund, 2005). Given the low treatment rates, it is likely that access and utilisation of preventive healthcare services is also lower among these individuals than those with SMI or SUDs alone. Further research focusing on this population is needed, particularly to evaluate interventions delivering integrated physical, mental health, and substance-use care.

All but two intervention studies were conducted in the USA. Unlike a number of OECD countries, the USA does not have a universal healthcare programme and healthcare facilities are largely owned and operated by private sector businesses. Consequently, interventions tested here are unlikely to be transferable to other healthcare contexts. Furthermore, integrated care interventions in the USA have largely been developed within government funded or Health Maintenance Organisation systems. Funding has not been based on the fee-for-service model characteristic of the private sector (Margolis et al., 2013). A number of challenges associated with integrated care delivery within private settings have been identified, such as scepticism regarding the financial value of behavioural health services and difficulties with obtaining reimbursement (Margolis et al., 2013). The degree to which outcomes of integrated care interventions can be observed across different health settings is currently unclear and requires exploration.

Less than half of the interventions examined reported being informed by a theory or model of integrated care, and these were often described in very limited detail. A mapping review of evidence and service models employing integrated care to address the physical health needs of people with SMI also found that few of the models were adequately described (Rodgers et al., 2018). The mapping review found there was a need for greater involvement from people with lived experience in the design, conduct, and evaluation of integrated care programmes. Similarly, our review identified only one study where the intervention was delivered by people with lived experience of SMI (Kelly et al., 2017). This involved peer health navigators teaching other people with SMI the skills needed to access and manage their healthcare effectively. Positive alliances between peer navigators and individuals who received the intervention were formed, and a number of health gains were observed up to six months after the intervention, including increased access and use of primary care health services, reduced preference for emergency or urgent care, improved detection of long-term health conditions, reductions in pain, and increased confidence in self-management of healthcare (Kelly et al., 2017).

Strengths of this review include the use of a systematic approach, a comprehensive search strategy, and a focus on intervention studies employing an empirical research design; an earlier review in this area has already reported on the grey literature and insights from expert advisors (Rodgers et al., 2018). While a previous systematic review of interventions to integrate physical and mental healthcare has been conducted, this focused specifically on studies that had endeavoured to improve medical outcomes and that had employed an RCT or quasi-experimental design (Bradford et al., 2013). Our review purposefully considered a broad range of outcomes and study designs. A further strength was the involvement of a stakeholder team at all stages of the review process, with valuable insights provided from people with lived experience, mental health professionals, other health professionals, and researchers from a range of disciplines.

A limitation of the review is that only studies published in English and those conducted in OECD countries were included. Another

limitation is that authors were not contacted to determine whether they had in fact incorporated aspects of integrated care that we identified as missing from intervention descriptions. It may be that a number of included studies did incorporate each of the different domains of integrated care specified in Singer et al. (2011) framework, but did not explicitly report on the activities relating to these domains. Because of the scoping nature of this review, which endeavoured to identify knowledge gaps and investigate the application of theory, an assessment of the methodological limitations or risk of bias associated with included studies was not completed. Therefore, it is not possible to comment on intervention effectiveness or make recommendations for clinical practice based on the evidence reviewed (Munn et al., 2018).

Instead, a number of recommendations can be made for future research in this area. As has been concluded by earlier reviews, there is a clear need to involve people with lived experience of SMI/SUDs in studies endeavouring to improve their physical healthcare and health outcomes (Happell et al., 2016b). Outcomes of the studies reviewed tended to focus on health service utilisation, physical health, and psychiatric symptom burden. This indicates a need for additional research to examine satisfaction with and experiences of interventions from the perspectives of participants, particularly when the aim is to provide person-centred care. More studies employing qualitative research designs would allow for individual experiences to be explored in greater depth, in addition to the experiences of staff responsible for delivering interventions. While several studies in our review included ethnically diverse samples, none explored the appropriateness or effectiveness of an intervention for particular ethnic groups. Community based participatory research could be conducted to increase the likelihood that treatment preferences and sociocultural barriers specific to ethnic minority groups, especially Indigenous populations, are addressed by future interventions (Delman et al., 2019).

To date, integrated care interventions have not focused specifically on the prevention of diagnostic overshadowing (Corrigan et al., 2014; Jones et al., 2008) within either the physical or mental health sector. Integrated care approaches may be a way to modify staff attitudes, skills and education needs, and practices, leading to improved recognition of physical health problems among people with SMI/SUDs (Happell et al., 2016a; Nash, 2013). Our review also found few interventions that were implemented in primary care settings, consistent with previous findings (Tosh et al., 2014). Delivering preventive strategies among people with SMI/SUDs who access primary care services may be an opportunity to improve their long-term health and life expectancy (Ilyas et al., 2017). There is also a need for further research examining interventions in countries other than the USA, in addition to research comparing the outcomes of universal healthcare programs with those delivering privatised healthcare. In all future research, the use of a comprehensive theory or model to inform intervention design is recommended to ensure that key components of integrated care are not overlooked. Making such a theory explicit can strengthen healthcare improvement research and facilitate the evaluation of the effectiveness of interventions (Davidoff et al., 2015).

In conclusion, all of the studies identified and described in this review represented quantitative evaluations of approaches to integrate physical and mental healthcare for people with SMI/SUDs. The theory of integrated care underpinning these approaches was often not made explicit which may explain why several important elements of integrated care (particularly coordination with community resources, continuity of care, and shared decision making) were absent from many of the studies reviewed. Future research in this area could include qualitative investigations, incorporate people with lived experience into the design and delivery of interventions, and utilise theory to inform intervention development and evaluation.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jpsychires.2020.05.021>.

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