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SYSTEMATIC REVIEW

A systematic review of barriers and enablers that health professionals experience to the delivery of type 2 diabetes care for adults with severe mental illness

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Abstract

Background: People with severe mental illness have a heightened risk for type 2 diabetes. They also experience poorer outcomes, including more diabetes complications, more emergency admissions, lower quality of life and excess mortality.

Aims: This systematic review aimed to identify health professionals' barriers to and enablers of delivering and organising type 2 diabetes care for people with severe mental illness.

Methods: Searches were conducted in Medline, EMBASE, PsycInfo, CINAHL, OVID Nursing, Cochrane Library, Google Scholar, OpenGrey, PsycExtra, Health Management Information Consortium and Ethos in March 2019, with updates in September 2019 and January 2023. There were no restrictions on study design, but studies were excluded if they did not include the perspective of health professionals or were not in English. Barriers and/or enablers of type 2 diabetes care for people with a severe mental illness were organised using the theoretical domains framework with additional inductive thematic coding.

Results: Twenty-eight studies were included in the review. Overall, eight domains were identified as important with barriers and enablers identified at individual, interpersonal and organisational levels.

Conclusions: Focussing on providing a collaborative healthcare environment which actively supports type 2 diabetes care, fostering improved communication both between professionals and service users, ensuring clear boundaries around roles and responsibilities as well as individual skill and knowledge support alongside confidence building all offer opportunities to improve type 2 diabetes care.

KEYWORDS

behaviour change, diabetes mellitus, health professionals, severe mental illness, systematic review, theoretical domains framework, type 2

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1 | INTRODUCTION

Individuals with a severe mental illness (SMI), such as schizophrenia, schizoaffective disorder, bipolar disorder and other psychoses, experience worse health outcomes compared to the general population; estimates vary but findings suggest a reduced life expectancy of 10–20 years, and a more than doubling of all-cause mortality (SMR = 2.5).¹ Physical ill-health has been identified as a considerable contributor to this increased mortality^{2,3} with type 2 diabetes impacting this inequality substantially.³

Individuals with an SMI have a two to threefold increased risk of developing type 2 diabetes,⁴ although it is challenging to obtain accurate rates because estimates suggest that up to 70% of diabetes is undiagnosed in people with SMI.⁵ Individuals with an SMI experience greater type 2 diabetes complications,^{6–9} are more likely to need emergency appointments for these complications,¹⁰ and have a poorer quality of life and higher mortality associated with their type 2 diabetes when compared to individuals without a comorbid SMI.^{11–14} The purported contributors to the poorer quality of life and outcomes for people with an SMI and type 2 diabetes are complex and multifactorial¹⁵ and include non-compliance with the care process,¹⁶ metabolic side-effects of antipsychotic medications,¹⁷ and the effect of SMI on self-management.¹⁸ Beyond factors identified at the level of the service user, evidence is accumulating to suggest that the availability and quality of health care may also contribute to these poorer outcomes.^{7,15,19,20}

There are relatively few reviews of the delivery of type 2 diabetes care in SMI; however, those that have examined this have identified evidence of disparities in care delivery.^{7,20} Recent longitudinal observational study evidence from a large-scale representative primary care sample in England reveals that, despite higher GP consultation rates and diabetes and metabolic health monitoring, there is under-diagnosis of cardiovascular disease, with increased rates of emergency rather than elective cardiac care admissions.⁸ Qualitative exploration of service user experiences of type 2 diabetes care suggest that there is a need for improvements in the receipt of care with perceptions of greater barriers to receiving type 2 diabetes support compared to people without an SMI.²¹ Challenges reported by service users such as the overshadowing of type 2 diabetes in the context of an SMI and difficulties in self-management of type 2 diabetes and an SMI, particularly when physical or mental health deteriorates, illustrate the potential for improving outcomes by targeting health professionals.²² This is also pertinent given the suggested links between meeting the support needs of service users with coexisting type 2 diabetes and how individuals can manage their conditions in everyday life.²³ Additionally,

Novelty statement

What Is Already Known?

- People with a severe mental illness and type 2 diabetes experience poorer health outcomes than those with type 2 diabetes alone.
- Supporting type 2 diabetes care provision has the potential to impact outcomes.

What Has this Study Found?

- Barriers and enablers to type 2 diabetes care centred on communication, collaboration, role boundaries, and professionals' knowledge and skills.

What Are the Implications of the Study?

- Several strategies that could be adopted include interprofessional multi-skill training, clarity over roles and responsibilities, a focus on the service user–health professional interaction and demonstrable and active prioritisation of type 2 diabetes care for people with a severe mental illness by organisations.

reviews of service user involvement in intervention planning for type 2 diabetes and an SMI highlight the difficulties in combined care including unequal attention to both conditions, challenges in communication, and care coordination.²⁴ Given the need to improve outcomes for people with type 2 diabetes, evidence^{12,15,21} suggests that targeting healthcare provision is one avenue that could provide a meaningful change in these outcomes. Efforts to change health professional behaviour are likely to be less successful if they do not consider pre-identified barriers and enablers of practice.²⁵ Barriers and enablers are factors that may compete with or support behaviour change²⁶ thus they could influence the effectiveness of an intervention to improve professional practice.²⁵ This review will develop an understanding of the barriers and enablers experienced by health professionals to the provision of type 2 diabetes care for individuals with an SMI and provide a basis for selecting theoretically informed behaviour change strategies.

The aim of this systematic review is to identify the modifiable barriers and enablers of delivering and organising type 2 diabetes care for people with an SMI, from a health professional perspective, with an exploration of possible differences between different healthcare professions and type 2 diabetes care processes.

2 | METHOD

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines.²⁷ A systematic search and review was followed to ensure an exhaustive search of published and grey literature, which is commensurate with the proposed framework analysis,²⁸ as well as a summary of what is known and recommendations for practice.²⁹ The protocol was registered on PROSPERO (CRD124491).

2.1 | Selection criteria

Selection criteria were identified using the SPIDER (sample, phenomenon of interest, design, evaluation and research type) question format.³⁰ The *sample* was health professionals, the *phenomenon of interest* was reported or explored perceived barriers and enablers of delivery and organisation of type 2 diabetes care for people with an SMI. Studies of any *design* or *evaluation* were eligible and primary research of qualitative, quantitative or mixed methods were an eligible *research type*.

The focus of care could be either (a) type 2 diabetes care generally; that is, not specified by the authors but discussed as 'type 2 diabetes care' or 'metabolic care', or (b) a specific type 2 diabetes care process. This could be those specified in standard guidelines for treating type 2 diabetes (e.g. National Institute for Care Excellence, American Diabetes Association; International Diabetes Federation), such as offering a structured education programme, foot risk surveillance, dietary advice etc.

Studies were excluded if they were not in English, were reviews, reported only the perspective of service users, focussed only on the management of mental health, or where it was not clear that the reported barriers and enablers pertained to type 2 diabetes care for adults with an SMI i.e. they were reported as part of broader physical health care for people with an SMI.

2.2 | Search strategy

Searches were conducted in Medline, EMBASE, PsycInfo, CINAHL, OVID Nursing, Cochrane Library, Google Scholar, OpenGrey, PsycExtra, Health Management Information Consortium and Ethos, with reference list, forward and backwards citation searching of included literature. The reference lists of four excluded reviews were searched to identify any potentially relevant studies.^{31,32,33,34} All databases were searched initially from inception to 05 March 2019. The same searches were undertaken again in September 2019 and January 2023, to

ensure the review was current. All searches were carried out using the same method i.e. no changes were made to the search terms nor sources. Notifications were set for subsequent publications. A combination of key words and mesh terms were used and combined using Boolean operators. The search terms were informed by a prior Cochrane³⁵ and systematic review.³⁶ Both were comprehensive and in a similar field supporting identification of appropriate health professional and type 2 diabetes care terms. Terms pertinent to barriers and enablers specifically in the field of type 2 diabetes and SMI research were also included (e.g. engagement, communication) informed by previous research.^{37,38} Additionally, terms related to the TDF domains were included, for example representing the domain *emotion* were the terms *anxiety* and *fear*. These terms were identified previously by seven research psychologists familiar with the TDF.³⁹ Identifying qualitative evidence can be challenging, therefore a combination of specific free-text words, broad terms and thesaurus terms are required.⁴⁰ The Medline search was initially devised by TD and reviewed by KM and AS as well as a Health Sciences Librarian (SD) with expertise in the development of systematic review search terms. The finalised Medline search was amended to the syntax and appropriate headings of each database. The full search strategy is provided in the supplementary file (appendix 1).

2.3 | Study selection

Initial search results from published and grey literature were imported into EPPI-reviewer 4. Following duplicate removal, the titles and abstracts were independently screened by two reviewers (TD & HM) against the eligibility criteria and those not excluded were submitted to full text screening. Any discrepancies in independent screening were resolved through discussion. Full text screening was independently undertaken by TD for 100% of all papers and compared to the screening decision by another member of the review team (HM, MH & KM) who each screened one third of papers. Discrepancies were resolved through discussion between two reviewers, with a third reviewer consulted if necessary. Citation searching was undertaken for all included studies and reviews, with the references identified imported into Excel and subject to the same review process for both title and full text screening.

2.4 | Quality assessment

Data quality was assessed by TD with a second reviewer (AZ) independently assessing a random sample of 20% of studies. Any differences were resolved through discussion.

The tools used were the critical appraisal skills programme (CASP) tool for qualitative studies,⁴¹ the AXIS tool for cross-sectional studies,⁴² JBI checklist for case reports⁴³ and the AACODS checklist for grey literature.⁴⁴ There is no known tool designed specifically to assess pilot RCTs therefore the CONSORT extension for reporting of pilot RCTs⁴⁵ was used to guide critical appraisal of the pilot study. The critical appraisal was used to gain an understanding of the relative strengths and weaknesses of the evidence base.

2.5 | Data extraction

Study characteristics extracted were author, year of publication, country, setting, profession (including, where possible, age, service duration, grade and number of service users under care), study aims, sampling frame, sampling method, sample size, type 2 diabetes care focus (e.g. care generally or specific care processes such as provision of dietary advice), study design, intervention content, analysis method and data, including participant quotes, survey or statistical analyses. All extraction was undertaken by TD with 20% checked by a second independent reviewer (AZ).

2.6 | Data analysis and synthesis of barriers and enablers

Framework synthesis⁴⁶ was undertaken to analyse the data with an additional assessment of relative domain importance. Framework analysis, and similarly synthesis, are best suited to research which has specific questions, a pre-designed sample, and pre-identified issues,⁴⁷ all of which are pertinent within this synthesis. Further, as the inclusion of both quantitative and qualitative data can be helpful in the development of complex, and especially behavioural, interventions,^{48,49} a framework synthesis offers a sufficiently flexible yet soundly organised mechanism for the synthesis of heterogenous data.⁴⁶ Framework synthesis consists of the following five steps:

1. *familiarisation*, achieved through reading each paper several times to ensure that salient information was identified.
2. *identification of a thematic framework*, the Theoretical Domains Framework (TDF) was adopted as the a priori framework to guide the synthesis. The TDF is a synthesis of 33 theories of behaviour and behaviour change, consisting of 14 domains, covering 84 theoretical constructs.⁵⁰ The 14 domains include (1) *knowledge*, (2) *skills*, (3) *social/professional role and identity*, (4) *beliefs about capabilities*, (5) *optimism*, (6) *beliefs about consequences*, (7) *reinforcement*, (8) *intentions*, (9) *goals*, (10) *memory*,

attention, and decision processes, (11) *environmental context and resources*, (12) *social influences*, (13) *emotion*, and (14) *behavioural regulation*.⁵⁰ Developed using consensus methods, the TDF was designed to identify perceived influences on the behaviour of health professionals.⁵¹ It was further refined and validated for use in implementation interventions as well as providing a basis for developing interventions to change health professional behaviour.⁵⁰ The TDF was chosen as it has sufficient breadth to analyse a wide range of potential barriers and enablers of care and its utility as an a priori framework for synthesis has been demonstrated in syntheses of qualitative and mixed study reviews,⁵²⁻⁵⁸ all of which aimed to understand and/or change health professional behaviour. The framework was also selected as it offers the opportunity to integrate theory into the understanding of barriers and enablers to support exploration of the theoretical content of pre-existing interventions as part of ongoing work.

3. *indexing*,^{37,38,59,60,61,62,63,64,65,66,67} whereby extracted data were labelled by describing the overall sentiment of the extracted data unit and whether the data unit was a barrier and/or enabler to type 2 diabetes care provision.
4. *charting*, where the data were organised within Excel to separate them by health professional category and care process.
5. *mapping and interpretation*, within which data units were mapped to the TDF domains and the assigned labels reviewed to create themes and sub-themes. These were influenced by the study objectives that is focusing on identifying barriers and enablers to the provision of type 2 diabetes care, as well as being informed by the constructs within each of the TDF domains. The coding of the first three studies were used to produce a coding protocol (available in the supplementary file, appendix 2), produced by TD, and reviewed by KM and MH, which supported consistency of coding across the remaining studies.

A 'data-based convergent synthesis'⁶⁸ was utilised with extraction and analysis of qualitative and quantitative data completed at the same time. This method requires data transformation⁶⁸ which involved the quantitative data being qualitisied. Quantitative data were included in the framework and given a descriptive code to inform the themes. For example, a statement such as "providers don't have enough time" with a mean score of 4.03, on a likert-type scale of 1 = not a barrier to 5 = a strong barrier, would be coded as a barrier suggesting a lack of time. This enabled the synthesis of findings using the TDF as a framework.

The domains were judged for importance based on three criteria; (1) frequency, identifying the number of studies indicated in each domain, (2) expressed importance, using

the author's expressions of importance to identify domains, and (3) discord, identified as any domain whereby the themes demonstrated opposing/conflicting views. These criteria have been utilised previously⁶⁹ and enable importance to be identified not only owing to prevalence or perceptions of importance, but also highlight differences in professional opinions, for example differences in professional responsibility, which can provide a focus for intervention development.

3 | RESULTS

3.1 | Search results

Titles and abstracts of 6802 references were screened across initial and citation chain searching, resulting in 284 full texts assessed for eligibility. One of the assessed studies was identified through knowledge of one of the supervisory team. Of these, 28 studies ($n=27$ database searches, $n=1$ other source) were included in the synthesis (Figure 1).

Summary characteristics of the included studies are provided in Table 1, full details of the included studies are provided in the supplementary file (appendix 3).

Most designs were either qualitative ($n=15$) or quantitative ($n=12$) with one mixed method. Most frequently, perspectives were sought from mixed samples of mental and physical health professionals ($n=13$). For the purpose of this review professionals were grouped into mental health professionals defined as those who focus on mental health solely (e.g. psychiatrist, mental health nurse), and physical health professionals (e.g. diabetologist, diabetes specialist nurse, general practitioner). Mixed samples were defined as samples containing both mental and physical health professionals that did not distinguish within their results and/or discussion whether the data were informed by a particular care group or profession. The majority of literature was published ($n=27$) and conducted in the UK ($n=11$) or USA ($n=8$). Studies which referred only to type 2 diabetes care and did not specify a particular care process e.g. diet, were labelled as type 2 diabetes care generally. Most ($n=22$) focussed on the delivery of type 2 diabetes care generally. As only a small number focussed on a specific care process, (four on the provision of type 2 diabetes education and two on type 2 diabetes diet/nutrition specifically) these were not considered separately.

3.2 | Key TDF domains

In total 628 units of data were extracted. Although all TDF domains were identified, assessments of TDF importance

using the predefined criteria of frequency, expression and discord were met by eight domains: (1) *environmental context and resources*, (2) *social influence*, (3) *skills*, (4) *knowledge*, (5) *social/professional role and identity*, (6) *goals*, (7) *beliefs about capabilities*, and (8) *intentions*. There was considerable variability in the frequency of the domain identification ranging from identification in all studies (TDF domain: environmental context and resources) to three studies (TDF domain: intention). All domains met the importance criteria of expressed importance, with nine domains meeting the discord criteria. Assessments of TDF importance, for all domains, ranked in frequency are shown in Table 2.

3.3 | Critical appraisal of included studies

Critical appraisal of the included studies can be found in the supplementary file (appendix 4). Qualitative studies frequently demonstrated a well-defined aim, appropriate methodology and clear findings statement; they did however have limited reporting of recruitment strategy, ethical consideration, and sufficiently rigorous analysis. Appraisal of cross-sectional studies revealed appropriate reporting and suitability of studies to address the hypothesised question as well as a clear results section and discussion of limitations. There was however a limited reporting of sample size justification and measurement tool rigour. Additionally, bias was frequently difficult to assess as there was limited information on the sample frame, selection process, and prevalence of non-responders. Appraisal details for the included case study,⁷⁰ grey literature,⁷¹ and pilot RCT⁷² can be found in appendix. No studies were excluded, as previously proposed, based on appraisal. This information was used to inform the discussion and limitations of the review.

3.4 | Themes within TDF domains

The themes identified in the eight domains are outlined in Figure 2; these are arranged in frequency order. A total of 25 themes, with three comprising 15 sub-themes, were identified across the important domains. *Environmental context and resources* had the greatest number of themes (nine main themes with six sub-themes), followed by *social influence* consisting of five main themes and ten sub-themes. Most themes were informed by either all care groups ($n=15$), or at least two care groups ($n=7$) (i.e. mixed samples and mental health professional samples or mental health professional samples and physical health professional samples) and three informed by only one care

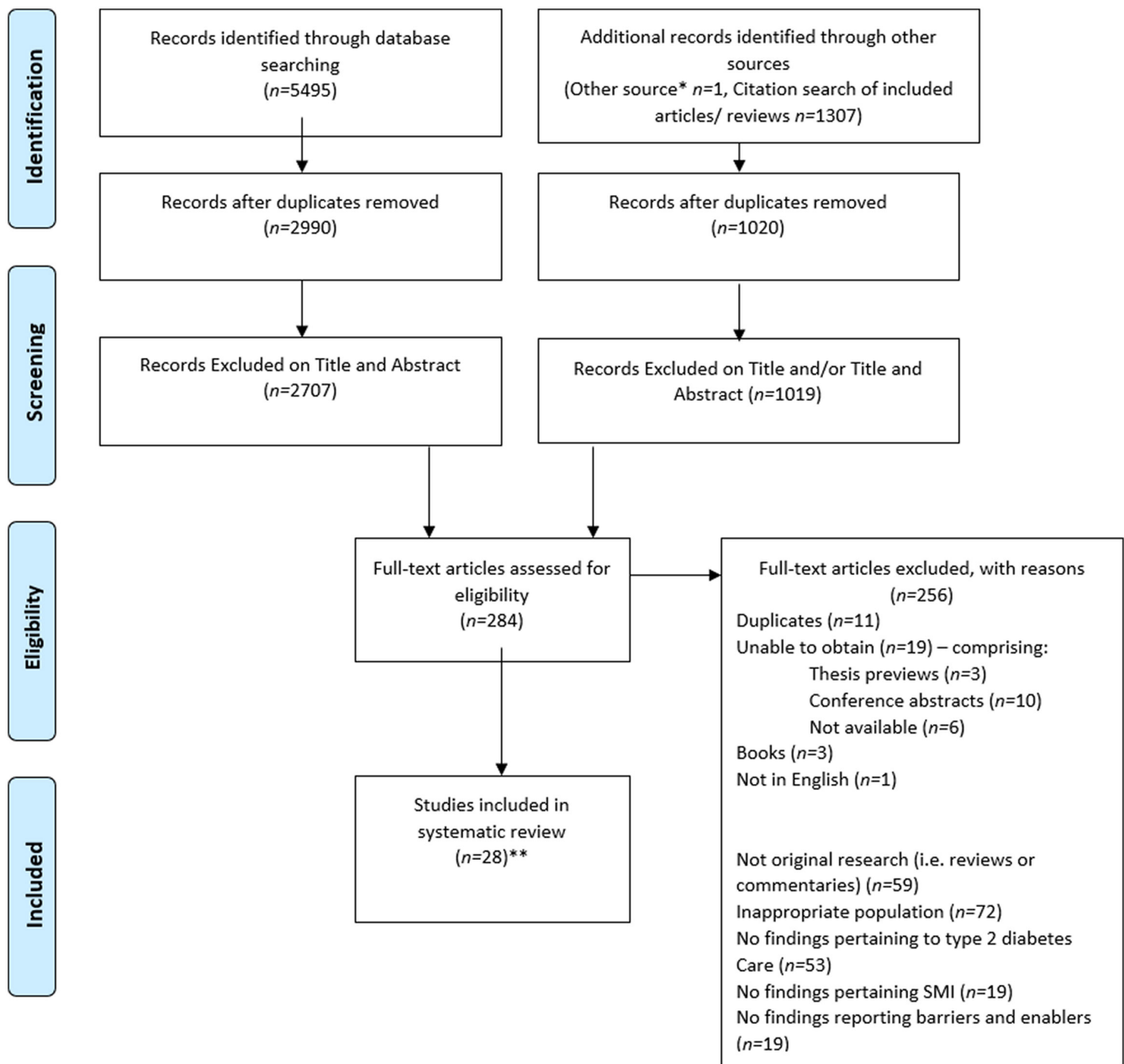


FIGURE 1 PRISMA of Studies Included and Excluded from the Review of Barriers and Enablers. * = Other source was the MSc student thesis known to one of the supervisory team. Agreement from student to provide thesis for assessment of inclusion in the review. ** = Studies included were $n = 27$ from database searches and $n = 1$ from other source.

group ($n = 1$ physical health professionals; $n = 2$ mental health professionals). The majority ($n = 9$) of subthemes were supported by at least two health professional groups, with only one subtheme supported by one care group. The eight domains assessed as important are discussed in greater detail below, all other domains and themes can be found in the supplementary file (appendix 5). A table of example quotes to support the themes are also provided in the supplementary file (appendix 6).

3.5 | Domain 1: Environmental Context and Resources

Coordinating care across different disciplines, such as mental and physical health professionals, was identified as a barrier to the delivery of type 2 diabetes care.^{37,72,73,74,75,76,77,78,79,80,81,82} These challenges were linked to a lack of IT system integration, limited access to other health professionals to support care (i.e. poor and

TABLE 1 Summary of study characteristics.

Study characteristics	Frequency n(%)
Study design	Qualitative: 15(54) Quantitative: 12(43) Mixed-Method: 1(3)
Study location	United Kingdom: 11(39) North America: 8(29) Australia: 2(7) Canada: 2(7) Denmark: 1(3) Sweden: 1(3) China: 1(3) Saudi Arabia: 1(3) Africa: 1(3)
Care process	T2D Care Generally: 22(79) T2D Education: 4(14) Diet/Nutrition Advice: 2(7)
Health professional perspective	Mixed (Mental and Physical Health Professionals): 13(46) Mental Health Nurses/Student MHN: 7(25) Psychiatrists: 2(7) Mixed Mental Health Professionals: 2(7) Nurse Educators: 1(3) Student Nurse: 1(3) Cardiometabolic Nurse: 1(3) Telephonic Nurse Case Manager: 1(3)
Publication type	Published: 27(96) Grey: 1(4)

infrequent communication; attempted contacts most likely occurring at a time of crisis) and the challenge of referring service users to other health professionals when needed. For example, mental health professionals' difficulties in accessing timely information, such as scheduled type 2 diabetes care appointments, impacted their ability to motivate service users and support their clinic attendance. Both mental and physical health professionals cited that there were challenges in providing type 2 diabetes care owing to pressures resulting from reduced staff levels,^{73,74,75,76,78,79,81,82,83,84} workload,^{73,76,79} and a perceived lack of time;^{37,73,74,75,78,80,81,82,85,86} although in one study mental health nurses and support workers felt they had sufficient time, and more so than general practitioners.³⁸ The identified pressures were compounded by the complex needs of individuals with both type 2 diabetes and SMI, who were deemed "undesirable" due to the "large amount of resources required

to treat them such as longer medical visits to explain treatment".⁷⁴

Current approaches to service provision, including transportation challenges and inappropriate appointment times, were identified as a barrier to access for service users,^{37,73,74,75,78,79,80,83,84,87} with a more flexible service, such as walk-in clinics or the development of a new care pathway, identified as a type 2 diabetes care enabler.^{37,73,74,78,79,83,84}

A further suggestion was the development, or deployment, of a specialist role^{73,74,78,79,85,88,89} with various identified responsibilities including provision of type 2 diabetes care and supporting service users to navigate the health system. The value of the role however was not unanimous as there were some concerns that the role would lead to service fragmentation or be unfeasible owing to cost implications.⁸⁹ Organisational priorities and culture could create a type 2 diabetes care barrier^{38,71,73,75,79,81} (e.g. whilst mental health nurses within a team had been designated physical health lead roles, implementation of ideas was hindered by bureaucratic issues and poor availability of equipment⁷¹), although this was not identified universally.³⁷ Finance challenges created barriers such as insufficient insurance for service users creating barriers to type 2 diabetes care^{76,78} or finances to provide appropriate dietary care.⁹⁰ Less frequently identified barriers included challenges in contacting service users to provide care over the phone⁹¹ and laws prohibiting prescribing by certain US states.⁷⁴

3.6 | Domain 2: Social Influence

Engagement of service users was reported to influence the delivery of type 2 diabetes care; the most frequently identified sub-themes included the severity of service users' SMI creating a barrier to type 2 diabetes care,^{38,72,73,74,75,78,79,80,81,82,83,87,88,91,94} with descriptions of treatment refusal owing to reasons which are not "rational because [service users] are not thinking clearly"⁷⁴, but also an enabler. For example where service users lacked capacity, health professionals felt individuals should be supported to empower them to care for their own physical health.⁷⁹ Perceptions of service users' illness beliefs created barriers to type 2 diabetes care,^{37,71,74,78,79,87,90} with examples including the perception that service users are not acknowledging their type 2 diabetes, which affects their willingness to engage with services impacting attendance.⁷⁹ Finally, a perception of a general lack of engagement was also identified as both a barrier and enabler^{37,71,73,78,79,81,86} (e.g. service user lack of interest [in type 2 diabetes care] led to avoidance by some health professionals but inspired a more proactive approach in others⁷¹).

TDF Domain	Frequency (n)	Expression	Discord
Environmental Context & Resources	28	Yes	Yes
Social Influence	22	Yes	Yes
Knowledge	16	Yes	Yes
Social/Professional Role and Identity	16	Yes	Yes
Skills	15	Yes	Yes
Goals	12	Yes	Yes
Memory, Attention, Decision Processes	10	Yes	No
Beliefs about Capabilities	8	Yes	Yes
Beliefs about Consequences	7	Yes	No
Reinforcement	5	Yes	No
Emotion	5	Yes	No
Intentions	3	Yes	Yes
Behavioural Regulation	3	Yes	No
Optimism	3	Yes	No

TABLE 2 Outcome of Domain assessment of importance arranged in frequency order.

Collaborative care with good communication between health and social care professionals was identified as an enabler to delivering type 2 diabetes care.^{37,38,71,87} Not all studies however identified positive relationships between professionals,^{80,87} with examples of mental health nurses receiving “chilly comments from the diabetes nurse when doing extra blood controls between diabetes appointments”.⁸⁷ The importance of social support received by service users was noted, particularly family support which could enable care.^{37,38,78,81,87} For example if service users had supportive family care, professionals identified that they would ‘use this’.³⁷ Other themes highlighted the importance of the relationship between service users and health professionals^{73,74,87} and the possibility of stigma affecting care negatively.^{73,74}

3.7 | Domain 3: Skills

Perceptions of inadequate type 2 diabetes care skills were identified as a barrier, most frequently for mental health professionals,^{37,38,73,75,78,79,81,85,88,89,92,93} who, beyond a general training need, expressed a need for more ‘practical skills’, particularly foot care advice, weight management and medication management as well as basic insulin training. Having good communication skills when working with service users was labelled as an enabler,^{37,38,88} with a lack of specialist communication skills a barrier to type 2 diabetes care.⁷⁴ The ability to communicate with other professionals about type 2 diabetes care was also identified as a training need by mental health professionals.⁹³ No studies identified a lack of type 2 diabetes skills as a barrier for physical health professionals, rather their skills were identified as an enabler.⁷³

3.8 | Domain 4: Knowledge

A lack of knowledge of type 2 diabetes was perceived as a barrier for mental health professionals in type 2 diabetes care delivery.^{37,38,71,73,81,85,86,87,89,90,92,93} This included limited knowledge of the type 2 diabetes clinical guidelines,^{37,38} basic information about type 2 diabetes, for example causes, types of diabetes, and the differences between hypoglycaemia and hyperglycaemia.⁹² Increased type 2 diabetes knowledge was however perceived as an enabler for physical health professionals.^{37,38,73,85,86} Greater knowledge was associated with increased delivery of type 2 diabetes education to service users.³⁸ The knowledge of SMI held by mental health professionals was a perceived enabler of type 2 diabetes care,⁷³ with the limited experience of working with service users a barrier for physical health professionals.^{73,78,87}

3.9 | Domain 5: Social/Professional Role & Identity

Physical health professionals more frequently identified that type 2 diabetes care was their professional responsibility,^{38,73} and when asked explicitly to rate survey item importance, primary care professionals identified feelings of professional responsibility as the least problematic barrier to type 2 diabetes care provision.⁷⁵ Some felt however that mental health professionals should take on more responsibility for the physical health of service users.⁷³ The importance of a positive relationship between service users and health professionals was cited as a reason as to why care would be better provided by mental health

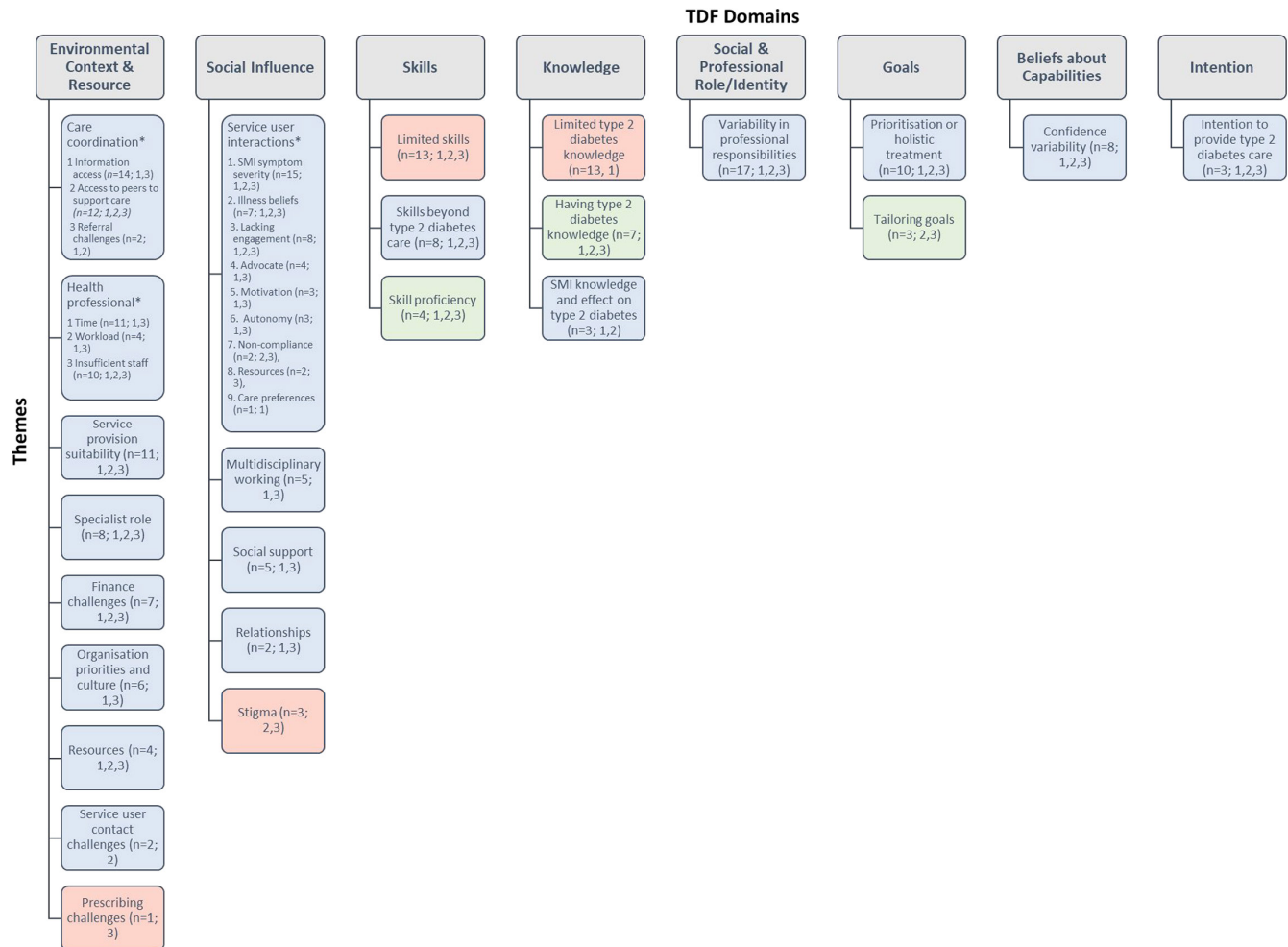


FIGURE 2 Themes identified within important TDF Domains Organised in Theme Identification Frequency (n = number of studies). Blue = Barrier & Enabler; Red = Barrier, Green = Enabler. 1 = Mental Health Professional Samples, 2 = Physical Health Professionals, 3 = Mixed Samples.

*Subthemes identified in *environmental context and resources* and *social influence* are numbered and contained within the themes.

professionals and in particular the greater rapport and understanding of people with SMI.⁷³ Mental health professionals expressed more variability in their perceptions of responsibility both across and within studies. Reasons for variability were diverse, linked to the date of graduation from residency,⁸⁰ the presence/absence of primary care professionals,⁸⁰ caseload, or whether care was preventative or active treatment. Prevention was identified as the remit of the mental health professional, but post-diagnosis of type 2 diabetes the responsibility of physical health professionals.⁸⁷ Additionally, differences in responsibility were linked to specific type 2 diabetes care tasks^{37,38} or individual practitioner differences.⁷¹ It was suggested that type 2 diabetes care could be improved if there was clarity in the division of labour between professional groups.⁸⁴ For example, the need to improve communication with other health professionals was identified by one study in this review,⁹³ suggesting a recognition of the importance of this skill but a need for improved ability. These factors

were also identified within this synthesis with a variable, and at times contradictory belief, about professional responsibility identified.

3.10 | Domain 6: Goals

The prioritisation of mental over physical health was identified as a barrier to the provision of type 2 diabetes for mental health professionals and mixed groups of health professionals.^{37,38,70,71,73,76,77,81,91,94} This was linked to the immediacy of the issues faced by service users regarding their SMI compared to the chronicity of type 2 diabetes, this did however cause conflict for mental health professionals owing to the known side effects of anti-psychotic medication in increasing the risk of diabetes. In contrast, some mental health professionals noted that optimal care was holistic.^{73,94} For physical health professionals, the opposite was noted, with physical health nurses identifying

that providing type 2 diabetes education was their focus. This was conditional however and was not prioritised when other issues emerged (e.g. troubleshooting housing emergencies).⁹¹ Setting individualised goals responsive to the needs of service users was perceived as an enabler of type 2 diabetes care;^{37,38,94} examples included setting smaller targets or focussing on one target behaviour. This was reported more frequently by physical health nurses than psychiatrists,³⁸ which likely reflects the focus on type 2 diabetes by physical health professionals.

3.11 | Domain 7: Beliefs about Capabilities

A lack of confidence in providing type 2 diabetes care was a barrier for mental health professionals^{71,87} and mixed samples³⁸ which they attributed to limited knowledge and practice in delivering type 2 diabetes care. Physical health professionals perceived a lack of confidence concerning working with service users as a type 2 diabetes care barrier,^{73,78} suggested to result from a lack of understanding of SMI.

3.12 | Domain 8: intention

Intention to refer to services or follow clinical guidelines was variable in mixed samples.^{37,38} It was also identified as residing at an individual level with some mental health nurses outlining no intention to be involved in type 2 diabetes care whereas others were active and interested.⁸⁷

4 | DISCUSSION

This systematic review explored health professionals' perceived barriers and enablers to the provision of type 2 diabetes care for people with an SMI. The review incorporated quantitative and qualitative study findings from published and grey literature, identifying 28 papers for inclusion. We used the TDF to interrogate study findings and structure our synthesis. Barriers and enablers to type 2 diabetes care were related to eight TDF domains (1) *environmental context and resources*, (2) *social influence*, (3) *skills*, (4) *knowledge*, (5) *social/professional role and identity*, (6) *goals*, (7) *beliefs about capabilities*, and (8) *intentions*.

The domains *knowledge*, *skills*, *beliefs about capabilities*, and *intentions* highlight that health professionals from mental and physical health services reported a variety of type 2 diabetes care barriers. Previous interventions have sought to improve type 2 diabetes care by mental health professionals by focussing on knowledge and skill

development.^{92,95,96} The findings from this review however suggest that whilst the need to acquire knowledge and skills is important, without the confidence and intention to put these into practice this may be insufficient. Focussing on these aspects of care delivery may also improve service user perceptions of care as previous literature has identified a need for increased diabetes knowledge in health professionals.²³ This has been further described as a poor understanding of type 2 diabetes (in mental health professionals) and suboptimal 'interaction' with people with an SMI (in physical health professionals) that leads to perceived poor care by people with an SMI.²¹ Thus a multi-skill intervention that is sensitive to the needs of the different professionals involved in type 2 diabetes care, and cognisant of service user experience and perceptions, has the potential to be beneficial in improving delivery of type 2 diabetes care.

The domains *environmental context and resources*, and *social influence* highlighted the interpersonal barriers that are perceived to affect the delivery of type 2 diabetes care for people with an SMI, including the relationship with service users and the ability to work as a multidisciplinary team. A focus on the interaction between health professionals and service user, potentially focussing on addressing issues of communication, may offer further opportunities to improve care. There were instances of beliefs by professionals, identified in this review, that are incongruent with literature on service user experiences of care, for example the ability to self-advocate was perceived as an enabler of care, however this can be challenging for people with SMI,²¹ therefore arguably the challenge of self-advocacy may be misconstrued as a lack of engagement. Additionally, the perception that service users see their type 2 diabetes as less important than their SMI can act as a care barrier, however previous literature suggests that it is the symptoms of mental illness that can hinder diabetes self-management and not a belief of lesser importance.⁹⁷ Such perceptions may hamper care, particularly as health professionals wished to respect the choice and autonomy of service users, more so regarding diet and lifestyle advice. This is particularly troublesome given that literature has found that diet and exercise management are especially challenging for people with an SMI^{12,21} and an area in which additional support is wanted.²¹ It may be crucial to support delivery of diet/nutrition advice considering this desire, particularly given the role of pessimism around such advice.⁹⁸ DIALOG is a method designed to structure the communication between service users and health professionals which has demonstrated favourable outcomes in community mental health care.⁹⁹ Whilst not type 2 diabetes specific, such methods could be investigated to achieve a supportive opportunity for service users to voice their preferences, such as the desire for diet/

nutrition advice, but also enable health professionals to gain a clearer understanding of these preferences.

The domains *social influence* and *social/professional role and identity* highlighted that fostering positive team working both within and between teams could improve type 2 diabetes care. Previous literature has identified that interpersonal conflict between health professionals may arise from communication breakdowns in the absence of timely and specified feedback to one another and clear expectations around task completion.¹⁰⁰ Additionally, conflicts generated by a lack of clarity in roles and responsibilities have been reported to reduce job satisfaction, morale, or retention, and are also perceived to be detrimental to care.¹⁰¹ Whilst not explicitly labelled as interpersonal conflict, this review identified that poor communication and blurred role boundaries were perceived by professionals. Interventions aimed at addressing these sources of ambiguity, providing role clarity and expectations, and supporting team working may be a focus with great potential. Providing opportunities for inter-professional training, rather than the often-siloed option, may be a useful first step in addressing these factors;¹⁰¹ such changes however will require leadership support and championship, particularly in regard to organisational culture and more practically for scheduling to make such training a reality in healthcare organisations.¹⁰¹

The domains *goals* and *environmental context and resource* highlighted organisational challenges to type 2 diabetes care. The importance of holistic and integrated care is championed in the literature¹⁵ as well as being supported by the, albeit limited, literature on the experience of type 2 diabetes care for people with an SMI who describe a lack of care integration¹⁰¹ and disjointed care¹⁰² as challenging. Recommendations for service change will however need careful consideration; whilst this review suggests that improved type 2 diabetes care can be supported through improvements in information access, integrated IT systems, and ability to access staff to support care, previous literature has identified that co-location of mental and physical services has a variable impact on the delivery of type 2 diabetes care.¹⁰³ Flexible service provision, including increased appointment times, which are sympathetic to challenges that people with SMI face, may also support care improvement. Whilst a short appointment time and high workload will place demands on health professionals there is a possibility that the perceived lack of time is also a result of prioritisation within the allocated time frame. It is possible that this may relate to a perceived lack of urgency for type 2 diabetes care because of its chronic nature, with priority given to issues perceived as urgent or time sensitive. Furthermore, a lack of prioritisation may send a message to service users that physical health is less important. This may be damaging as research with service

users has identified that the ability to self-manage is associated with support received and prioritisation of type 2 diabetes care.^{24,104} To address such issues it will be important for organisations to demonstrate an active prioritisation of type 2 diabetes care such as provision of resources, financial buy-in, statutory body recognition, and reorganisation of care pathways.

Most of the studies in this review focussed on overall type 2 diabetes care, however type 2 diabetes care is complex requiring many care processes. Understanding how, and whether, differences in barriers and enablers are at play for different care processes will be useful for future research. In particular, focussing on the provision of diet/exercise advice in future research has the potential to influence an area of care that service users find particularly challenging.¹²

4.1 | Strengths and limitations

A comprehensive search strategy was utilised including mixed studies from both published and grey literature to provide a wealth of perspectives on the barriers and enablers to type 2 diabetes care for people with SMI. The coding of data was subjected to an agreed coding protocol and 20% independent data extraction, which supports the results, although does not remove the potential bias of the researcher. The use of a framework synthesis enabled a structured exploration of heterogeneous data, however this may also lead to limitations owing to the predefined domains. Attempts to ameliorate this included the proposal of thematic analysis for extracted data which did not fit domains, the fact that no data required this analysis is indicative of the breadth of the TDF, and arguably the suitability for this review. Assessment of importance is also challenging; frequency is often not indicative of whether data are or are not important, the use of other methods of assessing importance (expression of importance and discord) may go some way to ameliorate this but any judgments of importance have the potential to introduce bias. The inclusion of the analysis of all domains, with those judged of lesser importance provided in supplementary appendix, may address some of this limitation.

Further limitations of the synthesis include the focus on type 2 diabetes care in general in the majority of studies and the participation of mixed professional samples, rather than a focus on more specific aspects of care among individual health professional groups. It was therefore not possible to distinguish from these studies which barriers and enablers related to which specific behaviours (e.g. specific type 2 diabetes care processes) nor which health professional group.

Limitations of the synthesis are also informed by potential limitations in the primary studies included in the review. Sample selection was generally weakly reported and affects the validity, generalisability, and transferability of individual and synthesised findings. The recorded barriers and enablers may be constrained and subject to reporting bias by the researchers and authors. Additionally, there is potential for attribution bias by study participants as individuals are more likely to attribute failures to external (environment or others) rather than internal (ability) factors^{105,106} and this may have influenced the prevalence of *social influence* and *environmental context and resources* domains. Such challenges could be overcome through the triangulation of data, achieved through observational data or the inclusion of perspectives beyond the health professional, importantly those of the service users and carers.

5 | CONCLUSION

This systematic review is the only known attempt to synthesise findings to explore the barriers and enablers to the provision of type 2 diabetes care in people with SMI. The findings demonstrated that barriers and enablers reside at an individual, interpersonal, and organisational level. There is a need for a more detailed analysis of the different care processes which contribute to the complex provision of type 2 diabetes care. Several recommendations were made including multi-skill training of health professionals delivered collectively, clarity over roles and responsibilities, a focus on the service user–health professional interaction, support for integrated, holistic care, and demonstrable active prioritisation of type 2 diabetes care for people with an SMI by organisations. This would suggest that there are many opportunities which could be explored to see whether they can support improved outcomes for those with type 2 diabetes and an SMI.

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CONFLICT OF INTEREST STATEMENT

No conflict of interest is known.

DATA AVAILABILITY STATEMENT

The data used and/or analysed during the current study are available from the corresponding author on reasonable request.

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REFERENCES

- Chesney E, Goodwin GM, Fazel S. Risks of all-cause and suicide mortality in mental disorders: a meta-review. *World Psychiatry*. 2014;13:153-160.
- Jayatileke N, Hayes RD, Dutta R, et al. Contributions of specific causes of death to lost life expectancy in severe mental illness. *Eur Psychiatry*. 2017;43:109-115.
- John A, McGregor J, Jones I, et al. Premature mortality among people with severe mental illness — new evidence from linked primary care data. *Schizophr Res*. 2018;199:154-162.
- Osborn DP, Wright CA, Levy G, King MB, Deo R, Nazareth I. Relative risk of diabetes, dyslipidaemia, hypertension and the metabolic syndrome in people with severe mental illnesses: systematic review and meta analysis. *BMC Psychiatry*. 2008;8:84.
- Mangurian C, Newcomer JW, Modlin C, Schillinger D. Diabetes and cardiovascular care among people with severe mental illness: a literature review. *J Gen Intern Med*. 2016;31:1083-1091.
- Becker T, Hux J. Risk of acute complications of diabetes among people with schizophrenia in Ontario. *Canada Diabetes Care*. 2011;34:398-402.
- Mitchell AJ, Malone D, Doebbeling CC. Quality of medical care for people with and without comorbid mental illness and substance misuse: systematic review of comparative studies. *Br J Psychiatry*. 2009;194:491-499.
- Han L, Doran T, Holt RIG, et al. Impact of severe mental illness on healthcare use and health outcomes for people with type 2 diabetes: a longitudinal observational study in England. *Br J Gen Pract*. 2021;71:e565-e573.
- Scheuer SH, Kosjerina V, Lindekilde N, et al. Severe mental illness and the risk of diabetes complications: a Nationwide, register-based cohort study. *J Clin Endocrinol Metab*. 2022;107:e3504-e3514.
- Kurdyak P, Vigod S, Duchon R, Jacob B, Stukel T, Kiran T. Diabetes quality of care and outcomes: comparison of individuals with and without schizophrenia. *Gen Hosp Psychiatry*. 2017;46:7-13.
- Ribe AR, Laursen TM, Sandbaek A, Charles M, Nordentoft M, Vestergaard M. Long-term mortality of persons with severe mental illness and diabetes: a population-based cohort study in Denmark. *Psychol Med*. 2014;44:3097-3107.
- Rønne ST, Zabell V, Joensen LE, Jørgensen R, Gæde PH, Hemmingsen Arnfred SM. Perceptions and experiences of living with coexisting type 2 diabetes and severe mental illness: a scoping review. *Diabet Med*. 2020;dme.14322:1627-1639. doi:10.1111/dme.14322
- Schoepf D, Potluri R, Uppal H, Natalwala A, Narendran P, Heun R. Type-2 diabetes mellitus in schizophrenia: increased prevalence and major risk factor of excess mortality in a naturalistic 7-year follow-up. *Eur Psychiatry J Assoc Eur Psychiatr*. 2012;27:33-42.
- Vinogradova Y, Coupland C, Hippisley-Cox J, Whyte S, Penny C. Effects of severe mental illness on survival of people with diabetes. *Br J Psychiatry*. 2010;197:272-277.
- Firth J, Siddiqi N, Koyanagi A, et al. The lancet psychiatry commission: a blueprint for protecting physical health in people with mental illness. *Lancet Psychiatry*. 2019;6:675-712.
- Gunzler DD, Morris N, Dalton JE, et al. Clinic appointment attendance in adults with serious mental illness and diabetes. *Am J Health Behav*. 2017;41:810-821.

17. Pillinger T et al. Comparative Effects of 18 Antipsychotics on Metabolic Function in Patients with Schizophrenia, Predictors of Metabolic Dysregulation, and Association with Psychopathology: A Systematic Review and Network Meta-Analysis. *Lancet Psychiatry*. 2020;7:65-77.
18. Chen S-R, Chien Y-P, Kang C-M, Jeng C, Chang W-Y. Comparing self-efficacy and self-care behaviours between outpatients with comorbid schizophrenia and type 2 diabetes and outpatients with only type 2 diabetes: self-care in patients with schizophrenia and diabetes. *J Psychiatr Ment Health Nurs*. 2014;21:414-422.
19. Holt RIG, Mitchell AJ. Diabetes mellitus and severe mental illness: mechanisms and clinical implications. *Nat Rev Endocrinol*. 2015;11:79-89.
20. McGinty E, Baller J, Azrin S, Juliano-Bult D, Daumit G. Quality of medical Care for Persons with serious mental illness: a comprehensive review. *Schizophr Res*. 2015;165:227-235.
21. Stenov V, Joensen LE, Knudsen L, Hansen DL, Tapager IW. "Mental health professionals have never mentioned my diabetes, they don't get into that": a qualitative study of support needs in people with severe mental illness and diabetes. *Can J Diabetes*. 2020;S1499267120300526:494-500. doi:10.1016/j.jcjd.2020.02.006
22. Bellass S, Lister J, Kitchen CEW, et al. Living with diabetes alongside a severe mental illness: a qualitative exploration with people with severe mental illness, family members and healthcare staff. *Diabet Med*. 2021;38:e14562.
23. Zabell V, Arnfred SM, Høgsgaard D, Gæde PH, Rønne ST, Jørgensen R. User accounts on received diabetes and mental health care in a Danish setting – an interview study. *Int J Ment Health Nurs*. 2022;31:1446-1456.
24. Zabell V, Rønne ST, Høgsgaard D, Jørgensen R, Gæde PH, Arnfred SM. Interventions involving own treatment choice for people living with coexisting severe mental illness and type 1 or 2 diabetes: a scoping review. *Diabet Med*. 2021;38:1-17.
25. Baker R, Camosso-Stefinovic J, Gillies C, et al. Tailored interventions to address determinants of practice. *Cochrane Database Syst Rev*. 2015;2015:CD005470. doi:10.1002/14651858.CD005470.pub3
26. Michie S, Atkins L, West R. *The Behaviour Change Wheel: A Guide to Designing Interventions*. Silverback Publishing; 2014.
27. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6:6.
28. Booth A. Searching for qualitative research for inclusion in systematic reviews: a structured methodological review. *Syst Rev*. 2016;5:74.
29. Booth A, Sutton A, Papaioannou D. *Systematic approaches to a successful literature review (2nd Ed)*. Sage. 2016.
30. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qual Health Res*. 2012;22:1435-1443.
31. Ayerbe L, Forgnone I, Foguet-Boreu Q, González E, Addo J, Ayis S. Disparities in the management of cardiovascular risk factors in patients with psychiatric disorders: a systematic review and meta-analysis. *Psychol Med*. 2018;48:2693-2701.
32. Grøn AO, Dalsgaard EM, Ribe AR, et al. Improving diabetes care among patients with severe mental illness: a systematic review of the effect of interventions. *Prim Care Diabetes*. 2018;12:289-304.
33. Hennessy S, Cocoman AM. What is the impact of targeted health education for mental health nurses in the provision of physical health care? An integrated literature review. *Issues Ment Health Nurs*. 2018;1-7:700-706. doi:10.1080/01612840.2018.1429509
34. Hultsjö SM, Hjelm K. Organizing care for persons with psychotic disorders and risk of or existing diabetes mellitus type 2: caring for persons with psychosis and DM type 2. *J Psychiatr Ment Health Nurs*. 2012;19:891-902.
35. McBain H, Mulligan K, Haddad M, et al. Self management interventions for type 2 diabetes in adult people with severe mental illness. *Cochrane Database Syst Rev*. 2016;4:CD011361. doi:10.1002/14651858.CD011361.pub2
36. Graham-Rowe E, Lorencatto F, Lawrenson JG, et al. Barriers to and enablers of diabetic retinopathy screening attendance: a systematic review of published and grey literature. *Diabet Med*. 2018;35:1308-1319.
37. McBain H, Mulligan K, Lamontagne-Godwin F, et al. Implementation of recommended type 2 diabetes care for people with severe mental illness – a qualitative exploration with healthcare professionals. *BMC Psychiatry*. 2016;16:222.
38. McBain H, Lamontagne-Godwin F, Haddad M, et al. Management of type 2 diabetes mellitus in people with severe mental illness: an online cross-sectional survey of healthcare professionals. *BMJ Open*. 2018;8:e019400.
39. Graham-Rowe E et al. Barriers and enablers to diabetic retinopathy screening attendance: protocol for a systematic review. *Syst Rev*. 2016;5:134.
40. Shaw RL, Booth A, Sutton AJ, et al. Finding qualitative research: an evaluation of search strategies. *BMC Medical Research Methodology*. 4:5.
41. Critical Appraisal Skills Programme. CASP Qualitative Checklist[Online]. 2018 www.casp-uk.net/casp-tools-checklist/
42. Downes MJ, Brennan ML, Williams HC, Dean RS. Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). *BMJ Open*. 2016;6:e011458.
43. Aromataris, E. & Munn, Z. *JBI Manual for Evidence Synthesis*. JBI, 2020. Available from <https://synthesismanual.jbi.global/10.46658/JBIMES-20-01>
44. Tyndall, J. *The AACODS Checklist*. Flinders University, 2010. Available from: <http://dspace.flinders.edu.au/dspace/>
45. Eldridge SM et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. *Pilot Feasibility Stud*. 2016;2, 64:s40814-016-0105-8.
46. Booth A, Carroll C. How to build up the actionable knowledge base: the role of 'best fit' framework synthesis for studies of improvement in healthcare. *BMJ Qual Saf*. 2015;24:700-708.
47. Srivastava A, Thomson SB. Framework analysis: a qualitative methodology for applied policy research. *JOAAG*. 2009;4(2):72-79.
48. Richardson M, Khouja CL, Sutcliffe K, Thomas J. Using the theoretical domains framework and the behavioural change wheel in an overarching synthesis of systematic reviews. *BMJ Open*. 2019;9:e024950.
49. Booth, A. et al. *Guidance on choosing qualitative evidence synthesis methods for use in health technology assessments of complex interventions [Online]*. 2016. Available from: <https://www.integrate-hta.eu/downloads>

50. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement. Sci.* 2012;7:37.
51. Michie S, Johnston M, Abraham C, et al. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care.* 2005;14:26-33.
52. Cox NS, Oliveira CC, Lahham A, Holland AE. Pulmonary rehabilitation referral and participation are commonly influenced by environment, knowledge, and beliefs about consequences: a systematic review using the theoretical domains framework. *J Physiother.* 2017;63:84-93.
53. Craig LE, McInnes E, Taylor N, et al. Identifying the barriers and enablers for a triage, treatment, and transfer clinical intervention to manage acute stroke patients in the emergency department: a systematic review using the theoretical domains framework (TDF). *Implement. Sci.* 2016;11:157.
54. Glowacki K, Weatherson K, Faulkner G. Barriers and facilitators to health care providers' promotion of physical activity for individuals with mental illness: a scoping review. *Ment Health Phys Act.* 2018;16:152-168. doi:10.1016/j.mhpa.2018.10.006
55. Heslehurst N, Newham J, Maniopoulos G, Fleetwood C, Robalino S, Rankin J. Implementation of pregnancy weight management and obesity guidelines: a meta-synthesis of healthcare professionals' barriers and facilitators using the theoretical domains framework: implementing pregnancy weight guidelines. *Obes Rev.* 2014;15:462-486.
56. Prajapati AR, Dima AL, Clark AB, et al. Mapping of modifiable barriers and facilitators of medication adherence in bipolar disorder to the theoretical domains framework: a systematic review protocol. *BMJ Open.* 2019;9:e026980.
57. Atkins L, Sallis A, Chadborn T, et al. Reducing catheter-associated urinary tract infections: a systematic review of barriers and facilitators and strategic behavioural analysis of interventions. *Implement. Sci.* 2020;15:44.
58. Rosário F et al. Factors influencing the implementation of screening and brief interventions for alcohol use in primary care practices: a systematic review using the COM-B system and theoretical domains framework. *Implement. Sci.* 2021;16:6.
59. Francis JJ, Stockton C, Eccles MP, et al. Evidence-based selection of theories for designing behaviour change interventions: using methods based on theoretical construct domains to understand clinicians' blood transfusion behaviour. *Br J Health Psychol.* 2009;14:625-646.
60. Keyworth C, Epton T, Goldthorpe J, Calam R, Armitage CJ. 'It's difficult, I think it's complicated': health care professionals' barriers and enablers to providing opportunistic behaviour change interventions during routine medical consultations. *Br J Health Psychol.* 2019;bjhp.12368:571-592. doi:10.1111/bjhp.12368
61. Michie S, Pilling S, Garety P, et al. Difficulties implementing a mental health guideline: an exploratory investigation using psychological theory. *Implement. Sci.* 2007;2:8.
62. Presseau J et al. Barriers and facilitators to healthcare professional behaviour change in clinical trials using the theoretical domains framework: a case study of a trial of individualized temperature-reduced haemodialysis. *Trials.* 2017;18:227.
63. Stewart RE, Williams N, Byeon YV, et al. The clinician crowd-sourcing challenge: using participatory design to seed implementation strategies. *Implement. Sci.* 2019;14:63.
64. Alqubaisi M, Tonna A, Strath A, Stewart D. Quantifying behavioural determinants relating to health professional reporting of medication errors: a cross-sectional survey using the theoretical domains framework. *Eur J Clin Pharmacol.* 2016;72:1401-1411.
65. Cottrell E, Roddy E, Rathod T, Porcheret M, Foster NE. What influences general practitioners' use of exercise for patients with chronic knee pain? Results from a national survey. *BMC Fam Pract.* 2016;17:172.
66. Isenor JE, Minard LV, Stewart SA, et al. Identification of the relationship between barriers and facilitators of pharmacist prescribing and self-reported prescribing activity using the theoretical domains framework. *Res Soc Adm Pharm.* 2018;14:784-791.
67. Gray TA, Wilson P, Dumville JC, Cullum NA. What factors influence community wound care in the UK? A focus group study using the theoretical domains framework. *BMJ Open.* 2019;9:e024859.
68. Noyes J, Booth A, Moore G, Flemming K, Tunçalp Ö, Shakibazadeh E. Synthesising quantitative and qualitative evidence to inform guidelines on complex interventions: clarifying the purposes, designs and outlining some methods. *BMJ Glob Health.* 2019;4:e000893.
69. Patey AM, Islam R, Francis JJ, Bryson GL, Grimshaw JM. Anesthesiologists' and surgeons' perceptions about routine pre-operative testing in low-risk patients: application of the Theoretical Domains Framework (TDF) to identify factors that influence physicians' decisions to order pre-operative tests. *Implement. Sci.* 2012;7:52.
70. Adams L. Mental health nurses can play a role in physical health. *Ment Health Today.* 2008;27-29.
71. Shannon, J. *What Are Mental Health nurses' Attitudes towards their Role in Preventing and Treating Type 2 Diabetes Mellitus in People with Severe Mental Illness?* (2017).
72. Chwastiak LA, Luongo M, Russo J, et al. Use of a mental health center collaborative care team to improve diabetes care and outcomes for patients with psychosis. *Psychiatr Serv.* 2018;69:349-352.
73. Wright CA, Osborn DP, Nazareth I, King MB. Prevention of coronary heart disease in people with severe mental illnesses: a qualitative study of patient and professionals' preferences for care. *BMC Psychiatry.* 2006;6:16.
74. Kaufman EA, McDonell MG, Cristofalo MA, Ries RK. Exploring barriers to primary care for patients with severe mental illness: frontline patient and provider accounts. *Issues Ment Health Nurs.* 2012;33:172-180.
75. McDonell MG, Kaufman EA, Srebnik DS, Ciechanowski PS, Ries RK. Barriers to metabolic Care for Adults with serious mental illness: provider perspectives. *Int J Psychiatry Med.* 2011;41:379-387.
76. Wang X, Birch S, Zhu W, Ma H, Embrett M, Meng Q. Coordination of care in the Chinese health care systems: a gap analysis of service delivery from a provider perspective. *BMC Health Serv Res.* 2016;16:571.
77. Newcomer JW. Second-generation (atypical) antipsychotics and metabolic effects: a comprehensive literature review. *CNS Drugs.* 2005;19:1-93.
78. Coblentz P, Leickly E, Chwastiak L, Cristofalo MA, Ries RK, McDonell MG. Schizophrenia and metabolic syndrome in rural

- communities: understanding barriers and improving care. *J Rural Ment Health*. 2015;39:34-45.
79. Papachristou Nadal I, Clifton C, Chamley M, Winkley K, Gaughran F, Ismail K. Exploring healthcare professionals' perspectives of barriers and facilitators to supporting people with severe mental illness and type 2 diabetes mellitus. *Health Soc Care Community*. 2019;hsc.12903:690-697. doi:10.1111/hsc.12903
 80. Parameswaran SG, Chang C, Swenson AK, Shumway M, Olsson M, Mangurian CV. Roles in and barriers to metabolic screening for people taking antipsychotic medications: a survey of psychiatrists. *Schizophr Res*. 2013;143:395-396.
 81. Aloudah NM, Almanea H, Alotaibi K, Al Rubeaan KA. Quality of diabetes care among patients with schizophrenia. A mixed-methods study. *Explor Res Clin Soc Pharm*. 2021;4:100070.
 82. Mangurian C, Giwa A, Brosey E, et al. Opinions of primary care clinicians and psychiatrists on monitoring the metabolic effects of antipsychotics. *J Am Board Fam Med*. 2019;32:418-423.
 83. Lawless ME, Kanuch SW, Martin S, et al. A nursing approach to self-management education for individuals with mental illness and diabetes. *Diabetes Spectr*. 2016;29:24-31.
 84. Vaez K, Diegel-Vacek L, Ryan C, Martyn-Nemeth P. Evaluating diabetes care for patients with serious mental illness using the chronic care model. *Health Serv Res Manag Epidemiol*. 2017;4: 1-7.
 85. Nadal IP, Clifton C, Tolani E, et al. Eliciting the mechanisms of action of care navigators in the management of type 2 diabetes in people with severe mental illness: a qualitative study. *Diabet Med*. 2022;39:e14894.
 86. Vancampfort D, Watkins A, Ward PB, et al. Barriers, attitudes, confidence, and knowledge of nurses regarding metabolic health screening and intervention in people with mental illness: a pilot study from Uganda. *Afr Health Sci*. 2019;19:2546-2554.
 87. Hultsjö. Mental healthcare staff's knowledge and experiences of diabetes care for persons with psychosis – a qualitative interview study. *Prim Health Care Res Dev*. 2013;14:281-292.
 88. Happell B, Hodgetts D, Stanton R, Millar F, Platania Phung C, Scott D. Lessons learned from the trial of a cardiometabolic health nurse: lessons learned from the trial of a cardiometabolic health nurse. *Perspect Psychiatr Care*. 2015;51:268-276.
 89. Happell B, Scott D, Platania-Phung C. Nurse views on the cardiometabolic health nurse as an approach to improving the physical health of people with serious mental illness in Australia: cardiometabolic health nurse role. *Int J Ment Health Nurs*. 2013;22:418-429.
 90. Lowndes R, Angus J, Peter E. Diabetes care and mental illness: constraining elements to physical activity and social participation in a residential care facility. *Can J Diabetes*. 2013;37:220-225.
 91. Kahn LS, Fox CH, Carrington J, et al. Telephonic nurse case management for patients with diabetes and mental illnesses: a qualitative perspective. *Chronic Illn*. 2009;5:257-267.
 92. Hemingway S, Stephenson J, Trotter F, Clifton A, Holdich P. Increasing the health literacy of learning disability and mental health nurses in physical care skills: a pre and post-test evaluation of a workshop on diabetes care. *Nurse Educ Pract*. 2015;15:30-37.
 93. Nash M. Mental health nurses' diabetes care skills – a training needs analysis. *Br J Nurs*. 2009;18:626-630.
 94. Cimo A, Dewa CS. Tailoring diabetes education to meet the needs of adults with type 2 diabetes and mental illness: client and health-care provider perspectives from an exploratory pilot study. *Can J Diabetes*. 2019;43:421-428.e3.
 95. Hemingway S, Trotter F, Stephenson J, Holdich P. Diabetes: increasing the knowledge base of mental health nurses. *Br J Nurs*. 2013;22:991-996.
 96. Wynn S. Improving the quality of care of veterans with diabetes: a simulation intervention for psychiatric nurses. *J Psychosoc Nurs Ment Health Serv*. 2011;49:38-45.
 97. Hyland, B., Judd, F., Davidson, S., Jolley, D. & Hocking, B. Case managers' attitudes to the physical health of their patients. 5.
 98. Priebe S, McCabe R, Bullenkamp J, et al. Structured patient - clinician communication and 1-year outcome in community mental healthcare: cluster randomised controlled trial. *Br J Psychiatry*. 2007;191:420-426.
 99. Duffy MEK, Ganster D, Pagon M. Social undermining in the workplace. *Acad Manage J*. 2002;45:331-351.
 100. Kim S, Bochatay N, Relyea-Chew A, et al. Individual, interpersonal, and organisational factors of healthcare conflict: a scoping review. *J Interprof Care*. 2017;31:282-290.
 101. Nash M. Mental health service users' experiences of diabetes care by mental health nurses: an exploratory study: physical health and mental health. *J Psychiatr Ment Health Nurs*. 2014;21:715-723.
 102. Blixen CE, Kanuch S, Perzynski AT, Thomas C, Dawson NV, Sajatovic M. Barriers to self-management of serious mental illness and diabetes. *Am J Health Behav*. 2016;40:194-204.
 103. Kilbourne AM et al. Quality of general medical care among patients with serious mental illness. *Does Colocation of Services Matter?* 2011;62:7.
 104. Mulligan K, McBain H, Lamontagne-Godwin F, et al. Barriers and enablers of type 2 diabetes self-management in people with severe mental illness. *Health Expect*. 2017;20:1020-1030.
 105. Miller DT, Ross M. Self-serving biases in the attribution of causality: fact or fiction? *Psychol Bull*. 1975;82:213-225.
 106. Zuckerman M. Attribution of success and failure revisited, or: the motivational bias is alive and well in attribution theory. *J Pers*. 1979;47:245-287.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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