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ORIGINAL ARTICLE

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Barriers and enablers to optimal diabetes care for adults with learning disabilities: A systematic review

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Accessible Summary

- Adults with learning disabilities and diabetes are more likely to have health problems than people with diabetes who do not have learning disabilities.
- This research had two aims. One was to find out what stops adults with learning disabilities from getting help with their diabetes. The other was to find out what things help them get the best care for their diabetes.
- We found 12 things that stop adults with learning disabilities from getting good care for their diabetes and 14 things that help them get good care.
- The findings from this research can be used to improve the lives of adults living with learning disabilities and diabetes.

Abstract

Background: Individuals with diabetes and a learning disability have poorer health outcomes than those without a learning disability. In the UK, the health inequalities faced by people with learning disabilities are often the result of barriers they face in accessing timely, appropriate and effective health care. The aim of the study was to review relevant literature to identify the barriers and enablers to optimal diabetes care for adults with learning disabilities.

Methods: Systematic review methodology was used to answer the research question: What barriers and enablers to optimal diabetes care exist for adults with learning disabilities? This review is reported according to PRISMA guidelines. Key databases were searched using relevant terms. Included studies were synthesised using thematic analysis and were quality appraised.

Findings: This review identified 12 barriers to optimal diabetes care for adults with learning disabilities and 14 enablers to optimal care from 10 diverse publications. *Low level of diabetes knowledge and understanding* and *systems that do not allow reasonable adjustments* were the barriers considered to have the greatest reliability. The enabler identified to have the highest reliability was *person-centred planning and reasonable adjustments*.

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Conclusion: This work highlights key actions that can be undertaken to address inequalities in diabetes care for people with learning disabilities. With additional research in this field, further progress can be made to improve the lives of those adults living with learning disabilities and diabetes.

1 | INTRODUCTION

Individuals with learning disabilities have poorer health outcomes than those without learning disabilities (NHS Digital, 2020). In the UK, the health inequalities faced by people with learning disabilities are often the result of barriers they face in accessing timely, appropriate and effective health care (Emerson & Baines, 2011). This inequality applies to specific health conditions. For example, evidence shows that diabetes management for individuals with a learning disability and a diagnosis of diabetes are poor (Shireman et al., 2010). The ongoing COVID-19 pandemic shines a spotlight on these inequalities. Individuals with learning disabilities were estimated to have had a death rate from COVID-19 between 4.1 and 6.3 times higher than the general population in England in Spring 2020 (UK Government, 2020). In addition, those with diabetes who acquire COVID-19 have a greater risk of severe illness (Muniyappa & Gubbi, 2020).

Diabetes mellitus is a metabolic disorder that results in abnormally high blood sugar levels (hyperglycaemia). There are two main types of diabetes mellitus: type 1 or insulin-dependent diabetes mellitus and type 2 or non-insulin-dependent diabetes mellitus. Insulin is required to allow the human body's cells to absorb and use sugar (glucose). Type 1 diabetes is characterised by individuals being unable to produce insulin at all, whereas type 2 diabetes produce insulin, but this is less effective and eventually leads to reduced insulin production (American Diabetes Association, 2010). Type 2 diabetes is the more prevalent of the two. Between 85 and 95 per cent of diabetics have type 2 diabetes, and 8 per cent of diabetics have type 1 diabetes (Diabetes UK, 2020).

Optimal diabetes management is required to prevent chronic hyperglycaemia and long-term complications. Potential complications include kidney damage leading to renal failure; peripheral neuropathy with a high risk of foot ulcers and amputations; and autonomic neuropathy causing cardiovascular, genitourinary and gastrointestinal symptoms. Patients with poorly controlled diabetes have an increased incidence of cardiovascular and cerebrovascular disease (American Diabetes Association, 2010).

Diabetes is more prevalent in people with learning disabilities than in the general population (McVilly et al., 2014). For those with learning disabilities, the estimated prevalence is between 9 and 11% (compared with 4%–5% in the general population) (Emerson, 2011; MacRae et al., 2015). Individuals with learning disabilities have a higher rate of hospital admission resulting from diabetes-related conditions that are usually managed in an outpatient or community setting (Dunn et al., 2018). The aim of this study was to review relevant literature to identify the barriers and enablers to optimal diabetes care for adults with learning disabilities.

2 | METHODS

Systematic review methodology was used to answer the research question: What barriers and enablers to optimal diabetes care exist for adults with learning disabilities? The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework guided the reporting of this review (Moher et al., 2010). Prior to commencing this research, the International Prospective Register of Systematic Reviews (PROSPERO) and the Cochrane Library were searched to ensure no similar reviews had previously been completed. The review protocol was not registered.

2.1 | Search strategy

Searches were conducted using electronic databases (for peer-reviewed and grey literature), hand searching of reference list citations and search engines for policy documents. The population, interest (phenomenon of) and evaluation (PIE) study design framework was used to formulate the review question and identify search terms (Table 1) (Methley et al., 2014). The search strategy used free-text synonyms for "learning disabilities" such as "intellectual impairment" and "cognitive deficit" (Appendix A). These synonyms were obtained from a 2017 systematic review examining a similar population (Robertson et al., 2018). Using text words, six electronic databases, CINAHL, MEDLINE, ASSIA, PsycINFO, The Cochrane Library and OpenGrey, were searched from their inception to August 2019. The search was revised until it was sensitive enough to capture at least all the studies identified in initial pilot searches.

TABLE 1 Population, interest and evaluation (PIE) study design framework components

PIE study design framework for the research question	
Population	Adults with learning disabilities and diabetes mellitus
Interest (phenomenon of)	Optimal diabetes care
Evaluation	What are the barriers and enablers to high-quality diabetes care for this group?

2.2 | Selection criteria

All publications that met the following criteria were included: (i) literature related to adults with a learning disability (those aged 18 years old and over); (ii) literature related to formal or informal caregivers of individuals with a learning disability; (iii) any type of publication (including peer-reviewed articles and grey literature); and (iv) all types of study design that include some form of qualitative data collection. Publications that met the following criteria were excluded from the review: (i) article not available in the English Language (due to the time constraints of this project); (ii) population described in the article do not have learning disabilities; (iii) no reference to management of diabetes; and (iv) no enabler or barrier to optimal diabetes care identified.

All the identified citations were imported into Mendeley, and duplicates were removed. Articles were screened at the title and abstract level, and the full text of potential articles was retrieved and assessed for inclusion based on the eligibility criteria.

2.3 | Quality assessment

Studies were evaluated using an adapted version of the Critical Appraisal Skills Programme's (CASP) tool for appraising qualitative research (CASP, 2013). This adapted version of the CASP tool has been augmented with four domains from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (The Joanna Briggs Institute, 2014). The adapted CASP tool was developed by Verboom et al. (2016) to include items that consider descriptive, interpretive and theoretical validity. This tool, labelled the "CASP instrument," is designed to aid interpretation of review findings by assigning an overall score of methodological quality (either "high quality," "moderate quality" or "low quality"). A copy of the CASP instrument template is included as an additional file (Appendix B).

2.4 | Data analysis & synthesis

Qualitative data were extracted from the identified studies, and thematic analysis was carried out using the methods described by Thomas and Harden (2008). A judgement was made on the reliability of each identified theme. A reliability index based on that used by Bach-Mortensen et al. (2018) was used to combine the quality of each study that contributed to the identified themes, and the number of times each theme was represented in the included studies. Reviewer 1 (BH) conducted the literature searches. If any concerns were identified, these were discussed with Reviewer 2 (AL). Likewise, the themes were identified by Reviewer 1 (BH) and double-checked by Reviewer 2 (AL).

These themes were evaluated through narrative synthesis, and the identified themes were applied to the social–ecological model to assist evaluation. The social–ecological model is a theory-based framework that uses an ecological approach to identify factors (such as barriers and enablers) that occur at multiple social and ecological levels (demonstrated in Figure 1) (Ohri-Vachaspati et al., 2015).

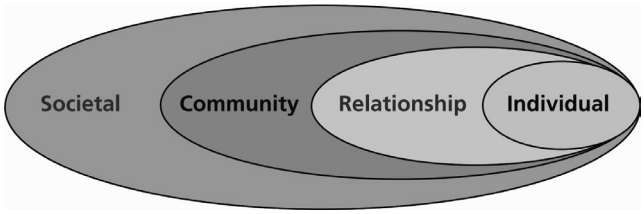

FIGURE 1 A diagram demonstrating the Social-Ecological Model (Ohri-Vachaspati et al., 2015).

It was anticipated that optimal diabetes care for those with learning disabilities is impaired and facilitated due to the interplay of individual, relationship, cultural, social and environmental factors. Through application of the social–ecological model, this study categorises these factors and evaluates how they may interrelate.

3 | FINDINGS

6255 articles were identified through database searches, of which 4464 remained after duplicates were removed. 4369 articles were excluded by title alone, and a further 62 were excluded after review of the article abstracts. 33 articles received a full-text review. At this stage, articles were excluded because no barriers or enablers were identified (n = 6), there was no reference to the impact of diabetes care (n = 16), and duplicate studies were identified (n = 3). Eight studies remained, and an additional two publications were identified from hand searching of grey literature (via searches of websites or review of reference lists). These results are summarised in the PRISMA diagram in Figure 2.

3.1 | Characteristics of included publications

The ten publications in this review include eight reports of research studies and two guidance documents identified from the grey literature. All references relate to work undertaken in high-income countries and have been published within the last nine years.

Of the eight research studies, six studies use a qualitative study design and semi-structured interviews for data collection methods. These qualitative studies included between 4 and 29 participants. The settings of each study vary, but include a number of learning disability services and residential locations (Brown et al., 2017; Cardol et al., 2012a; Cardol et al., 2012b; Dysch et al., 2012; Hale et al., 2011; Maine et al., 2017).

One research study (Maine et al., 2019) is a process evaluation that uses the updated Medical Research Council guidelines

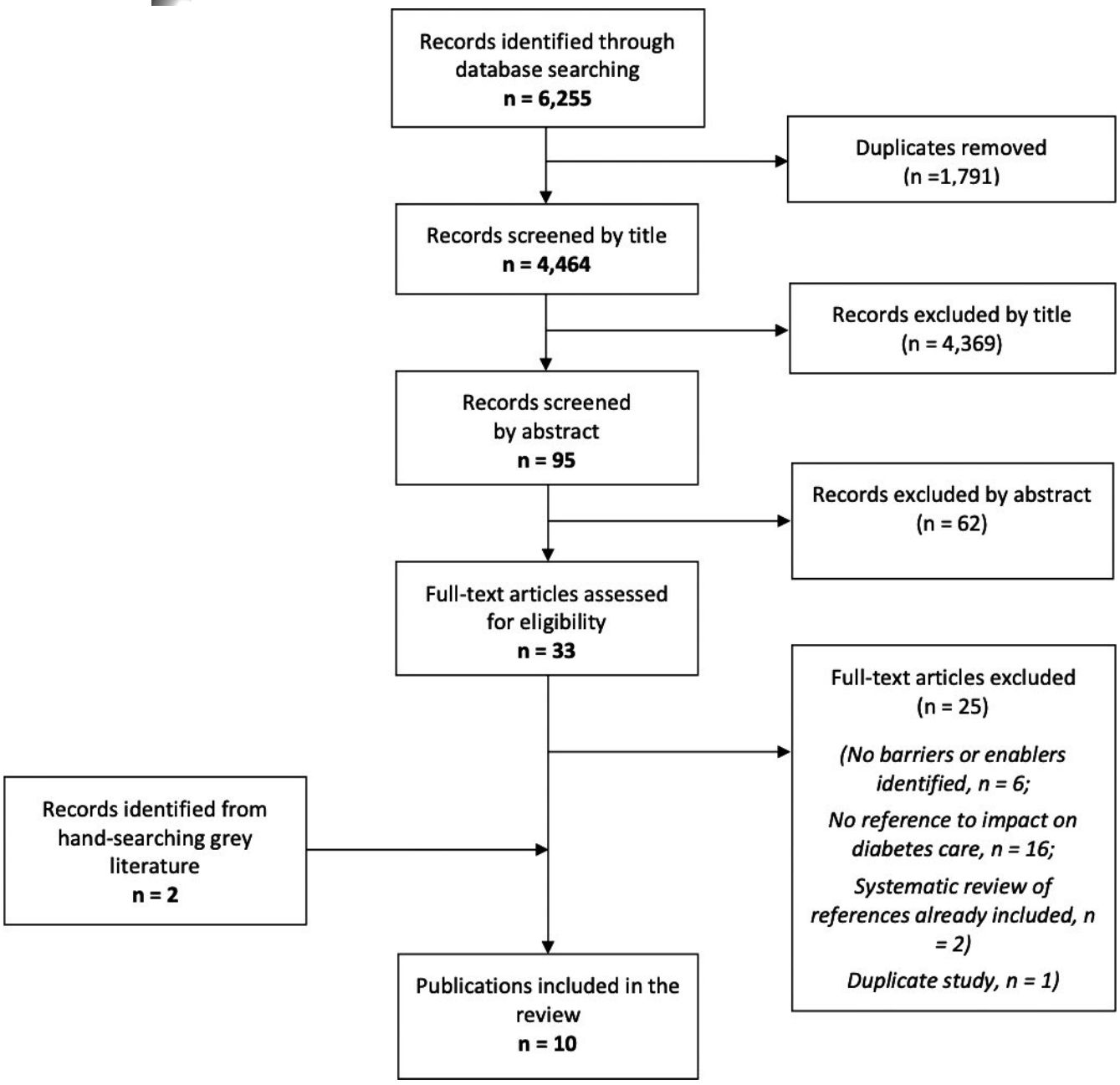

FIGURE 2 PRISMA Flowchart of the study selection process

for evaluating complex interventions in health. This included focus groups with participants. The final research study (Taggart et al., 2018) is a two-arm, individually randomised, pilot superiority trial undertaken to assess the feasibility of an intervention.

A report produced by a diabetes charity, Diabetes UK, summarises how individual services can make reasonable adjustments to improve the care of diabetes for adults with learning disabilities and draws advice from published research (Diabetes UK, 2018). NHS RightCare (2017) has produced a health policy document that is included in this review. They outline how commissioners and providers of diabetes services can enable reasonable adjustments for those with a learning disability. Further detail relating to each of the included studies can be found in Tables 2 and 3.

3.2 | Quality appraisal

The CASP instrument (Appendix B) was used to critically appraise the eight research studies included in this narrative review. The two guidance documents from Diabetes UK (2018) and NHS RightCare (2017) were not quality-assessed as they did not include any qualitative research methodology or findings.

The 3 studies authored by Brown et al. (2017), Dysch et al. (2012) and Maine et al. (2017) were considered to be of high quality. Cardol et al. (2012a), Cardol et al. (2012b) and Hale et al. (2011) were lacking in detail regarding the relationships between the researchers and participants, and their choice of data analysis. Therefore, these studies were assessed as medium quality.

TABLE 2 Publications included in this review

Authors	Publication title	Journal of publication	Year of publication
Brown M, Taggart L, Karatzias T, Truesdale M, Walley R, Northway R, Macrae S, Carey M, Davies M	Improving diabetes care for people with intellectual disabilities: a qualitative study exploring the perceptions and experiences of professionals in diabetes and intellectual disability services	Journal of Intellectual Disability Research	2017
Cardol M, Rijken M, van Schrojenstein Lantman-de Valk H	People with mild to moderate intellectual disability talking about their diabetes and how they manage	Journal of Intellectual Disability Research	2012a
Cardol M, Rijken M, van Schrojenstein Lantman-de Valk H	Attitudes and dilemmas of caregivers supporting people with intellectual disabilities who have diabetes	Patient Education and Counseling	2012b
Diabetes UK	How to… Make reasonable adjustments to diabetes care for adults with a learning disability	*Not applicable*	2018
Dysch C, Chung MC, Fox J	How do people with intellectual disabilities and diabetes experience and perceive their illness?	Journal of Applied Research in Intellectual Disabilities	2012
Hale LA, Trip HT, Whitehead L, Conder J	Self-management abilities of diabetes in people with an intellectual disability living in New Zealand	Journal of Policy and Practice in Intellectual Disabilities	2011
Maine A, Dickson A, Truesdale M, Brown M	An application of Bandura's "Four Sources of Self-Efficacy" to the self-management of type 2 diabetes in people with intellectual disability: An inductive and deductive thematic analysis	Research in Developmental Disabilities	2017
Maine A, Brown MJ, Dickson A, Truesdale M	Pilot feasibility study of the Walking Away from Diabetes programme for adults with intellectual disabilities in two further education colleges: Process evaluation findings	Journal of Applied Research in Intellectual Disabilities	2019
NHS RightCare	NHS RightCare Pathway: Diabetes - Reasonable adjustments for people with a learning disability who have diabetes	*Not applicable*	2017
Taggart L, Truesdale M, Carey ME, Martin-Stacey L, Scott J, Bunting B, Coates V, Brown M, Karatzias T, Northway R, Clarke JM	Pilot feasibility study examining a structured self-management diabetes education programme, DESMOND-ID, targeting HbA1c in adults with intellectual disabilities	Diabetic Medicine	2018

The articles by Maine et al. (2019) and Taggart et al. (2018) both described larger research studies, with qualitative methods comprising a small part of the process evaluations undertaken alongside testing of novel interventions. This meant that the qualitative exploration was not the main focus of either study. In view of this, Maine et al. (2019) and Taggart et al. (2018) were considered to be low-quality studies in terms of qualitative research.

A summary of the quality assessment results is shown below in Table 4.

3.3 | Thematic analysis

The synthesis identified 12 unique factors operating as barriers across the 10 publications. The barrier reported by the most publications was "low level of diabetes knowledge and understanding." 14 unique factors operating as enablers to optimal diabetes care were identified from the 10 publications. The enabler reported by the most publications was "person-centred planning and reasonable adjustments." These results are presented in Tables 5 and 6.

The identified barriers and enablers were grouped together into themes and allocated to the appropriate level of the social–ecological model. For both barriers and enablers, the identified factors were spread across all four levels of the model.

A judgement was then made on the reliability of each theme to appreciate the consistency between the identified barriers and enablers and the quality of the studies reporting them (see Key for reliability rating in Tables 5 and Table 6) (Bach-Mortensen et al., 2018).

Two barriers are considered to have high reliability as they have been supported by high-quality studies. The majority were recognised as having medium reliability with only "independent living" considered to have low reliability.

TABLE 3 Characteristics of included publications

Author	Year	Country of origin	Study design	Study setting	Number of participants	Population	Interest (phenomenon of)	Evaluation
Brown et al.	2017	United Kingdom	Qualitative study using semi-structured interviews	Specialist learning disability health services	29	Professionals working in diabetes and learning disability services	Perceptions and experiences of health and social care practitioners caring for people with learning disabilities who have diabetes	Thematic analysis and narrative synthesis
Cardol et al.	2012 (Apr)	The Netherlands	Qualitative study using semi-structured interviews	Participants' homes (including residential care facilities, community housing)	17	Adults with a mild or moderate learning disability and diabetes	Adults with a mild or moderate learning disability's perception of diabetes. Factors are related to the self-management of the disease	Thematic analysis and narrative synthesis
Cardol et al.	2012 (Jun)	The Netherlands	Qualitative study using semi-structured interviews	Community housing locations	13	Professional caregivers supporting adults with learning disabilities in communal living arrangements	How professional caregivers in communal living arrangements support people with a mild or moderate learning disability and diabetes	Thematic analysis and narrative synthesis
Diabetes UK	2018	United Kingdom	No study design—guidance document only	*Not applicable*	*Not applicable*	*Not applicable*	Reasonable adjustments to diabetes care for adults with a learning disability	*Not applicable*
Dysch et al.	2012	United Kingdom	Qualitative study using semi-structured interviews	Community learning disabilities service	4	Adults with a mild learning disability and diabetes	Adults with learning disabilities and diabetes experiences and perceptions of their illness	Interpretative phenomenological analysis
Hale et al.	2011	New Zealand	Qualitative study using semi-structured interviews	Participants' homes	14	Adults with a mild or moderate learning disability and diabetes	The knowledge and understanding of diabetes held by a group of adults with learning disabilities and diabetes	General inductive approach and narrative synthesis
Maine et al.	2017	United Kingdom	Qualitative study using semi-structured interviews	Day centres or participant's homes	10	Adults with learning disabilities and diabetes	People with learning disabilities' experiences and perceptions of self-managing diabetes	Thematic analysis and narrative synthesis

(Continues)

TABLE 3 (Continued)

Author	Year	Country of origin	Study design	Study setting	Number of participants	Population	Interest (phenomenon of)	Evaluation
Maine et al.	2019	United Kingdom	Process evaluation of intervention implementation that included focus groups with participants	Further education (FE) colleges	48	Students with learning disabilities and FE college lecturers	The feasibility of implementing an educational programme adapted for people with intellectual disabilities targeting ongoing diabetes self-management	Process evaluation
NHS RightCare	2017	United Kingdom	No study design—guidance document only	*Not applicable*	*Not applicable*	*Not applicable*	Reasonable adjustments to diabetes care for adults with a learning disability	*Not applicable*
Taggart et al.	2018	United Kingdom	Randomised controlled trial.	Community learning disability services	39	Adults with a mild or moderate learning disability and type 2 diabetes	Consider whether it is feasible to identify, recruit, consent and randomise adults with intellectual disabilities to an intervention or control group. Identify whether a multi-session education programme is acceptable and feasible to deliver	Process evaluation and statistical analysis

The identified enablers to optimal diabetes care were grouped into 14 separate themes. One enabler had a high reliability score, and two enablers were considered to have low reliability. Two facilitating factors, *training for staff and caregivers* and *social barriers addressed*, did not receive reliability scores. This was because they were extracted from health policy documents, which were not appropriate for quality assessment due to the lack of research study design. No reliability judgement could be made due to the lack of quality assessment. Much like the identified barriers, the majority of enablers were considered to have medium reliability.

4 | DISCUSSION

This review has identified 12 barriers to optimal diabetes care for adults with learning disabilities and 14 enablers to optimal care from 10 diverse publications. Where possible, quality assessment processes have informed a judgement on the reliability of each identified barrier and enabler. Due to the limited amount of literature available on this topic, the conclusions drawn from this work may not be generalisable to the wider population of adults with learning disabilities. However, the conclusions drawn in this discussion are representative of the included studies.

This review highlights a number of opportunities to improve diabetes care for those with learning disabilities, either by addressing the identified barriers, or by introducing the identified enablers. Categorisation through the social–ecological model indicates the level within the health and social care system where intervention would be most appropriate. The literature suggests that increasing the level of diabetes knowledge and understanding for people with learning disabilities will improve the likelihood of optimal diabetes care. Structured education programmes provide an opportunity to increase adults with learning disabilities' understanding of diabetes. However, these education programmes need to be adapted to the needs of this population.

In the UK, the general population are encouraged to attend one of two programmes specific to their diabetes type. DAFNE (Dose Adjustment for Normal Eating) is provided for type 1 diabetics and DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed) for type 2 diabetics (Speight et al., 2010). Studies in this review have suggested these courses are not appropriate to the learning needs of adults with learning disabilities. In view of this, the DESMOND-ID programme (evaluated by Taggart et al., [2018]) is a welcome development. The amended educational programme provides additional sessions for caregivers and advises how they can support those with learning disabilities and diabetes. The development and testing of adapted programmes such as DESMOND-ID provide an opportunity to improve diabetes care for adults with learning disabilities.

It is reassuring to recognise the existence of health policy reports from NHS RightCare (2017) and Diabetes UK (2018) in this review. This policy work by two key healthcare organisations demonstrates an important step to person-centred reasonable

TABLE 4 Quality assessment of included publications

Study	Quality assessment
Brown et al. (2017)	High
Cardol et al. (2012a)	Medium
Cardol et al. (2012b)	Medium
Diabetes UK (2018)	*Not applicable*
Dysch et al. (2012)	High
Hale et al. (2011)	Medium
Maine A et al. (2017)	High
Maine et al. (2019)	Low
NHS RightCare (2017)	*Not applicable*
Taggart et al. (2018)	Low

capacity or opportunity for reasonable adjustments. This may be due to a large amount of pressure on services, reduction in service budgets or restructure of specialist and community services. Alternatively, there may be a lack of awareness of the need to make these adjustments. This finding highlights an urgent need for further system change to recognise and allow reasonable adjustments for adults with learning disabilities living with diabetes.

It is important to consider the barriers and enablers described in the context of the current global situation regarding COVID-19. Public Health England analysis shows that people with learning disabilities are estimated to have had a death rate from COVID-19 between 4.1 and 6.3 times higher than those without (UK Government, 2020). The risk is greater for specific learning disabilities, with studies estimating a fourfold increased risk of COVID-19-related hospitalisation is four times greater, and COVID-19-related death is 10 times greater in people with Down syndrome (Clift et al., 2020). Another study estimates the risk of COVID-19-related death is over 32 times higher in females with Down syndrome (Clift, Coupland, Keogh, Diaz-Ordaz, et al., 2020). As previously discussed, individuals with learning disabilities are known to have poor physical health, including higher rates of obesity and diabetes, putting them at increased risk of severe illness and death from COVID-19 (Emerson et al., 2016). This clearly demonstrates the importance of optimal diabetes management and the wider impacts of barriers to accessing timely, appropriate and effective health care for chronic health conditions.

TABLE 5 Barriers to optimal diabetes care identified from publications

Level of social–ecological Model	Theme	Number of times cited	Reliability of findings
Individual	Low level of diabetes knowledge and understanding	7	High reliability
	Multiple other health conditions	3	Medium reliability
Relationship	Formal or informal caregivers lack diabetes knowledge and understanding	3	Medium reliability
	Caregivers do not encourage individual autonomy	2	Medium reliability
Community	Communal living arrangements	3	Medium reliability
	Independent living	1	Low reliability
	Felt stigma	1	Medium reliability
Societal	Lack of accessible information	2	Medium reliability
	Systems do not allow reasonable adjustments	2	High reliability
	Compromise on ideal diabetes management	1	Medium reliability
	Inappropriate structured self-management programmes	1	Medium reliability
	Inconsistent and disjointed care plans	1	Medium reliability
Key for reliability ratings[a]			
High reliability	The identified barrier is supported by several studies of medium quality and one high-quality study, or the study is supported by at least two high-quality studies.		
Medium reliability	The identified factor is supported from several medium-quality studies, or the factor is identified from at least one high-quality study.		
Low reliability	The identified factor is supported by several low-quality studies and/or one medium-quality study.		

[a]It should be noted that the confidence in these findings (reliability) does not relate to the generalisability of the findings.

adjustments being embedded within services across the UK. A further opportunity to improve care is the widespread uptake of the reasonable adjustments presented in both reports. Another finding from this review was the need for caregiver training and patient autonomy for diabetes self-management. Provision of staff and caregiver training could address both these factors. This could be provided as part of structured education programmes, or as part of a separate educational package targeting professionals and caregivers.

One barrier that an integrated healthcare system may be able to address is the finding that current systems do not provide the

TABLE 6 Enablers to optimal diabetes care identified from publications

Level of social–ecological model	Theme	Number of times cited	Reliability of findings
Individual	Motivation to self-manage condition	2	Medium reliability
	High level of diabetes knowledge and understanding	2	Medium reliability
Relationship	Presence of formal or informal caregivers	3	Medium reliability
	Close relatives with diabetes	2	Medium reliability
	Peer support	2	Medium reliability
	Autonomy facilitated by caregiver	2	Medium reliability
	Consistent approach from caregivers	1	Low reliability
Community	Living in residential care	1	Low reliability
	Social barriers addressed	1	*Not applicable*
Societal	Person-centred planning and reasonable adjustments	5	High reliability
	Adapted support programmes	4	Medium reliability
	Collaborative approaches	3	Medium reliability
	Accessible information	3	Medium reliability
	Training for staff and caregivers	2	*Not applicable*
Key for reliability ratings[a]			
High reliability	The identified barrier is supported by several studies of medium quality and one high-quality study, or the study is supported by at least two high-quality studies.		
Medium reliability	The identified factor is supported from several medium-quality studies, or the factor is identified from at least one high-quality study.		
Low reliability	The identified factor is supported by several low-quality studies and/or one medium-quality study.		

[a]It should be noted that the confidence in these findings (reliability) does not relate to the generalisability of the findings.

4.1 | Strengths of the study

A robust search strategy was developed, tested, amended and run as part of this research project. The systematic stages of each electronic database search and the detail provided in this manuscript ensure transparency and reproducibility of the searches. This research study collates a wide range of qualitative research studies and grey literature on an important public health issue. There are currently no narrative reviews available that have examined both study designs and relevant grey literature on this topic. The recommendations from this study can therefore be used by healthcare providers, commissioners and policymakers to improve diabetes care for adults with learning disabilities.

4.2 | Limitations of the study

Publication bias may exist in this review because the majority of searches were undertaken in electronic databases of peer-reviewed journals. There is increasing awareness that studies that include positive or interesting findings are more likely to be published, and indexed higher in these electronic databases. To mitigate this limitation, grey literature searches were also conducted using search engines. The review included publications that were health policy reports. The benefit of this is that any relevant barriers or enablers could be included in the findings from this work. However, as two of these studies did not include a study design it meant that quality appraisal could not be applied to these publications. This meant that no judgement could be made regarding the reliability of the extracted themes from those reports.

4.3 | Recommendations for future research

Although the findings from this narrative review allow identification of a number of opportunities for improving diabetes care, it is important to note the identified barriers and enablers have been selected from studies that include disparate study populations. These barriers and enablers provide important information for public health policy, but may not be generalisable to the all adults with learning disabilities. There are currently few high-quality qualitative studies that specifically review the barriers and enablers to optimal diabetes care for adults with learning disabilities. In order to provide more concrete recommendations to service providers and policymakers, there is a need for further research. Future studies require rigorous methods that draw upon a random sample of adults with mild, moderate and severe learning disabilities. This additional research should include detail regarding study recruitment and the relationships between the researchers and the research participants. In addition, further research should be undertaken to test the effectiveness of

the adapted educational programmes for adults with learning disabilities and diabetes.

4.4 | Policy and practice implications

Although there is limited high-quality literature on this topic, this narrative review provides information on a number of key barriers and enablers to optimal diabetes care for adults with learning disabilities. From these themes, initial recommendations for commissioners and service providers can be made. They should consider introducing structured educational programmes that have been adapted for adults with learning disabilities and diabetes. They should create capacity in healthcare systems to allow person-centred reasonable adjustments for adults with learning disabilities and diabetes. Service providers should be encouraged to make reasonable adjustments for adults with learning disabilities. Accessible information about diabetes that is appropriate should be provided for adults with learning disabilities. Educational programmes need to be introduced for healthcare professionals and caregivers supporting those with learning disabilities and diabetes.

5 | CONCLUSION

This narrative review sought to identify the barriers and enablers to optimal diabetes care that exist for adults with learning disabilities. Using a robust search strategy, ten publications were identified. From this literature, 12 barriers and 14 enablers to optimal diabetes care for adults with learning disabilities were identified. The lack of high-quality literature means that no judgement on the generalisability of the identified barriers and enablers can be made. However, this work highlights key actions that can be undertaken to address inequalities in diabetes care for people with learning disabilities. With additional research in this field, further progress can be made to improve the lives of those adults living with learning disabilities and diabetes.

CONFLICT OF INTEREST

The authors report no potential conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX A

EXAMPLE SEARCH STRATEGY

MEDLINE (via Ovid) Search strategy

1. exp Learning Disorders/
2. .(Learning adj2 (disorder* or disab* or defici* or difficult* or impair*)).tw.
3. exp Intellectual Disability/
4. .(Intellectual* adj2 (disorder* or disab* or defici* or difficult* or impair*)).tw.
5. exp Developmental Disabilities/
6. .(Developmental* adj2 (disorder* or disab* or defici* or difficult* or impair*)).tw.
7. exp Cognition disorders/
8. .(Cognit* adj2 (disorder* or disab* or defici* or difficult* or impair*)).tw.
9. Special need*.tw.
10. Special education*.tw.
11. Mental* deficien*.tw.
12. exp Diabetes Mellitus/
13. exp Diabetes Complications/
14. exp Diabetes Mellitus, Type 1/
15. exp Diabetes Mellitus, Type 2/
16. diabet*.tw.
17. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
18. 12 or 13 or 14 or 15 or 16
19. 17 and 18
20. limit 19 to humans
21. limit 20 to "all adult (19 plus years)"

APPENDIX B

ADAPTED CASP AND JBI CHECKLIST—THE "CASP INSTRUMENT"

Reviewer: _____.

Date: _____.

Study: _____.

Checklist questions	Yes	No	Not applicable	Unclear
Was there a clear statement of the aims?				
Is the qualitative methodology appropriate?				
Was the research design appropriate to address the research aims?				
Was the recruitment strategy/sampling appropriate to the aims of the research?				
Was the data collected in a way that addressed to research issue?				
Has the relationship between researcher and participant been adequately considered?				
Have ethical issue been taken into consideration?				
Was the data analysis significantly rigorous?				
Is there a clear statement of finding?				
Do the conclusion drawn in the research report flows from the analysis and interpretation of the data?				

Quality (circle): High Medium Low

Rationale and comment: _____