

## RESEARCH ARTICLE

# Using mixed methods to explore diabetes care in a medium-secure setting in England: A case study

Tammi Walker<sup>1</sup>  | Amanda Edmondson<sup>2</sup> | Fleur Riley<sup>1</sup> | Mark Harper<sup>2</sup> | Mike Lucock<sup>2</sup> | Nat Wright<sup>2</sup>

<sup>1</sup>Psychology, Teesside University, Middlesbrough, UK

<sup>2</sup>University of Huddersfield School of Human and Health Sciences, Huddersfield, UK

## Correspondence

Tammi Walker, Psychology, Teesside University, Middlesbrough, UK.  
Email: tammiwalker1972@icloud.com

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## Abstract

**Background and aims:** Diabetes is highly prevalent among individuals with serious mental illness. Managing diabetes in forensic mental health settings presents unique challenges which are under-reported and poorly understood. This study aimed to explore diabetes care in a medium-secure setting and identify key areas for improvement.

**Methods:** A single case study design used a retrospective chart review. Qualitative interviews and a focus group were analyzed using thematic analysis.

**Results:** Prevalence of diabetes was over twice that of the general population and highest in female service users. Evidence suggests limited understanding and lack of diabetes education for staff and service users, and difficulties in accessing external diabetes recourses.

**Conclusion:** Constraints inherent to forensic mental health settings contribute to difficulties in accessing external resources and adequate diabetes education. Secure mental health services should adopt a collaborative approach to diabetes care and provide appropriate specialist training to both staff and service users.

## KEYWORDS

diabetes, forensic, secure setting, severe mental illness

## 1 | INTRODUCTION

Diabetes mellitus (DM) is a serious condition affecting insulin production and subsequent blood glucose metabolism. Type 1 diabetes (T1DM) is defined by a total insulin deficiency while Type 2 diabetes (T2DM) entails insufficient or ineffective insulin function. In both types, unmetabolized glucose accumulates in the blood, causing debilitating and life-threatening symptoms. Diabetes is a global health problem affecting more than 425 million adults aged 20 to 79, with a projected increase of 48% by 2045.<sup>1</sup> The past two decades have seen a doubling in the number of UK adults with diabetes (now 1 in every 15) due to rapidly increased prevalence of T2DM.<sup>2</sup>

Internationally, the prevalence of diabetes among individuals with serious mental illness (SMI) (e.g., schizophrenia, bipolar disorder) is reported to be two to three times higher (10%–15%) than in the general population (6%).<sup>3</sup> A 2015 systematic review and meta-analysis<sup>4</sup> reported that approximately 1 in 10 people (worldwide) with SMI had T2DM. The pooled prevalence of 31 studies was higher in women (11.3%) than men (7.9%). T2DM also differed between those prescribed various antipsychotic medications, with a pooled prevalence of 10%, 13.2%, and 16% for people taking olanzapine, risperidone, and quetiapine, respectively, compared to 6.7% and 3.9% for aripiprazole and amisulpride.<sup>4</sup> This may reflect the metabolic side effects (i.e., weight gain) of certain psychotropic medication.<sup>5</sup>

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Existing data indicate an increased prevalence of risk factors for cardiovascular-related illnesses in forensic populations internationally (see Reference 6 for a systematic review). However, studies investigating diabetes in forensic mental health settings, a service that provides care and treatment to adults with SMI who present a serious risk of harm to others and to themselves, and who are prevented from leaving hospital, are extremely rare. A systematic review and meta-analysis of DM across various UK psychiatric inpatient settings reported a pooled prevalence of 1% for T1DM and 9% (1 in every 10 inpatients) for T2DM.<sup>7</sup> Of the 31 inpatient studies included in this latest review, only four focused on forensic inpatient settings. An additional study by Puzzo et al<sup>8</sup> focused on diabetes prevalence and quality of care in two UK secure care settings. These five studies reported prevalence rates of T2DM between 8.5% and 17.6%, with the highest rates reported in the most recent study<sup>8</sup>—prevalence of 15.4% (n = 30) in a high-secure all-male unit and 20.4% (n = 58) in medium/low-secure unit, of which 40 (17.9% prevalence) were male and 18 (29.5% prevalence) were female. Rates of T2DM in the medium-secure units (1 in 5) suggest that prevalence of T2DM is higher in forensic inpatients, particularly females (1 in 3), compared to general adult psychiatric inpatients (1 in 10) and the general population (1 in 15).

In the United Kingdom, primary care and the general practice team play a pivotal role in the management of diabetes. For example, general practice teams in the country participate in the annual National Diabetes Audit (NDA). The NDA provides a comprehensive view of diabetes care in England and Wales. It measures the effectiveness of diabetes health care against National Institute for Health and Care Excellence (NICE) Clinical Guidelines (2015<sup>9</sup>) and NICE Quality Standards such as the nine recommended care processes, which stipulate that all people with diabetes aged 12 years and over should undergo the nine key examinations, as detailed in Figure 1.

Taking part in the NDA supports improvement in the quality of diabetes care by enabling participating NHS services and organizations to assess local practice against NICE guidelines, compare their care and care outcomes with similar services and organizations, identify gaps or shortfalls that are priorities for improvement, and identify and share best practice.<sup>10</sup>

Mental health trusts in the United Kingdom are not required to report data to the NDA audit.<sup>8</sup> Therefore, best practice and areas for improvements in diabetes care for people using mental health services

are much less clear. Forensic mental health service users are typically long-term residents of mental health care services and not under general practitioner care.<sup>9</sup> While some forensic settings have an adjusted primary care provision based on general practice, most services depend on mental health staff who are not routinely trained in the management of conditions such as diabetes and associated complications.<sup>8</sup> Managing diabetes in forensic mental health settings therefore presents unique challenges; however, the lack of research on diabetes care for mental health forensic inpatients leaves those challenges unaddressed and poorly understood.

The Joint British Diabetes Societies for Inpatient Care (JBDS-IP), a collaboration of psychiatry and diabetes professionals, produced guidance to improve care for people with diabetes and mental illness in UK inpatient settings.<sup>11</sup> This report includes management of diabetes in adults in forensic units, featuring immediate recommendations such as creating a diabetes register for all patients; application of the nine NICE-recommended care processes; appointing a specialist diabetes nurse; and specialist staff training and inpatient health initiatives. Longer term recommendations include improved screening for undiagnosed diabetes, patient diabetes education, antipsychotic (medication) education, collaborative working between mental health and diabetes teams, and ensuring patients have equity of access to diabetes services including the diabetes annual review and the NHS Health Check. The Standards for Forensic Mental Health Services<sup>12</sup> also includes a set of guidance in relation to diabetes care for this group, among which it states, “patients are informed of the higher physical health risks for patients in secure mental health, such as diabetes, dyslipidaemia, hypertension, epilepsy, asthma etc. and gender-specific needs.” (p. 11).

The physical health of people with a severe mental illness is a global issue (e.g., Reference 13) and is recognized as a priority in the United Kingdom. The Commissioning for Quality and Innovation (CQUIN) framework supporting NHS to help adults in secure mental health services and achieve and maintain a healthy weight<sup>14</sup> is now under way. Nonetheless, health outcomes for this group are poor, with mortality rates for people with schizophrenia demonstrating that they die 15 to 20 years earlier from long-term conditions such as diabetes compared with those without a mental health condition. As diabetes is a current clinical practice concern in mental health, this mixed-methods case study examined the prevalence of diabetes and

<b>1. HbA1c</b> (blood test for glucose control)	<b>5. Urine Albumin/Creatinine Ratio</b> (urine test for risk of kidney disease)
<b>2. Blood Pressure</b> (measurement for cardiovascular risk)	<b>6. Foot Risk Surveillance</b> (examination for foot ulcer risk)
<b>3. Serum Cholesterol</b> (blood test for cardiovascular risk)	<b>7. Body Mass Index</b> (measurement for cardiovascular risk)
<b>4. Serum Creatinine</b> (blood test for kidney function)	<b>8. Smoking History</b> (question for cardiovascular risk)
<b>9. Digital Retinal Screening</b> (photographic eye test for early detection of eye disease)	

**FIGURE 1** Nine NICE-recommended care processes

delivery of diabetes care in one 90-bedded NHS medium-secure service in England.

## 2 | METHODS

To develop a holistic, comprehensive picture of diabetes care in a secure setting, this case study employed mixed methods, combining a quantitative retrospective chart review and a qualitative exploration of service user and staff perspectives using interviews and focus groups.

### 2.1 | Setting and sample

The study was conducted in a 90-bedded (15 female and 75 male beds) NHS medium-secure hospital in England. The research teams were approached by staff at the setting to explore this area, as it was identified as a healthcare priority in the service. Before designing the study, and securing funding, stakeholders providing care within the service were consulted, for example, colleagues within psychology, nursing, and primary care. The aim of the consultation was to identify the research need, to develop a feasible research design, and to construct productive relationships over the long term.

The service has seven wards and provides care and treatment for women and men with mental health problems and men with a learning disability. The primary care service has been in place for 10 years, consisting of two members of staff who had been in the service from the outset. On admission, screening involves a complete health history including family history, general observations, and routine blood tests. Those who screen positive for diabetes (or have known diabetes) will see the GP and primary care practitioners, and are automatically referred for retinal screening and podiatry.

Purposive sampling was used to recruit service users and staff, including primary care, ward staff, and “other” staff from the multi-disciplinary team for the interviews and focus groups. Conducting this research in a secure setting with an extremely vulnerable population meant that a pragmatic approach to sampling was required, with a small but broad sample considered adequate to achieve a rich, in-depth case study of diabetes care in the secure service from multiple perspectives.<sup>15</sup> To be included, the service users had to be (a) aged 18 and above, (b) have a diagnosis of diabetes on/during admission to the service, (c) have mental capacity, and (d) have sufficient command of English to participate in an interview or focus group. If participation raised any potential safeguarding concerns for service users, they were excluded. All staff with at least 3 months experience of delivering care and treatment to service users in the secure setting were included. All data were collected from November 2019 to March 2020 by T.W., A.E., and M.H.

### 2.2 | Quantitative methods

For the retrospective anonymized chart review, a literature search found no instruments that assessed diabetes prevalence and delivery of

diabetes care processes. Therefore, a data collection tool was devised by the authors that was informed by the literature. Extracted fields included total number of admissions from April 2016 to March 2019, total number of service users with diabetes type 1 or 2, body mass index (BMI), demographic data, and receipt of nine NICE-recommended annual care processes. The review was completed by A.E. and M.H.

### 2.3 | Statistical data analysis

The chart review data were analyzed quantitatively using an Excel spreadsheet (Microsoft 2013). Descriptive statistics were generated between April 2016 and March 2019 to describe the prevalence and incidence of diabetes within this period, service user characteristics of those diagnosed with diabetes, and diabetes care processes within the setting.

### 2.4 | Qualitative methods

This study adopted a qualitative description approach<sup>16</sup> utilizing low-inference data interpretation techniques that privilege participants' lived experiences over researcher-driven analyses. This approach prioritizes descriptive and interpretive clarity of participants' own words and meanings and avoids imposing conceptual, philosophical, or other abstract frameworks upon the data. Qualitative description is particularly appropriate in health research when understanding the implementational challenges of day-to-day clinical practices and procedures is central to the research question.

### 2.5 | Interviews and focus group

Service users were identified by ward staff and, if interested, the staff member briefly introduced the study, offered the information sheet, and sought verbal consent from service users to be visited by a researcher offering further information. Staff were invited to participate via email from ward managers or other internal contacts using the staff information sheet. Interested staff were asked to email the research team. Recruitment posters were visible in ward and communal areas in the secure service and posted on the NHS Trust intranet and other internal communication platforms.

The semistructured interviews and focus group explored experiences of diabetes care in a secure setting. Interview questions and topic guides were developed iteratively in consultation with academic and clinical experts in the field and individuals with lived expertise in SMI and secure services (see Table 1 for examples). All participants were given 24 hour to decide whether to participate and give written informed consent before participation. All available staff members participated in the study on the day of data collection. Some service users were unable to participate because of ill health and security-related concerns within the service. All personal and place names were changed to pseudonyms to ensure that no client could be identified through the research and all documentation remained securely stored. The interviews and focus

group were conducted by AE and TW at the study site and audio-recorded, and each lasted approximately 1 hour. Lead researcher TW has extensive clinical and qualitative interviewing experience within secure settings and with individuals with SMI, and A.E. is an experienced qualitative mental health researcher.

## 2.6 | Qualitative data analysis

Interviews and focus group data were professionally transcribed verbatim, and raw data was entered into the NVivo 12 qualitative data analysis software.<sup>17</sup> Inductive thematic analysis<sup>18</sup> constituted line-by-line descriptive coding, conducted independently by T.W. and A.E. Codes were then grouped and compared, and candidate themes were developed, reviewed, refined, and defined through ongoing discussion. Final themes encapsulated issues surrounding diabetes care as expressed by the participants.

## 2.7 | Ethical considerations

Ethical approval was obtained by a UK National Health Service (NHS) Ethics Committee, which gave a favorable opinion (Reference 19/LO/1291). It was also approved by the UK Health Research

Authority. All participants were given an information sheet and the opportunity to ask any further questions, and informed consent was collected before participation. Because the patients were suffering from mental illness, sensitivity was necessary in their recruitment and participation. The principles of the Mental Capacity Act<sup>19</sup> were followed, and the study also subscribed to the Declarations of Helsinki. Preparations were also made for the possible eventuality of participants being at risk from harm, during and after the interview, from themselves or others. None of the authors or researchers worked on the unit or had prior knowledge of service users or diabetes care protocols within the service.

## 2.8 | Rigor

Several strategies were used in this study to enhance rigor and to ensure a high-quality research process and trustworthy findings.<sup>20</sup> For example, the research process has been described with transparency, enhancing replicability. Descriptive and interpretive validity were ensured by using TW as a second coder to verify the inductive nature of the themes. Comparability was enhanced by retrospectively cross-checking themes against individual cases to ensure that all participants' views were represented.

## 3 | QUANTITATIVE RESULTS

### 3.1 | Profile of study participants

A total of 99 service users (88 males, 11 females) were admitted to the 90-bedded unit between April 2016 and March 2019. Service users were aged between 18 and 65 years and were White British ( $n = 64$ ; 64.6%) and Black, Asian and Minority Ethnic (BAME) ( $n = 27$ ; 27.2%). Further demographic data for admissions, plus BMI and diabetes diagnoses, are detailed in Table 2.

### 3.2 | Prevalence of diabetes mellitus T1 and T2

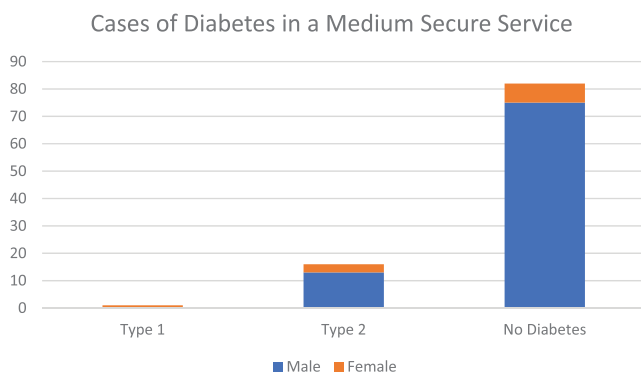
Of the 99 admissions, 17 (17.1%) were diagnosed with diabetes type 1 ( $n = 1$ , 1%), type 2 ( $n = 16$ , 16.1%), and no diabetes ( $n = 82$ , 82.8%). Four females (T1DM,  $n = 1$ /T2DM,  $n = 3$ ) and 13 males (T2DM,  $n = 13$ ) were diagnosed with diabetes (see Figure 2). The overall prevalence of diabetes was 17%—approximately one in six medium-secure service users—with T2DM being more widespread than T1DM. Overall prevalence rate of diabetes in female medium-secure service users was 36%, approximately one in three (T1DM, 9%/T2DM, 27.2%). Again, T2DM was more widespread, 27.2%, 1 in 4 females in the medium-secure service, compared to T1DM ( $n = 1$ ; 9%), which is less than 1 in 10. Overall prevalence rate of diabetes in male medium-secure service users was 21.5%, approximately one in five (T1DM, 0%; T2DM, 21.5%) for T2DM only (see Figure 2).

**TABLE 1** Example of interview and focus group questions

	Topic area	Example questions
All participants	Areas for improvement	How could diabetes care and management be improved?
	Understanding of diabetes	Do you know the signs and symptoms for diabetes?
Service user	Personal experiences of diabetes	How do your symptoms affect your everyday life?
	Experiences of diabetes care	Who takes the lead on looking after your diabetes?
	Personal diabetes management	Do you have a written personal plan for your diabetes?
Ward staff	Delivery of diabetes care	What would you do if you had concerns about a patient?
	Diabetes care in a secure setting	How is it different to caring for someone without diabetes?
Primary care	Delivery of diabetes care	Do you work on a referral system?
	Diabetes care in a secure setting	How does it differ to diabetes care in the community?

**TABLE 2** Retrospective summary data for all admissions (April 2016–March 2019)

Total number of admissions to the 90-bedded unit over a 3-year period (April 16–March 19)		n = 99 (females = 11, males = 88)					
Total number of service users diagnosed with diabetes		T1DM		T2DM		None	
		N = 1		N = 16		82	
Demographic data	Type 1		Type 2		No diabetes		n = 99 (%)
	M = 0	F = 1	M = 13	F = 3	M = 75	F = 7	
<b>Age</b>							
18–25	0	0	0	0	14	2	16(16.1)
26–35	0	0	4	0	24	0	28 (28.2)
36–45	0	1	3	1	25	2	32 (32.3)
46–55	0	0	2	1	9	3	15 (15.1)
56–65	0	0	4	1	3	0	8 (8)
<b>Ethnicity</b>							
White British	0	1	6	2	51	4	64 (64.6)
White and Black Caribbean	0	0	0	0	1	1	2 (2)
White Asian	0	0	0	0	1	0	1 (1)
Bangladeshi	0	0	0	0	1	0	1 (1)
Pakistani	0	0	2	0	3	0	5 (5)
Any other Asian background	0	0	0	0	3	0	3 (3)
Black African	0	0	1	0	5	0	6 (6)
Black Caribbean	0	0	0	0	3	1	4 (4)
Unknown	0	0	4	1	3	0	8 (8)
Any other background	0	0	0	0	1	1	5 (5)
<b>BMI on admission</b>							
Underweight range below 18.5	0	1	0	0	1	0	2 (2)
Normal/healthy weight range 18.5–24.9	0	0	1	0	31	3	35 (35.3)
Overweight range 25–29	0	0	1	1	19	0	21 (21.2)
Obese range 30+	0	0	7	1	18	1	27 (27.2)
Morbid obesity 40+	0	0	4	1	1	0	6 (6)
Not recorded	0	0	0	0	5	3	8 (8)

**FIGURE 2** Prevalence of diabetes

### 3.3 | Delivery of nine NICE care processes

All service users with diabetes received the following annual care processes: HbA1c, blood pressure, serum cholesterol, serum creatinine, urine albumin, foot-risk surveillance, BMI, smoking history, and digital retinal screening, as per the nine NICE-recommended guidelines.<sup>9,10</sup>

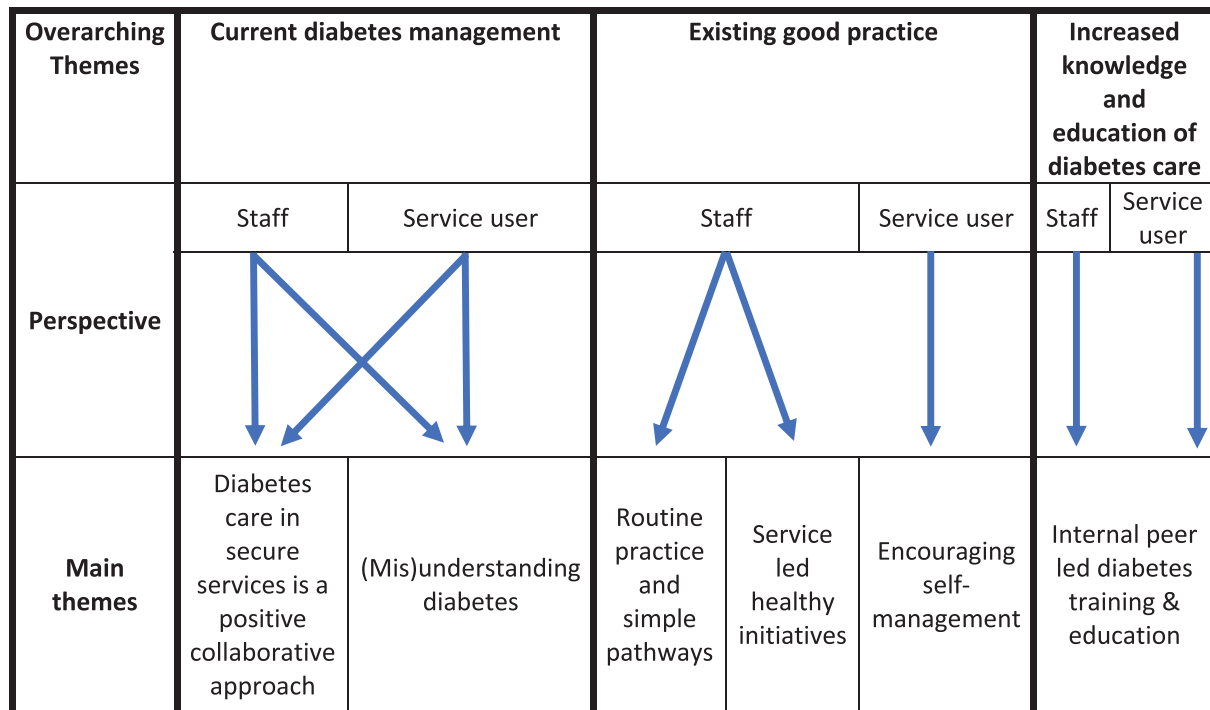
## 4 | QUALITATIVE RESULTS

### 4.1 | Profile of participants

We conducted one focus group with three nurses from the male wards, one interview with a dietician, a joint interview with two primary care staff, and one female service user interview, with “Eleanor,” who had been living with a diagnosis of T1DM for 15 years. All staff groups had experience and/or awareness of caring for people with diabetes within the service; primary care and dietetics had worked in the service for 10 years.

### 4.2 | Findings

Three overarching themes emerged from the data analysis: (1) Current diabetes management; (2) Existing good practice and increasing knowledge, and (3) Education of diabetes care. Each main theme included sub-themes, see Figure 3 for details.



**FIGURE 3** Map of overarching and main themes from a service user and staff perspective

### 4.3 | Main theme 1: Current diabetes management

This overarching theme captures the diabetes management pathway within the service, and an evaluation of the pathway and delivery of care from a service user and staff perspectives. Both explicit and implicit care processes are presented. The first sub-theme encapsulates the positive collaborative nature of secure-service diabetes care while the second sub-theme details a lack of understanding regarding diabetes among care professionals and service users.

#### 4.4 | Sub-theme 1: Diabetes care in secure services is a positive collaborative approach

Eleanor, a service user, described her current diabetes care very positively, as a whole team approach involving herself, the ward staff, and an externally based diabetes service who she visits every 3 months for insulin adjustments, advice, and resources:

“We all work together really...if I've got a problem, I just see the staff and if they need extra advice, they get in touch with, with the Diabetic thing [service] or...”—Service user

Because of her positive experience with the external diabetes service and her perceived level of diabetes [self-] management, Eleanor felt she did not require diabetes care from the internal services. However, she described her experience of the secure service as positively life-changing in terms of her diabetes care, general health, and well-being:

“My whole outlook has changed since I've been in hospital [medium secure]. I mean I've changed as a person, but I will take care of my diabetes when I get out...I just think if I'd have never come to this hospital [medium secure], I'd have never got to that frame of mind.”—Service user

Generally, staff stated that the physical health care of the service users was very much a whole team approach and service users were well cared for. Examples of collaborative working to address areas of concern, including providing service users with information regarding potential side effects of prescribed psychotropic medications such as weight gain and associated increased risk of diabetes, were discussed. However, when prompted to evaluate examples of such “anti-psychotic education,” its success in preventing weight gain was uncertain:

“I tend to get people who have already put the weight on. I don't tend to see people at the beginning, before, you know, when they just get put on the medications... So, I don't know how successful it is really...”—Dietician

#### 4.5 | Sub-theme 2: (Mis)understanding diabetes

Eleanor compared her current diabetes care and management to previous experiences in other mental health settings. She described incidents of miscommunication and misunderstandings among care professionals:

“I'd go to the Diabetic Nurse and she'd say look you can have treats...But then I'd get back to the hospital and the hospital would say no...I have been in a hospital before when...I were having a hypo and I said I need some sugar...and...the Nurse still said no... it were because they didn't know... I've found that a lot over the years, that the staff just doesn't have a clue.”—Service user

When discussing diabetes care and associated health risks, there was a consensus among staff that most service users had a very limited comprehension of these (including those diagnosed with T2DM). Overall, the interaction between physical and mental health seemed poorly understood:

“It's a lack of understanding...with a lot of them [service users], because like... you can die from it. But if you had to say that... they'd look at you and probably think you don't know what you're talking about...a couple on our ward [service users] kind of miss their diabetes meds because I feel like they don't think it's as important as their mental health [meds].”—Primary care staff

#### 4.6 | Main theme 2: Existing good practice

This theme captures some of the existing good practices within the service. Sub-theme 1 elaborates on how self-management of diabetes is encouraged, sub-theme 2 describes service practices that streamline diabetes care, and sub-theme 3 encapsulates initiatives that encourage healthy living.

#### 4.7 | Sub-theme 1: Encouraging self-management

When discussing good practice in the service, Eleanor was clear that it was the shared approach to managing diabetes, and enabling encouraging self-management where possible:

“When staff didn't stop me from having snacks, even though they'd advise me and they'd say do you really need it... they didn't stop me. I think that's been good because it's made, it let me make my own mind up and so like I've gone away and thought well maybe I don't need a snack.”—Service user

Throughout the interview Eleanor described a sense of growth in her own knowledge of diabetes and efficacy in her own self-management routine. She attributed her increased knowledge to the positive engagement with the *external* diabetes service. She voiced that carb counting, a meal planning tool to keep track of the amount of carbohydrate eaten daily, was particularly successful in enabling her to self-manage the diabetes.

#### 4.8 | Sub-theme 2: Routine practice and simple pathways

When describing areas of good practice in relation to diabetes care, staff described introducing numerous diabetes care processes in the setting, for example, undertaking routine HbA1c on admission and every service user being seen within 4 weeks of admission and then at least every 6 months. Primary care staff also reported the utility of attending pre-admission meetings for service users with more complex health needs and working with the dietician:

“Any signs or symptoms...there's a good process where we'll do a nutritional risk screening tool, and the dietician will come and look and then she'll do her work and it'll go onto her caseload.”—Primary care staff

#### 4.9 | Sub-theme 3: Service-led health initiatives

Staff discussed a number of service-led “healthy” initiatives aimed at addressing the “contributing factors” to diabetes. This involved limiting spending at the in-service shop and takeaways, replacing high sugar desserts with fruit, and addressing barriers to physical exercise. They highlighted the importance of striving to offer a balanced diet without the total removal of snacks and “treats”:

“It's like a treat for them as well, just they kind of like going to the shop...They do stock it, the pop, it is diet pop...crisps and chocolate...but I think you've got to have some sort of balance. You can't just eliminate everything.”—Ward staff

Current and proposed in/direct staff-led initiatives were also reported, such as a gardening group, a walking group, increased utilization of the sports facilities, and dietician-led ward-based sessions on nutrition.

#### 4.10 | Main theme 3: Increasing knowledge and education of diabetes care

This theme captures perceived barriers and inadequacies extant in the diabetes management and care practices within the setting and suggested initiatives for development. Staff training and increased knowledge and education for service users with diabetes were highlighted as key areas of improvement.

#### 4.11 | Sub-theme 1: Internal peer-led diabetes training and education

Eleanor explained that mental health staff in the setting appeared to know very little about diabetes, stating how she would transfer her

knowledge gained from the *external* diabetes service to them, including student nurses:

“When I've come to this hospital [study site] not many staff knew hardly anything about diabetes. They've more or less learnt since I've been here...like they didn't know what to do if I had a hypo...they've sort of learnt through me.”—Service user

Eleanor felt it would be useful to be supported by mental health nurses who understand the causes, symptoms, different treatment, and management regimes for diabetes.

Mental health nurses training in areas of physical health was noted as an area for increasing knowledge:

“They [mental health nurses] struggle, some of them don't have a lot of knowledge about diabetes at all. ... we're getting so many people with mental health issues, but also with a physical health side, so you need to be good at both nowadays.”—Dietician

None of the ward-based staff in this study had received specific training in diabetes, which was identified as a barrier to offering accurate health education to the service users, again indicating the difficulty in integrating mental and physical health care within a secure forensic setting:

“It's hard for us [staff] to obviously educate the patients if we don't know much about it ourselves. It's just like silly isn't it. It's not fair on them.”—Ward staff

Staff identified a training need and a preference for internally delivered face-to-face training. Suggestions included shared training sessions with physical healthcare professionals and shorter sessions covering diabetes awareness during existing routine meetings. It was also recommended that one member of staff per ward could attend initial training and then transfer knowledge to the team.

Staff discussed a need for diabetes education for service users, increasing awareness of symptoms, medication, general management, and associated health risks:

“It's just explaining the risks if it's not managed correctly, making sure that they understand that you need to monitor... this is for the rest of your life, you can't just cure, there's no cure for diabetes.”—Dietician

Difficulties of referring to the external Desmond program, a structured education program for people with, or at risk of, Type 2 diabetes, as part of the positive screen process, were described as unsuccessful by staff:

“They [Desmond facilitators] don't like the patients [medium secure] going and sitting in their clinic. They think they're going to do some ‘at, you know, something is going to happen.’”—Dietician

Finally, staff identified the potential benefits of diabetes peer support for service users offered by attending the Desmond program, which would enable service users to interact and learn about diabetes and its management with other people with diabetes:

“The Desmond program, it's more like you're with other people with diabetes. It's that peer group isn't it. It's peer to peer, whereas I'm [staff] just lecturing them...and I don't think they want to listen.”—Primary care staff

## 5 | DISCUSSION

The objective of this case study was to understand diabetes care in a medium-secure setting in England, as there is a scarcity of studies in this very important area. The quantitative component of the study revealed that 17% (one in six) service users had diabetes, with T2DM being more widespread. This prevalence rate of diabetes is consistent with rates of diabetes reported in other medium-secure services (range 8.5%-20.4%). Like the participants in a study by Puzzo et al,<sup>8</sup> our findings illustrated the prevalence of T2DM as higher in medium-secure service users (1 in 6), particularly for females (approximately 1 in 3), compared to general adult psychiatric inpatients (1 in 10) and the general population (1 in 15). The findings illustrated that all service users received the nine NICE-recommended care processes at least annually and the service was meeting several of the short- and long-term recommendations set by the Joint British Diabetes Societies for Inpatient Care,<sup>11</sup> such as creation of a diabetes register for all patients to track monitoring and liaison with other services and ensuring mental health teams have a clinical pathway to screen for undiagnosed diabetes.

Within the qualitative data, both the staff- and service-user-identified elements of good practice such as the promotion of self-management, service-led “healthy” initiatives, and monitoring processes before and after admission. Eleanor, the service user, also expressed that she felt listened to, empowered, and in control of her health care. However, areas for improvements were also voiced. The effectiveness of anti-psychotic education is unclear, and diabetes care and management should be included in the training of mental health staff. As access to the external Desmond program for service users appears difficult, an internal diabetes education program tailored to meet their needs should be developed within the service.

Our research suggests that, compared to mainstream community populations, medium-secure service users may have a higher prevalence of risk factors for complications of diabetes as evidenced by a mean BMI of 34 for those with diabetes and a BMI of 26 for those without diabetes. Therefore, despite robust monitoring of the condition, it is possible that such monitoring is failing to effect behavior change by service users to reduce their absolute risk from the condition. Furthermore, mental health care may take priority over physical health care within a secure psychiatric setting, neglecting the interactive relationship between physical and mental health.



This could potentially be alleviated by employing general nurses alongside mental health nurses who can share general practice knowledge and promote physical health care within a mental health care setting.

The mixed-method approach to the study enhanced the ability to interpret the quantitative findings and provided an understanding of staff and a service user perspective than with a quantitative analysis alone. We do recognize that, as this is a case study, there are limitations that should be considered. This study had a small sample size, was conducted within one medium-secure service, and included very limited-service user involvement. Despite numerous strategies to encourage participation (recruitment posters, direct approach from ward and “other” staff, data collection during the weekend), service-related issues presented a significant barrier.

Our findings highlight important future implications for research and practice. It may well be that current diabetes care procedures are failing to adequately negate risk factors for individuals in secure forensic settings. Consequently, there is merit in implementing and evaluating robust public health interventions underpinned by an evidence-based theory to support behavior change in marginalized groups<sup>21</sup> that is supported or delivered by peer educators in secure environments.<sup>22,23</sup>

## 6 | IMPLICATIONS FOR NURSING PRACTICE

The case study has indicated that diabetes care in secure mental health units should be a collaborative, whole-team approach focused on promoting self-management. Specialist diabetes training should be delivered in-house to both staff and service users to negate difficulties in accessing community-based initiatives. Diabetes training could be peer-led by a designated “diabetes champion” within the service and contribute to nursing and care staff's ongoing professional education, as recommended in the Willis report.<sup>24</sup> While difficulties with nursing shortages are acknowledged, service leaders could consider the potential benefits of including general nurses alongside specialist mental health nurses on staff. Policy makers and service leaders should consider the impact of the secure setting on the development and management of diabetes, including the impact of staffing levels on the deliverability of much needed health-promoting initiatives for service users, and the introduction of alternative “healthy” incentive programs.

This case study was one of the first attempts at exploring diabetes care in a medium-secure setting and identifying key areas for improvement. Future research is required to investigate the nature of the relationship between mental illness, BMI, and diabetes, focusing on risk factors and preventative interventions. Research should also explore barriers to diabetes knowledge and management in individuals with SMI, developing specialist educational tools to improve understanding and diabetes self-management and promote physical health in secure settings.

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### CONFLICT OF INTEREST

The authors declare no conflicts of interest.

### AUTHOR CONTRIBUTION

Conceptualization: Tammi Walker, Mike Lucock

Funding Acquisition: Tammi Walker, Mike Lucock, Amanda Edmondson, Nat Wright

Formal Analysis: Tammi Walker, Amanda Edmondson, Fleur Riley, Mark Harper

Writing-Review, Editing Original Draft: Tammi Walker, Mike Lucock, Amanda Edmondson,

Fleur Riley, Mark Harper, Nat Wright

All authors have read and approved the final version of the manuscript.

Tammi Walker had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

### TRANSPARENCY STATEMENT

Tammi Walker affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

### DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

### ORCID

Tammi Walker  <https://orcid.org/0000-0001-7446-8771>

### REFERENCES

1. International Diabetes Federation. *IDF Diabetes Atlas*. 8th ed. Brussels: International Diabetes Federation; 2019.
2. Diabetes UK. 2019. <https://www.diabetes.org.uk/>
3. 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.
4. Vancampfort D, Stubbs B, Mitchell AJ, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. *World Psychiatry*. 2015;14:339-347.
5. Barton BB, Segger F, Fischer K, Obermeier M, Musil R. Update on weight-gain caused by antipsychotics: a systematic review and meta-analysis. *Expert Opin Drug Saf*. 2020;19:295-314.
6. Agyapong NA, Annan RA, Apprey C. Prevalence of risk factors of cardiovascular diseases among prisoners: a systematic review. *Nutrit Food Sci*. 2017;47(6):896-906. doi:10.1108/NFS-06-2017-0114

7. Roberts E, Jones L, Blackman A, et al. The prevalence of diabetes mellitus and abnormal glucose metabolism in the inpatient psychiatric setting: a systematic review and meta-analysis. *Gen Hosp Psychiatry*. 2017;45:76-84.
8. Gable D, Cohen A. Using the National Diabetes Audit to improve the care of diabetes in secure hospital in-patient settings in the UK. *J Forensic Psychiatry Psychol*. 2017;28:400-411.
9. NICE Clinical Guidelines. National Institute of Clinical Excellence; NICE recommended care processes, NG17,NG28; 2015. <https://www.nice.org.uk/guidance>
10. NHS Digital. National Diabetes Audit, 2017–18. Report 1: care processes and treatment targets. England and Wales; 2019. <https://digital.nhs.uk/>
11. JBDS-IP. Joint British Diabetes Societies for Inpatient Care. A Good Inpatient Diabetes Service: Association of British Clinical Diabetologists; 2019. <https://www.diabetes.org.uk/resources>
12. Georgiou M, Oultram M, & Haque Q. Standards for Forensic Mental Health Services: Low and Medium Secure Care—Third Edition, Royal College of Psychiatrists Services QNFFMH; Report No: CCQ1304; 2019.
13. Bressington D, Badnapurkar A, Inoue S, et al. Physical health care for people with severe mental illness: the attitudes, practices, and training needs of nurses in three Asian countries. *Int J Environ Res Public Health*. 2018;15:343.
14. PSS4, NHS. Achieving healthy weight in adult secure mental health services PSS CQUIN indicator; 2019. <https://www.england.nhs.uk/publication/pss4-healthy-weight-in-adult-secure-mental-health-services-pss-cquin/>
15. Schoch K. *Research Design and Methods: An Applied Guide for the Scholar-Practitioner: Case Study Research*; London: SAGE Publications; 2020:245-258.
16. Bradshaw C, Atkinson S, Doody O. Employing a qualitative description approach in health care research. *Glob Qual Nurs Res*. 2017;21(4): 2333393617742282.
17. QSR International Pty Ltd. NVivo Version 12; 2020. <https://www.qsrinternational.com/nvivo/nvivo-products/nvivo-12-plus>
18. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Health*. 2019;11:589-597.
19. Brown RA, Barber P, Martin D. *The Mental Capacity Act 2005: A Guide for Practice*. London: Learning Matters; 2015.
20. Given LM, ed. *The Sage Encyclopaedia of Qualitative Research Methods*. London: Sage Publications; 2008.
21. Osborn D, Burton A, Hunter R, et al. Clinical and cost-effectiveness of an intervention for reducing cholesterol and cardiovascular risk for people with severe mental illness in English primary care: a cluster randomised controlled trial. *Lancet Psychiatry*. 2018;5: 145-154.
22. Buck G. *Peer Mentoring in Criminal Justice*. London: Routledge; 2020.
23. Woodall J, Freeman C. Promoting health and well-being in prisons: an analysis of one year's prison inspection reports. *Crit Public Health*. 2020;30:555-566.
24. Willis L. Shape of Caring: A Review of the Future Education and Training of Registered Nurses and Care Assistants; 2015. <https://www.hee.nhs.uk/sites/default/files/documents/2348-Shape-of-caring-review-FINAL.pdf>

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