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Reliance on Real-Time CGM Information in Diabetes Self-Management: A Qualitative Study

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Abstract

Background

Continuous glucose monitoring (CGM) provides real-time glucose information that can support diabetes self-management, but less is known about how much weight people give this information when making everyday decisions. This study aimed to explore how reliance on real-time CGM information was reflected in self-management decisions, checking behaviours, interpretation of bodily sensations and experiences of continuous monitoring among adults with diabetes.

Methods

A qualitative descriptive study using semi-structured interviews was conducted in a tertiary hospital in Guiyang, China. Fifteen adults with type 1 or type 2 diabetes who were currently using real-time CGM and had done so continuously for at least 1 month were purposively recruited. Interviews were audio-recorded, transcribed verbatim and analysed thematically. Operant conditioning theory was used as an interpretive perspective after preliminary theme development.

Results

Participants had a mean age of 55 years (SD 16); 10 (67%) were men and 13 (87%) had type 2 diabetes. The median duration of current real-time CGM use was 6 weeks (IQR 5–8). Four themes and nine subthemes were identified: (1) CGM feedback made glucose changes visible and supported behavioural learning; (2) glucose responses were linked to repeated self-management behaviours and checking, with checking sometimes helping to reduce uncertainty; (3) CGM information served as an important reference for self-management decisions, and some participants gave greater weight to sensor readings when these differed from bodily sensations; and (4) continuous glucose visibility was associated with worry and management fatigue.

Conclusions

CGM functioned as more than a monitoring tool in participants' everyday self-management. Its information was used to guide actions, interpret bodily sensations and manage uncertainty, while continuous access to glucose data could also add emotional and cognitive demands. These findings highlight the importance of considering how people use and interpret CGM information, rather than focusing on device use alone.

Introduction

Continuous glucose monitoring (CGM) provides near-continuous information on glucose levels and trends and has demonstrated glycaemic benefits in both type 1 and type 2 diabetes[1–4]. Real-time glucose information can also support day-to-day self-management by helping people relate glucose changes to food intake, physical activity and other everyday behaviours[5–10]. At the same time, continuous access to glucose values, trends and alerts can create new demands. Some users report persistent attention to glucose fluctuations, information overload, alert-related distress and frustration when glucose responses do not match their expectations[8–11].

As CGM becomes embedded in everyday diabetes management, an important question is how much weight people give sensor-generated information when deciding what to do. CGM readings may be considered alongside bodily sensations, previous experience, recent food intake, physical activity, medication use and the immediate situation[5, 7, 9, 10]. In some situations, sensor information may complement these other sources, whereas in others it may become a primary reference for interpreting symptoms, judging whether an action was effective or deciding whether further action is needed. Checking may also serve more than an informational purpose when viewing the sensor helps reduce uncertainty about current glucose levels. Reliance on CGM is not necessarily problematic; in many situations, it may improve confidence and support safer self-management. What remains less clear is how such reliance is reflected in everyday decisions and checking behaviours, how sensor information is weighed against bodily and contextual cues, and whether some patterns of reliance are associated with reduced decision flexibility or additional emotional and management burden.

Operant conditioning theory offers one perspective for understanding repeated behavioural responses to CGM feedback. Behaviours followed by favourable consequences are more likely to recur, while behaviours that reduce an unpleasant state, such as uncertainty or worry, may also be reinforced[12]. In the context of CGM, a self-management action followed by an expected glucose response may be more likely to be repeated, while reassurance obtained from checking may reinforce checking in similar situations. Operant conditioning was therefore used as an interpretive perspective rather than as a predetermined coding framework. This study aimed to explore how reliance on real-time CGM information was reflected in everyday self-management decisions, checking behaviours, interpretation of bodily sensations and emotional experiences of continuous monitoring.

Methods

Study design and setting

This qualitative descriptive study used individual semi-structured interviews and was conducted between December 2025 and February 2026 in the Department of Endocrinology of a tertiary general hospital in Guiyang, Guizhou Province, China. Operant conditioning theory informed the interpretation of the findings but did not guide the initial coding or theme development. Reporting followed the Consolidated Criteria for Reporting Qualitative Research (COREQ)[13].

Participants and recruitment

Participants were purposively recruited to achieve variation in age, sex, diabetes type and duration of diabetes. Eligible participants were adults aged ≥ 18 years who had a diagnosis of diabetes according to current Chinese clinical guidance[14], were currently using real-time CGM and had done so continuously for at least 1 month, were able to describe their experiences and agreed to audio recording. Individuals with severe impairment of consciousness or psychiatric conditions that prevented meaningful participation were excluded.

Potential participants were approached face to face. No invited participant declined participation. Recruitment continued until subsequent interviews provided no substantively new information relevant to the research question and did not meaningfully alter the developing thematic structure.

Data collection

All interviews were conducted by the first author, a registered nurse and graduate nursing student with training in qualitative research. The interviewer had no prior relationship with the participants. Interviews took place in a quiet room within the endocrinology department, with no other persons present.

The interview guide was developed through a review of the literature and discussion within the research team. It was pilot tested with two people with diabetes who had experience using CGM, after which minor changes were made to the wording and order of questions to improve clarity and conversational flow. The guide explored participants' experiences of using CGM, how they responded to and used glucose information in everyday self-management decisions, how CGM information was considered alongside bodily sensations and other contextual cues, self-management practices, and emotional experiences of continuous monitoring.

Neutral probes were used to obtain specific examples and clarify how participants made decisions. The full interview guide is provided in Additional file 1.

Interviews lasted approximately 30–50 min and were audio-recorded with participants' written consent. Recordings were transcribed verbatim within 24 h, and the transcripts were checked against the audio for accuracy. No repeat interviews were conducted, and transcripts were not returned to participants for comment or correction.

Data analysis

The interview data were analysed thematically through repeated reading, coding, theme development, and review and refinement of the thematic structure[15]. NVivo 12.0 was used to organise the data. The primary researcher read the transcripts several times before coding passages relevant to participants' experiences of CGM and self-management. Codes with related meanings were compared and grouped

into preliminary subthemes and themes. These were then reviewed against the coded extracts and the dataset as a whole, with attention to accounts that differed from the more common patterns.

Initial coding and theme development remained close to participants' accounts and were not organised around either operant conditioning or a predefined concept of reliance. Operant conditioning theory was considered after the preliminary themes had been developed and was used to interpret patterns involving feedback, repeated behavioural responses and checking. As relationships across the themes were examined, reliance on CGM information was identified as an interpretive concept linking repeated checking, the weight given to sensor information in decision-making, and participants' responses to uncertainty. This interpretation was repeatedly checked against the original transcripts to ensure that it remained grounded in participants' accounts. Representative quotations are presented in the Results to show how the interpretations were derived from the data.

Ethics

This study involved human participants and was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Human Research Ethics Committee of Guizhou Medical University (approval number: 2025.NO.392). Informed consent was obtained from all participants before their participation in the study.

Results

Fifteen adults with diabetes participated in the study. The mean age was 55 years (SD 16), and 10 participants (67%) were men. Thirteen participants (87%) had type 2 diabetes and two (13%) had type 1 diabetes. The mean duration of diabetes was 7 years (SD 5), and the median duration of current rtCGM use was 6 weeks (IQR 5–8). Five participants (33%) were receiving insulin therapy, and 12 (80%) lived in urban areas. Educational attainment ranged from primary school to a bachelor's degree, and seven participants (47%) were retired. Further demographic and clinical characteristics are presented in Table 1.

Table 1
Demographic and clinical characteristics of the participants (*n* = 15)

Characteristic	**Total (*n* = 15)**
Age, years	55 ± 16
Diabetes duration, years	7 ± 5
Duration of current rtCGM use, weeks	6 [5, 8]
Sex	
Male	10 (67%)
Female	5 (33%)
Diabetes type	
Type 1 diabetes	2 (13%)
Type 2 diabetes	13 (87%)
Insulin therapy	
Yes	5 (33%)
No	10 (67%)
Residence	
Urban	12 (80%)
Rural	3 (20%)
Education	
Primary school	5 (33%)
Junior high school	1 (6.7%)
College diploma	4 (27%)
Bachelor’s degree	5 (33%)
Employment status	
Employed	5 (33%)
Self-employed	1 (6.7%)
Retired	7 (47%)
Unemployed	2 (13%)

Data are presented as mean ± standard deviation, median [first quartile, third quartile], or n (%), as appropriate.

All participants used real-time continuous glucose monitoring (rtCGM). There were no missing data for the characteristics reported.

Theme 1 CGM Feedback Made Glucose Changes Visible and Supported Behavioral Learning

1.1 Continuous glucose information heightened awareness of diabetes

Participants described CGM as making glucose changes more visible and immediate than intermittent monitoring. Continuous access to glucose values and trend curves made fluctuations easier to notice and kept glucose more present in everyday awareness. One participant contrasted CGM with finger-stick testing: “With fingersticks, it used to be just one number. Now I can see the curve changing all the time, and it makes me feel that glucose is affecting me continuously.” (P4) Another participant described how seeing glucose change repeatedly altered the salience of diabetes in daily life: “I used to think that if I did not feel unwell, I did not need to pay much attention. Seeing the numbers change every day made diabetes feel much closer to me, so I started taking my glucose more seriously.” (P9)

1. **Glucose feedback linked everyday behaviors with glycemic responses**

Participants used CGM to connect glucose changes with specific everyday behaviors. Seeing glucose responses after eating or physical activity made these relationships more apparent and provided information that participants used in self-management decisions. One participant described changing breakfast after noticing a postprandial glucose rise: “I used to have soy milk and fried dough sticks for breakfast. I saw that it raised my glucose, so later I changed to eggs and milk.” (P6) Another described consulting the current glucose value before deciding whether to eat: “Before, I thought eating a little less was enough. Now I look at my glucose first before deciding whether to eat.” (P1)

These accounts illustrate how visible glucose feedback helped participants relate everyday actions to subsequent glucose responses and use those observations when making self-management decisions.

Theme 2 Repeated CGM Use Became Embedded in Everyday Self-Management

- **2.1 Favorable glucose responses reinforced self-management behaviors**

Several participants described greater confidence in particular self-management strategies when these were followed by glucose responses they considered favorable. Visible changes in glucose provided immediate feedback on whether an action appeared to work, and participants often described repeating

strategies associated with these responses. One participant described exercise in this way: “When I see my glucose come down after exercise, I feel that what I am doing works, so I remind myself to walk more every day.” (P6) Another participant described a sense of achievement when dietary changes were followed by improved glucose values and reported being more cautious about foods that had previously raised glucose. (P13)

For these participants, CGM made the consequences of everyday self-management actions easier to observe. Strategies associated with responses they considered successful were often used again in similar situations.

- **2.2 Checking CGM became part of daily routines and helped reduce uncertainty**

For some participants, checking CGM had become part of routine self-management. They described looking at glucose after meals, before sleep, during exercise or when away from home. One participant said, “Now I check my glucose after I eat.” (P4) Another described checking regularly before going to sleep as part of the evening routine. (P9)

Previous unexpected glucose changes also appeared to influence later checking. After experiencing a rapid decrease in glucose during exercise, one participant reported, “Once my glucose dropped very quickly during exercise. Since then, I keep checking it whenever I exercise.” (P8) Another participant described monitoring more closely while travelling, when food and activity were less predictable, and using the readings when deciding what to eat and how to plan the day. (P13)

In these situations, checking served not only to obtain information but also to reduce uncertainty about what glucose was doing at that moment.

Theme 3 CGM Information Gained Greater Weight in Self-Management Decisions

- **3.1 Previous glucose responses informed repeated behavioral responses**

Participants described using previous glucose responses to guide what they did when similar patterns appeared again. When an action had previously been followed by an expected change in glucose, some participants described using the same strategy in later situations. One participant reported that when his glucose was high, he would walk additional laps because previous experience had shown him that this was usually followed by a decrease in glucose. (P1)

In some accounts, individual CGM values were also used to guide self-adjustments to insulin. One participant reported increasing insulin when glucose was high, with little reference to the amount of food consumed. (P12) Another described withholding insulin when the premeal glucose value was within the expected range and reducing food intake instead. (P15) These accounts show that, for some participants, particular glucose values were linked to familiar responses, sometimes with limited consideration of other contextual information.

- **3.2 CGM readings were used to interpret bodily sensations**

Some participants described turning to CGM when trying to understand what their bodies were telling them. Rather than relying on physical sensations alone, they often checked the device to see whether a perceived symptom corresponded with a change in glucose. One participant explained that low glucose had previously been recognised mainly through bodily sensations, but “the first reaction now is to look at the phone.” (P5)

This was particularly apparent when bodily sensations and CGM readings did not correspond. One participant described feeling as though her glucose was low but deciding not to eat after seeing a sensor reading within the expected range. (P14) Another reported becoming nervous after seeing a high glucose value even though he did not feel physically unwell. (P11) In these accounts, CGM readings were used not only to confirm bodily sensations but also, at times, to reinterpret them.

- **3.3 When readings and bodily sensations differed, some participants prioritized CGM information**

When sensor readings and physical sensations did not correspond, several participants described giving greater weight to the CGM reading. One participant reported responding to a low-glucose reading despite having no symptoms because she regarded the device information as sufficient reason to act. (P3) Another stated that her physical sensations were “not always accurate” and that the glucose value shown by the device felt more reliable. (P8)

In these situations, CGM readings served as an important reference for deciding how to interpret physical sensations and whether action was needed.

Theme 4 Continuous Glucose Visibility Added Emotional and Management Burden

- **4.1 Glucose fluctuations prompted worry and anxiety**

Although participants valued continuous access to glucose information, visible fluctuations could also be a source of worry. Some participants became concerned when glucose remained above the range they expected despite efforts to control it. One participant described feeling frustrated when glucose stayed high even after substantially reducing food intake. (P3) Another reported worrying about possible complications whenever an elevated glucose value appeared on the device. (P6)

For some participants, an unexpected or persistently elevated reading also drew continued attention to the device. One participant described watching the glucose value until it began to fall and feeling increasingly anxious while it remained high. (P11) These accounts illustrate how continuous visibility could make short-term glucose fluctuations difficult to ignore, particularly when readings did not match participants’ expectations.

4.2 Repeated efforts to control glucose were accompanied by management fatigue

Several participants described paying close attention to food intake, glucose readings and day-to-day adjustments in an effort to keep glucose within a range they considered acceptable. When these efforts did not lead to the response they hoped for, participants described frustration and fatigue.

One participant described avoiding many foods while still being unable to achieve the glucose levels she wanted. (P9) Another similarly reported that substantial dietary restriction did not always bring glucose back into the expected range. (P7) One participant summed up the cumulative burden: “Every day I think about how to keep my glucose within the normal range. Sometimes it is exhausting.” (P15)

For these participants, CGM made the effects of self-management easier to observe, but it also made unwanted glucose responses harder to overlook. Repeated attempts to correct these responses were described as adding to the everyday work of managing diabetes.

Discussion

This study identified several ways in which reliance on real-time CGM information was reflected in everyday diabetes self-management. Reliance was not evident simply in how often participants viewed the device. It was more clearly reflected in the role sensor information played in their judgments and actions. Previous glucose responses informed later behaviours, checking became part of routine self-management and sometimes helped reduce uncertainty, and CGM readings were used to interpret bodily sensations. When sensor readings and physical sensations did not agree, some participants gave greater weight to CGM data. Continuous glucose visibility could also keep unwanted values in attention for longer, contributing to worry and management fatigue. Together, these findings suggest that reliance on CGM is better understood in terms of how sensor information is weighted and acted upon than in terms of device use alone.

Reliance in this context should not be equated with pathological dependence. Using CGM as an important source of information can be appropriate, reassuring and clinically useful. The key issue is whether patients remain able to interpret sensor data alongside symptoms, recent behaviour, previous experience and the treatment plan, and to adapt their response when circumstances change. Reliance may become less flexible when individual readings repeatedly trigger familiar responses with limited consideration of context, when sensor information is given priority over other relevant cues, or when checking mainly serves to relieve uncertainty without changing the decision that follows. Recent literature has raised similar concerns about technology dependency and overreliance in diabetes care[16], but the ways in which such reliance is expressed in everyday self-management remain less well described. The present findings add to this literature by identifying several behavioural, interpretive and emotional features associated with reliance on CGM information.

Learning From Continuous Glucose Feedback

Previous qualitative studies have shown that CGM helps people recognise the effects of food, physical activity and other everyday behaviours on glucose and can increase confidence in self-management[5–

10]. Similar experiences were evident in this study. Participants did not simply observe glucose changes; they used visible responses to build practical knowledge about what appeared to work for them. When exercise or a dietary adjustment was followed by a favourable glucose response, the same action was often used again when a similar situation arose.

Operant conditioning provides one explanation for this pattern. Behaviours followed by outcomes perceived as favourable are more likely to recur[12]. By making glucose responses visible soon after many everyday actions, CGM shortens the distance between behaviour and observable consequence. This can make action–response relationships easier to recognise and allows patients to learn from their own experience rather than relying solely on general recommendations.

However, knowledge derived from immediate feedback can also become simplified. A glucose response observed after a particular action does not necessarily mean that the action alone produced that response. Food composition, recent activity, medication timing and other physiological factors may all contribute. Nevertheless, once an action has appeared successful, patients may begin to associate a particular glucose value with a familiar response and reuse that response when a similar value appears. What begins as useful experiential learning may therefore become a relatively fixed “value–action” rule when the surrounding context receives less attention.

This distinction is important because the issue is not whether patients should learn from CGM data, but how conclusions drawn from those data are carried forward into later decisions. Clinical follow-up could therefore explore how patients arrived at their own self-management rules. Reviewing recent decision episodes—what the sensor showed, what action was taken, what happened afterwards and whether the same response would be appropriate under different circumstances—may help distinguish flexible learning from overgeneralisation based on an isolated glucose response. The aim is not to weaken patients’ confidence in their own experience, but to help ensure that the knowledge generated from CGM remains open to context and revision.

The Role of CGM in Interpreting Symptoms and Guiding Decisions

One of the more distinctive findings was the way participants used CGM in relation to bodily sensations. They did not simply replace bodily awareness with sensor data. Rather, CGM often became a reference for interpreting what physical sensations might mean. Some participants checked the device when symptoms were uncertain, and when bodily sensations and sensor readings did not agree, several gave greater weight to the CGM reading. Similar tensions between device-generated information and embodied experience have been reported in previous qualitative studies [7, 9, 10].

Greater trust in CGM is not inherently problematic. Symptoms of hypo- or hyperglycaemia may be absent, nonspecific or unreliable, and sensor data can provide information that bodily sensations alone cannot. The more important issue is how different sources of information are weighed when they point in different directions. In the present study, some participants acted on a sensor value despite having no

corresponding symptoms, whereas others used a reading within the expected range to reinterpret sensations they had previously associated with hypoglycaemia. These accounts suggest that reliance on CGM may be reflected less in the abandonment of bodily sensations than in the greater evidential weight assigned to sensor-generated data in particular situations.

This becomes especially important when glucose information is translated into treatment decisions. Some participants described adjusting insulin in response to individual CGM readings, at times with limited reference to food intake or other contextual information. Because the study did not assess participants' individual insulin plans, these decisions cannot be judged as clinically appropriate or inappropriate. They do, however, show that access to detailed glucose information does not by itself ensure that the information will be interpreted within the wider treatment context.

The findings therefore point to a need to consider not only whether patients trust CGM, but how they reason when different sources of information conflict. Clinical follow-up can explore what the patient felt, what the sensor showed, whether the trend supported the interpretation, what had recently been eaten or done, and how the response fitted with the agreed treatment plan. Current guidance recommends access to blood glucose monitoring when CGM readings do not match symptoms or expectations [17]. Beyond this, the present findings suggest that episodes of disagreement between sensor data and bodily sensations may offer a useful opportunity to examine how patients decide which information to prioritise and whether that decision remains sensitive to context.

Repeated Checking in Response to Uncertainty

Repeated checking was another way in which reliance on CGM information was reflected, although frequency alone did not distinguish useful from potentially burdensome use. Participants checked during exercise, after meals, before sleep and while travelling, often because these situations created a clear need for glucose information. In such contexts, frequent viewing could be part of appropriate self-management rather than a sign of problematic reliance.

Other accounts suggested that checking sometimes served an additional function. After an unexpected glucose event, some participants monitored more closely in similar situations or continued watching the display until an unwanted value began to change. In these situations, checking appeared to reduce uncertainty as well as provide information. From an operant conditioning perspective, if uncertainty or worry creates discomfort and checking provides reassurance, relief from that discomfort may reinforce the behaviour[12]. Repeated checking may therefore reflect not only a need for glucose information, but also a tendency to turn to the sensor when certainty is lacking.

This interpretation should remain cautious. The study did not objectively record checking frequency, measure anxiety before and after checking or assess compulsive behaviour. The findings therefore do not support describing frequent checking as compulsive or pathological. They do, however, suggest that similar levels of checking may serve different purposes. One person may check repeatedly because

glucose is changing rapidly during exercise, whereas another may check repeatedly because each reading provides only temporary reassurance.

This distinction has implications for clinical assessment. Asking how often a patient checks CGM may be less informative than asking what prompts the check, what the patient expects to learn and whether the result changes the action that follows. When checking serves a clear informational or safety purpose, frequent viewing may be entirely appropriate. When it mainly provides brief reassurance without altering the decision, support may need to focus on interpreting trends, clarifying which changes require action and recognising when another check is unlikely to provide additional useful information.

Current guidance already recommends initial and ongoing education for CGM users, including appropriate use of alerts and alarms[17]. The present findings add a different consideration: repeated monitoring should also be understood in relation to the uncertainty it is being used to manage. Clinical support and digital decision-support tools may therefore need to help users distinguish situations in which more information is needed from those in which repeated viewing is unlikely to improve the decision.

Emotional and Management Burden of Continuous Glucose Visibility

The same visibility that supported learning could also contribute to emotional and management burden. Participants sometimes continued watching glucose values that remained high despite restricting food or making other adjustments. When the expected improvement did not occur, frustration and anxiety could increase. Previous qualitative work has similarly shown that CGM can provide reassurance and confidence while also exposing users to data overload, alerts and emotional burden [8–11, 18]. Research on digital treatment burden has likewise described the additional work involved in monitoring, interpreting and responding to digital health data [19].

The present findings suggest that part of this burden may arise when glucose values become a continuing evaluation of self-management effort. A desired response after exercise or dietary change can confirm that an action appeared to work, whereas an unwanted value after considerable effort can be interpreted as evidence that further correction is needed. For some participants, this was followed by further dietary restriction, continued observation or another attempt to bring glucose back into the expected range.

The difficulty, therefore, may lie not only in the amount of information available, but in the meaning attached to that information and the perceived need to respond. Continuous access to glucose data can make short-term variation difficult to ignore. When individual deviations are repeatedly treated as signals that something should be corrected, attention may become increasingly focused on moment-to-moment values rather than broader patterns, adding to the cognitive and practical work of diabetes management.

Clinical support should therefore address how patients interpret fluctuations, not only whether they understand the numerical values. Exploring what a patient considers a “good” or “bad” reading, what they feel obliged to do when glucose moves outside their expected range, and whether every deviation prompts a behavioural response may reveal unrealistic expectations or excessive corrective effort. Support can then focus on expected glucose variability, individual targets and the distinction between clinically meaningful patterns and short-term changes that do not require immediate action. Persistent worry, repeated dietary restriction, substantial disruption of daily activities or a sense of being unable to disengage from monitoring may also indicate the need for broader psychosocial assessment rather than additional technical instruction alone.

Implications for Clinical Support and CGM Use Current

Current guidance already recommends initial and ongoing education for people using CGM[17]. The contribution of the present study is therefore not to argue that more education is needed, but to identify aspects of CGM use that may deserve closer attention during clinical follow-up.

Four areas appear particularly informative: why a person checks CGM, how sensor information is weighed against other cues, what action follows a reading, and what emotional effect the process has. These issues may be easier to understand through recent real-life decisions than through general questions about device use. Asking a patient to describe a recent occasion when a CGM reading changed what they did may reveal whether the response was based on a recurring pattern, an isolated value, bodily sensations, previous experience or a need for reassurance.

Treatment-related decisions deserve particular attention. When patients use CGM readings to guide insulin or other self-management adjustments, follow-up can explore what information was considered before acting and whether the response was consistent with the agreed treatment plan. This is especially relevant when a familiar response has been carried forward from a previous situation in which it appeared to work.

Situations in which CGM readings and bodily sensations do not agree may also provide useful insight into how patients weigh competing sources of information. The aim is not to encourage automatic preference for either the sensor or bodily cues, but to support interpretation of the reading alongside symptoms, trend direction, recent behaviour and treatment context, with confirmation when appropriate.

The relatively short duration of current rtCGM use in this sample is also noteworthy. Participants had used their current rtCGM continuously for a median of 6 weeks, yet routine checking, repeated value–action associations, greater weighting of sensor information and emotional responses were already present. Because the study was not longitudinal, these findings cannot show when such patterns developed or whether they become stronger with longer use. They do, however, suggest that these features can be present within the early period of CGM use represented in this sample and may therefore be relevant to follow-up soon after initiation.

More broadly, the findings shift attention from whether patients can operate CGM correctly to how sensor-generated information is incorporated into self-management. Clinical support may therefore need to address not only technical interpretation, but also when a reading should prompt action, when contextual information should modify the response, when another check is unlikely to add useful information and when a familiar strategy may need to be reconsidered. Digital decision-support tools may also have a role in making these distinctions clearer by helping users interpret individual readings within patterns and context rather than treating each value as a stand-alone signal.

Strengths and limitations

A strength of this study is its focus on how rtCGM information is used in everyday self-management decisions rather than on monitoring frequency or glycaemic outcomes alone. The analysis also retained accounts in which frequent checking or greater reliance on CGM information appeared useful, allowing the findings to capture both supportive and burdensome aspects of continuous glucose feedback.

Several limitations should be considered. Participants were recruited from a single tertiary hospital, which may limit the transferability of the findings to other clinical and community settings. The duration of current rtCGM use was relatively short, and the findings may therefore not reflect the experiences of longer-term users. The sample also included relatively few participants with type 1 diabetes, limiting comparisons by diabetes type. In addition, the findings were based on participants' accounts and qualitative interpretation; checking frequency, emotional distress and the clinical appropriateness of CGM-related decisions were not objectively assessed. The study therefore cannot establish causal effects of rtCGM on behaviour or emotional outcomes. Longitudinal studies with more diverse populations are needed to examine how these patterns change over time and whether they differ according to duration of CGM use or diabetes type.

Conclusion

Reliance on real-time CGM information was reflected in how participants learned from glucose feedback, incorporated checking into daily self-management, and used sensor readings to interpret bodily sensations and guide decisions. Such reliance was not inherently problematic, but it appeared less flexible when individual readings prompted familiar responses with limited consideration of context or when repeated checking mainly served to reduce uncertainty. Continuous glucose visibility could also draw sustained attention to unwanted fluctuations and contribute to emotional and management burden.

These findings suggest that effective CGM support should extend beyond technical competence to consider how sensor-generated information is interpreted, weighted and translated into action. Clinical follow-up may be strengthened by exploring why people check CGM, how they integrate sensor data with bodily and contextual cues, and whether their responses remain adaptable across situations. Longitudinal research is needed to determine how these patterns change over time and whether they become more or less flexible with longer-term CGM use.

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Author Contribution

PN, SRL, KH, ZL, YX, JL, LW, and RH conceptualized and designed the study. PN developed the interview guide, recruited participants, conducted the interviews, and performed the primary data analysis. SRL, KH, ZL, YX, JL, LW, and RH contributed to the interpretation of the findings. PN wrote the original manuscript draft. PN, SRL, KH, ZL, YX, JL, LW, and RH contributed to the review and editing of the manuscript. RH supervised the study. All authors provided critical input, reviewed the manuscript, and approved the final version for publication.

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Declaration of conflicting interest

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