



Factors affecting the self-monitoring of blood glucose levels in Aboriginal patients: findings from a remote community

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Suggested citation

Taylor S, Fatima Y, Solomon S (2017) Factors affecting the self-monitoring of blood glucose levels in Aboriginal patients: findings from a remote community. *Australian Indigenous HealthBulletin* 17(3).

Abstract

Objective: Despite self-monitoring of blood glucose (SMBG) being highly recommended it appears that many Aboriginal patients do not conduct SMBG. This study investigated factors affecting SMBG in rural and remote Aboriginal patients.

Methods: Two focus groups sessions were conducted with nine diabetic Aboriginal adults (age > 18 years) using insulin preparations. Focus group discussions were facilitated by a pharmacist and two Aboriginal researchers. Discussions were audio-recorded and later transcribed verbatim and thematically analyzed to identify enablers and barriers.

Results: Participants identified multiple barriers, e.g. access and relevant education to use glucometers and understand readings, poor continuity of care and consistency of advice, lack of comfortable environment, stress and emotions, lack of clear communication between health care providers and patients. Facilitators that encouraged participants to practice SMBG included: knowledge of diabetes and its manifestations; rituals and routines.

Conclusions: Health care providers should understand patients' knowledge of diabetes, challenges with SMBG, and the emotions associated with SMBG and value the role of culturally respectful interaction on patient motivation to conduct SMBG.

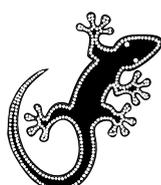
Implications: Aboriginal patients are often stigmatised and blamed for not looking after their diet and monitoring blood glucose. However, health care providers should understand that there are issues regarding the availability, functionality of glucometers as well as Aboriginal patients' understandings of blood glucose readings. Therefore, appropriate educational interventions aiming patient awareness and empowerment are needed to improve SMBG.

Keywords: blood glucose self-monitoring, diabetes mellitus, Aboriginal patients, qualitative study

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Core funding
is provided by the
Australian Government
Department of Health



Australian Indigenous
HealthInfoNet



Background

Indigenous Australians experience a disproportionately high rate of type 2 diabetes (T2DM) as the overall prevalence is around four times that of the general population (1-3). It is also seen that T2DM management is challenging in resource-limited remote settings (4). Many of these difficulties are seen to be reduced with appropriate community-based primary healthcare interventions (5, 6).

Self-monitoring of blood glucose (SMBG) is an important aspect of management for people with diabetes (7). Regular blood glucose level (BGL) monitoring can help individuals with T2DM to understand the role of their lifestyle, stress and other illness on their blood glucose levels, and may help to improve diabetic control significantly (8).

Evidence from epidemiological studies indicates that advancing age, lower education level and income group, and lack of physician support act as barriers to the practice of SMBG among people with diabetes (8). Whereas, patient-related barriers include: lack of awareness of hypoglycemia and hyperglycemia, lack of social support, and difficulty in interpreting SMBG results, etc. (9, 10).

Despite its relevance to diabetes, and cost-effectiveness of SMBG (11), relatively little is known about current practice patterns and barriers associated with SMBG in Aboriginal patients. Therefore, this study was conducted to investigate the enablers and barriers to self-monitoring of BGLs in the Aboriginal population in a remote regional context. This study was aimed to provide insights into the issues that Aboriginal patients face when managing their diabetes and highlight areas that can be targeted to assist in the management of diabetes in this population.

Methodology

Study Setting, Participants, and Procedures

This research was conducted in Mount Isa, a remote mining town in North-West Queensland (NWQ) with a significant Aboriginal population ($\approx 17\%$). Clients of the local Aboriginal Community Controlled Health Service (Gidgee Healing) and Medicare local were invited to participate in the study. The study participant was recruited if they were of Aboriginal or Torres Strait Islanders background, 18 years or older; resident of Mount Isa, diagnosed with type 2 diabetes and were using insulin preparations.

Patients were contacted via telephone, home visits by Aboriginal Health Workers (AHW) and sending letter and appointments were made for a mutually suitable time and location. An Informed consent form with a patient information sheet was provided to all participants. A verbal explanation of this process was also provided.

Study Tool

A focus group tool (Table 1) was developed based on literature review and input from the local community leaders. Focus groups discussion were facilitated by a local pharmacist, and two local Aboriginal Researchers with extensive experience of working in the community. Participants were encouraged to provide in-depth information. Prompts were used only if the participants did not discuss the key issues voluntarily. Each focus group session lasted approximately 45-60 minutes in duration.

Ethics

Ethics approval was obtained from the Human Research Ethics Committee James Cook University (H4595) with support from the relevant Indigenous bodies.

Data Analysis

Focus groups discussion were recorded and later transcribed verbatim. Inductive thematic analysis was used to generate themes from the qualitative data. All transcripts were reviewed by two investigators (ST, SS) to identify patterns. All themes and subthemes were revised several times until no further themes could be identified, and the resulting themes accounted for all relevant information found in the transcripts. Excerpts from the verbatim transcripts are provided in the results section to support further the authenticity of the themes derived.

Results

Quantitative analysis

Nine Aboriginal people participated in the two focus groups. Four participants were male. Eight participants had access to a glucometer; however, only four participants had working glucometers. Testing frequency varied from never to 10 times daily. Participants were asked whether they recorded their BGLs. Five of the participants did record their results, one only recorded sometimes, two only recorded if the result was high, one participant did not record results if they were 'sky high' and only one of these participants shared the results with their doctor. Only one patient understood the results; some said they had never been given any clear ranges for their results. Of the nine participants, six said they would like a glucometer if they were offered one. All said they would like training on how to use their glucometers and how to understand their results.

Qualitative analysis

A range of themes emerged from the study highlighting the barriers and facilitators of SMBG (Table 2).

Barriers to self-monitoring of blood glucose

Participants discussed some perceived barriers to their utilisation of SMBG. These included issues with access and relevant education to use glucometers; Poor continuity of care and consistency of advice, lack of comfortable environment, emotional factors, lack of clear communication between health care providers and patients, inadequate respect, and support from health care providers.

Access and relevant education to use glucometers

Among the barriers affecting the SMBG by Aboriginal patients, access, and relevant education to use glucometers was one of the recurring themes. Understanding the types of blood-glucose-level monitoring machines, how they work, how to use them, and what the readings mean is essential knowledge, according to the participants in both focus groups. Equally important for participants was an understanding of how to use the pen, finger pricking techniques and when and how to change needles.

"Well I'll be honest, when I first started using it, that calibration thing come up and I went... yeah, I don't know what that is."

"Not so much about how to use the machine, but the readings."

Poor continuity of care and consistency of advice

The majority of patients agreed that they could not receive their diabetes care from the same health care provider; therefore, continuity of care was missing. This frustrated them because they could receive different advice, which was confusing for them:

"Yeah. But see, this is the other thing, when ya lose the Accucheck one, then you go to the next fella, who will give you this other one, and that's where our mob getting confused, too."

"Yeah, different strips. Cause one you got the little um... the little lever things are different, ay. Different machines, different strips, confusion."

Lack of comfortable environment

Accessing affordable glucometers and associated consumables in 'comfortable' environments was a key issue for most of the participants in both focus groups. Comfortable environment was described as culturally safe places where low-cost equipment, consumables, and services can be accessed in the same setting/place. The following excerpt highlights this:

"They good like that (talking to you proper – the local chemist) but there's something I just... I like going to somewhere I feel comfortable like down Gidgee (local Aboriginal community controlled health service) like I order all me medication there (...) and it's very easy and its good."

.....Nah, well... of course, there's no cost, but I feel comfortable around my people and I... I like it in there. Ya know?.....You know that's where I feel very comfortable, where I can ring up from home, straight to Gidgee Healing, and you just go and get your medication. So... it'll be good... if we can ring up and get our strips as well..."

"Yeah that was what I was about to say, ya know I feel very uncomfortable going through the chemist, but I feel very comfortable going to Gidgee (local Aboriginal community controlled health service). I feel comfortable there. But up there, I just feel hmm... uncomfortable."

Stress and emotions

Participants identified and described shame, laziness, and forgetfulness as key issues for themselves or family and community members. The following excerpts highlight participant's emotional journeys as described by themselves.

"Do you know why our mob gets like that? Our mob would rather leave it broke than tell someone 'cause they too shame they gonna get in trouble."

"No... most of the time I'm lazy. So if I'm getting up... This is my days... If I'm getting up and I'm up early enough, I'll do it. But if it's half past seven? I know I gotta have a shower and get to work before eight... So I won't..."

"Even... forgetfulness. Because our mob don't have time. At the end of the day, they don't have time to self-check themselves."

Lack of clear communication between health care, providers and patients

The communication gap between the health providers and consumers was another recurring theme found in the transcripts. Aboriginal patients felt that information provided by health care providers was inadequate. The following excerpts highlight this:

"diabetes educator and dietician need to be talking about that. Need to be talking about just, wounds in general, you know? When you got a sore, they won't heal right away because the sugar helps the germs feed. So the germ will stay in the sore. It'll worsen. So our mob need to hear stories around that when we talking about diabetes. Cos that reality stuff. Even with thrush, with our women."

Participants also spoke directly or indirectly about how health practitioners should be communicating with them when providing services and education.

"Yeah but as long as they break the words down to our level. No good using big words in front of Murriss"

Focus Group participants suggested that they believe it is their doctor's responsibility to advise them on lifestyle choices, and know more about the community where they are working. The following excerpts highlight these issues:

"Lot of our mob expect that that's the doctor's role. ... like, you're the doctor, you should know all about me"

"And that's what you need to have in there too about alcohol, the drugs, and the smokes. You know, for a lot of our mob that a priority. Our mob'll walk around and walk everywhere picking up dumpers for a smoke fix; they don't worry about their diabetes."

Inadequate respect and support from health care providers

Many of the study participants emphasised the need for health care providers to be respectful and be able to hold a culturally appropriate conversation and suggested that perhaps they could be more helpful and polite.

"Any doctors, when ya see em, they need to umm... stop talking down to Aboriginal people. You know, you know like... if I went to the doctor right, he's a white man. He talk down to me cause I'm an Aboriginal. I don't need that."

Facilitators to self-monitoring of blood glucose

Facilitators that encouraged participants to practice SMBG included: knowledge of diabetes and its manifestations; rituals and routines.

Knowledge of diabetes and its manifestations

Learning to recognize physical manifestations of the condition, what it means for them were identified as key aspects of the diabetic management experience by participants. The following excerpts highlight these sub-themes:

"and if somebody else is doing it (BGL monitoring), then that becomes a priority. Unfortunately, that's the journey of our life. (name) will come and say to me, have you checked your sugar? And I'll say no. You wanna check it. And (name) will go get that little thing and check it. You know? So that's something. And I work in health! I've been there; I know the journey of diabetes."

"Yeah. Cos if you're in tune with ya body you know something's not right."

Rituals and Routines

Effectively managing stress, ways of remembering to monitor and manage their condition, were identified as important diabetes self-management strategies by participants in this study. The following excerpts highlight these sub-themes:

"Well I do it before breakfast, two hours after, check it again before dinner, check it again before supper."

"Put all ya little things in a little basket, when you sit down when you sit down and have your breakfast... like (name) got that little bag with all his tablets, like a little kid sitting there dishing it all out."

Discussion

The findings in this study suggest that effective health education strategies for Aboriginal patients should address the person and context factors including access barriers, psychosocial issues and personal rituals and routines. Health education focused only on disease etiology and client responses to the disease process alone is not effective. Our findings demonstrated a consensus that patients wanted more information and a better understanding of all aspects of diabetes to enable them to better self-care and care for others in the family and community with diabetes.

This study highlights the importance of diabetic knowledge and culturally safe spaces as significant issues for most participants in this study. Participants wanted greater knowledge and skills to self-manage. Previous studies have also shown that patient empowerment can help can improve self-management (3). Another examination of access and education issues relating to diabetes and self-management asserts that specialised diabetic education programs may benefit older, minority diabetic patients with language difficulties (12).

Recognising physical manifestations of Diabetes Type 2 and how to self-manage has significant implications for the diabetes self-management practices (13-15). Participants in the current study noted 'getting in tune with my body' and reported that the lack of knowledge to use of equipment and consumables in response to monitoring and effective management was challenging. Stress, shame, laziness and forgetfulness were considered key factors in successful self-management by participants in our study. Other studies have identified similar psychological and psychosocial factors as central in diabetes self-management (13). These factors are significant because they are an important area of diabetes education with people with diabetes generally (16) and Aboriginal and Torres Strait Islanders specifically (17). It is suggested that Aboriginal Health Workers (AHW) can play an important role in overcoming diabetes-related stigma and improving community

awareness for the benefits of SMBG. Education session facilitated by AHWs should focus on clearing the misconceptions about SMBG and help the community understand how blood glucose monitoring is an opportunity for them to take control of their health.

Participants in this study reported that establishing routines and rituals related to diabetes management were essential in the self-management of their condition. Kowanko, Helps (17) reports similar routines and rituals described by participants in their study that helped the participants take their medicines, eat more healthily, engage in the increased physical activity and manage stress and wellbeing more successfully. Our findings suggest that health professionals need to consider self-efficacy support training focused on individually established routines and rituals as key components of diabetes education.

The participants also identified a range of factors about how health practitioners should be connecting with them when providing diabetes services. Participants agreed that health professionals could add to the stress of their diabetes journey which can have a negative impact on their ability to self-manage. Participants also spoke of how, if health professionals emphasized the importance of diabetes management then this may improve their motivation to self-manage.

Appropriate communication from health professionals was highlighted by participants throughout the study. Ensuring health professionals speak to patients at their level and not speaking down to them, and acknowledging them when seen outside of the clinical setting were points raised to improve the self-management of diabetes in the clinical setting.

Implications for general practice

This study demonstrates that health care providers should understand that there are issues regarding the availability, functionality or patient understandings of the purpose of functional glucometers. Therefore, educational interventions aiming community training are needed regarding SMBG. While a goal of monitoring is always the improvement of metabolic status, the importance of empowering, patients should not be overlooked.

Giving patients the skills to monitor and the skills to use the data from their testing to make changes in their regimen is an important goal of diabetes education and requires an ongoing patient-health care provider team approach. While health care providers' attention in responding to the blood glucose readings is reported as one of the reasons some participants gave for continuing SMBG (15), the lack of interest of health care providers is seen to linked with a decrease in SMBG (10). Therefore, health care providers should discuss the SMBG results with those concerned, to encourage optimal use of SMBG.

Strength and Limitations

Although the researchers were able to gain an in-depth understanding of the experiences of remote dwelling Aboriginal people on the perceived factors affecting SMBG monitoring, the generalisability of our findings is constrained due to non-random sampling, small sample size and single geographic location. Nonetheless, as a small study, it provides a snapshot of the perspectives of Aboriginal people on the factors affecting SMBG and provides a foundation for a future large-scale study.

Conclusions

The study highlighted the gaps in the SMBG practice for Aboriginal patients. It was evident that these patients were not receiving the resources and education needed to be able to safely manage their diabetes with home blood glucose monitoring. This service gap is an area that AHWs can easily fill and take another step forward in closing the gap for the Indigenous Australians' health.

Based on the findings of this study, it is suggested that we need to develop more effective approaches to improving diabetes care, including self-care, for Aboriginal patients in remote areas. This will most likely be a combination of better medical management, support and help from clinicians and action to improve opportunities for self-care, including smoking cessation, nutrition, and physical activity.

Acknowledgements

We thank both Gidgee Healing Mount Isa and Medicare Local Mount Isa for their support of the project. We are grateful to Kaye Smith, Kerry Major, Bella Busch, Gus Page, Stephanie King, Duncan Harvey, Marita Verlaan and Catherine Hays for their help with collecting and recording data from focus groups.

List of Tables

Table 1: Summary of focus group discussion with Aboriginal patients on the factors associated with self-monitoring of blood glucose.

Questions	Prompts
Do you have a sugar machine? What type of machine is it?	
Do you use the sugar machine?	<p>How often?</p> <p>It is in working order? [Prompts: batteries, broken, consumables, unsure of use]</p> <p>If it isn't working but it was fixed, how often would you use it?</p> <p>What are the reasons behind not using a sugar machine? [Prompts: pain, understanding, cost/access of consumables]</p> <p>What could help you use the machine?</p>
Do you record your results? Provide your results to your GP/DE?	
What do you understand about what your results mean?	
How do you use your results?	
If you don't have a machine, would you like one if funding were available?	
Would you like training on how to use your machine and understand your results?	

Table 2: Results of qualitative analysis exploring the factors associated with self-management of blood glucose level in Aboriginal patients.

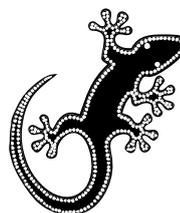
Study Group	Barriers	Facilitators
Aboriginal diabetic patients using insulin preparations (n=9)	Access and relevant education to use glucometers	Knowledge of diabetes and its manifestations
	Comfortable environment	Rituals and Routines
	Poor continuity of care and consistency of advice	
	Lack of clear communication between health care providers and patients	
	Stress and emotions	
	Inadequate respect and support from health care providers	

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Core funding
is provided by the
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