Attitudes and perceptions of people with diabetes mellitus on patient self-management in diabetes mellitus: a Singapore hospital’s perspective

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INTRODUCTION

Diabetes mellitus self-management education (DSME) is the process of facilitating the knowledge, skill, and ability necessary for diabetes mellitus (DM) self-care.\(^{(1)}\) Diabetes mellitus self-management support (DSMS) is the support required for implementing and sustaining coping skills and behaviours needed for self-management of DM on an ongoing basis.\(^{(1)}\) DSME and DSMS have been shown to improve health outcomes\(^{(2-4)}\) and reduce hospital admissions and readmissions.\(^{(5,6)}\)

The DSME framework consists of several key points: describing the DM disease process and treatment options; incorporating nutritional management into lifestyle; incorporating physical activity into lifestyle; using medications safely for maximum therapeutic effectiveness; monitoring blood glucose and other laboratory parameters and interpreting and using the results for self-management decision making; preventing, detecting and treating acute and chronic complications; and developing personal strategies to promote behaviour change to improve diabetes control.\(^{(7)}\)

In Singapore, the burden of DM is felt more than in other parts of the world. The Singapore Burden of Disease Study in 2010 estimated that DM (being the third biggest group after cardiovascular diseases and cancer) contributed to 10% of the disability-adjusted life-years (DALYs).\(^{(8)}\) The mean annual direct medical cost for a patient with DM was found to be SGD 2,138, of which 61% was accounted for by inpatient services.\(^{(9)}\)

To date, many studies have been conducted on barriers to and facilitators of DM self-management; some of the studies were conducted in healthcare providers\(^{(10-12)}\) and some in both healthcare providers and patients.\(^{(13-15)}\) Healthcare providers and educators view barriers and DM care differently,\(^{(16,17)}\) and this has led to an increasing number of studies being conducted in people with diabetes (PWD) to understand these differences and challenges. Because studies focusing only on PWD can reflect the practicality of implementation of DSME
and DSMS, most studies were conducted in outpatient settings.\(^{(18,19)}\) There is limited research on the perspectives of PWD in inpatient settings. People who experience dysglycaemic events and complications of DM are more likely to be admitted to the hospital.\(^{(20)}\) These inpatients also had impaired social circumstances that indirectly affected the outcomes of their medical conditions. Considering higher DM complication rates and healthcare utilisation from inpatient stay and emergency department visits,\(^{(21,22)}\) it is worthwhile to look at the perception and attitudes of this group of participants. Hence, this study aimed to fill the gap in the existing literature by exploring the attitudes and perceptions of inpatient PWD with regard to DM from the perspective of a hospital in Singapore. With a better understanding of the socio-dynamics of PWD, healthcare providers can empower patients to self-manage and take charge of their condition.

**METHODS**

The study was a cross-sectional qualitative study using in-depth interviews of participants to comprehend the understanding, experiences, expectations and motivations of patients in self-management of DM. Qualitative methodology was chosen to allow the investigators to obtain more in-depth information on various themes.\(^{(23)}\)

A semi-structured interview guide (Appendix) with an open-ended approach was developed based on factors, concepts and variables affecting DM self-management after an intensive literature review.\(^{(1-5,7)}\) The common themes obtained were then chosen and formulated by a focus group consisting of the authors FFV, LSG, LLL and OCY. In addition, certain unique variables such as caregiver roles in DM management that were not found in Asian or non-White populations were incorporated into this interview. Most questions were open ended to allow participants to share more broadly. Standardised prompts were only used if the participants did not raise any key issues spontaneously.
The guide was piloted with two patients to ensure the questions were clear and relevant. It helped improve the investigator’s comprehension and familiarity to complete the interview. This data was not included in the final analysis. Feedback on the guide was solicited, and the guide was revised accordingly after several discussions with experts from both academic and practice-orientated personnel. The final interview procedure and guide were maintained without amendments.

All participants were purposively sampled from PWD (Type 1 or Type 2) for more than one-year duration, who were admitted to Alexandra Hospital (a restructured hospital) during the study period from 4 September to 29 September 2017. Reasons for the admission of participants may or may not be directly related to DM or its complications. This sampling ensured that participants could provide a range of views and experiences on self-management in all DM circumstances.

All patients who were admitted during the period and met the inclusion criteria were identified and approached (n = 49). Written informed consent was obtained after the patients read the participant information sheet and agreed to participate. Patients who were not able to talk and participate in interviews were excluded. The participants did not face any challenges when answering questions during the interview.

Demographics and DM diagnosis data were obtained verbally from participants themselves during the interview. Ethical approval for this study was obtained from the SingHealth Centralised Institute of Research Board (IRB reference no. 2017/2128).

A total of 29 participants completed the interview during the study period. The interviews were conducted in English, Malay, Mandarin, Hokkien and Cantonese by OCY (primary investigator), who had formal training in various languages. This was to ensure consistency throughout all interviews and to avoid bias.
The interviews were conducted in the consultation room or by the bedside of the patients in the medical and surgical wards in private to ensure confidentiality. The interviews were performed based on the language with which the participant was most comfortable. Interviews were conducted in English where language barrier was not a concern. On average, the interview sessions lasted for 50–80 minutes.

All interviews were audiotaped and transcribed verbatim by OCY and LWC. All transcripts (except Malay transcripts) were cross-examined and checked independently for accuracy by LLL and LSG. Malay transcripts were verified by FFV. This ensured that the concepts were translated and transcribed properly from various languages before data analysis. Manual codes were assigned for a particular phrase, sentence or paragraph after the first round of reading. Sentences or paragraphs that carried similar meaning were right sited to the same code. Constant comparison across transcripts was done throughout the thematic analysis.

The researchers familiarised themselves with the data by reading the transcripts repeatedly to identify key ideas and recurrent codes. The transcripts were repeatedly read by two other independent researchers to ensure the reliability of the common themes. Emergent codes were discussed among the researchers to refine the analysis. The whole transcript was analysed until saturation of theme was achieved, and no newer emerging code were identified. Participant recruitment ceased with thematic saturation, when subsequent interviews produced no new information (saturation plus 3 formula applied).\(^{(24)}\)

Coding was compared for consistency to minimise biases and to enhance data credibility. Coding discrepancies were resolved through discussions until consensus was achieved.
RESULTS

A total of 29 inpatients participated in this study. The median age of the participants was 60 years, and their median duration of DM was 13 years (Table I). The participants had their follow-up visits at polyclinics (primary care clinics), general hospitals and private general practitioners’ clinics.

Four categories of themes emerged from the data analysis (Table II). Participant quotations were cited verbatim, after translation (where appropriate).

Table I. Characteristics of participants (n = 29).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age* (yr)</td>
<td>60 (54–69)</td>
</tr>
<tr>
<td>Years living with DM*</td>
<td>13 (14–19)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15 (51.7)</td>
</tr>
<tr>
<td>Male</td>
<td>13 (48.3)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>13 (44.8)</td>
</tr>
<tr>
<td>Chinese</td>
<td>10 (34.5)</td>
</tr>
<tr>
<td>Malay</td>
<td>5 (17.2)</td>
</tr>
<tr>
<td>Others</td>
<td>1 (3.4)</td>
</tr>
<tr>
<td>Follow-up</td>
<td></td>
</tr>
<tr>
<td>Polyclinic</td>
<td>16 (55.2)</td>
</tr>
<tr>
<td>General hospital</td>
<td>12 (41.3)</td>
</tr>
<tr>
<td>General practitioner’s clinic</td>
<td>1 (3.4)</td>
</tr>
</tbody>
</table>

*Data is presented as median (interquartile range). DM: diabetes mellitus

Table II. Emerging themes.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of self-management</td>
<td>General perception and understanding</td>
</tr>
<tr>
<td>Positive and negative experiences in self-management</td>
<td></td>
</tr>
<tr>
<td>• Self-rate (glucose levels and confidence in self-managing DM)</td>
<td></td>
</tr>
<tr>
<td>• Lifestyle challenges and struggles</td>
<td></td>
</tr>
<tr>
<td>– eating habits</td>
<td></td>
</tr>
<tr>
<td>– exercise</td>
<td></td>
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<tr>
<td>– medication taking</td>
<td></td>
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<tr>
<td>– integrating lifestyle recommendations in work and social life</td>
<td></td>
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<tr>
<td>• Coping and support</td>
<td></td>
</tr>
<tr>
<td>– perceived helplessness/impossibility of achieving good control</td>
<td></td>
</tr>
<tr>
<td>– family support</td>
<td></td>
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<tr>
<td>Experience with doctors</td>
<td>–</td>
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<tr>
<td>-------------------------</td>
<td>---</td>
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<tr>
<td>Motivation or protective factors</td>
<td>–</td>
</tr>
</tbody>
</table>

DM: diabetes mellitus

### Perception of self-management

The definition of self-management in DM was unfamiliar to the participants. The participants had an incomplete understanding of DM self-management, only quoting diet control.

*Participant 17:* “I don’t know. What I would know is that diabetes can cause foot problems and kidney damage.”

*Participant 18:* “I do not understand... (Paused for 7 seconds). Maybe not eating? I mean eat less food. Eat a little bit of rice. Have to take care of the food intake. (Paused). That’s all.”

*Participant 7:* “Three things: reduce sugar, reduce rice, and increase vegetable intake.”

One participant quoted responsibility as part of self-management and mentioned the psychological aspect of it.

*Participant 5:* “It is no use to rely on the doctors. Each patient is responsible for his/her own improvement. I am unsure about the effectiveness of behavioural therapy and other psychological interventions in improving diabetes. It depends on each individual.”

Although most participants reported some knowledge of dietary recommendations for PWD, this was sometimes also interspersed with misinformation.

*Participant 1:* “Take minimal sugar. Don’t eat food which is too salty. Avoid seafood.”

*Participant 26:* “....Avoid fried foods. Avoid cold drinks.”

*Participant 15:* “Cut down on certain food. Take only bread instead of rice.”
Positive and negative experiences in self-management

The participants did not know about glucose levels and targets and shared reasons for not understanding their diabetes control. Most participants were unable to differentiate between capillary blood glucose and glycated haemoglobin (HbA1c). Some were of the opinion that daily glucose monitoring has no practical use.

Participant 6: “I don’t know. My domestic worker is no longer with me and nobody monitors the glucose levels for me.”

Participant 3: “I don’t know what the control is. My doctors have never told me. I didn’t ask them about my diabetes control because even if I know that my control being not good, it would not have changed anything. Sometimes not knowing is better than knowing. It is good enough if I just control my diet.”

Participant 5: “I didn’t ask about my glucose control. I do not check my glucose level at home because it is meaningless to me: If my blood glucose is good today, does that mean I can eat unrestrictedly tomorrow? This would be more hazardous to me.”

Some participants admitted to having poor glucose control, with one of the female participants mentioning her being accustomed to the poor level of control.

Participant 17: “It is okay. The readings at home have been usually above 15 (mmol/L).”

Despite their limited knowledge of DM self-management, most participants expressed confidence and were happy with their current state of DM control. Some participants admitted being unhappy about their DM control; however, they remained confident in their ability to manage their DM.

Participant 5: “I am happy with my diabetes presently. I am living one day at a time. But I have no confidence about my glucose control in future. My friend who died from
renal failure advised that there was no use in controlling diet because she still ended up needing haemodialysis.”

Participant 22: (Shaking head) “Fuh... How am I supposed to be happy? I have no choice but to be confident managing it. Who would have wanted the illness?”

Lifestyle challenges and struggles

Eating habits

Most participants shared their negative experiences and struggles in managing their eating habits despite having been educated by the dietician and healthcare advocates. A few participants admitted to the difficulty or lack of conscious restriction on sugar-sweetened beverages.

Participant 4: “I will be sorry for myself if I see good and tasty food and not consume it. I don’t go on food trails but if I come across food that attracts me, I will not restrict myself.”

Participant 13: “When I go out, I will eat whatever I feel like eating. I drank a lot of sweet drinks during Hari Raya Puasa (Muslim festive season). Can I control (laugh)?”

Some shared their positive experiences in managing dietary habits, restraining themselves from consuming their favourite food, which is detrimental for sugar control. One even shared about the process of choosing and deciding food for herself.

Participant 21: “I gave up my favourite foods – cendol (local dessert with coconut milk and brown sugar) and durian. For diabetes, I forgo sweet foods... Subsequently, I was able to maintain HbA1c of 6% and this to me (and my doctor) was encouraging!”

Participant 28: “I take two vegetarian meals from Mondays to Fridays. I even look at the nutritional information and guidance such as calories and sugar content when buying food.”
Exercise

The participants faced certain limitations in achieving recommended intensity and duration of exercise. Various reasons were highlighted, including existing illnesses, environment and circumstances.

Participant 2: “I have stopped exercising since 6 months ago after recurrent falls. My children do not care about me and have no time to accompany me for exercise.”

Participant 4: “I do not walk around the neighbourhood park as I am afraid that snakes or insects might spring up and bite me. No, I would not walk along the corridor of the shop lots/premises as I am scared that the shopkeepers will scold me for wandering there.”

Some regarded their daily activities and even static, passive movements as part of the exercises that they performed.

Participant 17: “Exercise? A little... My helper takes me for walks, about 10 minutes twice a week, around the vicinity of my housing block. I cannot go far because of back pain; I may fall. I also exercise by putting my feet on the electrical foot massage.”

Participant 22: “I spend about 3–4 hours daily fishing. It is a good exercise; I have to throw the rod and pull up the string with fish.”

Some participants said that they did exercises as tolerated. These include static (stretching) exercises as well as dynamic ones such as walking and swimming.

Participant 11: “I do stretching exercises at any time I like because I place the stretchable bands beside my bed. My amputation stump is short; therefore, it does not fit the prosthesis. I usually stop walking after 15 minutes because the stump will either swell up or almost pop out from the prosthetic leg.”
Participant 23: “I walk daily from Alexandra Road to Tanglin Halt (distance of 2.4 km). I am able to walk with special footwear.”

Medication-taking

There were myriads of reasons and challenges faced by our participants in adhering to the medications and keeping up with the appointments at clinics.

Participant 13: “Yes, I do miss my medications 3–4 times a week. Sometimes I omit my insulin, sometimes Glipizide and sometimes both! I skip them because I am sick of taking the medication. There are so many medications to take- for hypertension, cholesterol, diabetes, gastritis, and inhalers. I have never talked to my doctor about the medication load. They will still actively prescribe these medications to me.”

Participant 19: “I had not taken my medications for two months as the medications had finished. I was under the follow-up of a private general practitioner during that time. It was very expensive. The medications cost me SGD 313 per month. Now I am glad to be under the polyclinic follow-up where subsidy is available.”

Participant 1: “I do not know why I forget the medications. And I forget it at least twice a week… I have not figured out how I can improve this.”

Integrating lifestyle recommendations in work and social life

Contrary to the view that patients with DM who are working face difficulty in managing their DM, most participants (particularly those on insulin injections) were able to adhere to medications and seemed to cope reasonably well.

Participant 23: “I work as a security officer. I work from 7 am to 7 pm. After my morning shower, I inject 12 units of Lantus before I have breakfast and then go out to work.”
Participant 25: *I prepare my medications beforehand (one week in advance), I pack them into a pill organiser box.*”

Two participants shared their preference of not revealing their diagnosis of DM to their friends for fear of social isolation.

Participant 20: “*I eat out with my friends almost daily. I’ve never told them that I have diabetes and diet restrictions because I want to feel the sense of belonging in the group. I often order Kentucky Fried Chicken and McDonalds for family outings...*”

Participant 27: “*I omit some of my insulin. Sometimes I only take two meals despite having four insulin doses a day. I skip these meals because sometimes I feel tired and oversleep on my non-dialysis days. Not only that, I also forget to take 30 units of Glargine at night... I do not inject in front of my friends. I will never tell them that I am a diabetic renal patient. I do not want them to visit me or worry about me.*”

**Coping and support**

*Perceived helplessness/impossibility in achieving good control*

Some participants expressed helplessness in achieving good control. Most did not know how their DM would fare; one expressed avoidance. Some did not know what to do when the blood glucose levels were high.

Participant 2: “*It will be worsened with age.*”

Participant 17: “*I do not know. I try not to think about it.*”

Some remained positive about achieving good DM control and were determined to play their role in controlling the progress of DM.

Participant 17: “*It will be better. As I am determined this time to control it better.*”
**Family support**

Most participants said that they did not receive family or caregiver support. Some even expressed the negative impact of ignorance shown by family members. The positive response received from the family encouraged them. In contrast, the negative response from the family discouraged them.

*Participant 3:* “My husband works from 10:30 am to 10:30 pm. However, he does encourage me to try to be happy and always reminds me about my medications. I feel good about it.”

*Participant 2:* “I depend on my granddaughter (for the past two years) for insulin injection as I have poor eyesight. When she goes overseas for short holidays, I will not have my insulin injections. There are no one else to take care of me. My daughter-in-law and son are busy with work. Nowadays children tend not to prioritise their parents. If I am able do it, I prefer to do it myself.”

**Access/utilisation of resource/community assistance**

The awareness or knowledge about the availability of community assistance or resources in the participants was low. Many mentioned that they do not know where in the community to get information about DM. Some mentioned the use of the Internet and search engines such as Google. One mentioned YouTube and two mentioned libraries.

*Participant 9:* “I search using “Google” from the internet. I took a skills course last year and just learnt how to surf the net.”

*Participant 4:* “I do not need this information. I have had diabetes mellitus for 10 years! I will not tell you and other patients with diabetes mellitus about the contents in diabetes mellitus brochures lest I cite it wrongly.”

*Participant 27:* “I have a lot of information, but I do not follow it.”
Most participants did not know where to go in the case of DM-related emergencies. Some participants mentioned going to primary care physicians and some mentioned going to the general hospital.

Participant 14: “Polyclinic. There is no other place that I know of.”

Experience with doctor

During the consultation experience, there were few expectations from the doctors with regard to self-empowerment of participants or how the physicians can help the participants on self-management. Some perceived that the doctors were limited by their busy schedule to advise, educate and empower patients.

Participant 2: “I don’t know if they can empower or help me and the patients more. I think they have done their best. I don’t expect anything more from them.”

Participant 4: “They do not care about me and continue repeating the same medications at each visit.”

Participant 17: “They are busy with many patients. They do not have much time for advice.”

Participant 28: “I feel that I need to depend on myself. I think that doctors feel that patients who have had diabetes mellitus for many years will know how to self-care.”

Participant 22: “It is useless. I do not understand the advice given.”

Enablers for self-management

Some participants mentioned that there was no motivating factor for them to control and better care for their DM themselves. Yet, some remarked about the role of family members as a source of motivation.
Participant 19: “I will try to comply with whatever is necessary if my grandchildren advise me to do so.”

Participant 28: “If my sister and my brother are willing to let me stay with them, I will feel more motivated...”

DISCUSSION

This study revealed that PWD did have different perceptions and values on self-management for DM.

Despite the consolidated efforts of educating and empowering PWD on self-management, the understanding of the concept and importance of self-management in our participants was low. Most PWD still followed the old care model of ‘paternalistic medicine’, whereby health professionals were the sole authority responsible for diagnosis, treatment and health outcomes.\(^{(25)}\) Patient education was merely restricted to following the prescriptive advice and therapeutic goals that were planned by health professionals. Evidently, based on our findings, some of the participants chose to remain passive by not taking ownership of their DSME and remained dependent on healthcare professionals whose patient contact time may not be sufficient to address all DM-related issues.

Most participants had an incomplete understanding of the aspects of DM self-management; nutritional management, physical activity and medications were often quoted. Other domains of DSME and DSMS such as monitoring and interpreting blood glucose levels for decision-making, preventing and treating acute and chronic complications and promoting behaviour changes were not mentioned by the participants.\(^{(7)}\)

Because of their incomplete understanding of DM self-management and control of their DM, most participants mentioned that they were quite comfortable and confident in managing their DM. By not knowing what to do or look out for in DM care, the participants perceived
that their DM was manageable. The level of confidence of participants may need to be quantified objectively to determine whether DM self-efficacy or complacency is present.\(^{(26)}\)

Participants reported varying levels of nutritional management. Most participants shared their struggles to eat appropriately as instructed. This self-management behaviour has been a barrier of the past\(^{(27)}\) and will likely remain a challenge for PWD, more so in settings where access to healthy food is not widely available. Because giving up favourite foods that are high in sugar content was one of the commendable actions from the participants, this often led them to feel demoralised. Misconceptions of a healthy diet are still common despite numerous government campaigns, initiatives and policies for ‘war against diabetes’ to educate the community to choose DM-friendly diets that did not involve eliminating their favourite food entirely.\(^{(28)}\)

Existing illness and environmental factors were often quoted as reasons for physical inactivity. This is consistent with most studies worldwide whereby exercise was reported to have not been carried out adequately.\(^{(29,30)}\) Some participants who engaged in the exercise had the understanding that static and passive exercises (low intensity) met the requirement of recommended activity. At the same time, a positive observation that was seen in participants was that some of the participants did work out as much as they can tolerate despite being busy or being physically handicapped. Appropriate footwear is particularly important in PWD with foot deformity or impaired sensation.

Medication-taking in participants was limited by the wilful omission of medications and the financial burden owing to the cost of medicines. Hence, there is a continuous need to subsidise health expenses for PWD to promote compliance that would then encourage them to achieve better control and reduce DM-related complications.\(^{(31)}\) Concurrently, there is also a need for targeted DSME and DSMS programmes to promote behaviour changes in PWD who are less motivated.
In contrast to a large-scale study conducted on DSME and DSMS in which PWD often had difficulties in adhering to insulin and diet regimens because of work priorities,\(^{(32,33)}\) some of our participants who were on insulin did show their commitment and consistency in adherence to the medications. Perhaps the private in-depth interviews allowed them space to share their thoughts deeply. It is also known that PWD on insulin in Singapore would have frequent contacts and visits with the dietician and DM nurse educator. Hence, they would have more access to proper education and are more highly invested in DSMS.\(^{(1,7)}\)

Emotional distress is well recognised as a barrier to successful DSME and DSMS.\(^{(33)}\) Some participants perceived helplessness in DSME and DSMS because their condition remained unimproved, thus leading to frustration and demotivation, and eventually resulting in ‘diabetes burnout’ and neglect of DSME and DSMS.\(^{(34)}\) Fear of social isolation from peers was evident; PWD did not want to be discriminated against or ‘treated differently’ compared with their peers and friends.\(^{(34,35)}\) Nondisclosure of having DM during outings with friends or colleagues contributed to deviations from meal-time medication and dietary recommendations.\(^{(36)}\) Some of the participants became emotional as they told stories about their DM. The negative feelings revolving around fear, rejection, guilt, anxiety and low-esteem can result in depression.\(^{(34)}\) This proved that psychological aspects and social stigma of PWD needed to be addressed to alleviate this emotional distress through patient empowerment and motivation and increased social support and community education.\(^{(1,7,15)}\)

The many interesting perceptions and values on self-management for DM encountered throughout this study could be because of the cultural and educational background of the participants.\(^{(37)}\) Most (40%) participants were from the elderly population who had fewer formal education opportunities. The elderly in our population tended to take a passive role in disease management and be dependent on their family members and caregivers.
Hence, family support had been identified as one of the facilitators in self-management,\(^{(15-17)}\) which was unique in the Asian/non-Caucasian population. Supportive family relationships increased the involvement in the care planning of one member of the family.\(^{(38)}\) The participants experienced both the positive and negative aspects of family involvement in their day-to-day DM management. Because some participants mentioned family support in terms of verbal encouragement, constant reminders and actions of administering insulin, some were discouraged by the lack and absence of family support. The impairment from lack of family support can also affect PWD if they need financial aid,\(^{(14,33)}\) transportation and a companion to attend follow-up appointments as well as help with household chores.

The participants expected more active engagement from the doctors and DM nurses in DSMS and not just providing generic, routine ‘indigestible’ information and uninformative advice. This is consistent with the observation that most PWD indicated that they had been inadequately engaged by their providers and that education and psychological services were not readily available. Moving forward, healthcare providers can aim to intentionally screen for the well-being, understanding and concerns of patients to address these issues. It has been shown that healthcare providers who engaged PWD with proper goal setting in DSMS were able to achieve better DM control in patients.\(^{(4,39)}\)

There were several misconceptions and gaps in understanding the ‘diabetes disease’ itself identified in this study. Some concerning examples would include the theme of disease complications and the poor availability of support. Hence, it is crucial to promote a more robust targeted outreach and educational efforts aimed towards PWD and the community to clarify and correct these misconceptions while also seizing these opportunities to advocate DSME and DSMS.
There is no one ‘best’ or ‘one size fits all’ education or self-management programme that will address all the circumstances and needs of PWD. The structure or framework provided should be a guiding principle rather than a checklist of things that ought to be incorporated in DSME and DSMS. We propose that all these efforts should be contextualised to the needs of each culture and population.

This study recruited participants from a sizable diverse background who were in great need of additional tailored support for their DM care in Singapore. Interviews were conducted in multiple languages to accurately capture participants’ responses.

Although insights from inpatients did not represent the general population of PWD who were treated in outpatient or community settings, it gathered the sicker, more complicated and challenging patients in terms of pathology and social circumstances as compared with the outpatients. These circumstances indirectly affect the outcomes of their medical conditions. By studying these groups of patients, we were able to identify these gaps, which would help in reducing the challenges associated with managing them. However, this study had some limitations. The recruitment of subsidized-paying class participants was from a single hospital in Singapore, and the rejection rate of participation was 41%. We acknowledge that there was a possibility of skewness in communication or needs in those who chose to participate. This limited the generalizability of the results obtained to the population with DM in Singapore, but this was deliberate as the study aimed to focus on attitudes and perceptions of inpatient PWD. The study could be extended to outpatient PWD in Singapore. Future studies on chronic diseases can also be conducted using qualitative methods to estimate the unquantifiable data, and hopefully, this will contribute to meaningful interventions.

In conclusion, this study established that the participants did not have a complete understanding of self-management in DM. The negative experiences and struggles of the participants in their day-to-day management had significantly affected their control and
motivation. Healthcare providers may use these themes to better engage, educate and empower PWD towards self-management, enabling PWD to take charge of their condition.

REFERENCES


8. Ministry of Health, Singapore. Singapore burden of disease study 2010. Available at:


APPENDIX

**Semi-structured guide for interview**

- Can you tell me about your diabetes? (When and how it was diagnosed, who is your doctor and how often do you see your doctor)?
- What do you know about diabetes self-management?
- How would you rate your diabetes control?
- Are you happy/ confident in managing your diabetes?
- Can you describe a typical day of yours at work (if applicable) and at home?
- Do you exercise?
- Do you control your diet?
- Have you ever missed your medications or appointments and what are the reasons?
- Who is/are your caregiver(s) and what is/are their role(s)? Are they supportive?
- Do you know where to get help or assistance in the community with regards to your diabetes?
- Do you know where to get information to help you manage your diabetes?
- Do you think your diabetes will improve? What are your thought about the progress of your diabetes?
- Do you see your doctor for diabetes or diabetes related problems before your scheduled visits? If yes, what are the circumstances?
- Describe your typical doctor’s consultation.
- How do you think your doctor will be able to assist you with regards to your diabetes self-care?
- Can you tell me what will motivate you to self-manage your diabetes better?