

# Improving type 2 diabetes care and self-management at the individual level by incorporating social determinants of health

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**S**ocially disadvantaged people are more likely than those of greater affluence to develop type 2 diabetes mellitus (T2DM).<sup>1</sup> Disadvantaged people also encounter more challenges when managing T2DM because of their life circumstances.<sup>1-4</sup> Underpinning the injustice of social disadvantage are poor social determinants of health (SDoH) such as low income, suboptimal education, inadequate transport, limited healthcare access and adverse living conditions.<sup>2</sup>

Advocacy and action to improve SDoH at population and community levels occur in political and societal arenas.<sup>2</sup> This approach is necessary to achieve sustained, population-wide improvement of people's SDoH. However, because adverse social determinants negatively affect health outcomes at the individual level, incorporating SDoH into individual care is also important.

While social determinants of health are often not considered at individual or clinical levels, momentum towards integrating the SDoH of individuals into clinical healthcare settings has begun. Individual SDoH assessments have been developed and trialled,<sup>5</sup> recommendations on levels of care in which SDoH could be incorporated have been made<sup>6-8</sup> and a review on how an individual's SDoH are assessed and addressed in clinical settings has been conducted.<sup>9</sup> However, the progressive addition of incorporating SDoH into individual care is not standard practice

## Abstract

**Objective:** Suboptimal social determinants of health impede type 2 diabetes self-management. They are usually considered at population and community levels, not individually. The study objective was to draw on perspectives of people who have type 2 diabetes to identify and explore the impact of social determinants on self-management and ways to incorporate them into individual care.

**Methods:** Purposively selected participants chose to partake in focus groups or interviews. Data were analysed and themes identified through deductive and inductive thematic analysis.

**Results:** Social issues hinder type 2 diabetes self-management. Additionally, an individual's feelings and poor mental health, competing priorities and understanding about diabetes are important considerations. Support was provided via health professionals, community supports, financial support, personal support and informal self-management support.

**Conclusions:** Social determinants of health could be formally incorporated into individual care for people with type 2 diabetes if a socio-ecological view of health is taken as it considers the broader social and environmental circumstances in peoples lives.

**Implications for public health:** Care for people with type 2 diabetes could be transformed if social determinants of health are formally assessed and responded to at an individual level. A socio-ecological view of health in individual care and clinical settings would enable social determinants of health to be formally incorporated into type 2 diabetes care.

**Key words:** social determinants of health, type 2 diabetes, self-management, person-centred care

and of relevance to this paper, lacks a specific focus on T2DM.<sup>9</sup>

Effective self-management of T2DM often requires various lifestyle modifications,<sup>3</sup> which could be difficult for people with poor SDoH. Social determinants are not currently incorporated into T2DM practice guidelines<sup>3</sup> and may explain why SDoH can be overlooked in individual care for people with T2DM. The absence of resources for incorporating SDoH into T2DM care was

highlighted in a literature review by Frier, Devine, Barnett and Dunning.<sup>9</sup> Their review investigated methods and strategies used to assess and address the SDoH of individuals with T2DM in clinical settings, and revealed an absence of tools or guidance to support this. Enhancing current T2DM practice by formally assessing and responding to SDoH issues as part of usual T2DM care may provide insight into self-management barriers arising from poor SDoH. Then strategies to overcome, or

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work within these barriers could be devised. Ultimately, this could result in improved self-management for people with T2DM.

This study explored SDoH related barriers to T2DM self management. In addition, it investigated ways in which SDoH could be formally incorporated into the usual clinical care for individuals who have T2DM.

## Methods

### Study design

This qualitative study used a phenomenological, exploratory, descriptive approach<sup>10</sup> to draw on the perspectives of people with T2DM to increase understanding of how SDoH affect self-management and ways SDoH could be formally incorporated into individual, clinical care. Phenomenology was an essential element to the research design as it enabled study participants to discuss their perspective on the phenomenon of 'living with T2DM and how SDoH affects this', thus allowing 'lived experience' to form the research findings.<sup>10,11</sup>

### Situating the researcher

The primary researcher (AF) is a dietitian and diabetes educator with approximately 19 years of experience providing diabetes care throughout rural, remote and regional North Queensland, Australia. This experience has provided exposure to SDoH challenges that can occur for people with T2DM and has motivated this research. Reflexivity assured continual self-reflection and self-awareness of AF's role and experiences throughout data collection, data analysis and report writing.<sup>12</sup> AF reflected on each participant interaction. These reflections considered her role and experiences' effect on the content and delivery of questions and her thoughts and perceptions about participant responses. This insight was also maintained during data analysis and report writing.

### Aims

The aims of this study were to draw on the perspectives of people who have T2DM to:

- Explore SDoH related T2DM self-management barriers and facilitators.
- Identify and explore how to include SDoH into the usual care for individuals who have T2DM.

### Setting

Three health services in North Queensland (NQ), Australia participated in the study. Two were government services ( $n=1$ ,  $n=4$  participants) and the other was a not-for-profit organisation ( $n=5$  participants). These services provide diabetes care to regional, rural and remote communities across the NQ region.

### Participant recruitment

Staff members from the participating health services assisted with purposive recruitment.<sup>10</sup> The participating health service staff informed people with T2DM about the project and invited them to volunteer for the study. In addition, AF attended waiting rooms to inform potential study participants about the study. If in agreement, potential participants were later contacted by AF to answer any specific questions they may have had about the study and to confirm participation.

### Data collection

Study participants chose to partake in a focus group or one-on-one interview. This choice enabled greater participant control over the researcher/participant interaction. The focus groups and interviews were held in meeting rooms rather than clinic rooms to create a relaxed and comfortable environment. None of the participants were known to each other or the researcher prior to the study. Demographic information and duration of diagnosis were collected using a short questionnaire. Participants were asked semi-structured, open-ended questions that explored their experience of living with T2DM and the barriers and facilitators to self-management. Intertwined were colloquial language prompts that encouraged

discussion on well-known SDoH (Table 1) and how these affected the self-management of T2DM.

AF and the second and third researchers SD and FB developed the interview guide, which was informed by a literature review on the topic.<sup>9</sup> Interviews and focus groups were audio-recorded and informed consent was gained immediately before commencement of each interview/focus group. Data saturation was inferred when no new topics of discussion arose amongst study participants (approximately  $n=7$  participants). Three subsequent interviews were conducted to reinforce topic consistency.

### Data analysis

Data analysis was guided by the six steps for thematic analysis outlined by Braun and Clarke.<sup>10,13</sup> Data collected from the focus group and interviews were amalgamated as only one small focus group eventuated ( $n=4$ ). All focus group and interview recordings were transcribed and then reviewed manually by AF. A sample of these transcripts was reviewed independently by SD to enable independent identification of themes and increase study rigour.

Transcripts were thematically analysed using a combination of deductive and inductive data analysis.<sup>14</sup> The combination of deductive and inductive analysis enabled targeted exploration into SDoH issues (deductive analysis) and open exploration of participant perspectives (inductive analysis) to be conducted simultaneously.<sup>10,14</sup> Deductive analysis was based on a framework of well-known SDoH (Table 1) and was conducted to identify examples of how SDoH can affect T2DM self-management. The phenomenological approach to the inductive analyses, to understand the lived experience of people with T2DM, enabled deep exploration of participant experiences<sup>13</sup> of T2DM through a SDoH lens and how these issues could be formally incorporated into T2DM care.

Regular analytical discussions on coding and theme development were conducted between AF, SD and the fourth researcher KMR. These discussions fostered reflexivity, critical discussion and transparency of the analysis process. Member checking was conducted via phone. Of the 10 participants in the study, four confirmed correctness of the findings. One declined participation in the member checking process, and the remaining five were not contactable.

**Table 1: SDoH framework used for deductive analysis.<sup>2</sup>**

#### Social Determinants of Health

Addiction
Economic status (income)
Education
Employment
Food security
Healthcare access
Housing
Social exclusion
Social support
Stress
The social gradient
Transport

### Ethics approval

Ethics approval was granted by the Human Research Ethics Committee of Queensland Health (HREC/18/QTHS/128) and James Cook University, Australia (H7480).

### Results

Six interviews and one focus group were conducted. Three females and seven males aged between 42–79 years (mean age 64.3 years) participated in the study. One study participant was the carer of a person with T2DM. The person with T2DM they cared for was unable to attend on the day but wanted their perspective represented. On analysis, there were no differences between responses given by the carer or people with T2DM. Duration of T2DM diagnosis ranged between 3–25 years. All participants were non-Indigenous. Indigenous Australian perspectives are reported in a separate paper.<sup>15</sup>

### Interview and focus group findings

Two major themes were identified. The first involves T2DM self-management barriers (Theme 1: Barriers to T2DM self-management). This concept is divided into five subthemes, which are detailed below. The second major theme pertains to the supports utilised by people with T2DM to surmount the identified barriers (Theme 2: Diverse support). Theme 2 is also divided into five subthemes (also detailed below).

#### Theme 1: Barriers to T2DM self-management

- Social determinant challenges.
- Competing priorities.
- Poor mental health.
- Understanding T2DM.
- Feelings about living with T2DM.

#### Theme 2: Diverse support

- Self-management support.
- Health professional support.
- Community support.
- Financial support.
- Personal support.

#### Theme 1: Barriers to T2DM self-management

The five subthemes of Theme 1 (listed above) are the barriers to self-management identified among people with T2DM.

### Social determinant challenges

Commonly known SDoH (Table 1) were at the core of many self-management barriers described by people with T2DM. Whilst study participants seemed unaware of the relationship between poor SDoH and T2DM, they portrayed SDoH issues as having negative coactions on each other.

Almost all people with T2DM lamented about the vast impediment financial insecurity had on many aspects of life. Financial expenditure associated with having T2DM, budgetary constraints and minimal income appeared to hinder optimal T2DM management. Participants often discussed how a low income restricted the necessary aspects of T2DM self-management, for example, purchasing medications and affording appropriate nutrition. In the quote below, restricted finances limited healthy food choices.

*My eating habits have changed somewhat over a period of time; don't have the money. I'm financially struggling, so I've just got to try and find the cheapest sort of thing.* PWD 8

Financial burden also led to an inability to afford transport. This deficit was further compounded by limited access to other suitable transport modes and deepened SDoH related barriers to T2DM self-management. One participant described the protracted effort required to attend medical appointments due to unaffordable taxi fares.

*I have to ... catch the bus to [1<sup>st</sup> shopping centre] and walk across the road to [2<sup>nd</sup> shopping centre], and sometimes I have to catch – like, to come to a hospital appointment, I have to catch a bus from [suburb] to [3<sup>rd</sup> shopping centre] to the hospital.* PWD 2

The impact of unsuitable transport and limited finance extended beyond attending medical appointments and the consequent reduced healthcare access. Reduced transport options and financial inadequacy also overflowed to obstruct other aspects of life, for example, their shortfall seemed to intensify social isolation. The quote below demonstrates the distress and social isolation that can occur when transport options are limited.

*Devastated. Because the kids are all ... daughter lives in the [suburb far away]. I hardly ever see her. She's got a baby. I hardly ever see him.* PWD 6

### Competing priorities

Self-management of T2DM was often peripheral to the competing priorities in people's lives. People with T2DM reported being concerned about their own health, but often placed the needs of family members and loved ones first. The competing priorities described included: legal issues, incarcerated family members, death of loved ones, illness of friends and family and other health conditions such as cancer, back pain, arthritis, knee replacements and depression. These issues took precedence over T2DM self-management and seemed to add worry and stress. The example below demonstrates how T2DM self-management can be jeopardised by the stress and worry associated with competing priorities.

*And you are worried about them [loved ones], you're not worried about your sugar [T2DM] and it creeps up on you ... It's another thing, and I know unfortunately you have to be on the backburners, because of everything else that was stressing me out.* PWD 9

### Poor mental health

Poor mental health appeared chronic among people with T2DM. Depression was overtly articulated and there was no doubt study participants felt T2DM was contributing to, or even causing, their depression. At times poor mental health appeared to be associated with the complexities and challenges of self-management tasks. For example, the requirement of regular blood glucose testing and the anticipated results contributed to elevated anxiety, stress and worry. This overflowed and impacted the daily activities of people with T2DM. Furthermore, mental health fragility increased when self-management strategies were ineffectual. The quotes below affirm the burden on mental health that T2DM and self-management can instigate.

*I found when I was testing twice a day, morning and night, you'd become anxious about what you're doing during the day because of what impact it's going to have on you. I think that's where my stress kicks in ... I get so stressed worrying about the readings [blood glucose levels].* PWD 2

*... when I can't get it back into the singles [blood glucose levels]. And that sort of gets me down.* PWD 7

### Understanding T2DM

Understanding the intricacies of T2DM and self-management depended on the

quality of education provided by the health professionals. Some people described feeling overwhelmed by complicated explanations. On other occasions, people with T2DM felt the explanations they received were inadequate and they were given conflicting advice from different health professionals. There was a hesitancy to ask for clarification as the people with T2DM felt the health professional knew what they were talking about, and therefore they (the person with T2DM) should have been able to comprehend the message. In the quotes below, the person with T2DM assumed the health professional was the expert and had provided T2DM education appropriately.

*How do you go with understanding some of the messages that we [health professionals] talk to you about; do we make it clear to you?* INTERVIEWER (AF)

*Well, the way [health professional], she can't talk to people. She's all – all scientific... yeah... You can't, you just think, oh, they must know what they're doing.* PWD 6

Many study participants felt the solution to providing well understood T2DM education was simple. Health professionals merely needed to confirm understanding and encourage people with T2DM to ask questions.

*Just keep talking until they understand. But also, I mean, I know I'm not the dumbest person on the planet, and there are other people who don't understand things... Just encourage them to ask questions.* PWD 6

### Feelings about living with T2DM

How people with T2DM feel about living with a chronic disease such as diabetes was identified as an important point to consider. There were mixed feelings about living with the T2DM diagnosis. Some people expressed frustration and disdain associated with having T2DM and the self-management requirements, as seen below.

*I hate it. Absolute pain in the arse.* PWD 6

*It's very frustrating! And I get very, sort of very cranky because I can't – I can't get it out of the area where it is, and that, back into the single figures [blood glucose levels], you know.* PWD 7

Diverging from the above dismayed view of T2DM, other people appeared to display a blasé attitude.

*I know that I've got it [T2DM], and so I have to take pills, and I have to inject, but it's still me and I do it, cruise along, virtually like I've always cruised along.* PWD 10

For some, T2DM created stress worry and anxiety. The one carer in this study described distressing feelings about her responsibilities.

*I panic, but I get very stressed... I'm so scared... it feels like it's all on me and I just feel like I've got the world on me... PWD 1 (carer)*

Overall study participants felt living with T2DM affected many aspects of their life and was an unavoidable impost, as is articulated below.

*It just affects you on so many different levels [living with T2DM] that you become conscious of it all the time, you're never away from it. It's just always there.* PWD 2

No single feeling or emotion was dominant amongst people with T2DM; however, their varying perceptions suggest that insight into how people feel about living with T2DM is a valuable inclusion in T2DM care.

### Theme 2: Diverse support

Support, in its varying modes, was identified as a vital component of T2DM care to address SDoH related barriers to self-management. The self-management challenges described by people with T2DM were contended through various support mechanisms, depending on the pertinent issue.

#### Self-management support

People with T2DM articulated a multitude of undertakings involved with self-management. Support with self-management was provided to people with T2DM by carers, family, friends and community services. This included healthy eating and shopping accordingly, attending medical appointments and pharmacy visits. In addition to one-on-one support, other informal self-management support strategies were beneficial to people with T2DM, such as Webster-Paks (multidose medication blister packs). Webster-paks enabled people to take medications correctly whilst maintaining their independence. People with T2DM appreciated the support to meet their self-management requirements. The person below overtly described a sense of safety from the medication adherence support that was provided i.e. his Webster-Pak.

*I felt safe giving me self the medication through me blisters [Webster-Pak].* PWD 10

#### Health professional support

Health professionals of multiple disciplines provided expertise and guidance to help their clients with T2DM self-management.

While people with T2DM did not elaborate on the specifics of the support provided by each discipline, they discussed the many health professional's involved in their care. The person with T2DM below eludes to the varying disciplines involved in T2DM care.

*I see [name] – that's my psychologist – once a month. My doctor and my diabetes nurse every three months. I go to the hospital [diabetes centre] ... PWD 7*

People with T2DM expressed appreciation for the support provided by health professionals. Furthermore, some attained a 'peace of mind' from the health professional support they received, as is suggested in the quote below.

*So, what's been good then; what's been helpful for you? [asked at a diabetes clinic].*

INTERVIEWER (AF)

*Just the fact of coming here and keeping an eye on it [T2DM].* PWD 4

#### Community support

People with T2DM utilised supports available within the community, for example, community transport services. Accessing community services enabled people with T2DM to maintain independence and participate in general life activities such as shopping, attending appointments and social outings. However, people with T2DM also expressed a desire for increased community support options. This included both T2DM specific and other community supports. The person with T2DM below describes a desire for more community support groups.

*It probably would [the support of others would be helpful]... maybe a group might be an idea but, even a diabetic group, or something.* PWD 8

The utilisation of existing community supports and the desire for increased support options within the community demonstrate the importance study participants placed on community support.

#### Financial support

With restricted finances identified as a major barrier to T2DM self-management, almost all study participants expressed the necessity of financial assistance to enable effective T2DM self-management. The below conversation with a person with T2DM highlighted the potential detriment lack of finances can have.

*Without the pension?* INTERVIEWER (AF)

*I'd have been having to just die. Because it's expensive. There's no way I could have*

afforded it [living with T2DM]... PWD 7

Oh, so you get the subsidy for your scripts?

INTERVIEWER (AF)

Yeah. Otherwise I wouldn't be buying it...

And so, if you didn't have that support you wouldn't buy the medication at all?

INTERVIEWER (AF)

No, no! I wouldn't. I'd just take whatever comes. PWD 7

Financial support such as pensions and government subsidies for medications undoubtedly assisted the participants with T2DM in the study to manage their condition.

**Personal support**

People with T2DM discussed varying supports that were personal to them, including the support of family members and also of companion animals. Personal support was not necessarily related to T2DM self-management, nonetheless being able to lean on these supports, whatever they were, provided fortitude and companionship, as is demonstrated in the quotes below.

*It was amazing when I was here in hospital, it was just astonishing. And my son who works 600 kilometres away, he of course came up, but 5am every morning and that, I slowly arise in ICU and I just seen this big face there.... It was just so beautiful. Just holding my hand ... It's just beautiful. And of course they give you the strength.* PWD 2

*I've got a dog at home too, which is sort of good company.* PWD 9

Contrary to the above quotes, the absence of personal support exacerbated feelings of social isolation and aloneness, as indicated below.

*I heard you just say that you don't feel like you've got any support?* INTERVIEWER (AF)

*No, I haven't. I mean, my children keep to themselves ... Now, I could get sick and go to hospital and nobody gives a [swear word]. Nobody gives a damn whether I'm in hospital or anything. Nobody will come and visit or anything.* PWD 3

The conflicting outlooks identified between those who had personal supports to lean on and those who did not exemplify the feelings of isolation and aloneness that can occur when personal support is unavailable to people with T2DM.

Figure 1 provides a diagrammatic representation of the themes. The diagram displays the 'Barriers to T2DM self-management' in the centre of the diagram (Theme 1) and the 'Diverse support' utilised

by people with T2DM to assist in surmounting these barriers in the outer circle of the diagram (Theme 2).

**Discussion**

A person-centred approach enhances T2DM care.<sup>3,16</sup> To enable this and empower successful T2DM self-management, insight into an individual's social context is beneficial.<sup>3</sup> This study aimed to draw on the perspectives of people with T2DM to explore SDoH related self-management barriers and facilitators, and identify how SDoH could be formally incorporated into the usual, individual care for people with T2DM.

In this study, well-known SDoH such as income, transport and social isolation were identified as barriers to self-management. This is not a surprising finding as these well known SDoH<sup>2</sup> are common hindrances for T2DM self-management.<sup>17</sup> In addition, and possibly also influenced by an individual's life and societal circumstances,<sup>2</sup> were the competing priorities in the lives of people with T2DM, understanding of T2DM, poor mental health and how people felt about living with T2DM, all affected self-management. These identified barriers to self-management are all interrelated. For

example, feelings about living with T2DM, competing priorities, social determinant challenges, or lack of understanding about T2DM could all affect a person's mental health. Conversely, poor mental health could have diverse repercussions for any, or all of these components.

The study findings portrayed a connected and cogent relationship between T2DM, individual, societal, financial and environmental factors. Consequently, an approach to T2DM care that includes the external influences on a person's ability to manage the condition may be required. The multilayered influence on T2DM self-management suggests applying a socio-ecological model of health, such as that developed by Dahlgren and Whitehead,<sup>18</sup> may assist in incorporating SDoH into individual care for people with T2DM by encouraging a broader view of the influences on T2DM self-management. The socio-ecological model of health includes and extends a biomedical, individualistic responsibility for health and recognises the influence of community, living, working, and social conditions on an individual's lifestyle, and subsequently their health,<sup>18,19</sup> i.e. their SDoH.

The socio-ecological model of health has

Figure 1: Diagrammatic representation of identified themes.



previously been used to investigate the influences on T2DM self-management in a low socio-economic, Australian population.<sup>20</sup> In line with the issues reported by people with T2DM in the current study, the authors confirmed multiple influences on T2DM self-management. The influences they identified were; individual (e.g. motivation), interpersonal supports (e.g. health professionals, friends and family), organisational (e.g. health care access issues) and community level (e.g. self-management support services). These layers compound to affect health in general, and more specifically, the behaviours required for T2DM self-management.<sup>18,19</sup>

Adopting a socio-ecological approach to incorporate SDoH into the usual clinical care of individuals with T2DM could help identify the influences on self-management, which may then catalyse strategies to action or work within these issues. Furthermore, it could enhance current practices around understanding the individual and broader social circumstances of people with T2DM. Diabetes education provided to people with T2DM could become more personalised when there is a deep understanding of how a person's social circumstances influence their self-management. An example specific to the findings in this study could be: budgeting support to assist with the financial difficulties described by people with T2DM in the current study. Personalising T2DM education would enable a targeted approach to each individual's identified SDoH related barriers, empower improved self-management, and accommodate for varying health literacy levels.<sup>21</sup>

Poor mental health and feelings about living with T2DM was also a barrier to T2DM self-management in this study. Disenabled self-management resulting from a poor mental and emotional status is well documented and forms an integral part of T2DM management guidelines.<sup>3,22</sup> It is argued that effective diabetes care is not possible without considering emotional status.<sup>23</sup> People with T2DM in the current study highlighted the importance of this through overt expressions of depression affecting their T2DM self-management and the noticeable undertone of stress and anxiety.

There is an association between mental health and SDoH.<sup>1</sup> Understanding the mental and emotional status of each unique individual, by providing person-centred care

and incorporating a holistic, socio-ecological view of health and wellbeing<sup>16</sup> amplifies the likelihood of identifying the relevant emotional and psychological aspects of living with T2DM.<sup>23</sup>

After identifying T2DM self-management barriers, appropriate support that facilitates effective self-management could be arranged. Apposite support could also stem from a socio-ecological framework. A socio-ecological view would provoke a broader and multifaceted interpretation of support requirements, similar to the support utilised by people with T2DM in this study (health professional support, self-management support, community support, financial support and personal support). A broader view could help address the complex needs of people with T2DM more comprehensively. This may be through connecting people to support not typically considered to be health-specific, such as transport and housing departments, or other available social support and community services. Acknowledging the influences on health, beyond the healthcare system, and arranging support accordingly, may assist people with T2DM to overcome or make self-management progress despite SDoH related barriers. Consequently, the support provided could then become a facilitator of effective T2DM self-management.

The association between social support and improved glycaemic management is not a new concept. Previous studies have shown the effectiveness of social support on T2DM outcomes.<sup>24,25</sup> Furthermore, Strom and Egede<sup>26</sup> consolidated the importance of social support in their systematic review. Their definition of social support included formal support, such as that provided by health professionals, and informal support, such as friends and family. They reviewed 37 articles and determined that higher levels of social support indeed contributes to improved outcomes for people with T2DM.<sup>26</sup> The people with T2DM in the current study also concur the advantage of both formal (health professional support and financial support) and informal supports (self-management support, community support and personal support).

### Limitations

The themes in the current study were identified from the perspectives of people with T2DM in regional, rural and remote NQ,

Australia. Similar research, conducted in other locations may lead to different theme development due to the divergent influences on people's lives stemming from geographic location. Accordingly, geographic location will require consideration if replicating this study. Consideration should also be given to the use of purposive sampling and voluntary study participation. While it was essential to recruit people with T2DM to discuss the self-management challenges associated with SDoH, and voluntary study participation is necessary, the life circumstances of participants may have influenced their choice to participate, and thus the findings. Finally, only half (n=5) of the participants were contactable for member checking; however, those who provided feedback confirmed the correctness of the findings.

### Conclusions

People living with T2DM often have poor SDoH.<sup>1</sup> A socio-ecological model of health considers the multilayered and intertwined influence of culture, socio-economics, environment, living and working conditions, and social and community networks on an individual's lifestyle.<sup>18</sup> Using a socio-ecological model of health to incorporate SDoH into the individual care of people with T2DM could provide insight into SDoH related barriers to self-management and guide a person-centred approach to individual care. Following comprehensive identification of SDoH related barriers, coinciding support based on a socio-ecological model of health could be arranged. Ultimately then, improved self-management of T2DM may be achieved.

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## References

1. Australian Institute of Health and Welfare. *Australia's Health 2018*. Canberra (AUST): AIHW; 2018.
2. Wilkinson RG, Marmot M. *Social Determinants of Health: The Solid Facts*. 2nd ed. Copenhagen (DNK): World Health Organisation Regional Office for Europe; 2003.
3. Royal Australian College of General Practitioners. *Management of Type 2 Diabetes: A Handbook for General Practice*. Melbourne (AUST): RACGP; 2020.
4. Walker RJ, Gebregziabher M, Martin-Harris B, Egede LE. Relationship between social determinants of health and processes and outcomes in adults with type 2 diabetes: Validation of a conceptual framework. *BMC Endocr Disord*. 2014;14:82.
5. Neadley K, McMichael G, Freeman T, Browne-Yung K, Baum F, Pretorius E, et al. Capturing the social determinants of health at the individual level: A pilot study. *Public Health Res Pract*. 2021;31(2):30232008.
6. Andermann A. Taking action on the social determinants of health in clinical practice: A framework for health professionals. *Can Med Assoc J*. 2016;188(17-18):e474-e83.
7. CLEAR Collaboration. *The Clear Toolkit: Helping Health Workers Tackle the Social Causes of Poor Health*. Version 3.0. Montréal (CAN): McGill University Department of Family Medicine; 2013.
8. Baum FE, Legge DG, Freeman T, Lawless A, Labonté R, Jolley GM. The potential for multi-disciplinary primary health care services to take action on the social determinants of health: Actions and constraints. *BMC Public Health*. 2013;13:460.
9. Frier A, Devine S, Barnett F, Dunning T. Utilising clinical settings to identify and respond to the social determinants of health of individuals with type 2 diabetes-A review of the literature. *Health Soc Care Community*. 2020;28(4):1119-33.
10. Braun V, Clarke V. *Successful Qualitative Research: A Practical Guide for Beginners*. London (UK): SAGE; 2013.
11. Liamputtong P. *Research Methods in Health: Foundations for Evidence-Based Practice*. South Melbourne (AUST): Oxford University Press; 2013.
12. Dodgson JE. Reflexivity in qualitative research. *J Hum Lact*. 2019;35(2):220-2.
13. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
14. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol*. 2013;13(1):117.
15. Frier A, Devine S, McBain-Rigg K, Barnett F, Cassady Z, Dunning T, et al. Indigenous Australian perspectives on incorporating the social determinants of health into the clinical management of type 2 diabetes. *Rural Remote Health*. 2021;21(2):6352.
16. Australian Diabetes Educators Association. *Person Centred Care for People with Diabetes*. Canberra (AUST): Diabetes Australia; 2015.
17. Walker RJ, Smalls BL, Egede LE. Social determinants of health in adults with type 2 diabetes-contribution of mutable and immutable factors. *Diabetes Res Clin Pract*. 2015;110(2):193.
18. Dahlgren G, Whitehead M. *Policies and Strategies to Promote Social Equity in Health. Background Document to WHO—Strategy Paper for Europe*. Stockholm (SWE): Sweden Institute for Further Studies; 1991.
19. Hill JO, Galloway JM, Goley A, Marrero DG, Minners R, Montgomery B, et al. Scientific statement: Socioecological determinants of prediabetes and type 2 diabetes. *Diabetes Care*. 2013;36(8):2430-9.
20. Dao J, Spooner C, Lo W, Harris MF. Factors influencing self-management in patients with type 2 diabetes in general practice: A qualitative study. *Aust J Prim Health*. 2019;25(2):176.
21. Kim SH, Lee A. Health-literacy-sensitive diabetes self-management interventions: A systematic review and meta-analysis. *Worldviews Evid Based Nurs*. 2016;13(4):324-33.
22. Walker RJ, Gebregziabher M, Martin-Harris B, Egede LE. Independent effects of socioeconomic and psychological social determinants of health on self-care and outcomes in type 2 diabetes. *Gen Hosp Psychiatry*. 2014;36(6):662-8.
23. Young-Hyman D, de Groot M, Hill-Briggs F, Gonzalez JS, Hood K, Peyrot M. Psychosocial care for people with diabetes: A position statement of the american diabetes association. *Diabetes Care*. 2016;39(12):2126-40.
24. Black S, Maitland C, Hilbers J, Orinuela K. Diabetes literacy and informal social support: A qualitative study of patients at a diabetes centre. *J Clin Nurs*. 2017;26(1/2):248-57.
25. Whittemore R, D'Eramo Melkus G, Grey M. Applying the social ecological theory to type 2 diabetes prevention and management. *J Community Health Nurs*. 2004;21(2):87-99.
26. Strom JL, Egede LE. The impact of social support on outcomes in adult patients with type 2 diabetes: A systematic review. *Curr Diab Rep*. 2012;12(6):769-81.