ZIBELINE INTERNATIONAL™ PUBLISHING

ISSN: 2785-8391 (Online)
CODEN: JHDCAZ

Journal of Healthcare in Developing Countries (JHCDC)

DOI: http://doi.org/10.26480/jhcdc.01.2024.01.09

CrossMark

RESEARCH ARTICLE

EXPLORING THE VIEWS AND EXPERIENCES OF HEALTHCARE PROVIDERS IN PATIENT DIABETES MANAGEMENT USING THE INFORMATION, MOTIVATION, AND BEHAVIOR MODEL: A QUALITATIVE STUDY IN MALAYSIA

Norbaidurah Ithnain*, Rosnani Kassim, Nadia Amirudin, Manimaran Krishnan, Albeny Joslyn Panting

[a]Institute for Health Behavioural Research, Ministry of Health Malaysia, Blok B3, National Institutes of Health, Jalan Setia Murni U13/52, Seksyen U13, Setia Alam, 40170 Shah Alam, Selangor Darul Ehsan. Malaysia
**Corresponding Author Email: Norbaidurah Ithnain durrah@moh.gov.my*

ARTICLE DETAILS

Article History:

Received 18 November 2023
Revised 20 December 2023
Accepted 09 January 2024
Available online 11 January 2024

ABSTRACT

Background: Healthcare providers (HCPs) are vital in empowering self-care among diabetic patients. They act as an enabler in promoting positive behavioral change that may improve diabetes self-management and clinical outcomes. Therefore, this qualitative study aimed to explore HCPs' views and experiences with regard to diabetes management using the Information, Motivation, and Behavior (IMB) Model. According to the IMB model, an individual's ability to perform behavioral change depends on their level of knowledge about the behavior, motivation to engage in the action, and power of the behavior skills to do so in various contexts. **Methods:** In this qualitative study, two Focus Group Discussions (FGD) were conducted in Selangor, Malaysia in 2019. A purposive sampling technique was used to recruit 13 diverse teams of HCPs. An interview guide was used during the FGD. All interviews were audio-recorded before being transcribed verbatim and analysed using a thematic analysis approach. **Results:** Eight emerging themes and 21 subthemes were extracted based on the three primary constructs of IMB, namely: 1) Information: Diabetes knowledge and health education delivery method, 2) Motivation: Patient's motivation in diabetes management, HCPs motivating and demotivating factors in providing diabetes management health services, HCP's motivational approaches, and 3) Behavior: Diabetes-related behavior and lifestyle behavior. **Conclusion:** Based on the findings of FGDs, the IMB model is a comprehensive health behavior change framework that is appropriate for diabetes management. In addition to educating patients with information, HCPs should focus on motivating patients and enhancing behavioral skills to stimulate behavioral change. Understanding the views and experience of HCPs using the IMB model is beneficial in establishing the interventional strategies that can improve the outcome of diabetes management.

KEYWORDS

Healthcare provider, diabetes management, qualitative, Malaysia, Information, Motivation and Behavior Model (IMB

1. INTRODUCTION

Diabetes mellitus (DM) is a significant global public health burden (Lim et al. 2019). It can lead to a substantial socio-economic impact due to increased morbidity from various complications such as nephropathy, retinopathy, neuropathy, and premature death (CPG 2023). Moreover, diabetes manag ement requires multi-faceted strategies including interventions aimed at improving glycaemic control, preventing complications, and lowering risk factors (Willens et al., 2011). In 2009, the global prevalence of adult diabetes was 9.3%, and it is expected to increase to 10.2% by 2030 and 10.8% by 2045 (Saeedi et al., 2019). Malaysia recorded the highest prevalence of DM in the Western Pacific Region and one of the highest in the world (Ganasegeran et al., 2020). According to a national survey, the prevalence of DM in Malaysia increased from 11.2% in 2011 to 18.3% in 2019, in which more than 70% of the diagnosed DM patients seek care in the Ministry of Health (MOH) primary health clinics (Institute for Public Health 2020).

To improve the delivery of diabetes care, many initiatives have been implemented by the Ministry of Health (MOH) Malaysia in the past three decades. For example, Diabetes Resource Centres (DRCs) were established as one-stop centres for diabetes patients in MOH hospitals and health clinics (Hussein et al., 2016). In 2009, MOH also implemented a nationwide Diabetes Clinical Audit for Type 2 DM patients (T2DM) together with a Quality Assurance (QA) Programme known as the "Quality of care of diabetes care in MOH health clinics: Glycaemic control." These efforts were strengthened by the National Diabetes Registry (NDR) a web-based application established in 2011 (Chan 2018). In addition, Clinical Practice Guidelines (CPGs) related to the management of DM have been published to assist HCPs in identifying, diagnosing, and managing T2DM patients via the multi-prong strategies of lifestyle modification, medical nutrition therapy, and patient education that focuses on self-care and empowerment (Clinical Practice Guidelines, 2020).

Similar to other countries MOH primary care service in Malaysia adopts a multidisciplinary team approach to diabetes care (Abdulrhim et al., 2021; Sorensen et al. 2020; American Diabetes Association 2020). Multidisciplinary collaboration between all healthcare providers (HCPs) such as doctors, nurses, assistant MOs, nutritionists, dieticians, pharmacists, physiotherapists, health education officers, and occupational therapists is the key to a successful DM care model (Chan 2015) that can improve the quality and outcome of care (Abdulrhim et al., 2021; Sorensen et al., 2020). A multidisciplinary approach team is vital to empower

Quick Response Code	Access this article online	
	Website: www.jhcdc.com.my	**DOI:** 10.26480/jhcdc.01.2024.01.09

Cite The Article: Norbaidurah Ithnain, Rosnani Kassim, Nadia Amirudin, Manimaran Krishnan, Albeny Joslyn Panting (2024). Exploring the Views and Experiences of Healthcare Providers in Patient Diabetes Management Using The Information, Motivation, and Behavior Model: A Qualitative Study in Malaysia. *Journal of Healthcare in Developing Countries, 4(1): 01-09.*

patients' diabetes self-care in managing DM effectively by providing the necessary information, supporting patients' motivation, and equipping them with the necessary behavior skills to drive lifestyle changes (Maneze et al., 2019).

Qualitative research involving diabetes patients in Malaysia in the past revealed that more specific information and practical counselling from HCPs, especially on diet, exercise, and medications are needed (Neblett et al., 2019). Another study found that Diabetes Self-Management Education (DSME) was inadequate due to the limited time allocated for consultations with doctors, language barriers, lack of motivation, as well as lack of interpersonal and communication skills among HCPs (Cheng et al., 2018). On a similar note, another study emphasises that HCPs must motivate T2DM patients to convince them about the treatment effectiveness to boost their self-efficacy so that the DSME efforts can be sustained (Gunggu et al., 2016).

It is undeniable that DM patients face many barriers in the management of their conditions. However, the HCP multidisciplinary team treating them is also burdened with an increasing amount of responsibility in addressing the medical and psychosocial requirements of persons with diabetes, especially with the increased prevalence of diabetes and evolving complexity in its management (Willens et al., 2011). In Malaysia, the quality of care for diabetes is closely related to the organisational system, staffing, and patient load of healthcare facilities (Yen et al., 2016). The establishment of human resource capability is essential in resolving the management gaps of Non-Communicable Diseases (NCDs) (Samb et al., 2010). In view of the importance of HCP's knowledge and skills in the management process of DM, MOH Malaysia collaborated with the Steno Diabetes Centre to conduct a six-month training programme for general physicians and nurses. The Steno REACH Certificate Course in Clinical Diabetes Care (SRCC) showed that the programme should be expanded to other HCPs involved in the multidisciplinary team of diabetes care, such as medical officers, dieticians, pharmacists, and physiotherapists (Lim et al., 2019).

Given the challenges mentioned above, this study applied a comprehensive theoretical model of health behavior change, known as the Information-Motivation-Behavioral Skills (IMB) model to evaluate diabetes self-care (DSC) in Malaysia. The IMB model is a comprehensive health behavior change framework for DSC (Osborn et al., 2010; Liu et al., 2018). Figure 1 explains the three primary constructs of Information, Motivation, and Behavior (Fisher et al. 2006). IMB suggested that patients with higher information and motivation are more likely to perform DSC behaviors. Thus, the empowerment of self-care is essential in promoting positive behavioral change among patients. We believe that this model is beneficial to understanding the HCPs' experience in diabetes management. Previous studies stated that HCPs should enhance patients' motivation and behavioral skills to produce behavior changes rather than focusing on knowledge alone (Osborn et al., 2010; Liu et al., 2018; Gao et al., 2013). Understanding the experience of HCPs is crucial in DM management as they serve as the enablers in empowering patients' behavior (Yoon et al., 2022; Sibounheuang et al., 2020) which can subsequently lead to better diabetes self-management and improved clinical outcomes (Luo et al., 2015). Therefore, this qualitative study aimed to explore the views and experiences HCPs with regard to diabetes management in Selangor, Malaysia. The themes generated through this qualitative study were integrated within the IMB Model construct to fill a significant gap in understanding how the experience of HCPs can be used to plan possible interventions that are essential in improving diabetes management.

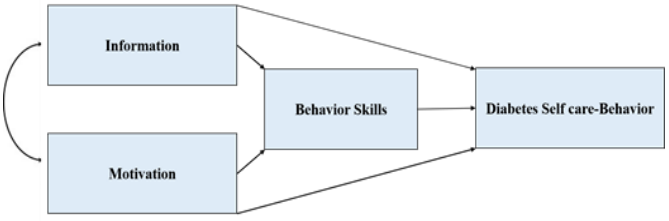

Figure 1: IMB Model for diabetes

2. Material and Methods

2.1 Study Design And Setting

A qualitative study was conducted among HCPs in a public health clinic and a government hospital in Selangor, Malaysia. These two facilities were chosen due to the availability of a multidisciplinary DM management team consisting of various HCPs in order to fulfill the study's aims of exploring the experiences of HCPs in managing diabetes care.

2.2 Participant Recruitment And Data Collection

The interviewer is the study's Principal Investigator, RK, Senior Principal Assistant Director (Health Education), an experienced qualitative researcher. She also had experience caring for family members with diabetes and experience working with people with non-communicable diseases. There was no contact between the interviewer and research team with the participants before the study started. The heads of the two diabetes centres who are not part of the research team in charge of the participant recruitments and scheduling the interview times. Only HCPs who have been involved in diabetes care for more than a year were included in this study. After explaining the study objectives, all of them agreed to participate. Two FGDs were conducted, one in each site. Before FGD sessions, a briefing about the study's purpose was given to the participants before they signed a consent form. The participation was voluntary and they were permitted to leave the interview at any point. The FGDs were conducted face-to-face in a confidential setting at the workplace of the HCPs so that the informants felt comfortable in sharing their perspectives. Both FGDs lasted 45-60 minutes and were audio-recorded. The team conducted one FGD in each site as planned. After both FGDs, the data reached saturation and no further session was required.

The FGD was conducted using semi-structured interview guides developed based on IMB Model. It comprised three main sections, i.e. information, motivation, and behavioral skills. Besides, the interview guide also included two additional sections on the challenges and potential strategies for diabetes care (Table 1). During the interview session, general probing was utilised to facilitate inquiries, for example: "Could you expand on that?", "What are your thoughts on this?", "Could you please elaborate, for example?"

Table 1: FGD Interview Guide based on the IMB Model

Constructs	Questions
Information	• What kind of information does HCP give to the patients? • How does HCP give information to the patients?
Motivation	• What are the factors influencing patients' motivation in diabetes management? • What are the factors influencing HCP in motivating patients in diabetes management? • What are the demotivating factors influencing HCP in motivating patients in diabetes management? • What is your approach in motivating patients in diabetes management?
Behavior	• What is your perception and experience of patients' diabetes behavior?

2.3 Data Analysis

All the interviews were recorded and transcribed. The principal investigator, who facilitated the FGDs and made notes, double-checked the transcripts for accuracy. The interview continued until data saturation when no new data were obtained from the participants. The transcripts from FGDs were coded and examined qualitatively according to themes. The team reached a consensus on the identified themes after several discussions. The themes were then presented using the components in the IMB model and supplemented with illustrative quotes. To ensure the trustworthiness of the data, the investigators ensured that the data encompassed the input of a variety of participants. Comprehensive reviews were made by the research team members on the FGD transcripts and the codes to ensure validity. Three experts in qualitative research evaluated the transcripts, codes, and categories to identify any discrepancies in the coding process (Polit and Beck 2021).

2.4 Confidentiality And Ethical Consideration

Each participant was given a code number. All transcripts, notes, and audio recordings were deidentified to maintain confidentiality. All files were kept in a closed room in a locked file cabinet.

3. Results

3.1 Participants

Two FGDs were conducted comprising 15 HCPs (two males and 13 females). They were made up of endocrinologists, medical officers, nurses, pharmacists, and dieticians. The average year of working was 6.3 (Table 2).

Table 2: Summary of demographic profile for FGD respondents	
Demographic Profile	**Number of HCPs**
Position	
Dietician	2
Endocrinologists	3
Medical Officer	2
Pharmacist	4
Nurses	4
Involved in DM management (years)	
Less than 5	2
5-10	8
More than 10	2
Not Stated	3

3.2 HCP's Experiences In Patient Diabetes Management

Overall, the participants reported a wide range of experiences with diabetes management under the three main constructs of IMB; Information, Motivation, and Behavior. Eight emerging themes and 21 subthemes emerged from the thematic analysis as shown in Figure 2.

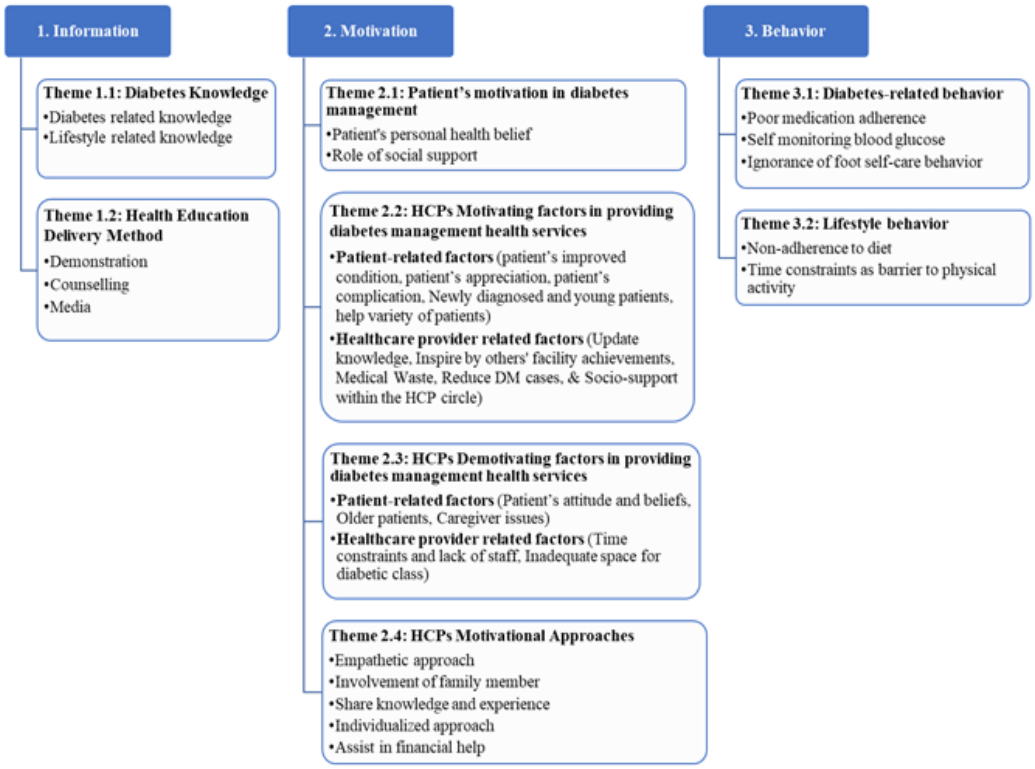

Figure 2: Summary of the emerged themes and subthemes.

Construct 1: Information

Diabetes treatment is complicated. It requires a healthcare team that includes at least one HCP who is fully aware of all treatment efforts. This HCP is usually a doctor, nurse practitioner, or physician assistant. The patients must possess comprehensive information on diabetes management, the majority of which should be provided by the HCPs. Patients with a higher level of knowledge are more likely to understand the disease better, especially in terms of disease progression and complications. The next section explains what information is given to the patients and how the HCPs deliver the information.

Theme 1.1: Diabetes knowledge

Subtheme 1.1.1: Diabetes-related knowledge

Diabetes-related knowledge such as medication intake, self-monitoring blood glucose (SMBG), as well as eye and foot care were the common diabetes knowledge given consistently by the HCPs to their patients.

"…Usually we will explain how to monitor their blood glucose at home, which equipment to use, some information on how to read the reading, and what level they should aim for." (F3HT)

Subtheme 1.1.2: Lifestyle-related knowledge

Lifestyle modification, such as diet and physical activity, is equally vital in the management of T2DM. HCPs described how they deliver information regarding lifestyle-related knowledge, such as the recommended exercise duration by MOH and alternatives for those with complications.

"…my advice is to follow their ability… for those who are less able, I suggest maybe 20 to 30 minutes a day as recommended by the Ministry of Health... But of course, for immobile people who have complications, who have amputated legs, we also advise doing upper exercises, such as stretching muscles that do not use much movement... We will also ask for a referral to a physiotherapist... do light exercises to lose weight maybe... Those who are active... follow what they like, play ball, play badminton...." (F2HT)

Theme 1.2: Health education delivery method

HCPs mentioned that they use a variety of strategies to provide health education to their patients, including demonstration, counselling, and via media.

Subtheme 1.2.1: Demonstration

The HCPs shared their common practices in demonstrating the methods of performing SMBG to ensure that the patients understand and can do it independently.

"First, we ask the patient, does he know how to use the glucometer machine with strips... If he does not understand, we will tell him to use our machine and demonstrate until he understands. Then we will give him a form and ask him to perform SMBG at home following the form." (F4HT)

Subtheme 1.2.2: Counselling

Some HCPs mentioned that counselling is a main part of their health education delivery method. For example, counselling is commonly performed for Medical Nutrition Therapy (MNT) and Medication Therapy Adherence Clinic (MTAC).

"I think the service we provide is called Medical Nutrition Therapy. Medical Nutrition Therapy means counselling, nutritional counselling for type 2 diabetes patients. We have two categories: individual counselling and group counselling. The group counselling is more like a lecture, but there is Q&A, so it is more like an individual lecture." (F1KM)

"We are mainly giving counselling. We have another service called MTAC, Medication Therapy Adherence Clinic for type 2 diabetes patients. In MTAC, every time a patient comes, he will meet the pharmacy officer so that we can give counselling regarding drug use. Ok, it is like a small amount of education, how to eat, and then, a little exercise. Then, we will see if there is any problem with his medicine. Usually, we will tell him to do SMBG at home and we will look at the trend before giving suggestions. Ok, this is to solve their medication-related problems." (F4KM)

Subtheme 1.2.3: Media

As media such as internet websites and phone applications (apps) form a significant part of modern lives today, HCPs also mentioned that they would inform the patients to refer to media. For example, they suggest patients watch YouTube exercise videos and obtain information from established sources such as government websites and professional dieticians' Facebook/ Instagram pages.

"So, I will give the correct sources. In terms of exercise, they can look it up on YouTube. For nutritional information, I will usually give them an established website. For example, the MOH MySihat portal. The dietician website is there, the nutrition website is also there. One more thing, I have created a website specifically for patients who have met me... I will suggest an established FB or IG page that he can follow to get support from dieticians. When I receive many patients or when I give a talk or individual counselling, I will share the links with them. Most people like to read from mobile phones because they can access a lot of information there." (F1KM)

Construct 2: Motivation

Motivation support is important in patient self-care for any condition. It goes beyond the mere provision of information by HCPs. It also includes efforts in building patients' confidence and assisting them in making the right choices to ensure improved self-care and health outcomes. This part explores the views of HCPs on the factors influencing patient motivation and to obtain a better understanding of their approaches to motivating their patients. Additionally, this part also explores the motivating and demotivating factors of HCPs in providing diabetes care for patients.

Theme 2.1: Patient's motivation in diabetes management

When discussing the factors influencing patients' motivation in diabetes management, the HCPs informed that the patient's personal health beliefs and social support play a vital role.

Subtheme 2.1.1: Patient's personal health belief

HCPs expressed that personal health beliefs played a major role in patients' motivation in diabetes management. The diabetic experience in the patient's family and the perceived severity significantly impacts their health beliefs.

"The most common impact is from those who are very close to them. For example, if the patient sees her mother who has diabetes and suffers from complications, she is motivated to take medicine and to control the condition to avoid getting severe diabetes." (F5KM)

"When he has one of the complications, he will be even more anxious... because he is scared... So, he comes to us when he has that complication." (F4HT)

Subtheme 2.1.1: Social support

Furthermore, HCPs also discussed how family, employer, and financial aid are essential support in motivating the patients to manage their diabetes.

"... Support. If your partner or child does not know about your illness, or what you can eat, it is difficult to survive. If they have to deal with it alone, it is pretty tricky. But when they get support from others, maybe things will be easier for them. So, they will easily follow the regime, then manage to recover." (F3KM)

"... family member is essential. From a financial point of view, for example, SMBG requires expensive strips. However, elderly patients who are not working have no money and need their children's help. Some of the children cannot help because they say they do not have money. However, when it comes to toys, they can buy expensive toys for their children, but they cannot buy their mother's strips. That is why family support is also one of the critical factors." (F4HT)

"In terms of social welfare, zakat assistance also plays a role. Some diabetic patients request help from us to buy pampers and other items. Some also want to use the glucometer but cannot afford it. If everyone cannot survive, how can they improve their health?" (F6KM)

Theme 2.2: Motivating factors for HCPs in providing diabetes management health services

Besides that, the results show that HCP's motivation greatly impacts diabetes management. HCPs need to be motivated to keep their professional skills up to date so that they can positively empower the patients to perform DSC. From the discussion, HCPs expressed that the main factors influencing their motivation can be categorised as patient-related and HCP-related factors.

Subtheme 2.2.1: Patient-related factors

In terms of patient-related factors, HCPs mentioned that patients' improved condition and appreciation often boost their motivation to support the patients continuously. Besides that, some of them were motivated to help newly diagnosed patients, especially young patients, to ensure that they can manage their diabetes at an early stage before the onset of complications. In addition, HCPs also shared their frustration with medical waste. The HCPs claimed that they strive to do the best for their patients despite the challenges, as they believe everyone deserves quality health.

a) Patient's improved condition

"Another motivation is if I see that my patient is following our advice and his condition is getting better..." (F4KM)

b) Patient's appreciation

"Ok, they will show us appreciation, mainly if we have succeeded in helping him control his food and reduce sugar. Some of my colleagues receive gifts from patients." (F1HT)

c) Patient's complication

"When we see in front of our eyes the effects of DM in a type 1 patient such as leg amputation, kidney damage, dialysis, and blindness, we feel so bad. Then it motivates us to ensure other patients will not experience that. We want our patients to live healthily." (F4HT)

"We do not want to see many patients who end up with complications of diabetes. So, we want to try to reduce complications of T2DM patients." (F6HT).

d) Newly diagnosed and young patients

"Mainly, the diabetic patients are older adults, but a few are still young. It motivates us to treat young people because we want to ensure that they will not suffer like others. It is more challenging for the elderly to manage the disease. This also motivates us to ensure that their HbA1c levels are good. We do not want them to go through complications too early." (F5KM)

e) The variety of patients to be treated

"We feel disappointed sometimes but we cannot stop because all patients are different, and they have different backgrounds. So, we bring ourselves to understand their backgrounds. We identify their problems and check whether they have a spouse or family members at home, as well as their working statuses. From there, we can understand their problems in terms of not taking medicine, not checking their sugar level, or not controlling their diet, aside from exploring the underlying causes of these problems. We do this so that we can help other patients as well. From the identified problem, we can find solutions and use them for other patients " (F2HT).

"Some patients are non-compliant. But, many others need knowledge and we have yet to provide the service to the patients. So, there is always hope to change. This indirectly motivates us to do better for other patients." (F3HT).

Subtheme 2.2.2: HCP-related factors

In terms of HCP-related factors, it was shown that HCPs were motivated to provide the best service to the patients because they believe that this is one of the ways for them to update their knowledge and skills in diabetes management. They were also inspired by the achievements of other facilities in diabetes management, which increased their sense of responsibility to reduce diabetes cases. Some of them expressed their frustrations with medication wastage. During the interview, HCP also expressed that the social support within the HCP circle increased their motivation to work harder in providing high-quality diabetes care.

a) Update knowledge

"I think what motivates us to go out and attend seminars is to update our knowledge, our skills. We can improve and update ourselves with new knowledge so that later, we can give something better to the patients." (F1KM).

"When we go to courses, we know that in dealing with patients, we need a combination of communication and medication. So, we hear things like, " Oh, if the patient is like this, we manage like this. When we get other people's opinions, we will see other possibilities. So, it is motivating for us, right?"(F5KM)

b) Inspired by the achievements of other facilities

"*We look at our clinic's achievements and then compare them with other clinics. Other clinics can do it. Why can't we do it? So, we learn from there and try to apply it in our clinic to improve our achievements" (F2KM).*

c) Medical Waste

"When patients get medicine from us but do not take them, we feel like we are wasting it when they return the medicine to us. So, we feel that it is necessary to give them the awareness of why they need medicine to control their disease. Besides, we are disappointed because we are now facing a stock problem. When the patient comes to return it to us, sometimes with a large plastic, we feel like a waste" (F3KM).

d) Reduction of DM cases

"We must increase our effort to provide more robust diabetic services. This is essential to ensure that the patients do not get worse." (F6KM)

"Even if people do not fully comply, at least they take the medication, giving hope to fewer complications and admissions that are a burden to our healthcare" (F2HT).

e) Social support within the HCP circle

"I have a support group for dieticians in Selangor and Malaysia. So, I will ask my friends if there is any problem or question. Then, when we go to a conference or seminar, we will meet friends who share the same struggles, right? So, we can exchange opinions. This motivates me as well because I received new ideas from them managing the patients." (F1KM)

Theme 2.3: Factors demotivating HCPs from providing diabetes management health services

However, HCPs are also confronted with various challenges in handling diabetic patients. From the discussion, HCPs expressed that these demotivating factors can be categorised as patients-related and HCPs-related.

Subtheme 2.3.1: Patient-related factors

In terms of patient-related factors, some of the demotivating factors raised by HCPs are related closely to the patient's attitude and beliefs, old age, caregiver issues, and language constraints.

a) Patient's attitude and beliefs

"Sometimes, patients or family members believe in alternative medicine, or when the children say that it is more effective, then the patients will start to have trust issues with hospital medication." (F3HT)

b) Older patients

"For the elderly patients, we need to explain to them and it can take a long time. For example, it takes a long time to check their eyes and feet, and we also need to educate them. Sometimes they don't even understand, especially if they do not have any family members with them. That is why it takes a long time." (F6KM).

c) Caregiver issues

"We know that some patients do not understand the information we give because they are disabled, but educating the caregiver can also be difficult. So, this is the most challenging part. We try to do the best for the patients but our efforts can be limited because the patient does not understand and the caregiver also does not understand." (F5KM)

Subtheme 2.3.2: HCP-related factors

Besides patient-related factors, time constraints, staff shortage, and poor facilities were also mentioned as HCP-related factors in this section.

a) Time constraints and staff shortage

"Time constraint is an issue because, like us, there is an MTAC group, but there are times when we do not have enough staff, so, we cannot use up too much time to explain the information to the patients." (F3KM).

b) Inadequate space for diabetic class

"Facility problems. I have many seminars; I give lectures for diabetics. But the problem is the place. It is common in health clinics, especially the small ones." (F1KM).

Theme 2.4: HCP Motivational Approaches

In addition, the HCPs shared their experiences on the approaches they commonly used to motivate patients. The motivational approaches included using an empathetic approach, involving the family members, sharing knowledge and experiences, and providing individualised treatment, and financial assistance.

Subtheme 2.4.1: Empathetic approach

One of the HCPs shared his experiences in using an emotional approach to build a positive relationship with the patients before proceeding to the actual treatment.

"If he is alone, I will just chat with him first to tackle his emotion, providing some emotional support to him first. Maybe he is not ready yet because we are strangers, so, it is important to build rapport with him." (F1KM)

Subtheme 2.4.2: Involvement of family member

The HCPs discussed the importance of the involvement of family members in motivating patients to take charge of their disease management.

"If the patients do not want to share with me, I will ask their family members. Usually, the family member will tell the truth." (F1KM)

It is better if the patient comes with a family member. We will advise the family members as well. It is better, especially for older patients. Sometimes he does not hear well or does not understand. So, it is better to involve family members (F4HT).

"If it is someone who is bedridden and cannot get up, we will tell the family members to help the patients to move their hands and legs as contractures may happen if there is no movement at all." (F5HT)

Subtheme 2.4.3: Sharing of knowledge and experience with patients

One of the HCPs mentioned that knowledge and experience sharing between HCPs is also one of the motivational approaches to influence and motivate patients in managing their diet behavior.

"In the last two years, I have attended training in Japan. One of the courses is about nutrition and its practices. When I get an idea from there, I will share it with my patients." (F1KM)

Subtheme 2.4.4: Individualised approach

The HCPs also felt that the use of an individualised approach according to the patient's characteristics and communication styles can be beneficial in diabetes management.

"So, it is individualised... I will manage according to the patient's type and communication style. I would ask him what he does and where he comes

from. At least we have talked to him and he is not shy in sharing his dietary intake with me." (F1KM)

Subtheme 2.4.5: Financial Assistance

In addition, some HCPs mentioned they would assist their patients in obtaining financial help to help them to manage their diabetes, especially when they need to buy DSC equipment such as glucometers.

"For patients who cannot afford to buy the glucometer they need… I will ask my diabetic educator to refer the patients to social welfare… For certain patients who are illiterate, the diabetic educator will help them to obtain financial help." (F5KM)

Construct 3: Behavior

This part explores HCP's perception and experience of patients' DSC behavior and lifestyle behavior.

Theme 3.1: Diabetes Self-Care Behavior

The findings demonstrated the three main behavioral issues related to DSC, including poor medication adherence, SBMG, and neglect of foot self-care.

Subtheme 3.1.1 Poor medication adherence

HCPs reported that poor medication adherence is a common problem among diabetic patients. They also expressed that the time factor can influence patient adherence, especially for those who are working.

"Some patients only change the needle after they use up one ampoule of medicine. I said, 'Uncle, you cannot do this'. He replied, 'I have been injecting insulin using the same method for 20 years, I don't even care. Sometimes, I do not even change the site of the injection'. Some patients even used the same needle for the whole week." (F5HT)

"Sometimes, we see a patient who does not take medicine or insulin, or control his diet because he is working on shifts. He cannot follow the injection timing. For example, he sleeps in the morning because he must work at night, so he will miss the morning injection. We must change the regime for them. However, if we do not ask, we will not find out his background or understand his problem." (F2HT)

Subtheme 3.1.2 Self-monitoring blood glucose

Although SBMG is universally considered an integral part of diabetes management nowadays, the HCPs stated that it remains a big challenge because some patients are still ignorant about its importance. They also discussed issues related to the patient's affordability to buy the glucometer strips.

"Another thing is his attitude. He understood after we gave the counselling. However, when we met two weeks later to review his SMBG, he said 'Eh?' It is like he is pretending to forget or does not want to practise what we teach. Maybe that is his attitude. That is our biggest problem." (F4HT)

"There are financial issues with strips and hospital visits. Many people use the bus or walk because they do not have money. Some also do not have money for healthy food so they can only buy cheaper food." (F3HT)

Nevertheless, they also shared that their young patients have good practice in SMBG, including having the app to track their records.

"I have also seen a patient who used the phone app to track the SMBG. But it is only for the tech-savvy young people." (F4KM)

Subtheme 3.1.3: Ignorance of foot self-care behavior

While talking about foot self-care behavior, most HCPs agreed that this is the prioritised care by the patients because they often assume that the condition of their feet is good. They also tend to disregard the HCPs' advice.

"In terms of foot care, it is difficult. It is the last thing that patients will think about… Every time I see a patient coming in, their feet are not that good, with calluses and all that. So, I think it is the lowest priority they will consider." (F2HT)

Theme 3.2: Lifestyle behaviors

The significance of adopting healthy lifestyle behaviors, particularly concerning diet and physical activity, has been emphasised because it can reduce the risk of complications and improve QOL. This part discusses the two main findings about lifestyle behaviors, i.e. non-adherence to diet and time constraints as a barrier to physical activity.

Subtheme 3.2.1 Non-adherence to diet

When discussing diet behavior, HCPs shared that attitude, norms (culture), affordability to buy healthy food, and family support play a significant role in determining patients' diet behavior.

"For me, it is their dietary behaviors. For example, if they want to meet doctors, they will fast the night before to ensure their (glucose) reading is okay, unfortunately, it is not the right way. We will check the reading before and after their meals. Besides that, if they did not eat properly before that, they will feel hungry and proceed to eat a lot. This happens when they do not follow the eating schedule." (F6KM)

"In terms of diet and exercise, it is very difficult for them to follow because of financial constraints. Buying healthy bread or biscuits is considered very pricey for them. So, it is very challenging for them to follow it (diet recommendations)." (F2HT)

"Regarding family support, why can't they change their way of life after seeing their family members who have diabetes? Although his mother has diabetes, he refuses to change, he does not want to eat separate food." (F9HT)

Subtheme 3.2.2: Time constraint as a barrier to physical activity

HCPs also stated that it is challenging for patients to perform physical activity, especially those with time constraints. However, they still strive to advise the patients accordingly.

"For those who work, they do not have time to exercise, right? But they can do aerobics at night or use a bench to exercise. Sometimes the reason why they do not want to go out for exercise is because they leave the house at seven in the morning and then return home at six in the evening. There is no time for them. They need to cook and perform house chores. So, we encourage those who work to jog, walk during their days off or holiday, according to their ability, at least 150 minutes a week." (F4HT)

4. Discussion

This study contributes in-depth understanding of HCPs' experience in delivering proper diabetes management, especially from the perspective of information, motivation, and behavior. It is important for HCPs to identify patient-related factors that may affect their ability to manage and cope with diabetes complications, including patients' knowledge, health conditions, medications, physical limitations, emotional needs, and basic living requirements (Powers et al., 2015).

Regarding information, it is essential to address diabetes-specific and lifestyle behavior knowledge during patient education (Swanson et al., 2019). Based on the FGD, the HCPs emphasised two main areas of knowledge related to diabetes, including patients' medicine intake, SBMG, eye, and foot care, as well as lifestyle-related knowledge with regard to healthy eating and physical activity. These behaviors are known to correlate positively with improved QOL, decreased complications, and optimal glycaemic control (Shrivastava et al., 2013; Kugbey et al., 2017).

In addition, HCPs mentioned that a variety of strategies are applied to provide health education to patients, including demonstrations, counselling, and the use of the media. These strategies are believed to help provide accurate information to the patients increasing their awareness of their diabetic condition. This will in turn boost their confidence in managing their diabetes to maintain an optimum level of blood sugar (Steinsbekk et al., 2012; Lee et al., 2016; Gurmu et al., 2018). In this study, the MNT and MTAC were two of the counselling methods mentioned by the HCPs. One of the dieticians administered MNT to provide nutritional recommendations (healthy food choices) based on the patient characteristics and lifestyles to achieve targeted treatment goals (Malaysian Dietitians' Association 2013). At the same time, MTAC is an ambulatory care service provided by trained pharmacists in collaboration with endocrinologists, medical officers, and diabetes nurses to improve patient understanding of medicine and medication adherence (Ministry of Health Malaysia 2022).

Besides, the HCPs also discussed the use of social media such as Facebook, Instagram, and YouTube to educate their patients. As media plays a big role in spreading knowledge and skills related to diabetes care, HCPs need to use the different media types appropriately (Wroe 2006). Moreover, social media has been highlighted as an effective intervention strategy in delivering patient education to improve diabetes management and to

promote a positive behavior change (Coiera 2013) that is beneficial in improving the health outcomes such as HbA1c levels (Gabarron et al., 2018).

Apart from information, motivation was another major concern for HCPs involved in diabetes self-management. DM can be psychologically demanding. The patients can self-manage diabetes-specific tasks more effectively if the HCPs can support them toward behavioral changes (Swanson et al., 2019). This study demonstrates that patients' improved condition and appreciation as well as HCPs' eagerness to help newly diagnosed patients, especially young patients are the two motivating factors for them to keep contributing positively to diabetes management. They were also inspired by the achievement of other facilities to step up their efforts in helping diabetic patients. Frustration with medicine wastage also drives the HCPs to maintain and improve their professional competencies. HCPs can support people to self-manage more effectively if they acquire the necessary psychological skills to promote motivation and support behavioral change (Swanson et al., 2019).

Our findings also illustrate that HCPs can be demotivated to perform their duty due to factors related to patient's attitudes and beliefs, characteristics, caregiver issues, language constraints, and belief in alternative medicine. A study reported that the usage of herbal medicines, along with patients' attitudes and behaviors were among the challenges encountered by the HCPs (Kragelund et al., 2020). They stated that patients continued to use herbal remedies despite being non-compliant with medication, diet, and other treatment regimens despite receiving sufficient information from HCPs. Besides, poor facility infrastructures, as well as financial and time constraints were also listed as challenges by HCPs in this study. Few studies also reported the same issues regarding staff shortage and time constraints (Kragelund et al., 2020; Alshammari 2021; Kumar et al., 2022).

Furthermore, another significant finding of this study is the common approaches used by HCPs to motivate their patients. For example, HCPs often involve family members in the management of diabetes. One systematic review reported that a healthy diet, higher perceived support, higher self-efficacy, improved psychological wellbeing, and better glycaemic control were all positive impacts following family support (Pamungkas et al., 2017). Socioeconomic and social support factors are also positive contributors to facilitating self-care activities among diabetic patients (Shrivastava et al., 2013). Another study highlighted the influence of patient adherence, attitude, belief, knowledge of diabetes, language and cultural capabilities, health literacy, financial resources, comorbidities, and social support on the outcome of diabetes care (Currie et al., 2012).

Regarding the behaviors, the HCPs reported that they must advise and educate patients about self-care behaviors to enhance health outcomes (DiBonaventura et al., 2014). This study found that the significant behavior issues perceived by HCPs included poor medication adherence, ignorance about the importance of SMBG, lack of means to buy healthy food and strips, poor family support, and ignorance of foot care. These findings are similar to another qualitative study conducted in Malaysia, in which the barriers to self-care management among diabetic patients were attributed to their attitude, in addition to other barriers such as cost of care and lack of social support (Kragelund et al. 2020). Previous studies also noted that poor medication adherence is associated with suboptimal glycaemic control, increased use of healthcare resources, higher medical costs, and higher mortality rates (Currie et al., 2012; DiBonaventura et al., 2014). However, despite numerous strategies such as educational programmes, intensive behavioral support, and medication reminders, poor medication adherence is still a major challenge in the healthcare system (Nieuwlaat et al., 2014).

Adherence to self-care behaviors is challenging, notably among patients with financial difficulties. They struggle to purchase diabetes supplies like strips, medication, and healthy food (Jayawardena et al., 2012; Osborn et al., 2016; Adu et al., 2019). A systematic review in South Asia revealed that access to glucometer at the household level is minimal because of cost constraints, thus contributing to suboptimal SBGM (Paudel et al., 2022). Diabetes self-management becomes more challenging when basic needs such as access to medication and a healthy diet are not fulfilled due to financial constraints (Powers et al., 2015). HCPs can address these problems by advising patients about the available resources they can utilise, besides working with them to develop a self-management plan that addresses these difficulties.

This study also revealed that many patients showed poor foot care behavior. In another study, the use of inappropriate footwear, poor awareness of foot care and its complications, together with poor counselling on foot care from HCPs are linked to a lower prevalence of foot care among diabetic patients (Begum et al., 2018). As for lifestyle behaviors, the HCPs listed non-adherence to diet and time constraints as a barrier to physical activity. Previous studies revealed that diabetic patients who underwent lifestyle interventions such as diet modifications and physical activity exhibited a significant reduction in risk factors linked to the onset of cardiovascular diseases (Chen et al., 2015; Galaviz et al., 2015).

Overall, previous studies recommended that HCPs document the patient's individual DSC behavior regimen entirely in the medical record as it will improve communication between different parties and facilitate a long-term evaluation of patient compliance (Shrivastava et al., 2013). Additionally, routine follow-up in managing a chronic disease such as DM is important. Lastly, further improve me nts such as seamless referral systems, continuity of care, and family member involvement are vital steps to overcome all the barriers discussed above (Sibounheuang et al., 2020).

4.1 Strengths, Limitations and Recommendation

The outcomes of this study, which focused on HCPs' experiences guided by the IMB Model, provide HCPs with valuable recommendations for enhancing their capacity, particularly when it comes to influencing patients' behavior. They have been selected for their knowledge of treating diabetic patients and their capacity for self-reflection and contextualization of personal experience. Although numerous and varied, the perspectives of study participants are not entirely representative of the experiences or views of other HCPs in Malaysia. Future studies are also needed to explore the differences of view among healthcare workers regarding managing patients with diabetes to understand how this may reflect on healthcare.

5. Conclusion

The results of the FGD in this study showed that the IMB model is a suitable, all-inclusive framework for health behavior change that can help HCPs better understand how to manage diabetes. According to our findings, the HCPs provided the patients with pertinent information about diabetes and lifestyle through various health education delivery techniques, including demonstration, counseling, and media. In terms of motivation, HCPs are one of the major players in encouraging patients to manage their diabetes. It is impossible to dispute their commitment to empowering patients as patient-related elements like increased health and appreciation become crucial for enabling patients to practice diabetes self-care.

In addition, HCP-related factors, including a commitment to updating knowledge, being motivated by other facilities' successes, and a reduction in the number of cases of diabetes drive them to provide patients with the best care possible. They also emphasized the significance of a patient's inspiration for managing their diabetes, whether that motivation derives from their beliefs or social support. They also cannot avoid challenges such as patients' attitudes and beliefs, older patients, caregiver issues, and language barriers. Staff shortages, facilities issues, and time constraints also exacerbated the challenges. HCP used a variety of motivational strategies, including empathy, family participation, and an individualized approach, to help them engage with the patients. Finally, HCPs also encountered some concerns with the diabetes self-care behavior of the patients, including poor medication adherence, poor blood glucose monitoring, ignorance about foot self-care behavior, nonadherence to diet, and time constraints as a barrier to physical activity. The results showed that to achieve lasting behavioral changes, HCPs must further develop behavior skills in addition to presenting patients with pertinent information and motivating them.

Acknowledgments

We would like to thank the Director-General of Health and Deputy Director-General of Health (Research and Technical Support), Ministry of Health Malaysia for the permission to publish this paper.

Declaration

Conflict of Interest

The authors declare that there are no competing or potential conflicts of interest.

Funding

This work was funded by a grant from the Ministry of Health Malaysia.

Data Availability

The datasets generated are available from the corresponding author on reasonable request.

Declarations

Ethics Approval

Ethics approval was granted by Medical Research Ethics Committee (MREC), Ministry of Health Malaysia (NMRR 19-862-46635).

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

Consent for Publication

Not applicable

Author Contributions

All authors contributed to the study conception, methodology and data analysis. The first draft of the manuscript was written by Norbaidurah Ithnain and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

References

Abdulrhim, S., Sankaralingam, S., Ibrahim, M.I., et al., 2021. Collaborative Care Model for diabetes in primary care settings in Qatar: A qualitative exploration among healthcare professionals and patients who experienced the service. BMC Health Services Research. doi: 10.1186/s12913-021-06183-z

Adu, M.D., Malabu, U.H, Malau-Aduli, A.E., Malau-Aduli, B.S., 2019. Enablers and barriers to effective diabetes self-management: A multi-national investigation. PLOS ONE. doi: 10.1371/journal.pone.0217771

Alshammari, M., Windle, R., Bowskill, D., Adams, G., 2021. The role of nurses in diabetes care: A qualitative study. Open Journal of Nursing 11: Pp. 682–695. doi: 10.4236/ojn.2021.118058

American Diabetes Association. 2020. Standards of medical care in diabetes-2020 abridged for Primary Care Providers. In: American Diabetes Association. Https ://diabetes journals.org/clin ical/article/38/1/10/32237/Standards-of-Medical-Care-in-Diabetes-2020. Accessed 19 May 2023

Begum, S., Venkatesan, M., Ganapathy, K. 2018. Foot Care Practices, its barriers and risk for peripheral neuropathy among diabetic patients attending medical college in rural Puducherry. International Journal of Community Medicine and Public Health 6: Pp. 203. doi: 10.18203/2394-6040.ijcmph20185243

Chan, S.P., 2015 Diabetes care model in Malaysia. Journal of the ASEAN Federation of Endocrine Societies 30: Pp. 100–104. doi: 10.15605/jafes.030.02.09

Chen, L., Pei, J.H., Kuang, J., et al., 2015. Effect of lifestyle intervention in patients with type 2 diabetes: A meta-analysis. Metabolism 64: Pp.338–347. doi: 10.1016/j.metabol.2014.10.018

Cheng, L.S., Aagaard-Hansen, J., Mustapha, F.I., Bjerre-Christensen, U., 2018. Malaysian diabetes patients' perceptions, attitudes, and practices in relation to self-care and encounters with primary health care providers. Volume 2 Issue 3 2: Pp. 1–10. doi: 10.31674/mjmr.2018.v02i03.001

Clinical Practice Guidelines (CPG). 2020. Management of Type 2 Diabetes Mellitus.https://www2 .moh.gov.my/moh/resources/Penerbitan/CPG/Endocrine/QR_T2DM _6th_Edition_QR_Guide_Digital.pdf (accessed Mac 9, 2023).

Coiera, E., 2013. Social networks, social media, and Social Diseases. BMJ. doi: 10.1136/bmj.f3007

Currie, C.J., Peyrot, M., Morgan, C.L., et al., 2012. The impact of treatment noncompliance on mortality in people with type 2 diabetes. Diabetes Care 35: Pp. 1279–1284. doi: 10.2337/dc11-1277

DiBonaventura, M., Wintfeld, N., Huang, J., Goren, A., 2014. The association between Nona dhere nce and glycated hemoglobin among type 2 diabetes patients using basal insulin analogs. Patient Preference and Adherence 873. doi: 10.2147/ppa.s55550

Fisher, J.D., Fisher, W.A., Amico, K.R., Harman, J.J., 2006. An information-motivation-behavioral skills model of adherence to antiretroviral therapy. Health Psychology 25: Pp. 462–473. doi: 10.10 37/0278-6133.25.4.462

Gabarron, E., Årsand, E., Wynn, R., 2018. Social media use in interventions for diabetes: Rapid evidence-based review. Journal of Medical Internet Research. doi: 10.2196/10303

Galaviz, K.I., Narayan, K.M., Lobelo, F., Weber, M.B., 2015. Lifestyle and the prevention of type 2 diabetes: A status report. American Journal of Lifestyle Medicine 12: Pp. 4–20. doi: 10.11 77/1 559827615619159

Ganasegeran, K., Hor, C.P., Jamil, M.F., et al., 2020. A systematic review of the economic burden of type 2 diabetes in Malaysia. International Journal of Environmental Research and Public Health 17:5723. doi: 10.3390/ijerph17165723

Gao, J., Wang, J., Zhu, Y., Yu, J., 2013. Validation of an information–motivation–behavioral skills model of self-care among Chinese adults with type 2 diabetes. BMC Public Health. doi: 10.1186 /1471-2458-13-100

Gunggu, A., Thon, C.C., Whye Lian, C., 2016. Predictors of diabetes self-management among type 2 diabetes patients. Journal of Diabetes Research 2016: Pp. 1–7. doi: 10.1155/2016/9158943

Gurmu, Y., Gela, D., Aga, F., 2018. Factors associated with self-care practice among adult diabetes patients in West Shoa Zone, Oromia Regional State, Ethiopia. BMC Health Services Research. doi: 10.1186/s12913-018-3448-4

Hussein, Z., Wahyu Taher, S., Gilcharan Singh, H.K., Siew Swee, W.C., 2016. Diabetes care in Malaysia: Problems, new models, and solutions. Annals of Global Health 81:Pp. 851.doi:10. 1016/j.aogh.2015.12.016

Institute for Public Health. 2020. National Health and Morbidity Survey (NHMS) : NCDs—Non-Communicable Diseases: Risk Factors and other Health Problems. In: Institute for Public Health. https://iku.moh.gov.my/nhms-2019.

Jayawardena, R., Ranasinghe, P., Byrne, N.M., et al., 2012. Prevalence and trends of the diabetes epidemic in South Asia: A systematic review and meta-analysis. BMC Public Health. doi:10.11 86/1471-2458-12-380

Nielsen, K., Calopietro, M., Yeow, T.P., et al., 2020. Perceptions and abilities related to patient engagement in diabetes care among primary healthcare providers in Malaysia: A qualitative study. Malaysian Journal of Public Health Medicine 20: Pp. 207–214.doi:10.37268/mjphm/vol.20 /no.2/art.280

Kugbey, N., Oppong Asante, K., Adulai, K., 2017. Illness perception, diabetes knowledge and self-care practices among type-2 diabetes patients: A cross-sectional study. BMC Research Notes. doi: 10.1186/s13104-017-2707-5

Kumar, L., Mohammadnezhad, M., 2022. Health Care Workers' perceptions on factors affecting diabetes self-management among type 2 diabetes mellitus patients in Fiji: A qualitative study. Frontiers in Public Health. doi: 10.3389/fpubh.2022.779266

Lee, Y.J., Shin, S.J., Wang, R.H., et al., 2016. Pathways of Empowerment Perceptions, health literacy, self-efficacy, and self-care behaviors to glycemic control in patients with type 2 diabetes mellitus. Patient Education and Counseling 99: Pp. 287–294. doi: 10.1016/j.pec.2015.08.021

Lim, S.C., Mustapha, F.I., Aagaard-Hansen, J., et al., 2019. Impact of continuing medical education for primary healthcare providers in Malaysia on diabetes knowledge, attitudes, skills and clinical practices. Medical Education Online. doi: 10.1080/10872981.2019.1710330

Liu, T., Wu, D., Wang, J., et al., 2018. Testing the information-motivation-behavioural skills model of diabetes self-management among Chinese adults with type 2 diabetes: A protocol of a 3-month follow-up study. BMJ Open. doi: 10.1136/bmjopen-2017-020894

Luo, X., Liu, T., Yuan, X., et al., 2015. Factors influencing self-management in Chinese adults with type 2 diabetes: A systematic review and meta-analysis. International Journal of Environmental Research and Public Health 12: Pp. 11304–11327. doi:10.3390/ijerph1 20911304

Malaysian Dietitians' Association. 2013. Medical Nutrition Therapy Guidelines for Type 2 Diabetes Mellitus (2nd Edition).

Maneze, D., Weaver, R., Kovai, V., et al., 2019. Some say no, some say yes: Receiving inconsistent or insufficient information from healthcare professionals and consequences for diabetes self-management: A qualitative study in patients with type 2 diabetes. Diabetes Research and Clinical Practice 156:107830. doi: 10.1016/j.diabres.2019.107830

Ministry of Health Malaysia. 2022. Diabetes Medication Therapy Adherence Clinic (DMTAC) Protocol, 3rd Edition.

Neblett, R.S., Chia, Y.C., Abdullah, N., Ablah, E., 2019. Goals, beliefs, knowledge, and barriers for diabetes self-care in a multi-ethnic population in Malaysia: A qualitative study. Med J Malaysia 74(6): Pp. 483-491. PMID: 31929473.

Nieuwlaat, R., Wilczynski, N., Navarro, T., et al., 2014. Interventions for enhancing medication adherence. Cochrane Database of Systematic Reviews. doi: 10.1002/14651858.cd000011.pub4

Osborn, C.Y., Egede, L.E., 2010. Validation of an information–motivation–behavioral skills model of diabetes self-care (IMB-DSC). Patient Education and Counseling 79: Pp. 49–54. doi: 10.1016/j.pec.2009.07.016

Osborn, C.Y., Gonzalez, J.S., 2016. Measuring insulin adherence among adults with type 2 diabetes. Journal of Behavioral Medicine 39: Pp. 633–641. doi: 10.1007/s10865-016-9741-y

Pamungkas, R., Chamroonsawasdi, K., Vatanasomboon, P., 2017. A systematic review: Family Support Integrated with diabetes self-management among uncontrolled type II diabetes mellitus patients. Behavioral Sciences 7: Pp. 62. doi: 10.3390/bs7030062

Paudel, G., Vandelanotte, C., Dahal, P.K., et al., 2022. Self-care behaviours among people with type 2 diabetes mellitus in South Asia: A systematic review and meta-analysis. Journal of Global Health. doi: 10.7189/jogh.12.04056

Polit, D.F., Beck, C.T., 2021. Resource Manual for Nursing Research: Generating and assessing evidence for nursing practice. Philadelphia: Wolters Kluwer

Powers, M.A., Bardsley, J., Cypress, M., et al., 2015. Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Journal of the Academy of Nutrition and Dietetics 115:1323–1334. doi: 10.1016/j.jand.2015.05.012

Saeedi, P., Petersohn, I., Salpea, P., et al., 2019. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federat ion Diabetes Atlas, 9th edition. Diabetes Research and Clinical Practice 157:107843. Doi: 10.1016/j.diabres.2019.107843

Samb, B., Desai, N., Nishtar, S., et al., 2010. Prevention and management of chronic disease: A Litmus test for health-systems strengthening in low-income and middle-income countries. The Lancet 376: Pp. 1785–1797. doi: 10.1016/s0140-6736(10)61353-0

Shrivastava, S.R., Shrivastava, P.S., Ramasamy. J., 2013. Role of self-care in management of diabetes mellitus. Journal of Diabetes & Metabolic Disorders. doi: 10.1186/2251-6581-12-14

Sibounheuang, P., Olson, P.S, Kittiboonyakun, P., 2020. Patients' and healthcare providers' Perspectives on Diabetes Management: A systematic review of qualitative studies. Research in Social and Administrative Pharmacy 16:854–874. doi: 10.1016/j.sapharm.2019.09.001

Steinsbekk, A., Rygg, L., Lisulo, M., et al., 2012. Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus. A systematic review with meta-analysis. BMC Health Services Research. doi: 10.1186/1472-6963-12-213

Swanson, V., Maltinsky, W., 2019. Motivational and behaviour change approaches for improving diabetes management. Practical Diabetes 36: Pp. 121–125. doi: 10.1002/pdi.2229

Sørensen, M., Groven, K.S., Gjelsvik, B., et al., 2020. The roles of healthcare professionals in diabetes care: A qualitative study in Norwegian general practice. Scandinavian Journal of Primary Health Care 38: Pp. 12–23. doi: 10.1080/02813432.2020.1714145

Willens, D., Cripps, R., Wilson, A., et al., 2011. Interdisciplinary team care for diabetic patients by primary care physicians, advanced practice nurses, and Clinical Pharmacists. Clinical Diabetes 29: Pp.60–68. doi: 10.2337/diaclin.29.2.60

Wroe, J., 2006. How can the media be best used to influence the diabetes policy makers? Practical Diabetes International 23:178–182. doi: 10.1002/pdi.939

Yen, S.T., Tan, A.K.G., Mustapha, F.I., 2016. Awareness of diabetes, hypertension, and hypercholesterolemia in Malaysia. Journal of Diabetes 9:874–883. doi: 10.1111/1753-0407.12502

Yoon, S., Ng, J.H., Kwan, Y.H., Low, L.L., 2022. Healthcare professionals' views of factors influe ncing diabetes self-management and the utility of a mHealth application and its features to support self-care. Frontiers in Endocrinology. doi: 10.3389/fendo.2022.793473