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Research Article

Self-management Experience of Middle-aged and Older Adults With Type 2 Diabetes: A Qualitative Study

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SUMMARY

Purpose: Diabetes mellitus has been either the fourth or fifth leading cause of death among Taiwanese adults during 1995–2015. Older adults with diabetes are at higher risk of developing diabetic macro-vascular and micro-vascular complications. The purpose of this study explored the self-management experiences of middle-aged and older adults with diabetes through a focus group.
Methods: Purposive sampling was used to recruit patients with diabetes from the metabolic outpatient clinics of medical centers and regional hospitals in Taiwan. Two focus groups, comprising a total of 23 participants, were employed to collect data, and group discussions were held a total of four times in an education room that was distant from clinical areas.
Results: Three themes were generated from analysis of the collected data: (1) "listening to the voice of the body and observing physical changes," (2) "re-recognizing diabetes and challenges," and (3) "self-management implementation dilemmas." This study provided new insights into the experiences of middle-aged and older adults in Taiwan regarding their self-management of diabetes.
Conclusion: Healthcare teams should be involved in the self-management education of patients with diabetes as early as possible to reduce patients' anxiety and to develop more patient-centered, culture-sensitive clinical skills. In addition to monitoring patients' self-management, healthcare professor should pay more attention to patients' successful adaptation to and coexistence with the disease.

Introduction

Individuals with diabetes have higher rates of premature death, functional disability, and coexisting illnesses than those without diabetes [1]. The estimated number of adults with diabetes worldwide is 425 million, 37% of whom live in the Western Pacific region [2]. In 2016, 1.7 million adults in Taiwan were diagnosed as having diabetes, and the disease was either the fourth or fifth leading cause of death among Taiwanese adults during 1995–2015 [3]. Older adults with diabetes are at higher risk of developing diabetic macrovascular and microvascular complications [4]. If diabetes is not well controlled in middle-aged individuals, the associated difficulties result in a heavy burden on individuals, their family, and public health. Medical treatment may be required, or the related complications may lead to a decline in productivity that could even force the individual to withdraw from the labor market. Therefore, disease management and better glycemic control are crucial for middle-aged and older adults with diabetes.

Diabetes mellitus negatively affects multiple aspects of a person's life. In general, structured personal care is associated with a more favorable glycemic control [5]. Self-management significantly improves the health and well-being of people with diabetes. Diabetes self-management education is the process of acquiring the knowledge and skills necessary for diabetes self-care [6]. Daily diabetes management (through diet, exercise, blood glucose monitoring, and medication adherence) is primarily the responsibility of the patient; thus, patients must be given the information and taught the skills required to self-manage. Many studies have investigated the numerous factors associated with self-management in people with diabetes. The National Health Insurance Administration in Taiwan ran a multidisciplinary diabetes care program from 2001 to 2005 aimed at improving diabetes care [7]. The Taiwanese health-care

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system has also run nationwide public health campaigns on this topic, implemented diabetes awareness initiatives, established patient self-help organizations, and instituted accreditation for diabetes care providers [8]. Both diabetes patients' self-care behavior and health providers' accountability consequently have improved over the previous decade. Nevertheless, studies continue to report poor understanding of Glycosylated Hemoglobin, Type A1C (HbA1c), glycemic control, and diabetes self-care behavior among patients with diabetes [9], highlighting a great need of for disease self-management education and skills.

Self-management is the cornerstone of diabetes control. In Taiwan, the number of old adults with diabetes continues to increase. A recent study investigated how such patients coped with their diabetes and found that only 13.2% and 26.5% of patients aged 45–64 and $\geq$ 65 years, respectively, were found to effectively control their blood glucose levels [10]. This underlines the need for better insights into the status and implementation of self-management in patients with diabetes.

The purpose of this study explored the self-management experiences of middle-aged and older adults with diabetes through a focus group. Such understanding enables the design of more suitable strategies for teaching diabetes self-management so that the affected individuals can effectively control and coexist with the disease.

Methods

Study design

This qualitative study used the focus group interview method to explore the self-management experiences of middle-aged and older adults with type 2 diabetes mellitus. A focus group, also termed group interviewing, comprises several interacting individuals discussing common interests in the presence of a moderator [11]. In this study, two focus group interviews were conducted between May and October 2015.

Setting and sample

Purposive sampling was used to recruit patients with diabetes from the metabolic outpatient clinics of medical centers and regional hospitals in Taiwan. The inclusion criteria were as follows: (a) age $\geq$ 45 years, (b) type 2 diabetes diagnosis $\geq$1 year previously, (c) willing to openly share their experiences with the investigator and engage in a dialog, and (d) willing to be audio recorded.

Ethical consideration

This study obtained approval from the institutional review boards of Chang Gung Memorial Hospital (Approval no. 104-8872B). Participants were enrolled after they responded to recruitment posters and flyers or through an outpatient referral. Each participant received an information sheet, which explained the purpose of the research, potential risks and benefits, and issues of confidentiality, and the informed consent form. Researchers clearly explained the purpose and process of the study to the participants. Any participant was allowed to withdraw from the study at any time. Informed consent was obtained from all the participants.

Data collection and procedure

This study used focus groups because group exchange facilitates discussion on barriers to and facilitators of self-management when living with diabetes [12]. Group dynamics generally produce valid ideas because interaction between group members stimulates the verbalization of a wide range of thoughts and feelings [11]. Focus group sessions were conducted every 2 weeks, each session lasting 60–90 minutes. Four sessions were held in an education room distant from the clinical areas. The topics and activity content were determined in advance. Initially, authors explained the purposes and procedures of the group activity to the participants. In addition, the participants were informed that the entire group session was being audio recorded and that observations were being noted to ensure complete information was being obtained.

The researchers participated in the group activity, facilitated the discussion, and encouraged the participants to share their experiences. The researchers inquired what the participants thought about diabetes self-management or how the participants felt; moreover, the researchers shared their experiences with the participants and asked the participants questions such as “Can you tell me about your experience with diabetes?” “How has diabetes affected your health?” “What must happen to help you manage your blood glucose day to day?” “What impact does diabetes have on your daily life?” and “What is most difficult about managing diabetes?” They were stimulated to think through group interaction. The participants were encouraged to share their experiences and express their thoughts and concerns. They obtained help and emotional support and clarified their doubts through interaction with others. Because some middle-aged and older adults have impaired hearing, the researchers sat face-to-face with the participants and talked to them using clear mouth shapes, as well as sometimes repeated their words to help the participants completely understand what was meant. If the researchers did not understand what a participant said, the researchers requested the participant to repeat or provide an example.

During the group activity, the researchers and observers monitored and recorded the facial expressions, movements, and intonation of the participants. The group activity ended when the participants indicated that they had expressed all that they intended to say. A review meeting was held immediately after a group activity ended; the results of this review served as a reference for the next group activity. The authors also discussed the responses of the participants, and these results provided a reference for data analysis.

Data analysis

In this study, content analysis was performed [13,14]. The data analysis procedure was as follows: (1) all the data collected were transcribed verbatim, including audio records, observation records, reflection dialogs, and focus group; (2) the transcripts were repeatedly read to understand and identify meaning units formed by words, phrases, and sentences; (3) the words, phrases, and sentences that formed meaning units in the text were shortened while maintaining their meaning; (4) meaning units were extracted and coded; (5) meaning units were compared according to the differences and similarities between their codes, and subthemes were developed according to the correlations between meaning units; and (6) subthemes with similar concepts were grouped to form main themes [13,14]. The first author performed the initial analysis, from which primary meaning units and main themes were obtained. All current researchers discussed whether the analysis results were appropriate according to the observation records, reflection dialogs, and verbatim transcripts from the focus group. If the authors had differing opinions, the discussion continued until all authors achieved consensus. Table 1 presents examples of the codes and meaning units obtained from the transcribed data.

Table 1 *Example of the Coding of Transcribed Data from Meaning Units.*

Meaning unit	Codes	Subtheme
"I know that I must exercise … However, I simply cannot act on this. I also feel very distressed. No one actually wants to suffer from long-term hyperglycemia and everyone wishes to control their physical health and disease condition …"	Patients know that exercise is critical; they usually cannot put it into practice.	"To know is easier than to do" in exercise implementation

Rigor

Rigor was reviewed using the following four criteria proposed by Lincoln and Guba [15] and Sandelowski [16]. (1) True value: Data were analyzed collaboratively by the authors of this article, followed by peer debriefing and the provision of the article to six participants for a member check to increase the true value of the analysis. (2) Applicability: When recruiting in an outpatient clinic, the researchers engaged with patients to build trust relationships. Guaranteed confidentiality for the opinions expressed in group sessions enabled the participants to discuss their experiences within a comfortable and trusting relationship, which produced rich descriptions. (3) Consistency: In each group session, the researcher (the first author) served as the leader and personally participated in data collection to prevent differences in data collection methods caused by the involvement of multiple leaders; thus, biases in the collected data were prevented. (4) Confirmability: Complete records and related materials were retained. The research process was recorded in detail to serve as an audit trail for future research interpretations, thereby ensuring further confirmation of the study findings.

Results

Participant characteristics

The characteristics of the study participants (N = 23) are provided in Table 2. The participants comprised 12 men and 11 women, and their ages ranged from 50 to 73 years (mean 60.26 years). Regarding their education, 2 participants had completed primary or lower education, 5 had completed junior high school, 11 had completed senior high school, and 5 had completed a university degree or higher education. Most participants were married and employed. The median duration of their diabetes treatment was 12.64 years. The mean HbA1c level of the participants was 8.1%.

Table 3 summarizes the findings for the three themes of (1) "listening to the voice of the body and observing physical changes," (2) "re-recognizing diabetes and challenges," and (3) "self-management implementation dilemmas."

Theme 1: listening to the voice of the body and observing physical changes

Patients with diabetes face various types of distress from disease diagnosis to the awareness of the fact that the disease is incurable, which makes them start to pay attention to any clues from their body as warning messages. During group interactions, patients of various ages and employment statuses shared different physical feelings to understand their own current physical changes.

Frequent fatigue. Although young patients who are currently employed do not feel it is abnormal to experience a sense of thirst when they communicate and interact with others, their physical strength has become very poor and they tend to feel "fatigue." They can perceive physical changes and noticeable signs.

> "In general, I frequently talk at work; so, it's very normal for me to feel thirsty. However, if my physical strength becomes very poor and I tend to feel fatigued, I know there's something wrong with my blood glucose level …. " (Participant 13)

> "If I feel powerless, which is different from 'fatigue,' the cause will be the excessively low blood glucose level …. After suffering from diabetes, I have no choice but to pay attention to any physical change that occurs to me." (Participant 15)

Very hungry and very thirsty. Currently unemployed and older patients with poor physical strength may view fatigue as a normal phenomenon. They may also start perceiving physical abnormality and signs of change in their blood glucose level because they perceive the senses of hunger and thirst that are different from those in the past.

> "After all, I am an old adult, so my physical strength is poor. I tend to feel exhausted after doing things for a while, which is very normal. However, when I have a lingering feeling of hunger …. Or I would like to eat watermelon and have been very thirsty

Table 2 *Characteristics of Participants (N = 23).*

Characteristics	n	Mean	Range	Median
Age (yrs)		60.26	50–73	61.24
Gender				
Women	11			
Men	12			
Educational level				
Completed primary or lower	2			
Completed junior high school	5			
Senior high school	11			
College or university	3			
Higher than the master's degree	2			
Marriage status				
Married	15			
Unmarried	8			
Employment status				
Yes	16			
No	7			
Duration of diabetes (yrs)		13.42	2–23	12.64
HbA1c level (%)		8.1	7.2–9.8	7.7

Table 3 *Theme and Subthemes of Self-management Experiences in Middle-aged and Older Adults With Type 2 Diabetes.*

Theme		Subtheme
Listening to the voice of the body and observing physical changes	1	Frequent fatigue
	2	Very hungry and very thirsty
	3	Frequent use of toilets
	4	Being unable to see clearly
Re-recognizing diabetes and challenges	1	Diet control is not restricting the diet.
	2	Renal disease is caused by self-medication reduction and hyperglycemia.
	3	Perspiration activity is not equivalent to exercise.
	4	Diabetes self-management threatened by emotions
Self-management implementation dilemmas	1	Diet challenges during social occasions
	2	"To know is easier than to do" in exercise implementation
	3	Psychological burden of coexistence with diabetes

… I will know that my blood glucose level has risen." (Participant 1)

"When my blood glucose level is low, I would like to eat something and I will feel so hungry that I tremble …. " (Participant 3)

Frequent use of toilets. When the patients are busy working, they do not assess their own blood glucose level by using objective values or quantify it, but instead, they use their own physical sensations.

"I am very busy during working hours. If my blood glucose level is high, I can feel that …. For example, if I use the toilet 5 or 6 times in one morning, which is different from what I normally do, then I will know that my blood glucose is abnormal …. " (Participant 6)

Being unable to see clearly. Older patients who are housewives are able to perceive the physical change in their blood glucose levels in daily life experiences such as vision change.

"I've discovered that when I can no longer see clearly what I used to see very clearly, my blood glucose level rises …. For example, I saw some black spots on the towel and originally thought that they were molds. I washed the towel using washing powder, but I could not wash away those black spots. I've learned that when I start to see many black spots on the towel, my blood glucose level is too high. The higher the blood glucose level is, the more the black spots are …. " (Participant 6)

"I cannot see clearly and feel dizzy occasionally …. When I cannot see clearly, my heartbeat accelerates. I will have cold sweat. Sometimes, my blood glucose level is so low that I cannot see clearly …. " (Participant 2)

Theme 2: re-recognizing diabetes and challenges

Self-management methods for diabetes in group interactions and conversations included "diet control is not restricting the diet," "renal disease is caused by self-medication reduction and hyperglycemia," "perspiration activity isn't equivalent to exercise," and "diabetes self-management is threatened by emotions." The participants provided different opinions, experiences, and clarifications, as well as tried to understand diabetes and its challenges from a completely different perspective in mutual discussions.

Diet control is not restricting the diet. In Taiwanese culture, the meaning of "eating" and "food" is traditionally not just to meet one's "physical need" or "sensory need." For older adults, their dream, which is to enjoy all kinds of delicious food in this stage of life after working hard for their entire life, is shattered owing to diabetes. Therefore, it is vital to share the value and methods of "eating" in group interactions. Focus group members used their own words and contexts to express and further develop insights into different experiences.

"I worked very hard for my career to make money and was unwilling to enjoy delicious food. I thought I could enjoy delicious food and a wonderful life now. However, I cannot enjoy them at all since I've been diagnosed with diabetes. I'd rather work hard to eat than to starve." (Participant 5)

The members in the group shared different opinions according to their own experiences.

"Suffering from diabetes does not mean that you cannot eat delicious food; you have to control how to eat …. As a matter of fact, in order to become healthy, all people, regardless of the diagnosis of diabetes, have to implement diet control. Patients with diabetes can still enjoy delicious food freely, but they have to pay attention to a balanced diet …. " (Participant 7)

In group interactions, patients learned about the diabetic diet. They are naturally not prohibited from eating, but they have to control what they eat.

"Because I eat meals very fast, I tend to gorge on rice … my blood glucose level rose to 220 and almost reached 300 …. Originally, I thought that I could not eat rice …. After sharing this experience with the group members, I found that patients with diabetes actually can eat anything, but have to properly control the amount of food." (Participant 11)

Renal disease is caused by self-medication reduction and hyperglycemia. Diabetes treatment is affected by culture and environmental discourse of ordinary people. For example, in Taiwan's traditional society, it is generally perceived that "Western medicines are poisonous, whereas traditional Chinese medicines are natural;" and "Western medicines" are foreign from the Western society. Some people feel that "Western medicines are chemical compounds that are not natural and are poisonous" and that "diabetes medications damage kidneys and cause renal disease." Renal disease is attributed to diabetes medications or their side effects, leading to patients' worries, hesitation, and self-medication reduction. These rumors were further clarified through group sharing of different experiences and opinions.

"I heard that … medicines are poisonous and are chemical compounds that are not natural. Besides, diabetes medications will damage kidneys. I have no idea whether renal disease is caused by the side effects of medications. Many patients with diabetes end up in dialysis. I wonder whether diabetes medications will make me end up with renal failure or failure of other organs …. " (Participant 9)

Group members shared experiences to clarify some concepts.

"I also used to worry that diabetes medications could damage my kidneys, and so I reduced medications by one tablet per day by myself. However, my blood glucose level after meals rose to 180 in less than 1 month, with a very high urine glucose level (+++). My doctor told me that renal disease is not caused by medications, but hyperglycemia." (Participant 11)

Perspiration activity is not equivalent to exercise. Exercise plays a critical role in the control of blood glucose of diabetes. In the group interactions, patients shared which exercise is suitable for them and the effect of exercise on the control of blood glucose. They also shared their opinions and clarified whether a perspiration activity (taking a hot spring bath) is equivalent to exercise.

"It's very important to take exercise, which consumes glucose and is vital to the control of blood glucose …. " (Participant 8)

In the group interactions, patients shared which exercise is suitable for them and the effect of exercise.

"I force myself to take exercise at least 3 days per week. Because I tend to experience pain in tendons and joints, I choose to stroll for 30-40 min every time. Originally, my glycated hemoglobin level was 6.1. After I started to stroll, it decreased to 5.7 …. " (Participant 8)

"It's impossible for us in our sixties to run or jump. The only exercise we can take is to stroll…. I will stroll for half an hour after meals. I stroll every day, and my blood glucose level becomes more normal as well…."(Participant 15)

The participants provided an opinion on whether a perspiration activity (taking a hot spring bath) is equivalent to exercise.

"Perspiration can effectively consume glucose. I sweat a lot when I take a hot spring bath …. Therefore, taking a hot spring bath may also help control blood glucose …. " (Participant 17)

The participants shared their experiences.

"The effect of taking exercise is irreplaceable. Perspiring alone without taking any exercise is not an exercise, and it does not consume glucose …. " (Participant 19)

Diabetes self-management threatened by emotions. Long-term diet control makes patients with diabetes suffer from various levels of psychological stress. In group sharing, they told one another their psychological adjustment methods to develop positive mindfulness to activate positive emotions and further control diabetes.

"I've known that eating cakes will elevate my blood glucose level. However, cakes are my favorite. When I realized the fact that I don't even have the liberty to eat what I want, I was so angry that I gorged on cakes. My blood glucose level surged again after I gorged on cakes …. After learning many defeats, I started to change my mindfulness, which is really difficult …. I'd like to share with everyone that mindfulness indeed decides your emotions. I repeatedly tell myself that emotions are stable can my blood glucose level become stable." (Participant 4)

Theme 3: self-management implementation dilemmas

Self-management is crucial for controlling chronic disease. Its practical implementation in one's daily life involves overcoming diet challenges during social events, "to know is easier than to do" in exercise implementation and the psychological burden of coexistence with diabetes. Therefore, patients with diabetes face self-management implementation dilemmas.

Diet challenges during social occasions. When faced with diet challenges during social events, patients usually experience a sense of guilt if they do not restrict themselves and subsequently lose control. Therefore, people with diabetes always experience a dilemma in such situations of whether to exert self-control.

"It's impolite to refuse to attend social events with friends. If I restrict myself from eating something or eat less at social occasions, my friends feel embarrassed …. However, if I lose self-control, I feel a sense of guilt …. " (Participant 12).

"To know is easier than to do" in exercise implementation. The most difficult part of exercise implementation is usually the feeling that "to know is easier than to do." Although patients know that exercise is critical, they usually cannot put it into practice.

"I know that I must exercise …. However, I simply cannot act on this. I also feel very distressed. No one actually wants to suffer from long-term hyperglycemia, and everyone wishes to control their physical health and disease condition …. " (Participant 10)

Psychological burden of co-existence with diabetes. The level of diabetes control is closely related to one's lifestyle. To coexist with diabetes, patients must modify their living habits, including making changes to their daily diet, ensuring regular exercise, monitoring their blood sugar level regularly, and adhering to their medication. The long-term implementation of these self-care behaviors and the acceptance of strict limitations in life place a heavy psychological burden on middle-aged and older adults with diabetes.

"In the morning, when I open my eyes, I wonder what I should eat and how much should I eat … I have to go out to exercise. I cannot take my medicine until I have eaten. I worry that my blood glucose will be too low if I do not eat anything …. Taking less exercise may lead to poor control of my blood glucose …. " (Participant 12)

"It's dangerous if I exercise too much … I must consider my diabetes whatever I do. I must pay attention to and control my diabetes in everyday life … to reconcile with my diabetes, which I will have for the rest of my life. It's really difficult and stressful …. " (Participant 14).

Discussion

This qualitative study was conducted to understand the self-management experiences of older adults with diabetes in Taiwan. The participants reported that diabetes self-monitoring and symptom identification, different perceptions of self-management and health professionals' challenges, and self-management implementation dilemmas and experiences are critical to their ability to self-manage their diabetes.

Diabetes self-monitoring and symptom identification

In the current medical environment, the so-called effective treatment model is to determine the cause of a disease, diagnose the disease accurately, implement effective treatment, and help patients recover from the disease and regain health [17]. However, from the moment they are accurately diagnosed with diabetes, patients with diabetes discover that the disease is incurable and have to face a series of stressful times caused by the disease; this makes them use physical changes as warning messages to understand their blood glucose level [18]. In this study, the patients assessed their own blood glucose level according to their physical sensation and associated physical symptoms with their blood glucose level. In group interactions, patients of various ages and employment statuses shared how they could understand their current physical changes according to different physical sensations. Physical perception should be used for early symptom identification, and the detection of these warning messages early before disease onset can be a reference for patients with diabetes to prevent disease onset [19]. Health-care professionals should also reflect on how to improve patients' self-observation from the clues to symptoms before onset to further reduce the frequency of acute

onset. Everyone's physical adaptation to the blood glucose level is different. If health-care professionals can help patients develop the connection between themselves and their body and empathize the patient-centered disease empowerment process, then it will be a worthwhile progress [20].

Different perceptions of self-management and health professionals' challenges

With an understanding that different perceptions between patients and health professionals are important causes of conflict or patients' nonadherence [21], most studies have suggested a patient-centered clinical method and recommend more attention to patients' illness experience, personal beliefs, feelings, and seeing them as a partner in the care process [20,22]. Health-care providers explain treatments and alternatives to patients and help them choose the treatment option that best aligns with their preferences and their unique culture.

In dietary management, all the rationales that the participants held focused on "dietary desire." Lai et al. [22] reported that the most obvious reason is that most participants believed that diabetes is usually caused by consumption of sugar, and thus, they focused their treatment on "sugar control" instead of the amount of food. According to the interaction of focus groups, sugar control is only a part of health care, and exercise and medication adherence is also essential in diabetes management.

Exercise is called "huo-dong" in Chinese and literally means "survive-and-move." The concept "exercise is beneficial to the control of blood glucose" is comprehensible to the general concept as long as it is explained from the perspective that exercise consumes glucose. In addition, such a concept conforms to current scientific and medical knowledge [1]. However, it is necessary to clarify that perspiring is different from taking up exercise. A perspiration activity (e.g., partaking in a hot spring bath) may not achieve the benefits of exercise, and patients with neuropathy should be careful of burns and wounds in feet.

For pharmaceutical management, our participants worried most that they were at high risk of "renal injury" as a major adverse effect of medical treatment. Similar to our results, most participants view Western medicinal substances as artificial chemical compounds that are toxic, whereas herbal medicine, obtained from natural sources, is considered safer and more compatible with human physiological functions [23]. The kidney is seen as containing the inherited "vital essence" and sperm in Chinese culture.

Kidney injury is considered quite serious because of the tightly semantic network between lumbago, kidney deficiency ("shen xu"), and loss of vital essence, which leads to shortened lifespan [24]. Thus, participants regard all treatment strategies as integrative and intertwined in their daily life. Engaging in diabetes self-management may increase a patient's disease-related negative moods and discourage glucose self-monitoring. Our results indicated that the health-care provider should offer clarifications during medical consultations.

Self-management implementation dilemmas and experiences

Meals are crucial in developing interpersonal relationships in Chinese culture. Social entertainment, gatherings with family and friends, and weddings are important occasions that test the diet control of patients with diabetes. Relevant studies have indicated that the wish "not to eat" of patients with diabetes during social occasions tends to separate the patients from others [25]. Therefore, in gatherings where "delicious food" is provided, diet control becomes representative of a deprivation of life and social relationships. Our results accorded with those of the study by Huang et al. [26]. Regarding diet control, controlling the desire to eat was the most challenging aspect for the participants. This cultural inclination must be recognized and accepted as part of the care process. During healthy diet education, professionals should consider how to enable patients with diabetes to learn dietary skills and coping strategies for special dietary occasions, such as eating out, gatherings with family and friends, and other social events, without being controlled by food owing to diet control. Professionals should bypass the restrictions on institutionalized health education, integrate diet control in daily life, and assist patients to make positive changes.

Exercise is the most economic strategy in diabetes control programs. It can not only reduce insulin resistance but also delay the occurrence of complications. Most of the participants in this study were aware that exercise is an essential part of diabetes treatment; however, maintaining an exercise habit was considered difficult. Studies on exercise and diabetes have mainly used an exercise intervention to increase patients' exercise motivation and execution [27]. However, the challenge for nurses is not to strictly request that patients perform the same amount of exercise daily but to integrate exercise into patients' daily life and environmental interactions for further strengthening the relationship between exercise and disease, which is particularly important for middle-aged and older adults. Lachance et al. [28] mentioned that peer coaching and social support are beneficial to the exercise self-management of women in communities. The present study suggests that diabetes care teams should gradually increase the frequency of exercise management behaviors performed during the regular working day and social occasions in middle-aged and older adults with diabetes.

Diabetes is a lifelong disease. Patients with diabetes must exert tight control over their life, and this requires psychological and behavioral adjustments and self-management [1]. Implementing long-term self-care rules and accepting life limitations is extremely difficult for many patients and increases the psychological burden on middle-aged and older adults. These populations require special attention in their diabetes self-management, including physical, psychological, and interactive assistance. Cryer [29] reported that older adults with diabetes experience more illness management-related distress and are at higher risk of such stress than patients with diabetes in other age-groups. People with the disease experience repeated mood swings as their illness improves and worsens. Therefore, health-care personnel should pay more attention to teaching middle-aged and older adult patients how to live with their illness rather than focusing solely on physiological treatment. How a patient adjusts to an illness is significantly correlated with the quality of the physician–patient relationship, and a physician's attention to their patient's psychological problems can improve the outcome of the patient's diabetic care [20]. High-quality diabetes self-management education was previously demonstrated to improve patient self-management [6]. It is recommended that health-care professionals listen to patients when they express their self-management difficulties and help them develop strategies for making healthy lifestyle choices (regarding eating, physical activity, and stress). Furthermore, health-care teams should include clinical psychology consultants to help patients adopt a more positive attitude toward life that will enable them to successfully adapt to and coexist with the disease.

This study provided rich data and outlined the culturally sensitive perspectives of middle-aged and older adults with diabetes in Taiwan. However, several limitations must be addressed. First, this study enrolled outpatients at two hospitals in the same region; the study results may thus not reflect the self-management demands of all patients with diabetes. Future studies should

enroll patients from a variety of settings to increase the generalizability of our findings. Second, the authors recorded only the diabetes self-management experiences of a given informant at one point in time; the results may not reflect changes to an individual's perspective over time.

Conclusion

This study offers new insights into the experiences of middle-aged and older adults in Taiwan regarding their self-management of diabetes. Health-care teams should be involved in the self-management education of patients with diabetes as early as possible to reduce their anxiety and frustration regarding the glucose level and symptoms. In addition to considering their self-management, health professionals should pay more attention to how patients can successfully adapt to and coexist with the disease. The authors believe our results can help health professionals to develop more patient-centered, culture-sensitive clinical skills. Diabetes support groups should be formed to encourage patients to share their self-management experiences. Such an exchange of experiences helps patients express their emotions, provides effective peer support, and educates patients.

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Conflicts of interest

This manuscript has no relevant financial or other relationships to disclose.

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Appendix A. Supplementary data

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References

1. American Diabetes Association. Older adults. Sec. 11. In: Standards of medical care in diabetes-2017. Diabetes care. 2017;40(Suppl. 1):S99–104. https://doi.org/10.2337/dc17-S014
2. International Diabetes Federation. Across the globe [Internet]. Brussels, Belgium: IDF; 2017 [cited 2018 May 25]. Available from: https://diabetesatlas.org/across-the-globe.html
3. Ministry of Health and Welfare. Cause of death statistics [Internet]. Taipei, Taiwan: Ministry of Health and Welfare; 2015 [cited 2016 May 11]. Available from: http://dep.mohw.gov.tw/DOS/lp-1777–113.html
4. Chi MJ, Liang CK, Lee WJ, Peng LN, Chou MY, Chen LK. Association of new-onset diabetes mellitus in older people and mortality in Taiwan: a 10-year nationwide population-based study. J Nutr Health Aging. 2017;21(2):227–32. https://doi.org/10.1007/s12603-016-0751-9
5. Chrvala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with type 2 diabetes mellitus: a systematic review of the effect on glycemic control. Patient Educ Couns. 2016;99(6):926–43. https://doi.org/10.1016/j.pec.2015.11.003
6. Powers MA, Bardsley J, Cypress M, Duker P, Funnell MM, Fischl AH, et al. 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. Clin Diabetes. 2016;34(2):70–80. https://doi.org/10.2337/diaclin.34.2.70
7. Chang RE, Lin SP, Aron DC. A pay-for-performance program in Taiwan improved care for some diabetes patients, but doctors may have excluded sicker ones. Health Aff. 2012;31(1):93–102. https://doi.org/10.1377/hlthaff.2010.0402
8. Li CL, Lin NY, Wang HH, Hsu CC, Hurng BS, Chang HY. A population study on changes in diabetes self-care behaviors in Taiwan between 2001 and 2005. Prev Med. 2010;50(5-6):308–9. https://doi.org/10.1016/j.ypmed.2010.03.005
9. Yu NC, Su HY, Chiou ST, Yeh MC, Yeh SW, Tzeng MS, et al. Trends of ABC control 2006-2011: a national survey of diabetes health promotion institutes in Taiwan. Diabetes Res Clin Pract. 2013;99(2):112–9. https://doi.org/10.1016/j.diabres.2012.11.018
10. Koo M, Lee MH, Chang YY, Huang CF, Chen SC, Yeh YC. Factors associated with self-care behaviors in middle-aged adults and elderly with diabetes mellitus. J Nurs. 2011;58(5):43–52. Chinese.
11. Webb C, Kevern J. Focus groups as a research method: a critique of some aspects of their use in nursing research. J Adv Nurs. 2001;33(6):798–805. https://doi.org/10.1046/j.1365-2648.2001.01720.x
12. Polit DF, Beck CT. Designing quantitative studies. In: Nursing research: generating and assessing evidence for nursing practice. 10th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2015. 784p.
13. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today. 2004;24(2):105–12. https://doi.org/10.1016/j.nedt.2003.10.001
14. Liang SY, Chuang YH, Wu SF. Preliminarily application of content analysis to qualitative nursing data. J Nurs. 2012;59(5):84–90. https://doi.org/10.6224/JN.59.5.84. Chinese.
15. Lincoln YS, Guba EG. Implementing the naturalistic inquiry. In: Naturalistic Inquiry. London, UK: Sage Publications; 1985. 416p.
16. Sandelowski M. Rigor or rigor mortis: the problem of rigor in qualitative research revisited. ANS Adv Nurs Sci. 1993;16(2):1–8.
17. Lai WA. Patient's "meanings of illness"-centered health care. Taiwan J Fam Med. 2017;27(1):32–41. https://doi.org/10.3966/168232812017032701005
18. Ling YS, Wu YC. Exploring the characteristics of emotional state an the risk appraisal between the different depressive disposition and age groups for the diabetic. Arch Clin Psychol. 2005;2(2):64–75. Chinese.
19. Ong WM, Chua SS, Ng CJ. Barriers and facilitators to self-monitoring of blood glucose in people with type 2 diabetes using insulin: a qualitative study. Patient Prefer Adher. 2014;15(8):237–46. https://doi.org/10.2147/PPA.S57567
20. Wu FL, Juang JH, Yeh MC. The dilemma of diabetic patients living with hypoglycaemia. J Clin Nurs. 2011;20(15-16):2277–85. https://doi.org/10.1111/j.1365-2702.2011.03725.x
21. Freeman J, Loewe R. Barriers to communication about diabetes mellitus: patients' and physicians' different view of the disease. J Fam Pract. 2000;49(6):507–12.
22. Lai WA, Chie WC, Lew-Ting CY. How diabetic patients' ideas of illness course affect non-adherent behaviour: a qualitative study. Br J Gen Pract. 2007;57(537):296–302.
23. Ernst E. Harmless herbs? A review of the recent literature. Am J Med. 1998;104(2):170–8. https://doi.org/10.1016/s0002-9343(97)00397-5
24. Ots T. The angry liver, the anxious heart and the melancholy spleen. The phenomenology of perceptions in Chinese culture. Cult Med Psychiatry. 1990;14(1):21–58. https://doi.org/10.1007/BF00046703
25. Hsu MT, Hsu HC, Hsu HY, Wang RH. Disorder in life and the world: the illness experiences of women with diabetes in Taiwan. J Nurs. 2015;62(2):34–44. https://doi.org/10.6224/JN.62.2.34. Chinese.
26. Huang CL, Liu MJ, Tai YK, Chiou CJ, Hsiao JY. Implementation and evaluation of a proper dietary behavior program in diabetes support groups. J Nurs. 2010;57(1):35–44. Chinese.
27. Ng TK, Kwan RL, Lo SK, Cheing GL. A tailor-made exercise program for improving balance and mobility in older adults with Type 2 diabetes. J Gerontol Nurs. 2018;44(2):41–8. https://doi.org/10.3928/00989134-20171002-04
28. Lachance L, Kelly RP, Wilkin M, Burke J, Waddell S. Community-based efforts to prevent and manage diabetes in women living in vulnerable communities. J Community Health. 2018;43(3):508–17. https://doi.org/10.1007/s10900-017-0444-2
29. Cryer PE. Hypoglycemia, functional brain failure, and brain death. J Clin Invest. 2007;117(4):868–70. https://doi.org/10.1172/JCI31669