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ORIGINAL RESEARCH

Distress and Coping Strategy among Indonesian Men with Type-2 Diabetes Mellitus

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Abstract

Background: Type-2 diabetes mellitus (T2DM) can have a notable impact on the psychological and physical well-being of individuals, which in turn affects the management of the condition. Men and women experiencing stress and adopting distinct coping strategies. However, research focusing specifically on T2DM in men is still limited.
Purpose: The present study intends to investigate the distress and coping strategies adopted by male T2DM outpatients in Malang, East Java, Indonesia.
Methods: This study employed a qualitative research design and conducted in-depth interviews to 24 male T2DM outpatients. The interview guidelines were formulated using the Indonesian version of the Diabetes Distress Scale (DDS17) questionnaire, which comprised four domains: physician-related distress, emotional burden, regimen-related distress, and interpersonal distress. A thematic analysis was performed to analyze the results gathered during the research and compile them into a final report.
Results: The study revealed that individuals diagnosed with T2DM experienced a range of emotional and practical difficulties, including feelings of fear, anxiety, and a lack of understanding. Disease burden, a lack of understanding of both diabetes and healthcare services, difficulties managing their diet, routine medication, financial concerns, and fatigue also contributed to the distress. To cope with distress, the informants identified eight distinct coping strategies. Of these, the most effective strategy was receiving support from family members, followed by acceptance, self management, positive attitude, understanding of their illness, joining the diabetes community, spirituality, and getting more information about T2DM.
Conclusion: The findings of this study indicated that men experience eight distinct types of stress and utilise comparable coping strategies associated with T2DM. Emotional distress represents the predominant pressure, while family support constitutes the primary coping strategy. These results are important for nurses and other healthcare professionals in supporting patients.

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1. Introduction

According to the World Health Organization, diabetes mellitus (DM) is a chronic metabolic disease characterised by impaired metabolism of carbohydrates, lipids, and proteins due to insulin deficiency. DM can increase the risk of various diseases, including cardiovascular diseases, neuropathy, obesity, liver diseases, and others (WHO, 2020). In Southeast Asia, Indonesia is positioned among the countries with the highest prevalence of DM cases accounting for 11.3% cases (Kurtanty et al., 2023). According to the National Report of Riskesdas 2018, the prevalence of DM in Indonesia increased by 1.5% in 2013 and by an additional 2% in 2018 (Riskesdas, 2019). The prevalence of DM in Indonesia, particularly in East Java, is among the five highest with a rate of 2.6%. It is also noteworthy that DM is more prevalent among women, with a prevalence of 1.78%, compared to men with a prevalence of 1.21% (Riskesdas, 2019). Riskesdas (2019) reports that Surabaya (4.43%) and Malang (2.88%) have the highest prevalence of DM in East Java.

Diabetes mellitus (DM) could potentially have a valuable adverse impact on the psychosocial adjustment and physical well-being of patients due to the complex nature of managing the condition (Younis et al., 2017). Moreover, DM may negatively affect the physical and psychological health of diabetic patients, leading to a decline in their quality of life (Bak et al., 2018; Surjoseto & Sofyanty, 2022). Hence, there is an association between coping strategies and the quality of life of individuals with DM. Individuals with diabetes may experience stress if their coping strategies are not utilised correctly. Psychological stress can also have a direct impact on glycaemic control, resulting in elevated levels of glucose in the bloodstream. These stress conditions lead to changes within the body that react to glucose (Dewi et al., 2021). Moreover, gender differences may affect the severity of type 2 diabetes mellitus (T2DM), including hormonal and dietary obedience. Another study indicated that men with diabetes mellitus typically exhibit lower compliance in adhering to the prescribed dietary regimen than their female counterparts (Kusumawati, 2015). However, it was reported in another study that genders possess distinct abilities to adapt and comply (Mathew et al., 2012).

Coping stress strategies techniques are methods used to adjust to stress, address issues, and adapt to change. Coping stress strategies aim to regulate the internal and external needs of individuals, including physiological, psychological, developmental, maturational, environmental, cultural, and religious factors, in response to conditions that threaten their psychological well-being (Surjoseto & Sofyanty, 2022). These mechanisms, when employed, have the potential to enhance the patient's quality of life (Bilsker et al., 2018; Setyoadi et al., 2023). They can mitigate stress, preserve positive social relationships, and cultivate a positive self-concept (Dewi et al., 2021).

The stress conditions experienced by patients with DM vary greatly from person to person, necessitating the development of coping stress strategies (Surjoseto & Sofyanty, 2022). A previous study found that women had a 2.7 times higher likelihood of experiencing stress compared to men (Kountul et al., 2018). This may be attributed to women using their emotions while men tend to exhibit a calmer and more rational approach when encountering difficulties. However, research studies on coping strategies in men with DM are still limited at present. Men often handle their problems privately and seek practical solutions (Adasi et al., 2020; Ziabari & Treur, 2018). They typically avoid stress management techniques that focus on emotions (Situngkir, 2018). Men typically cope with the process of avoiding, dulling, distracting, adapting, and engaging in new activities (Wilson et al., 2022). Therefore, this study was conducted to investigate distress and coping strategies in male DM patients.

2. Methods

2.1 Research design

This qualitative study employed a phenomenological approach and sought to elucidate the nature of diabetes-related distress and associated coping strategies among men diagnosed with T2DM.

2.2 Setting and participants

The research study was carried out from April to June 2023, employing a purposive sampling method for participants' recruitment. The selected purposive sampling approach aligned with the research methodology, aims and objectives, thus addressing each aspect of accuracy (Campbell et al., 2020). Inclusion criteria of this study were males over 18 years of age with type-2 diabetes, and residing in the Malang Raya region (Malang City and Malang District).

The recruitment of participants was conducted via social media (Facebook and Instagram) and in collaboration with private clinics. Each prospective participant was provided with a comprehensive, written explanation of the research project, delivered in a direct and transparent manner according to the convenience of the individual. Should the informant express interest, they were asked to sign an informed consent form, following which a time was set for the interview, which would either be conducted in-person or via a video conference, depending on the preferences of the individual.

The 24 of participants who were involved in the final phase of research represented an in-depth exploration of the variations in opinion that continued to be identified in relation to the four question domains. Researchers observed that dominant opinions in a given domain achieved saturation point more quickly and needed fewer participants to confirm this. Meanwhile, opinions

that were not common or unique required a larger number of participants to achieve the same level of saturation. No exclusion criteria were used to select the informants involved in this study.

2.3 Data collection

The questions used in the interview were derived from the DDS 17 questionnaire (Fukuda et al., 2019). Specifically, they were taken from the DDS 17 Indonesian version which had already been employed in previous research (Arifin et al., 2020). The questions from the Indonesian version of DDS17 were subsequently adopted as an interview guideline. All questions were posed as an initial probing, the purpose of which was to explore the informant's experiences with the objective of developing a detailed picture across several domains. In particular, this included physician-related distress, emotional distress, regimen-related distress, and interpersonal distress as presented in Table 1.

Table 1. Interview questions guidelines

Domain		Interview Questions
Physician-Related Distress	1.	Do you feel that your doctor does not understand enough about DM and its treatment?
	2.	Do you feel that your doctor does not give you clear instructions on how to manage your multiple sclerosis (DM)?
	3.	Do you have the feeling that your doctor doesn't take your concerns seriously?
	4.	Do you have the feeling that you don't have a doctor you can see regularly for advice about your DM?
Emotional Distress	5.	Is there a feeling that diabetes is too much of a drain on your energy, both mentally and physically?
	6.	Do you have feelings of anger, anxiety and/or depression when you think about living with type 2 diabetes?
	7.	Do you have the feeling that diabetes is in control of your life?
	8.	Do you feel that no matter what you do, you will end up with long term complications?
	9.	Do you feel overwhelmed by the demands of living with DM?
Regimen-Related Distress	10.	Do you feel that you are not measuring your blood glucose on a regular basis?
	11.	Do you have the feeling that you often fail in your diabetes care routine?
	12.	Do you have feelings of insecurity about your ability to control your blood glucose every day?
	13.	Do you have the feeling that you are not following a proper plan for your diet?
	14.	Do you have a feeling of lack of motivation to continue with the management of your DMs on your own?
Interpersonal Distress	15.	Do you have the feeling that your friends and family are not supportive enough of your condition?
	16.	Do you have the feeling that your friends and family don't understand the difficulties you face in living with DM?
	17.	Do you feel that your friends and family do not give you the emotional support that you would like them to?

Data were collected through in-depth interviews using the tools mentioned earlier. The following are illustrative examples of questions pertaining to the physician-related distress: "Do you perceive that your doctor lacks sufficient understanding about DM and its treatment?"; emotional distress: "Do you feel that diabetes consumes a significant amount of your mental and physical resources?"; regimen-related distress: "Do you experience a lack of motivation to continue self-managing your DM?"; and finally, interpersonal distress: "Do you feel that your friends and family do not appreciate your difficulties living with DM?."

In this study, in-depth interviews were conducted with each participant using the provided interview guideline, and each interview lasted approximately 45-60 minutes. The research team (RBC, NL, and SR), working in pair, conducted semi-structured in-depth interviews with the

participants. One investigator served as the primary interviewer, while the other served as an observer. Interviews were conducted with each participant on a single occasion, as part of the research process. The full range of information, opinion, non-verbal communication, vocal inflection, and facial expressions expressed by each individual was documented, including those conveyed via Zoom. For instances where the interviews were conducted via Zoom, the process was recorded through the Zoom recorder and notes, while in the case of live interviews, the process was captured on audio and notes.

2.4 Data analysis

The Colaizzi approach, which was first identified in 1978, was employed to analyse data thematically. The Colaizzi approach represents a robust and rigorous methodology for analysing informants' experiences with the objective of guaranteeing the credibility and reliability of the outcomes of qualitative research (Wirihana et al., 2018). The collected and extracted data were then subjected to further analysis to produce significant findings, grouped according to pre-selected themes in order to address the stated research objectives in a meaningful way. Furthermore, the resulting themes were then subjected to a detailed examination and verification process, in which statements from participants were taken into account in order to gain a more comprehensive understanding. The final results obtained were thus a set of organised themes which encapsulated the phenomena described by participants in terms of distress and coping strategies.

As an illustrative example, the responses to the open questions in the emotional distress domain, which asked about feelings of anger, fear and/or depression when living with DM, indicated that the participants only experienced distress at the beginning of the diagnosis. With family support, however, they were able to understand the condition and therefore the distress was no longer experienced. This leads to two conclusions, namely that distress can be a consequence of emotional burden and that family support can serve as a coping strategy. A similar process was then applied to the other domains, leading to the finalisation of eight themes representing distress experiences and eight themes representing coping strategies.

2.5 Trustworthiness/rigor

To ensure the integrity and credibility of the research process, the researchers (FAN, RBC, NL, SR, IK, ARC, LAI and ANLH) responsible for each stage of data collection, extraction, analysis, and theme development ensured that the appropriate methodology was applied and that the results submitted for review were accurately and clearly represented. These results were reviewed by all research team members in regularly scheduled meetings every two weeks, ensuring transparency, accountability, and alignment with established research procedures. Following the transcription of the interviews, the results were read by all researchers and re-read to ensure comprehension and accuracy. Thereafter, the key statements obtained from the informants were re-checked for suitability in answering the qualitative research questions initially posed. The statements were subsequently organised and summarised into themes, which were then presented to the participants to ascertain their confirmation. This process of ensuring dependability and confirmability represents a fundamental aspect of this research. The entire data-gathering process made use of a predefined question guide (DDS 17 Indonesian version), the efficacy of which had previously been demonstrated by the results of published studies. This ensured the transferability of the research and provided an excellent foundation for further replication or utilisation in subsequent studies.

2.6 Ethical considerations

The collection of data commenced once ethical approval had been granted by the Health Research Ethics Committee of the Faculty of Health Sciences at Universitas Brawijaya, with reference number of 1127/UN10.F17.10.4/TU/2023. Participants were contacted based on predetermined criteria and provided with a clear explanation of the study's objectives. Therefore, upon obtaining consent from the participant, information regarding the research was provided, including the objectives, procedures, potential discomfort, risks, benefits, and expectations. The recorded data was securely saved in a password-protected root directory using Microsoft Word, with anonymisation and pseudonymisation applied. The folders were kept secure, and anonymity

ensured informants could not be linked to their respective stories. Researchers had exclusive access to the data collected through this study.

3. Results

3.1 Characteristics of the participants

The study comprised 24 married men, aged between 23 and 79 years old, with the highest percentage (54%) falling within the age bracket below 53 years (Table 2). Of these participants, 75% of the participants were active employees, while the remaining participants were retirees. The majority of participants (58%) reported completing their most recent education at primary and secondary school level. A total of 13 (54%) out of 24 informants reported that they had been diagnosed with type-2 diabetes mellitus for more than five years.

Table 2. Characteristics of participants (n=24)

Characteristics	f	%
Age (years)		
<53	13	54
≥53	11	46
Education		
Primary-Secondary	14	58
College-Graduate	10	42
Employment		
Active employee	18	75
Retirement	6	25
Diabetes Duration (years)		
≥5	13	54
<5	11	46

Two themes resulted from the analysis were eight sources of distress and eight coping strategies. The sources of distress included emotional burden, disease burden, lack of knowledge, distress concerning healthcare services, distress in managing the diet, distress concerning routine medication, financial concern, and fatigue due to T2DM; while the coping strategies were family support, acceptance, self management, positive attitude, understanding of their illness, joining the diabetes community, spirituality, and getting more information about T2DM.

3.2 Sources of distress

Investigations of participants revealed eight distinct sources of distress. These included a range of emotional and practical difficulties, disease burden, lack of knowledge, distress concerning healthcare services, difficulties managing one's diet, routine medication, financial concerns, and fatigue. Each of these distress factors is explained in further detail below.

3.2.1 Emotional burden

Emotional distress is a state of mental or physical depression, causing a draining of energy, with the felt emotions being typically anger and fear. Overall, all the participants diagnosed with T2DM encountered psychological distress at the beginning, such as feelings of anger and depression. These emotions appeared as they had not been able to accept their diabetes diagnosis. Meanwhile, concerns about the prospect of living with diabetes mellitus could lead to depressive symptoms. However, for the majority of participants, these emotions were not present during the interview. Participants revealed, "In the beginning, I felt angry and depressed when I found out that I had diabetes mellitus, but now I don't feel that way anymore and I feel normal …" (P-21), and "… For the first 1-2 months of being diagnosed with diabetes, I still felt stress, however, for now, I don't feel that stress" (P-24).

Nevertheless, there were individuals who continued to suffer from psychological distress at present at the time of conducting the interview. The participants still experienced worry and anxiety with regards to living with diabetes, which was a notable burden for them. Some of them also struggled with controlling their blood glucose and making necessary lifestyle modifications. This was stated by P-14, "The side effects that I feel from suffering from diabetes mellitus are being confused, traumatized, and also afraid …" and P16: "… I sometimes think about it, I think

about how to deal with diabetes mellitus, I also feel sad because DM is a lifelong disease. I'm afraid complications occur. DM also changed my lifestyle."

3.2.2 Disease burden

The symptoms of disease burden experienced by the participants were varied, encompassing frequent thirst and hunger, disrupted sleep, loss of weight, and even amputation. Almost all participants experienced stress due to these symptoms. Symptoms of diabetes occurred when participants were tardy in taking medication or seeking medical attention. Additionally, disrupted sleep was an experiencing symptom, triggered by the need to urinate during the night. This in turn caused fatigue and hindered daily activities, as stated by P-5, "... When my blood sugar content rises, I can't sleep comfortably because I frequently get out of bed to take a pee. This makes me feel tired the next day."

3.2.3 Lack of knowledge

The study findings indicated a widespread lack of knowledge among informants regarding the diabetes self-management of diabetes, particularly pertaining to diet and medication. Several participants had expressed concerns that the regular use of diabetes medication might potentially cause harm to other organs within the body, as stated by P-4, " ... I used to think that the medicine I drank could reduce my blood sugar content, however, it would be problematic for my other body organs"

Several participants reported following advice from a T2DM group, despite the lack of scientific evidence supporting their claims. Contradictory advice, such as the recommendation to avoid vegetables and prioritize egg consumption, was reported by multiple participants as stated by for example by P-18:

> *... I've stopped consuming carbohydrates, now I consume 5-6 boiled eggs for lunch and dinner each. I also eat fish meat, chicken innards, chicken and cow meat, and seafood such as shrimp, clam, etc for my source of protein. I also stopped consuming vegetables and only ate varieties of mushrooms ...* (P-18)

In addition, the majority of participants did not have a comprehensive understanding of T2DM management. This problem led participants to reach a conclusion that was not based on scientific evidence. One of the informants stated that he was doing intermittent fasting as a way of resting the pancreas organ as said by P-24, "I think that the key to dealing with DM is to consume low carbohydrate and intermittent fasting. Intermittent fasting's function is to rest the pancreas ..."

3.2.4 Distress concerning healthcare services

Several participants stated that the service provided by the medical staff was still inadequate. They said that the duration of the consultation was very short because of the long waiting list. While the availability of the chronic disease management program (PROLANIS) in Indonesia provided an avenue for easier access to treatment for patients suffering from diabetes and hypertension, the participants did not confirm this to be the case. This problem led them to believe that junior doctors did not pay enough attention to the growth and education of their illness, as stated by two of the participants, "I think that the doctors didn't pay much attention to each of their patients. So, I reduced my doses of medicine ..." (P-17). " I think that the explanation my doctor gave me is too simple ... while I think I need a more detailed interpretation of my food diet" (P-1).

3.2.5 Distress in managing the diet

Meal planning for people with diabetes was very strict in order to maintain blood sugar levels and required drastic changes to the usual meal plan in a short period of time. These sudden changes could cause feelings of stress. Participants expressed that they had difficulty following the sudden change in meal plan because of the need to calculate the portion for each meal. This was, for example, stated by P-21: "... If I follow the DM's meal plan, I'm the one who is uncomfortable because I need to weigh my food ... I don't feel many changes to my blood sugar content even after doing it for 1 month" (P-21).

In addition, participants found it difficult to stick to a diet when they had a family event or went out to eat. Some participants also found it difficult to decide what to eat. Another barrier felt by informants was having to control themselves to eat carbohydrate-rich foods. This was corroborated by P-8, "I couldn't determine which food to eat because I had to follow the meal plan from my superior ..." and by P-1, "I understand that carbohydrate food sources are not good for my blood sugar, however, I still eat high-carbohydrate snacks or sweet drinks ..."

3.2.6 Distress concering routine medication

People with T2DM had to take medication for life. This routine is seen as a burden by some participants. Neglecting to take medication had often become a source of stress, leading them to feel burdened by the disease. The participants said that not taking their medication happened because they were too tired after daily activities, as said by an informant, "... I often slack on drinking my meds because I wake up late, especially when I feel tired ..." (P-11).

3.2.7 Financial concern

The majority of patients did not experience any financial difficulties with their routine medical check-ups. This was because of the BPJS (Indonesian National Insurance) programme, which was supported by the government to provide free medical check-ups and medicines to the community. However, some participants did not understand the benefits of the BPJS, so they overlooked the routine check-up because of the difficulty in paying the hospital fees themselves. This was revealed by a participant: "I'm a university student and I haven't enrolled in BPJS yet. Furthermore, I felt that checking my blood sugar content with the doctor no longer became my priority because I have more important expenses to cover" (P-1).

3.2.8 Fatigue due to T2DM

Several participants said that they felt tired more easily because of diabetes. This feeling was often experienced before they were diagnosed with T2DM. This was identified by participants when they felt that their work performance was lower than usual, as reported by P-21, "I felt the effect of diabetes mellitus, which is feeling tired when my blood sugar content is under the normal range ...". However, many of the participants felt that T2DM made an important difference in their performance in everyday activities. Participants said that T2DM should not be a barrier to performing at their best in everyday activities, as mentioned by one of participants, "My friends were wondering why even though I had diabetes, I still work with much passion ..." (P-10).

3.3 Coping strategies

The research revealed that individuals with T2DM employed various strategies to cope with their condition. These included receiving support from family members, accepting the condition, self-managing the illness through lifestyle changes and medication adherence, maintaining a positive attitude, seeking out information about the disease and participating in online support groups. Additionally, many participants reported that spiritual solace and a deeper understanding of T2DM contributed to their ability to cope. Details of these findings are presented below in the form of a discussion.

3.3.1 Family support

Family support became one of the methods used by informants to reduce their stress. The participants felt that the family could give them the attention and facilities they needed. Supports from wives, such as reminding them to take their medication and preparing dinner, made the participants felt loved. This was supported by P-14, "My family is very supportive and reminds me about my weight, working out, and consuming medicine ..." and P-9, "My wife always reminds me to drink medicine, she is becoming like a doctor in the house."

This study also found that family became a good motivator for informants to control their blood glucose and take care of their health. Participants said that they had to do this because of their responsibility as the head of the family to support their family. One participant revealed, "... his growth and development and his future depend on my health. It means if I'm not healthy no one can take care of him, no one can pay for his schooling" (P-3).

3.3.2 Acceptance

One solution to prevent stress-related illnesses was accepting the illness. According to the interview, most participants had come to terms with their DM and expressed gratitude for it. Individuals who have embraced their diabetes generally possessed a more optimistic outlook and exhibit greater drive to manage the condition, as said by P-22, "I just accept my disease (Diabetes) as it is …" However, we found that this acceptance often took the form of reckless behaviour to cope with their stress. This coping strategy was found in several participants who experienced stress over their diet such as stated by P-20, "I just enjoy my life, I just eat anything I want to eat, and I don't control my diet meticulously anymore …"

3.3.3 Self-management

Self-management, including adhering to a diet and regularly taking medication, had become a popular therapy for maintaining blood glucose levels. Participants expressed a sense of responsibility to control their own blood glucose levels and to avoid symptoms of diabetes. The burden of the disease resulted in stress if medication was not taken due to negligence, leading to diabetes symptoms. One way to proactively address this issue was to administer the medication prior to meals to enable direct consumption as said by a participant, "I always prepare my medicine that I will drink before mealtime, so I don't forget.." (P-13).

3.3.4 Positive attitudes

Several participants expressed positive attitudes towards the medical staff's recommendations, stating that following them could reduce their stress levels. They perceived the recommendations as professional and appreciated the staff's deep understanding of diabetes therapy, which helped them accept the referral. This was reported by P-13, "I am never late to consume my meds, because I follow the doctor's instructions that said my disease will be much worse if I forget to drink my medicine …"

However, some participants offered negative feedback about the medical staff's recommendation. They stated that they did not adhere to the DM diet recommendation suggested by the medical staffs and instead implemented their own version based on their personal experience that was stated by one participant, "I did not follow the meal plan that was recommended by the nutritionist … I made my version of my meal plan such as eating one or two times a day" (P-19).

3.3.5 Understanding of their illness

The experience enabled certain participants to manage their stress. This experience could come from their own experience or the experiences of others. Some participants reported that the experience was originated from personal situations, such as the repercussions of errors made during their diabetes treatment. This was reported by two participants: "… Now I limit my blood sugar content to not exceed 200, especially after my leg was amputated after being wounded" (P-2), and "I was late on my routine appointments once and I felt numb sensations on my feet … Because I was afraid of the risk of being amputated, I started my routine check ups regularly again" (P-4).

3.3.6 Joining the diabetes community

Being part of a community with peers who shared similar experiences, such as the diabetes group, might increase the well-being of those with diabetes. Based on the interview, a number of participants reported positive impacts following their involvement in this community. The participants highlighted the opportunity to meet with others sharing the same disease, which in turn, provided them with motivation and encouragement. There were several noteworthy results in the coping strategies. It was observed that joining a community could effectively lessen stress levels. This was stated by participant P-18, "… When I met with the Diabetes Mellitus community, I felt very comfortable and happier … I also stopped consuming carbohydrates and did breathing exercises," and was also supported by participant P-23: "It was when I visited my community members that I felt more confident and had more motivation to share and discuss things and experiences about Diabetes with the members …"

However, several errors in the medical nutrition knowledge disseminated within the community were identified. The recommended diet in the community does not align with the DM

principle. Nevertheless, these outcomes were not probed further as it fell beyond the scope of the research.

3.3.7 Spirituality

Spirituality as a coping strategy has an abstract interpretation and will vary between individuals. Several participants used T2DM as a way to get closer to God. Participants believed that God could heal their diabetes since diabetes was a medically incurable disease as reported by a participant, "The doctor said that my diabetes cannot be cured. Thus, I got myself more involved with God through my prayer …" (P-2).

3.3.8 Getting more information about T2DM

In order to live with DM, one participant improved his knowledge about T2DM through self-education. The participant said that he sought information about T2DM by consulting to doctors and reading research journals. Particiapants who did this often had a bachelor's degree, as said by one of them, "Apart from the doctor consultation, I often searched for information from many credible literature sources" (P-3).

4. Discussion

The aim of this study was to investigate the sources of distress and coping strategies in male DM patients. This aim was answered by the results of the study showing that eight distress's sources and eight coping strategies were identified as two main themes among Indonesian men with type-2 diabetes mellitus. Each of the themes will be discussed in the following section.

4.1 Sources of distress

This research had identified the sources of diabetes-related distress and effective coping strategies among men with T2DM. The sources of distress were emotional in nature, manifested as a burden of disease, a lack of knowledge, concerns about healthcare services, difficulties in managing diet, coping with routine medication, financial stress and fatigue related to T2DM.

Most participants experienced emotional distress, including fear and anxiety related to inadequate knowledge about diabetes management and fear of mortality. Their concerns pertained to the responsibility of men towards their families. These findings align with earlier systematic review research which indicated that male diabetes patients exhibited symptoms of anxiety (18%) and depression (29.4%) (Garcia-Lara et al., 2022). This is also believed to be associated with anxieties about future diabetes complications and decreased quality of life (Sharma et al., 2021). However, the majority of participants in this study indicated an enhanced confidence in managing their diabetes along the time and no longer experienced the same sentiments. Nonetheless, some participants reported persisting stress, fear and unease despite having lived with diabetes for several years. This phenomenon was similarly discovered in an alternative study by Yu et al. (2020), which tracked 24-month stress levels in 3,263 individuals diagnosed with diabetes. This research reveals that over 50% of participants reported experiencing persistent diabetes-related distress following their initial diagnosis (Yu et al., 2020). A further investigation found that patients with diabetes experienced repeated distress when undergoing an ongoing therapy process, leading to high and sustained levels of distress (Kuniss et al., 2021).

The impact of the disease burden was another source of stress experienced by most participants. This stress occurred when they failed to adhere to diabetes management, primarily in relation to their diet and prescribed medication. One of the effects reported by participants was disrupted sleep, which led to difficulties in carrying out their daily activities. A previous study indicates that a third of individuals with DM experience sleep disturbances, which can arise from several factors linked to substandard disease management (Surani et al., 2015). Sleep disturbances may present as nocturia, nocturnal hypoglycaemia, peripheral neuropathy, restless leg syndrome, or sleep-disordered breathing. When associated with DM, these factors could result in fragmented sleep and a diminished quality of life (Khandelwal et al., 2017).

This study discovered that individuals lacked understanding about managing diabetes, particularly in regard to medication and diet. This deficiency in knowledge led participants to form their own opinions that do not align with scientific medical therapy guidelines. This could result in detrimental consequences for diabetes management results, thus putting a burden of

stress on men with T2DM. A study revealed that over half of diabetes patients exhibited inadequate knowledge regarding the symptoms, treatment, and complications of T2DM (Almousa et al., 2023). Correspondingly, Siddique et al. (2017) reported that a mere 18% of T2DM patients demonstrated sufficient knowledge regarding diabetes.

Participants also reported experiencing stress due to healthcare services. They felt that their diabetes condition was not given enough attention, particularly demonstrated by the brief consultation time. According to research conducted by Irving et al. (2017), consultation times with doctors in developing countries tend to be shorter than those in developed countries. Insufficient consultation time not only negatively impacts patient care, but also puts pressure on medical staff. This result was supported by research conducted by Holton et al. (2022), which revealed that one in five participants reported insufficient discussion time with medical staffs to resolve their diabetes concerns. This study identified that the majority of participants utilised BPJS, the Indonesian National Health Insurance, to access healthcare and consult with to specialist doctors. However, a few participants still faced financial difficulties. Although it may not be the primary cause of stress related to healthcare services, further exploration is necessary to determine its potential impact.

Managing the diet was also found as the distress's source. The primary challenge in dietary management was the implementation of strict eating regulations and the subsequent impact on blood sugar. This had been identified as a significant source of distress experienced by patients diagnosed with T2DM. A review of the literature indicates that the difficulty in regulating blood sugar levels, which may be caused by complex dietary patterns, can lead to stress in individuals with diabetes, in addition to elevated blood sugar levels that result in an increase in stress hormones (Sharma et al., 2022). This highlights the pressing need for nurses and other healthcare workers to emphasise the significance of dietary management and stress reduction as key factors in the prevention of adverse outcomes in patients with diabetes (Rustini et al., 2020).

In this study, the participants indicated that non-compliance with treatment was the cause of stress during the treatment period. This finding aligns with a review that identified elevated stress among individuals with T2DM who were non-compliant with treatment (Roohafza et al., 2016). A study found that non-compliance with treatment was driven by patients' distrust of the efficacy of the prescribed treatment and their concerns about its potential adverse effects (Rezaei et al., 2019). Furthermore, the results of data gathered from participants indicated that financial distress was not a direct consequence of their condition, due to the availability of insurance services. However, there have been reports of adaptive failures, such as the inability to afford healthcare costs, being associated with low levels of distress in individuals with T2DM (Patel et al., 2023). However, other studies indicate that the high prevalence of stress in T2DM sufferers without financial problems may result from a lack of utilisation of health services (Vidyulatha et al., 2022). This finding was also evident in the participants of this study.

It had also been observed that individuals suffering from type 2 diabetes mellitus (T2DM) frequently reported to experience fatigue. A study suggests that this condition may be caused by a range of factors, including sleep disturbances, the onset of pain and changes in the patient's body mass index (BMI) (Singh et al., 2016). It is possible that the various stress responses associated with fatigue may be influenced by a number of factors, with the specific causes being different for each individual (Hidayat et al., 2020). This finding was corroborated by participants in this study.

4.2 Coping strategies

The study also identified some coping strategies carried out by male T2DM patients, such as receiving support from family, acceptance, self-management, maintaining a positive attitude, understanding of illness, joining a diabetes community, seeking spiritual guidance, and obtaining additional information. These results slightly deviated from previous research.

This study highlighted that supports from family members, particularly a wife and children, could effectively enhance self-management strategies among men with T2DM. A systematic review has similarly found evidence supporting the involvement of family in enhancing self-management and health outcomes for patients with type-2 diabetes (Pamungkas et al., 2017). Family acts as a motivating factor for men with T2DM to adhere to diabetes management owing to their role as heads of the household. The participants noted that they fulfiled the role of head of the family, resulting in a sense of responsibility to provide funds for their household. This aligns

with a patriarchal concept adopted by most Indonesian cultures, where men are regarded as the "head of the family" and held accountable for the financial state of the family unit (Raharjo et al., 2018). A sense of responsibility towards family had a very positive impact on self-management and positive attitude coping strategies. Apart from the family support, a strategy reported by participants for coping with stress was to accept the disease and thought positively. This represents a form of diplomacy on the part of T2DM patients in relation to the conditions they experience (Hapunda, 2022). Another study reported that the combined intervention of acceptance and commitment in ACT therapy proved successful in controlling the stress levels of T2DM patients (Nobel et al., 2023), thereby corroborating the findings of this qualitative research.

Self-management practices, employed by participants as coping strategies, had proven to be very effective in managing stress. These practices offered a practical and objective approach to reducing stress without the need for external interventions. The use of self-management methods, therefore, could be considered as a primary strategy for stress reduction. This finding is supported by Eshete et al.'s (2023) research which indicates that effective self-management is a strategy for coping with distress that can lower stress levels in patients with T2DM. Although it was deemed an effective method for managing stress, this approach was only suitable if the patient possessed adequate knowledge regarding regulating their diet and medication use for the illness (Mikhael et al., 2019).

The next coping strategy was positive attitude. The degree to which participants adhere to their therapy was a positive attitude that resulted in a state where they could take control and felt confident in managing their illness. Participants also recognised the significance of always adhering to professional advice. A cross-sectional study endorses these findings, where patients with T2DM who hold positive attitudes exhibit higher rates of coping stress than other groups (Arifin et al., 2020). The patient's positive attitude towards their illness produced comprehension and reduces stress. Positive patient behaviour, combined with adequate knowledge and compliance, has been previously reported by Almousa et al., (2023) to have a crucial role in mitigating stress in diabetic patients. Therefore, it is highly recommended that healthcare professionals maximize this period via educating their patients (Almousa et al., 2023).

This study discovered that one method by which participants comprehended their illness was through personal understanding of their illness and seeking further information, either independently or with supports from healthcare professionals. Understanding of their illness through personal experience, as perceived, improved participants' self-management since they wished to avoid a recurrence of the same. As an illustration, participants learn from the experience of feeling dizzy, weak, and numb in their legs when they fail to take control promptly. This self-efficacy has also been recorded by a previous study that found a positive association between self-efficacy and the level of coping strategies among DM patients (Kurniyawan et al., 2022). This improved their ability to self-manage and acts as a reminder to prevent the occurrence of a similar experience in the future. With experience, individuals with diabetes mellitus will reach a state where the condition is integrated into daily life, gradually providing them with greater control over potential stressors (van Smoorenburg et al., 2019).

Several participants reported social support experience upon joining a diabetes community. As noted in a review of multiple prior studies, a lack of social support among those living with diabetes mellitus may increase the risk of developing depression (Azmiardi et al., 2022). While involvement in various community-based activities, especially regular discussions addressing their issues, led to increased levels of happiness and motivation. This finding was supported by a previous study that found an inverse correlation between social support and the extent of emotional distress among those with DM (Ramkisson et al., 2017). Evidently, higher levels of social support offered DM patients a better coping strategy against emotional distress. This study also revealed that the use of spirituality as a coping strategy was less efective among participants, and this trend was consistent with previous research indicating that men exhibit lower levels of spirituality than women and were less inclined to use it as a coping strategy for stress (Gugun et al., 2021). Only one participant in this study noted spiritual coping, but no further explanation was given at the end of this investigation.

The last coping strategy was getting more information about T2DM. While some participants made an effort to understand their illness, this coping option was only utilized by a few of them. The study observed that the latter participants carried out further independent research on the

disease by studying journals, which could explain why not everyone was able to take this approach. It has been previously established that diabetic patients with lower knowledge may possess more stress facing their condition (Li et al., 2022). The acquisition of knowledge can facilitate an understanding of the disease experienced by patients with T2DM, thus enabling them to cope more effectively with the stressors that arise in the context of their condition (Najjar et al., 2020). It is possible to further review this finding, despite the lack of further exploration in this qualitative study.

5. Implication and limitation

This research finding implies that nurses and other health workers can utilize a variety of coping strategies to help men with T2DM to overcome the distress caused by their disease. Such strategies may thus facilitate the provision of optimal support, which is essential for the successful implementation of comprehensive therapy. However, the research is constrained by the fact that the responses provided by participants may have been influenced by the direct presence of the interviewer (zoom versus face-to-face) which could have affected the outcomes. Although the researcher made efforts to mitigate this particular bias by involving two interviewers for each participant, it was not possible to eliminate it completely.

6. Conclusion

This research highlighted that men with T2DM experienced eight types of distress, with emotional burden being the most dominant. The study also found that family support was the primary coping strategy among the eight coping strategies explored. This research has important implications for nurses and other health professionals. It helps them to assist patients in identifying distress and provides suggested alternative coping strategies that might be used to overcome it. Moreover, further research is required to ascertain which coping strategies are the most effective based on existing research results. These results will inform the selection of priority coping strategies that can be used to support the treatment of type-2 diabetes.

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Author contribution

Research conceptualisation was carried out by FAN. The methodology and formal analysis were conducted by FAN, RBC, NL, SR and ANLH. Supervision and validation were provided by FAN, IK, ARC and LAI. Funding acquisition and funding administration were undertaken by FAN in collaboration with IK. The original draft of the manuscript was written by FAN, RBC, NL, SR, IK, ARC and LAI, while review and editing were conducted by FAN.

Conflict of interest

The authors declare no potential conflict of interest concerning this research, authorship, and/or publications of this article.

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