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Self-care in migrants with type 2 diabetes, during the COVID-19 pandemic

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Abstract

Introduction: Type 2 diabetes is increasing globally and particularly affects vulnerable groups in society, such as migrants. Research shows that type 2 diabetes is a risk factor for severe illness when infected with COVID-19. Diabetes-related complications can be prevented with good glycaemic control. In addition, good glycaemic control has been shown to be an important cornerstone for preventing severe illness in individuals infected with COVID-19. In order to maintain good glycaemic control, self-care is needed. The purpose of this article is to describe self-care maintenance and possible changes in self-care maintenance and to explore factors related to unchanged self-care maintenance in migrant patients with type 2 diabetes during the COVID-19 pandemic. The second aim is to describe well-being, social support, and the need for support from healthcare services during the COVID-19 pandemic in migrant patients with type 2 diabetes.

Design/Method: A triangulation design with cross-sectional data collection was used. Both quantitative and qualitative data were collected and interpreted together in a triangulation design. Patients were selected by a diabetes nurse from a computer system at a health center in south-eastern Sweden and invited to participate in the study. A questionnaire was translated into the languages most commonly used at the clinic and sent out to 332 migrant patients who had been diagnosed with type 2 diabetes and treated in primary care. This questionnaire assessed self-care maintenance for diabetes (questions inspired by the Self-Care of Diabetes Inventory), with questions added to every item to assess changes during the pandemic. When changes occurred, we asked the participants to elaborate. Open-ended questions asked the participants how they would like to receive information when there are changes in their healthcare. Descriptive statistical analyses were used for the quantitative data and qualitative data was analyzed using a directed approach to content analysis.

Results: In total, 79 participants answered the questionnaire (mean age 69 ± 11, 51% male, 47% born in the Middle East). Of these, 76% stated a change in self-care. More than half (58%) stated changes in maintaining an active lifestyle, 40% had changed their physical exercise, and 38% had changed their behavior to avoid getting sick.

Participants said that this change was due to staying at home or canceling social activities because they feared meeting people during the pandemic. Others were more physically active than before on a regular basis during the pandemic due to taking walks to get fit, as a precaution related to COVID-19, and having greater awareness about how to avoid getting sick. Approximately one-quarter of the participants experienced a change in contact with healthcare due to poorer access to care, with fewer doctors' appointments and care being postponed during the pandemic. More than half (58%) would like to receive information about healthcare changes by a letter in the regular mail. Social support had changed for 35% of the participants, with less support from family and friends due to the risk of being infected with COVID-19.

Conclusion: The COVID-19 pandemic led to societal restrictions that changed the way of life for many individuals. Migrant patients with type 2 diabetes, who are already a vulnerable group regarding self-care, had difficulties in maintaining good living habits during the pandemic. During crises such as COVID-19, support with self-care, such as closer contact with healthcare providers, is vital.

Clinical Relevance: Knowledge about how the COVID-19 pandemic has affected migrants with type 2 diabetes can be used to support healthcare providers in identifying individuals who are at high risk of suffering from the consequences of their diabetes associated with the pandemic.

KEYWORDS
COVID-19, migrants, primary healthcare, self-care, type 2 diabetes

INTRODUCTION

Type 2 diabetes is a risk factor for severe illness and increased risk of mortality when affected by COVID-19 (Huang et al., 2020; Kumar et al., 2020; Mantovani et al., 2020; Rajpal et al., 2020). Type 2 diabetes is increasing across the world and particularly affects vulnerable groups in society, such as migrants (Cho et al., 2018). Migrants are foreign-born people who have moved to another country, either voluntarily as immigrants or involuntarily as refugees (IOM, 2019). Sweden, like other European countries, has been transformed during recent decades into a multicultural society, due to ongoing global migration, and now has a population of approximately 10 million, of whom 19% were born abroad (SOS, 2020). Most of the immigrants in Sweden were born in Syria, Iraq, Finland, Poland, or Somalia. During the last decade, migration to Sweden has been dominated by people of non-European origin, with the largest group being refugees from the Middle East (SCB, 2016). Research shows that migrant patients with type 2 diabetes, especially those from the Middle East, often lack knowledge about the disease and have inadequate self-care, causing an increased prevalence of diabetes with poor glycaemic control compared to the native Swedish population (Bennet et al., 2014; Elinder et al., 2017; Rawshani et al., 2018; Wandell et al., 2010). In addition, migrant patients believe that the diabetes care they receive is not culturally tailored (Chambre et al., 2017). But, for individuals with type 2 diabetes, complications and severe illness can be prevented with good glycaemic control, and to maintain such control, self-care is essential (Saeedi et al., 2019). The middle-range theory developed by Riegel et al. (2012, p. 195) defines self-care as "a process of maintaining health by promoting health practices and managing illness." Self-care can be seen as an overarching concept built from: self-care maintenance, self-care monitoring, and self-care management (Figure 1). Self-care maintenance is defined as

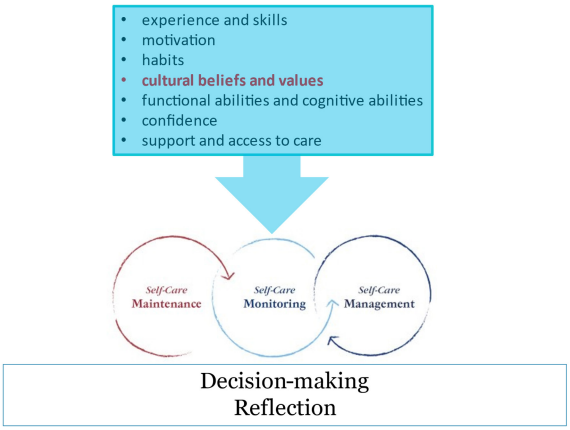

FIGURE 1 This figure is an adapted version of the middle-range theory (Riegel et al., 2012) and shows how self-care behavior is divided into self-care maintenance, self-care monitoring, and self-care management. Each of these is influenced by several factors and they underpin a person's decision-making and reflection on their self-care behavior (Jaarsma et al., 2017).

behaviors performed by patients with a chronic illness to maintain physical and emotional stability (Riegel et al., 2012), and includes illness-related behaviors, such as adherence to follow-up visits and examinations, and health-promoting behaviors, such as eating a healthy diet or engaging in physical activity. As Figure 1 shows, self-care behavior, including self-care maintenance, is influenced by a number of factors, including culture, habits, experience, motivation, support, and access to care, all of which underpin a person's decision-making in their self-care (Jaarsma et al., 2017) and are thus important for healthcare providers to consider.

When a new situation arises, such as the COVID-19 pandemic, information also needs to reach vulnerable groups, such as migrants with language difficulties. Although there was no lockdown in Sweden during the pandemic, there were restrictions, and access to healthcare was affected, in particular for patients with chronic diseases (Farsalinos et al., 2021; Van Poel et al., 2022). Mortality among migrants increased after the onset of the COVID-19 pandemic in many countries (Hayward et al., 2021). A comparison between all-cause mortality data in Sweden pre-pandemic with data from the same timeframe during the pandemic found that, among middle-aged (40–64 years) and older (>65 years) migrants born in Syria, Iraq, and Somalia, excess mortality was approximately 220%. Among people born in Sweden, the EU, the Nordic countries, or North America, the excess mortality among those >65 was 19% and among the middle-aged was 1% (Calderón-Larrañaga et al., 2020). There are many factors that might explain the worse outcomes of migrants, such as lower socioeconomic status, less access to up-to-date information, or poor access to healthcare due to a lack of trust in doctors or difficulties in contacting a healthcare provider due, for example, to language barriers (Mangrio et al., 2020). Other factors related to worse health outcomes in migrants during the pandemic might be that in Sweden they have higher rates of smoking and obesity. These factors are all seen as risk factors for diabetes, and also for COVID-19 (WHO, 2004, 2019).

Rationale

This study was conducted in order to describe self-care during the COVID-19 pandemic and explore factors related to changes in self-care among migrant patients with type 2 diabetes. Individuals with type 2 diabetes are at high risk of developing serious disease after COVID-19 infection (Rajpal et al., 2020) and if the diabetes is poorly controlled the prognosis is worse than with well-controlled disease (Butler & Barrientos, 2020). We know from previous studies that prolonged periods at home, due to COVID-19, accompanied by limited mobility during the lockdown, can lead to disruptions in diet and lifestyle in patients with type 2 diabetes (Ghosh, 2020). As migrants with type 2 diabetes are known to be a vulnerable group in terms of diabetes prevalence, knowledge, and self-care (Cho et al., 2018; Montesi et al., 2016; Pettersson et al., 2019; Testa et al., 2016), and also subject to higher levels of illness-related stress (Alzubaidi et al., 2022), they need support from healthcare services. During the pandemic, routine visits were canceled and information about COVID-19 was at first only available in Swedish. Hence, important information might not have reached those who do not understand Swedish or cannot read. Thus, migrants with type 2 diabetes may have faced acute problems with self-care due to the COVID-19 pandemic and there is a lack of knowledge about their need for information and support. The fact that the pandemic also caused further anxiety and stress should make this even more of a priority since anxiety, stress, and depression increase the risk of impaired glycaemic control and lack of self-care (Fisekovic Kremic, 2020; Joensen et al., 2020). The data collection was undertaken to identify current problems, but also to enable strategies for future teaching programs and organizational factors to prepare for a similar crisis regarding the need for support and information.

Thus, the purpose of this study is to describe self-care maintenance and possible changes in self-care maintenance and to explore factors related to unchanged self-care maintenance in migrant patients with type 2 diabetes during the COVID-19 pandemic. The second purpose is to describe well-being, social support, and the need for support from healthcare services during the COVID-19 pandemic among migrant patients with type 2 diabetes.

MATERIALS AND METHODS

Design

Both quantitative and qualitative data were collected using cross-sectional data collection methods and interpreted together in a triangulation design (Creswell, 2014).

Procedure

Patients were eligible if they were migrants diagnosed with type 2 diabetes, ICD E11 (WHO, 2004) listed at a healthcare center, and aged 18 years or older. Exclusion criteria were inability to understand Swedish or Arabic, Bosnian or Spanish, or documented inability to complete the questionnaire (e.g., severe cognitive problems). All patients who met the inclusion criteria were selected by a diabetes nurse from the computer system Cosmic at a health center in south-eastern Sweden and invited to participate in the study. Patients were sent the invitation along with the questionnaires by letter and asked to complete the questionnaire and send it back in the enclosed stamped reply envelope. Patients received a reminder after 2 weeks. They were offered help to fill in the questionnaire if they wanted it by contacting the research team. The data collection started in June 2020 and ended in September 2020.

Measurements

Based on the middle-range theory of Riegel et al. (2012), self-care maintenance was assessed using both multiple-choice and

open-ended questions to capture the experiences of migrants with type 2 diabetes of possible changes in their self-care maintenance during the COVID-19 pandemic. The questionnaire was adapted from the Self-Care of Diabetes Inventory (SCODI) (Ausili et al., 2017), also based on middle-range theory (Riegel et al., 2012). In this study, we used the self-care maintenance items (12) of the SCODI (answered on a 5-point scale where 1 = never and 5 = always). The self-care maintenance scale was standardized to a total possible score of 100 for ease of interpretation. In former studies involving patients with heart failure, a cut-off of 70 points was used to discriminate between adequate or inadequate self-care maintenance (Riegel et al., 2009). This cut-off was also used in this study (Caruso et al., 2019).

Self-efficacy was measured with the question: "How confident do you feel that you can perform the self-care behaviours?" Answer options were on a 5-point scale (1 = never to 5 = always). Well-being was measured using Cantril's ladder (Cantril, 1965) on a 10-point scale where higher scores indicate greater well-being. The participants were asked to state a number (from 0 to 10) on a figure depicting the ladder of life. The top step (10) represents the best possible life, and the bottom step (0) means the worst possible life.

Change due to the COVID-19 pandemic

For each self-care behavior item, the self-efficacy item, and Cantril's ladder, an open-ended question was added: "Did this change due to the COVID-19 pandemic? (yes/no). If yes, please elaborate." In addition, the questionnaire included open-ended questions to explore possible changes in social support: "Did your social support change due to the COVID-19 pandemic? (yes/no) If yes please elaborate."

Participants could also describe the support they needed from healthcare services, and how they would like to receive information during the COVID-19 pandemic, both in general as a patient and also as a patient with type 2 diabetes. We also collected data on background, such as gender, age, country of birth, educational level, duration of type 2 diabetes, and how long the person had been living in Sweden. Patients received the questionnaire in multiple languages (Swedish, Arabic, Bosnian and Spanish) since these are the languages mostly spoken at the primary care center in which we collected data. They could choose the language in which they wanted to respond to the questionnaire.

Data analysis

Quantitative and qualitative data were interpreted together within a triangulation design (Creswell, 2014; Figure 2). SPSS, version 26 (IBM) was used to analyze the quantitative data. For continuous data, mean and standard deviation were reported, and for nominal data frequency and percentages were given. Differences in self-care maintenance related to marital status, gender, educational level, region of birth (born in the Middle East or not), and having children or grandchildren living nearby were analyzed using the student *t*-test. $p < 0.05$ was considered statistically significant.

Pearson correlations were calculated between self-care maintenance and age, well-being (Cantril's ladder), duration in years of diabetes, and years living in Sweden. To explore factors related to unchanged self-care maintenance, a χ^2 analysis was conducted with changed/unchanged self-care maintenance and gender, marital status, education, and having children or grandchildren living nearby.

Answers from the open-ended questions in Arabic, Bosnian or Spanish were translated into Swedish by an authorized interpreter. These were first read (by all four authors) to gain an overall impression of the meaning of the text. Data from the open-ended questions regarding changes in self-care maintenance, well-being, and need for support were then analyzed using an approach of directed content analysis (Hsieh & Shannon, 2005). With this approach, data was precoded and divided, both before and during the data analysis, into ***positive and negative aspects*** of changes due to the COVID-19 pandemic. In the next step (Figure 2), all four authors discussed both qualitative and quantitative data together and used the qualitative results to validate the quantitative results. In the final step, we interpreted quantitative plus qualitative data to address the purpose of the study.

Ethical approval and considerations

This study was conducted according to the principles of the Declaration of Helsinki and in accordance with the Medical Research Involving Human Subjects Act in Sweden (Regionala etikprövningsnämnden i Linköping). Ethical approval was received (Dnr: 2020-02042). Written informed consent was obtained from all patients and it was clarified that they could terminate their participation at any time and that participation in the study would not affect their care.

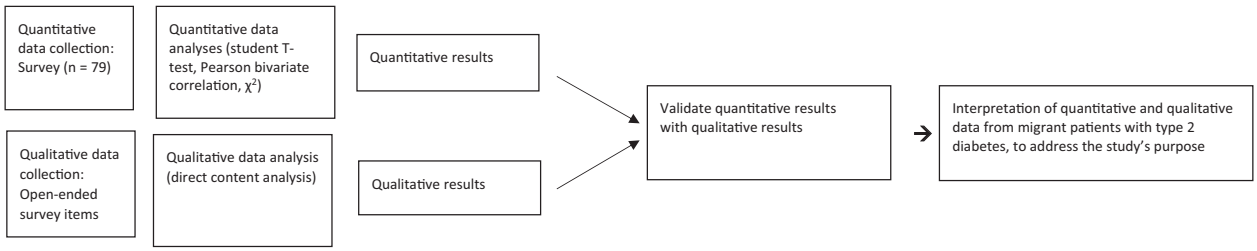

FIGURE 2 Quantitative and qualitative data from 79 migrant patients with type 2 diabetes were analyzed and then merged in a triangulation design (Cresswell, 2014)

RESULTS

Sample

In total, 79 participants answered the questionnaire, a response rate of 24%. The mean age was 69 (±11) and 51% of the participants were male. The sample consisted of people born in either the Middle East (47%) or European countries (53%). The individuals from the Middle East had immigrated to Sweden from Syria, Turkey, Iraq, Lebanon, or Iran. Participants from European countries were particularly born in Bosnia, Poland, and Finland. The participants had been living in Sweden for an average of 33 years (±14) and had a median duration of type 2 diabetes of 13 years (1–40) (Table 1).

TABLE 1 Characteristics of the sample

	n = 79
Age (years) (mean ± SD)	69 (±11)
Female gender (*n* %)	39 (49)
Country of birth (*n* %)	
Middle East	*34 (47)*
Syria	13 (18)
Turkey	12 (17)
Iraq	7 (10)
Lebanon	1 (1)
Iran	1 (1)
Europe	*26 (33)*
Bosnia	10 (14)
Finland	7 (10)
Poland	4 (5)
Rest of Europe	5 (6)
Outside Europe	12 (17)
Highest education (*n* %)	
No education	10 (13)
Primary school	29 (37)
Secondary school	24 (30)
University	13 (17)
Years living in Sweden (median range)	33 (6–62)
Marital status *n* (%)	
Married/living together	54 (68)
Living alone	29 (32)
Children living nearby	61 (77)
Grandchildren living nearby	45 (57)
Duration of diabetes years (median range)	13 (1–40)

Self-care maintenance and self-efficacy

The mean value on the self-care maintenance scale was 78 (±14), using the standardized scoring scale from 0 to 100 (Ausili et al., 2017). In this study, 20% (*n* = 16) of the participants scored <70, reflecting inadequate self-care maintenance. Most of the patients (84%, *n* = 66) stated that they 'almost always' or 'always' felt confident about performing self-care behaviors.

Looking at an item level, 26% (*n* = 21) of the participants stated they always performed physical activity and 31% (*n* = 24) stated they always maintained an active lifestyle. In total, 34% (*n* = 27) of the participants stated that they always consumed a balanced diet and 21% (*n* = 17) always avoided eating salt and fat. However, 87% (*n* = 71) of the participants reported that they always took all prescribed medicines (Figure 3).

Changes in self-care maintenance

Of the patients, 76% (*n* = 60) reported a change in self-care maintenance during the pandemic, meaning that they had changed at least one self-care maintenance item. In total, 58% (*n* = 46) of the participants reported a change in maintaining an active lifestyle, 40% (*n* = 32) in their physical exercise, and 38% (*n* = 30) changed their behavior around avoiding getting sick (Figure 4).

Patients wrote in the open-ended questions that this change was due to staying at home because they feared meeting people during the pandemic and had canceled social activities. Others were more physically active than previously on a regular basis during the pandemic. They were taking walks to get fit, as a precaution related to COVID-19. Twenty participants (25%) had experienced a change in contact with healthcare services due to poorer access to care, with fewer doctors' appointments and care being postponed during the pandemic. Regarding eating habits, 20% (*n* = 16) stated that they had changed their diet due to being tired and unable to cook and therefore did not eat as before. On the contrary, some participants wrote that their behavior regarding diet had changed positively during the pandemic because they did not make impulse purchases and ate meals more regularly, thus keeping better control of their diet.

Factors related to self-care maintenance

Region of birth was significantly related to self-care maintenance scores, with people coming from the Middle East having lower self-care maintenance compared to participants from other countries ($p = 0.035$). Well-being was significantly related to self-care maintenance ($p = 0.01$).

When comparing the 24% (*n* = 19) of participants who stated that they had not changed their self-care maintenance during COVID-19 with those who reported changes, male gender ($p = 0.018$) and being married/living with somebody ($p = 0.039$) were significantly related to no changes in self-care maintenance during the pandemic.

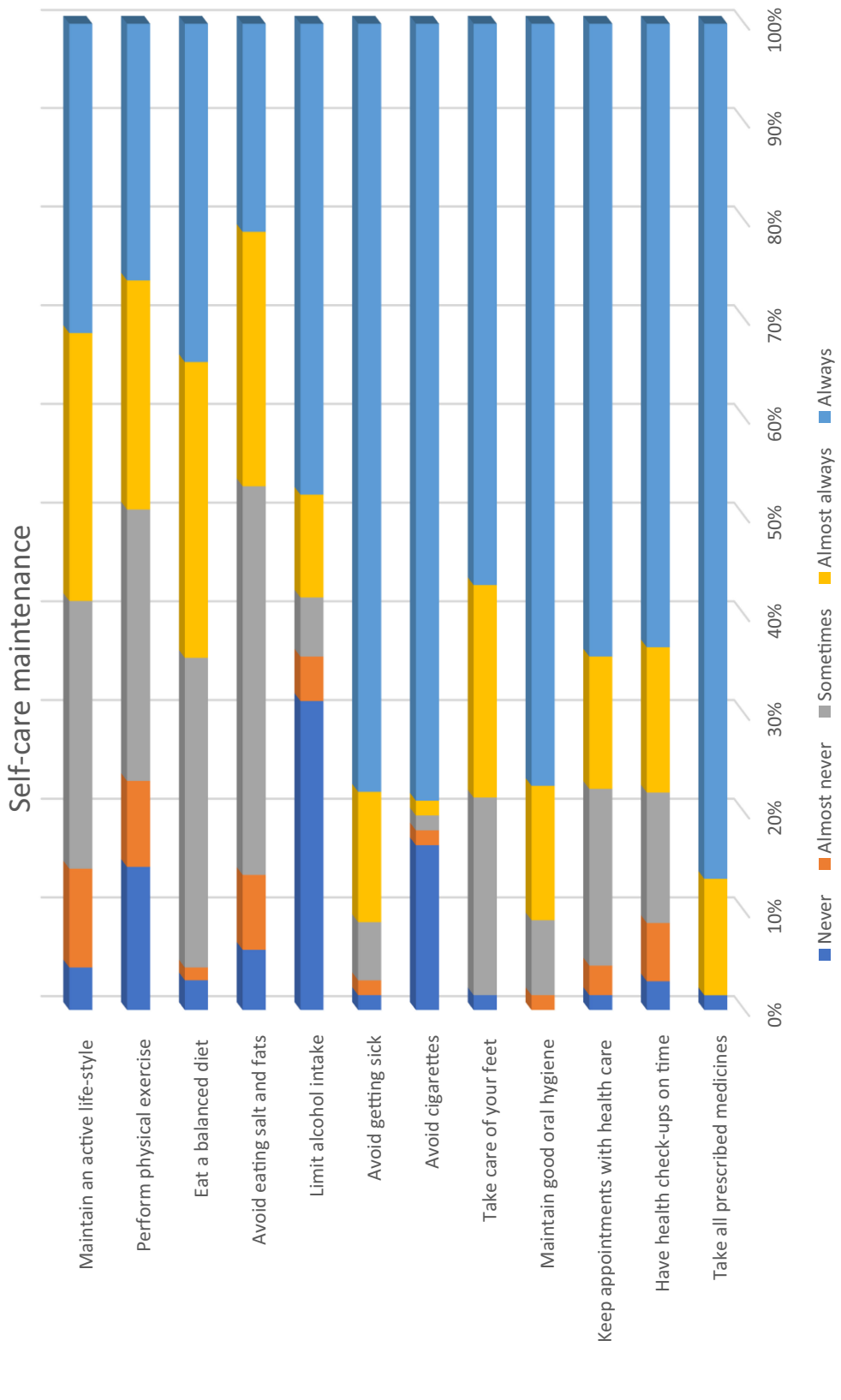

FIGURE 3 Self-care maintenance, measured by 12 self-care behavior items

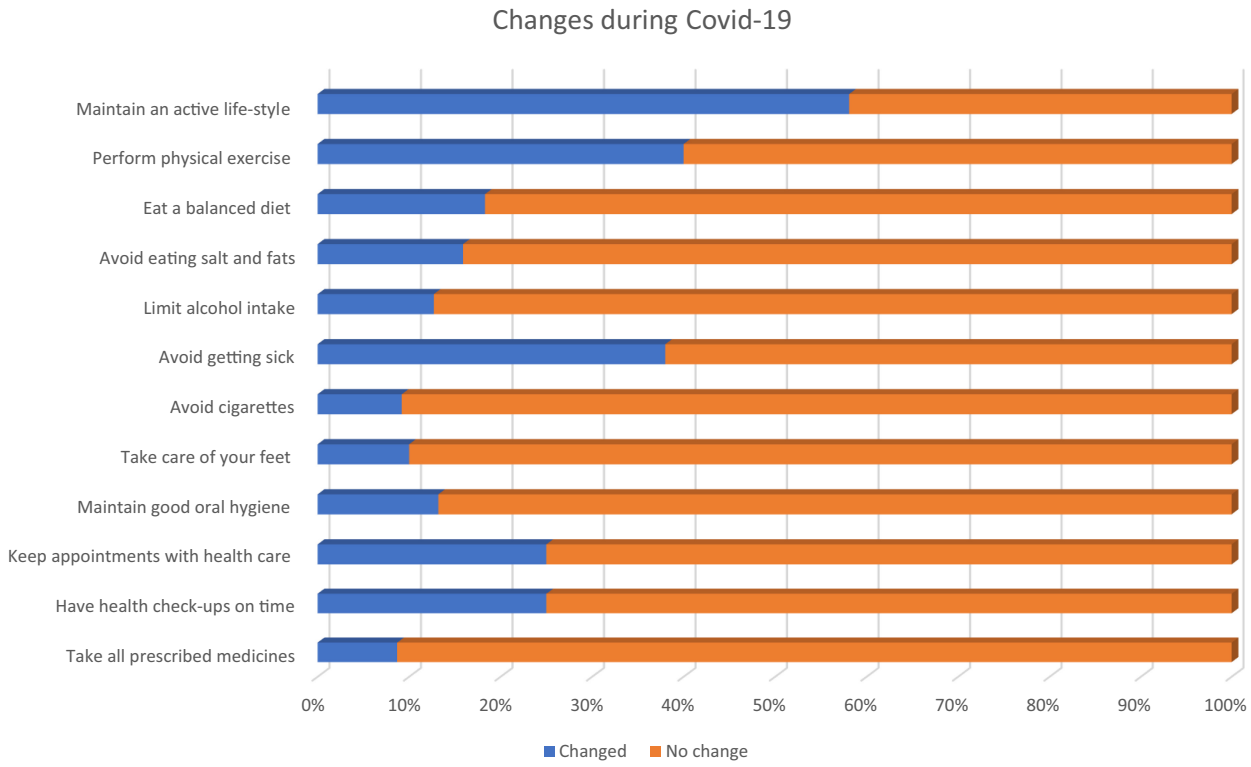

FIGURE 4 Changes in self-care maintenance, measured by 12 self-care behavior items, during the Covid-19 pandemic

Well-being, social support, and need for support from healthcare services

The participants had a mean value for well-being of 6.58 (SD: 2.28) and 20% (n = 16) scored lower than 5. In total, 48% (n = 38) experienced a change in their well-being during the COVID-19 pandemic. Both positive and negative aspects were found. A positive change occurred when participants wrote that they took better care of themselves. Negative aspects found were a decrease in physical activity and social activities, when participants experienced fear about being affected by COVID-19 and fear about being in a risk group due to their diabetes. Some participants experienced an increase in anxiety and loneliness due to the pandemic, which influenced their well-being.

Social support had changed for 35% of the participants (n = 28), with less support from family and friends due to the risk of being infected by COVID-19. Participants wrote that the isolation had influenced their social support networks since they could not meet relatives, friends, or family due to the risk of infection. However, even though there were fewer social contexts available, some participants found other ways to socialize, such as outdoor activities.

In total, 58% of the patients (n = 46) said they would like to receive information about healthcare changes by a letter in the regular mail. Patients expressed a desire to feel safe within the healthcare system by receiving more information regarding COVID-19 because people with diabetes are a risk group. They also preferred to have more check-ups related to diabetes and wished that healthcare providers would call every now and then to check on them. They also asked for the possibility of home visits for blood sugar tests. Furthermore, they wrote that they were in need of support regarding self-care by means of more information and tools for self-care activities, such as material for foot care and blood glucose monitors. In addition, the patients needed help in maintaining physical activity.

DISCUSSION

During the pandemic, almost all of us had to adapt our lives, some more dramatically than others. Even though Sweden did not go into total lockdown, and the restrictions were considered 'mild', there were considerable changes to society, healthcare, and daily life. For example, sports facilities were closed, primary care centers shifted their focus to acute care and redeployed healthcare personnel, people were advised to avoid busy places (such as shopping malls), to restrict the number of visitors they received, and to restrict travel out of the province. In countries with a stricter/total lockdown, the consequences for self-care were more pronounced, making it harder to buy fresh food, go for a walk outside or have any visitors at home. Patients with chronic disease seem to have suffered more from the pandemic than the general population since they faced the consequences of clinical challenges (e.g., the disruption of multidisciplinary teams), patient-related challenges (e.g., reduced follow-up) and logistical challenges (e.g., limited internet access, which was needed for virtual visits) (Neubeck et al., 2020). Routine healthcare visits for patients with chronic disease changed considerably, access

to materials and medication for treatment became restricted, and new challenges arose for patients as they sought to perform healthy behaviors.

The migrant patients with diabetes in our study described several changes in self-care due to the COVID-19 pandemic. The majority (76%) reported that they had changed their self-care in some way during the pandemic, most often the self-care behaviors related to physical activity and diet. Although our participants reported high levels of total self-care behavior, specific self-care behaviors were low, with only 26% of the patients always performing physical activity and 31% reporting that they always maintain an active lifestyle. Consequences of the pandemic included patients finding it difficult to maintain physical activity and they stated that this was due to canceled activities. In total, only 34% of patients stated they always consumed a balanced diet and 21% always avoided eating salt and fat.

These results confirm the findings of previous studies in a general population of patients with diabetes, showing difficulties in maintaining healthy lifestyles (Banerjee et al., 2020; Felix et al., 2021; Ruiz-Roso et al., 2020; Silva-Tinoco et al., 2021). Other studies show that people who already had uncontrolled diabetes before the pandemic had the most difficulty maintaining their weight and a good diet during the pandemic (Felix et al., 2021), and self-care activities decreased during the pandemic (Silva-Tinoco et al., 2021). People with type 2 diabetes are also at greater risk of developing serious diseases after COVID-19 infection (Rajpal et al., 2020), and with uncontrolled diabetes, the prognosis is worse than with well-controlled disease (Butler & Barrientos, 2020).

In addition to these challenges, being an immigrant with diabetes seems to have made the situation during the pandemic even more challenging due to less access to up-to-date information or lower access to healthcare due to a lack of trust in doctors or difficulties in contacting a healthcare provider (Mangrio et al., 2020). During the COVID-19 pandemic, it was important that individual goals and treatment strategies for glycaemic control and self-care be established for people with type 2 diabetes, specifically targeting vulnerable groups (Banerjee et al., 2020).

We found a relationship between unchanged self-care behaviors and living with a partner, and unchanged self-care behaviors and being male. This might imply that female patients and those who are living alone might have suffered more from the pandemic and might even be more vulnerable. Policy needs to be put in place to optimally support these groups during difficult times.

Patients in our study also reported a need for more contact with healthcare services during times of fewer routine visits. People with diabetes are at high risk of catching infections, especially flu and pneumonia. Careful blood glucose control should be emphasized in the treatment of COVID-19 and therefore less frequent contact with healthcare providers can increase the risks (Ghosh et al., 2020). Policy implications include the need to develop strategies to remain in contact with vulnerable groups of patients.

One-third of the participants in our study also reported that their social support had changed, with less support from family and friends due to the risk of being infected by COVID-19, and 20% of the patients recorded a well-being score lower than 5 (on a 10-point scale). The mental health impact of the COVID-19 pandemic and its associated restrictions has been well-documented. Migrants may be particularly affected due to pre-existing risk factors (Falicov et al., 2020; Júnior et al., 2020) and potential exclusion and social isolation (Júnior et al., 2020). Anxiety, stress, and depression increase the risk of impaired glycaemic control and lack of self-care. Patients in this study experienced anxiety during COVID-19, which has also been seen in other studies (Joensen et al., 2020; Nachimuthu et al., 2020). This should be given greater attention in healthcare to prevent poor glycaemic control, which can lead to diabetes-related complications such as severe illness if infected by COVID-19.

Another important finding was that more than half of the participants preferred to be informed by written letters to their home addresses. During the pandemic, there was a large shift toward telecare, information provided through the internet or social media, with the rationale that telemedicine, consultation counseling, and treatment remotely can reduce feelings of loneliness and isolation. This was indeed confirmed in a study involving people with type 2 diabetes during the COVID-19 pandemic (Quinn et al., 2020). Although telemedicine is convenient and has a wide reach, it is important to consider that some patients might experience challenges in accessing remote healthcare if they suffer from sensory, cognitive, and/or physical decline, and this needs to be taken into account when offering telehealth (Allemann et al., 2019).

Some of the patients in this study had lived in Sweden for quite a long time, but it is important to consider the literature's suggestion that growing older in a new homeland with a chronic disease poses a range of challenges related to cultural norms and values that differ between western and non-western countries. Even if a person has lived in a country for a long time, they might feel closer to the values of their birth country (Liu & Gallois, 2022). In previous studies, we found that people who had immigrated from the Middle East had lower diabetes knowledge than native Swedes (even after living in Sweden for a long time) (Pettersson et al., 2019).

An appropriate way to address our findings is to acknowledge that messaging on the response to new situations (such as a pandemic) should be tailored to different cultural and social situations. Migrant populations may have unique vulnerabilities regarding self-care, and meaningful solutions and support should be offered. Another appropriate response is to consider the preferred use of communication and different media by the target group. More research is needed into how to efficiently co-design interventions with the target group of migrants.

Methodological reflections

This is a descriptive cross-sectional study, meaning that causal explanations are not possible. The response rate was 24%, which is rather low, and we realize that there might be missing data relating to participants who cannot read or write. It is known that *adult literacy rates*

are lower among migrants than in a non-immigrant population, with about 21% of refugees having difficulties reading or writing, and only 60% having good health literacy (Wångdahl, 2014). Literacy is *especially low in migrants from the Middle East* (Hammoud, 2005). Considering this, the results of this study might have been different if we could also have reached the illiterate migrant patients with type 2 diabetes. Most of the migrants in Sweden are born in Syria, Iraq, Finland, Poland, Iran, or Somalia. Our data were collected from a population reflecting this diversity. In a recently published systematic review covering 15 high-income countries that discussed the consequences of COVID-19 (Hayward et al., 2021), migrants, irrespective of country of residence, were found to have higher levels of many of the risk factors and vulnerabilities for COVID-19. The Swedish data was comparable to data from other high-income countries. We, therefore, believe that our results can be generalized to migrants in other high-income countries (who are not living in refugee camps). The strength of the study is that we used questionnaires translated into the languages of the target population of the specific primary care center. We also used a triangulation design to optimize the interpretation of the data. However, it would add strength to compare the population in this study with a group of native-born individuals with type 2 diabetes.

CONCLUSION

The COVID-19 pandemic led to many restrictions on society that changed the way of life for many individuals. Migrant patients with type 2 diabetes, who are already a vulnerable group regarding self-care, had difficulties in maintaining good living habits during the pandemic. During crises such as COVID-19, support with self-care, such as closer contact with healthcare providers, is vital.

CLINICAL RESOURCES

Self-care measurements. Self-Care of Diabetes Inventory. https://self-care-measures.com/available-self-care-measures/self-care-of-diabetes-inventory/.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Table S1

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