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ORIGINAL ARTICLE

Cultural Dimensions of Diabetes Management: a Qualitative Study of Middle Eastern Immigrants in the U.S.

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Abstract
This study examined how aspects of culture, social support, isolation, and loneliness are perceived as influences in chronic illness management by pre-diabetic (Glycated hemoglobin A_{1c} levels between 5.7 and 6.4) or Type 2 diabetic patients (A_{1c} levels between 6.4 and 8). Twenty-eight Middle Eastern immigrants in the greater Philadelphia area were interviewed using a semi-structured approach. Results were consistent with other research which suggests that patients benefit from family and community support in the management of their illness. However, findings also suggest that even in the presence of strong family and social support, patients report increased feelings of isolation and loneliness because they have to manage a complex illness that requires many lifestyle changes. For immigrant suffering from chronic illnesses, social gatherings, especially those that center on the consumption of traditional ethnic food, can be highly stressful because they need to avoid such foods as part of their daily treatment regimen. The results of this study have significant implications for patients, physicians, and psychologists who can benefit from an increased sensitivity to patients' challenges in illness management by understanding how cultural factors affect compliance in diabetes treatment regimens.

Keywords Pre-diabetes · Type 2 diabetes · Lifestyle change challenges · Illness management · Family and social gatherings influence · Culture, family and social support influence importance of ethnic food, isolation and loneliness

Diabetes is a debilitating illness that affects more than 30 million Americans; an additional 79 million worldwide are pre-diabetic and millions more are undiagnosed (Bernstein and Munoz 2016). Among older adults the situation is even more problematic. Twenty five percent of those over 65 have Type 2 diabetes and an even greater percentage are pre-diabetic (Briscoe 2014). Not only is Type 2 diabetes a

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serious lifelong disease, it also increases the risk for other conditions such as heart disease, stroke, blindness, and kidney disease (National Council on Aging, 2015; National Institute on Aging, 2015).

While Type 2 diabetes is treatable, often through adopting healthy lifestyle practices, it is also seen as one of the most challenging chronic illnesses to manage. Coping and adjusting to any chronic condition depends on the intersecting influences of personal, social, economic, and cultural factors. Social support appears to play a major role in successful diabetes management (McConatha et al. 2011; Ridder et al. 2008). Although studies have examined the relationship between self-care and social support, few have addressed the challenges older immigrants face in managing diabetes. In order to address this void in the literature, we investigated the illness management and coping strategies used by a convenience sample of older Middle Eastern immigrants.

Social Support, Control, and Coping

Social support networks can be invaluable in providing information, emotional support, and material assistance to cope with stressful and traumatic events. Effective social support includes satisfying relationships with family, friends, and support groups and access to emotional, social, spiritual, and environmental resources. Hobfoll et al. (1990) defined social support as a sense of connectedness or attachment with others that includes caring or loving interactions providing emotional and/or material support. They formulated a theory of social support as a resource or reserve complementing individual resources (e.g., sense of optimism). Personal and social resources can help offset environmental pressures and demands that challenge a person's sense of self and quality of life. Social support can be particularly helpful when the demands of a situation become overwhelming, when people are at risk for becoming isolated and lonely, and when they are faced with challenges that are too difficult to manage alone (Cornwell and Waite 2009).

Several studies (Cheng and Boey 2000; Gallant et al. 2010; Lynch et al. 2012; Song et al. 2012; Strom and Egede 2012; Vassilev et al. 2013) have found that social support can help minimize distress and promote effective illness management. Cheng and Boey (2000) examined the relationship of depressive symptoms with receiving diabetes-specific support, receiving general support (family networks, social networks, & interdependence), and concealment of feelings in a group of 60 to 92-year old Chinese patients in Hong Kong. An interesting finding in their study was that while diabetic specific support from family ($r = .28$, $p < .01$) and friends $r = -.16$, $p < .01$) had mild negative correlations with depression, general social support from family ($r = -.45$, $p < .01$), friends ($r = -.45$, $p < 01$), and interdependence ($r = -.47$, $p < .01$) had moderately high negative correlations with depressive symptoms. They also found (a) concealment of feelings had a strong positive correlation, with depressive symptoms ($r = .62$, $p < .01$), and (b) positive orientation ($r = -.46$, $p < .01$), active self-care ($r = -.40$, $p < .01$), and seeking of social support ($r = -.22$, $p < .01$) had inverse correlations with depressive symptoms.

Gallant et al. (2010) reviewed the literature on the role of families, friends, and cultural beliefs and practices in managing a chronic illness among elder African Americans, Latinos, Asian Americans, and American Indians. As would be expected, patterns of family and social support varied among the various ethnic groups. For example, they noted that older African American women have larger social support networks than other ethnic groups but reported receiving little support from their networks. Older African American men are more likely to live alone and receive little social support. Among Asian Americans, there is greater emphasis on elder care from family members, but this appears to be changing. Asian Americans tend to be open to receiving health related help from their friends. Among older Latino men, their

wives provide them with major support managing their health-related issues, including dietary needs, often at the expense of meeting their own needs. The literature on American Indians is sparse, but it points out that health care activities occur within their large families and the tribe. Older American Indian men, who are usually taken care of by younger family, older women, and tribal members, tend to be hesitant to report their illnesses because they put the needs of their families and the tribe before their own. Based on their review, Gallant et al. stressed the need for more research with ethnic groups on how health promotion and self-care issues can be understood within their cultural context, and social and family ties.

Vassilev et al. (2013) evaluated the role of family and social networks in chronic illness management among 300 people living in deprived areas in the north-west part of England. They found that close family members (partners/spouses, adult children and their partners) contributed the most to managing an individual's illness and emotions. However, those with very close ties to their families reported less potential to change or to seek health-related interventions; this was possibly because of greater enmeshment within the families. Individuals meaningfully engaged in social networks, especially those with weak family ties, reported receiving emotional support from their networks, accessing more health care interventions, and adapting better to new practices.

Strom and Egede (2012) summarized four forms of support: (a) emotional support for fostering feelings of warmth, nurturance; value and worth (b) tangible support for financial assistance, material goods, and services; (c) information support for guidance on health-related concerns, and (d) companionship support to provide for a sense of social belongingness and for engaging in shared activities. They reviewed 37 published studies (21 observational & 16 interventional) related to diabetes care and clinical and behavioral outcomes and found "17 studies provided information on clinical outcomes, 13 on behavior modification, 2 on psychosocial factors, and 5 on support preferences" (p. 8). Of the clinical outcome studies, 14 found evidence of positive relationships between social support and better motivation and health-care related decision-making and motivation. Eleven studies reviewed found social support to be associated with better self-management, medication adherence, and adoption of healthier dietary practices and active lifestyles. In addition, 2 studies found higher levels of social support to be associated with fewer stress and depression symptoms. Five articles reviewed showed that perceptions of where support came from and where it should come from vary with sex and ethnicity. Overall, despite a dearth of studies, the above review of studies (Strom and Egede 2012) provides encouraging evidence for the importance of social support in reducing psychosocial symptomatology, adopting beneficial lifestyle activities, and improving clinical outcomes.

Song et al. (2012) argued that an optimal level of support is required for patients to be able engage in self-care activities independently. Too little or too much support may have negative consequences for the patients' managing their own illnesses. They suggested that ethnic/cultural aspects play an important role in the extent to which patients ask for and receive social support. For example, they found in a sample of Korean Americans with uncontrolled diabetes, women expressed greater unmet needs than men. While, 83.3% of men indicated their spouse as primary source of support, only 60% of indicated their spouse as primary support. They interpreted this finding within the context of the Korean patriarchal and vertical family structure where women assume the nurturer role, always ready to make self-sacrifices by prioritizing their family needs over their own. Interestingly, both men and women diabetics stated that emotional support was their most unmet need. Song et al. suggested that Koreans, like other Asians, have difficulty in asking for and offering emotional support because these cultures, based on Confucian philosophy, judge peoples' maturity in terms of how well they

control their emotions. Although Song et al. examined the influence of cultural aspects, they did not address how daily interactions with family, friends, and the broader ethnic community were affected by chronic illness and how they influenced self-care activities. In the present study, we examined participants' perceptions of how such daily interactions with their family members, friends, and community were affected by their chronic illness and if any changes in interactions had any impact on their illness management.

Health concerns can reduce a person's ability to control his or her interactions with the environment. A serious chronic illness requires regular interactions with the medical establishment, requiring potentially unpleasant, painful, and anxiety producing assessments and treatments (McConatha et al. 2011; Prakash et al. 2015). Patients' coping responses to such unpleasantness are shaped, to some extent, by existing social support. Emotion-oriented coping can help regulate negative feelings associated with a chronic illness diagnosis (Burns et al. 2016). Talking about one's illness can reduce anxiety associated with the coping process (Cheng and Boey 2000). Negative avoidance coping is more likely when patients equate their diagnosis with loss of control and consider the progression of diabetes as irreversible; this kind of coping may lead to avoidance of medical, social, and emotional support. Negative avoidance coping strategies increase the risk for poorer health outcomes, social isolation, and loneliness (Gallant et al. 2010). In this study, we compared the coping strategies of pre-diabetic and diabetic patients in managing their illness.

There is little doubt that Type 2 diabetes presents multiple challenges to a person's overall quality of life. In addition to related physical and lifestyle concerns, diabetes may lead to feelings of vulnerability, isolation, loneliness, and depression. Chronic conditions such as diabetes compel patients to engage in a re-evaluation of their selves, their lives, and relationships with others (McConatha et al. 2011; Krause 1990).

Immigrants, particularly older immigrants, are "at risk" for developing and managing chronic conditions like Type 2 Diabetes. At the same time, older immigrants may lack knowledge about illness management, have inadequate access to medical care, or distrust the medical establishment, factors that may prevent them from seeking help. Other potential barriers immigrants face may include a lack of language proficiency, concerns about cultural competency, and/or an unwillingness or inability to use services and programs designed to promote diabetes management (Krause 1990). Given the complexity of Type 2 Diabetes management among older immigrants, the interactions of personal, social, and cultural factors that promote or hinder successful illness management warrant further study.

Type 2 diabetes is often managed by adopting healthy lifestyles. Unfortunately, making healthy lifestyle changes is also very challenging (Samuel-Hodge et al. 2000). Illness management strategies are linked to a person's cultural and ethnic background. Managing diabetes requires significant changes in diet and physical activity, which in turn may impact the nature of patients' familial and social relationships. For example, most social gatherings center on food consumption. Family gathering and holiday festivities tend to be shaped by specific high calorie ethnic delicacies. For immigrants particularly, social interactions serve to reinforce connections with people from their culture of origin. Social gatherings that feature an array of traditional ethnic delicacies contribute to personal identity, cultural connection, and continuity. A diabetes diagnosis can pose challenges to the maintenance of important cultural connections because dietary restrictions can result in disengagement from social gatherings and having to avoid certain foods resulting in increased feelings of isolation and loneliness.

Social disconnectedness, social isolation, and spirituality are important factors influencing illness management and self-care. Lynch et al. (2012) examined the association of spirituality

and depression among type 2 diabetes patients at an indigent clinic. They argued that spirituality provides personal motivation through faith related beliefs to cope with health-related issues. They found spirituality was related inversely to depression even after adjusting for demographic and clinical variables. Social isolation or disconnectedness relates to an objective measure of the lack of social connections; whereas perceived loneliness refers to a subjective feeling associated with a need and desire to connect with others. Forty percent of adults over 65 experience feelings of loneliness (Hawkley and Cacioppo 2010), which has a negative association with health and overall wellbeing (Hawkley and Cacioppo 2010). A diagnosis of chronic illness tends to be associated with increased feelings of both isolation and loneliness (Stankiewicz 2015; Stepoe et al. 2013). Chronic illness combined with loneliness and social disconnectedness can contribute to increased rates of morbidity and mortality (Cornwell and Waite 2009). For older immigrants especially, feelings of loneliness and social isolation can play a crucial role in their failure to manage their illness. It is not known to what extent immigrants suffer isolation and loneliness as a result of chronic conditions such as Type 2 Diabetes. Thus, questions related to loneliness were included in the present study.

As noted earlier, little research exists in understanding the challenges faced by older immigrants in managing diabetes from their subjective perspectives. In this study, we examined the impact of cultural and social factors on illness management as perceived by a group of older Middle Eastern immigrants. We employed a qualitative semi-structured interview approach to examine what factors might be related to the challenges faced by diabetic and pre-diabetic older Middle-Eastern immigrants in their efforts to cope with and to manage the illness and to understand by these older patients perceive their illness, react to it emotionally, how they use their available support to adjust to and cope with illness related stress and trauma.

A qualitative semi-structured interview approach was used in this study with the hope that it would lead to a more nuanced understanding of how people understand, manage, and cope with chronic illness, and to help identify the socially constructed and cultural constraints that putatively influence an individual's response to being diagnosed with a highly stressful illness.

Method

Participants consisted of a sample of older Middle Eastern immigrants who had been diagnosed with diabetes or pre-diabetes in the past 3 years and were recruited via the snowball sampling technique, through flyers posted at community organizations and through personal contacts. Selection criteria for inclusion in the study were age (over 60), legal immigration status, a recent (less than 3 years) diagnosis of Type 2 diabetes or pre-diabetes, serious concerns about their illness, the absence of serious comorbid conditions (heart disease, psychiatric conditions such as clinical depression, amputations, and/or hearing or vision loss). Two male participants took medication for their Diabetes—Metformin in both cases. These participants did not report serious side effects but did mention a slight increase in fatigue. Pre-diabetic patients have hemoglobin A_{1c} levels between 5.7 and 6.4, diabetics have above 6.4, and long-term uncontrolled Type 2 diabetics have levels above 8. This study's participants' self-reported A_{1c} levels were above 5.7 but below 8.

We interviewed 17 women and 11 men between the ages of 60 and 80 who were immigrants from the Middle-Eastern countries (Iran, Turkey, and Lebanon) and had lived in the U.S. for at least 5 years. Fifteen participants (Men $n = 4$; Women $n = 11$) had been diagnosed with pre-diabetes and 13 with Type 2 diabetes (Men $n = 7$; Women $n = 6$). All were

proficient in English and identified themselves as being "middle class." The majority (all but 3 women) had attended university, although none were university graduates. All participants had retired, lived with their spouses and in 4 cases with additional family members; two widowed women lived alone; 6 women had been full-time homemakers.

One to two-hour semi-structured interviews were conducted with each participant. Interviews were recorded, participants were assured of anonymity, confidentiality, and their right to withdraw or refuse to answer any questions. The interview protocol was based on the goals of the study and a review of the literature (Livneh 2001; Ryan et al. 2009). Livneh's (2001) suggestions were particularly helpful for including questions on (a) the situation prior to the onset of illness; (b) the process of adapting to and coping with the illness; and (c) and psychological, social, and cultural factors associated with the adaptation process. The protocol included questions on general wellbeing, the nature of participants' social and community support, stress concerns, overall life satisfaction levels, feelings of loneliness, lifestyles, and illness management strategies. Consistent with the goals of the study, interview questions probed life circumstances before diagnosis as well as adaptation to illness, illness coping strategies, changes made in response to diagnoses, and feelings and thoughts about altered life circumstances. Items from the UCLA Loneliness Scale (Russell et al. 1978) were embedded in the interview protocol to assess loneliness and used in an open-ended format. The UCLA loneliness measure includes 20-items (e.g., "I feel shut out and excluded by others") rated on 4-point scales (0 = *I never feel this way*; 1 = *I rarely feel this way; 2 = I sometimes feel this way; and 3 = I often feel this way)*.

Interviews were transcribed and narratives were developed for all participants based on their responses to the interview questions. A thematic analysis procedure was employed in order to identify themes and patterns in the data (Braun and Clarke 2006). Themes included responses to illness diagnosis, management strategies employed, and factors influencing illness management and coping with diabetes and pre-diabetes. Two researchers analyzed the narratives repeatedly to identify themes and sub-themes. Analysis was conducted inductively (from the bottom up) and deductively (from the perspective of social support theory) until no additional themes could be identified. Themes were interpreted to reflect underlying meanings associated with illness management.

Results and Discussion

The thematic analysis of interview data revealed three interrelated challenges faced by diabetic and pre-diabetic patients: (a) personal factors focusing on a loss of control, feelings of vulnerability, anxiety, and stress; (b) interpersonal factors relating to relationship and social support challenges; (c) cultural factors relating to cultural disconnection, loneliness and resulting feelings of social isolation (see Table 1). These are discussed in detail below.

Vulnerability, Anxiety, and Stress Associated with Making Lifestyle Changes All 28 participants reported increased feelings of vulnerability as they made efforts to cope with the stress and anxiety associated with managing their illness. All participants reported that the stress and anxiety resulting from having to manage diabetes affected many aspects of their everyday lives; this in turn made it difficult to make the needed lifestyle changes to combat the disease. Almost 90% ($n = 24$) of the participants specifically reported experiencing increased feelings of loss of a "sense of self" or personal identity and loneliness from having to manage diabetes. For example, 72-year-old widow Layla (not her real name) expressed her vulnerability eloquently:

> I always felt that I could manage my health. But now I am not so certain. I feel like this is only the beginning and other health problems will follow.

Layla also commented on how her illness had changed her lifestyle and her relationships.

> I cannot stop thinking about what I should and should not be doing, I feel anxious all the time. I do not enjoy eating anymore. I do not like going to visit my friends and family because we always eat together and I do not want to talk about my diabetes with them.

Eight women and 3 men stated that their illness has shaken their views of themselves. Alan's comments well illustrate the vulnerability these participants experience:

> One of the things I like about America is the "can do spirit" of Americans. I have always felt that way myself, even last year when I was 75. Now for the first time in my life I am not so sure I can do what I need to do to fight this disease. It feels like it [has taken] over my whole life.

About 79% ($n = 22$) of the participants described how diabetes has impacted the activities they had always enjoyed. More than half of the participants ($n = 16$) reported that they find it difficult to pursue many activities from having to attend constantly to manage their illness. Amy, who has Type 2 diabetes, loves to travel with her husband. Now that she has diabetes, she is preoccupied with planning what to eat and how to manage diabetes when she travels; consequently, she finds traveling "less enjoyable." Another participant stated, "I have been upset and down about [traveling] because I have to think and I have to watch everything I eat and drink and that interferes with [my enjoyment]."

Although all participants reported making attempts to increase their physical activities, most (24/28 or 86%) said that their stress levels have increased in making efforts to do so. For example, Sarah said:

> I decided I was going to invest in a fit bit, nutritionist, and gym membership. These were a financial struggle for me, but I knew I could not make the necessary changes by myself.

About 55% ($n = 6$ out of 11) of the men reported that increasing their physical activity levels has been a major challenge. They reported feeling frustrated from having to make changes in the type of physical activities they engaged in prior to their diagnosis and from repeated failures to maintain adequate physical activity levels. For example, Ali, 69, said:

> I used to play soccer, but now I do not know what I should do to get exercise, I do not like going to a gym or walking with no purpose. I live in a condominium so gardening is not [possible].

It is important to note that almost 48% (13/28; men 5/11, Women 8/17) of the participants reported successfully finding ways to increase their physical activity levels on a regular basis. For example, Layla said: "I wanted to spend more time with my sister, now we go to the park and walk 4 to 5 times a week for one hour, it is very nice."

Relationship and Social Support Challenges Cornwell and Waite (2009) found satisfying social support to be linked to making successful lifestyle changes that improve health. However, our data suggest that although social support is important for successful coping with serious health conditions, social support may be reciprocally affected by changes that

patients need to make to manage their illness. For example, our participants (90%) reported having to make changes in their diet and that exercise habits were a source of stress inasmuch as it caused problems in their relationships with their family members and close friends, particularly in partaking in social gatherings. Sixty-six-year old Sara stated:

> I never had to lose weight before; I am not too heavy. This diabetes has made me very nervous. Now I have to be careful what I cook and eat. My family is not happy since they love the food I make. I cannot use the same ingredients. But I want to be healthy again.

Eleven participants (39%) stated that their diagnosis was a "wake up call" that motivated them to decrease food portions, to seek help from a dietitian with meal planning, to cook less, to cut out sweets, and to reduce their intake of carbohydrates. However, these changes were stressful for their families, and in some cases, they were a source of familial tension. Seventy-year-old Bob said that being diagnosed with Type 2 diabetes compelled him to change his lifestyle:

> I have to cut out carbs and eat more fish, salad and soup. The hardest thing is not having wine every day. This was a time when my wife and I would sit and talk and catch up. Somehow it does not work as well with tea or water.

Bob, however, stated that he had increased his activity level and that he and his wife now tried to walk and talk together, an activity that was bringing them closer.

Despite the stress associated in maintaining social relationships in the face of illness management, the most important influence on the participant's ability to successfully make the needed life style changes was the presence of satisfying social and emotional support. All participants reported that they found a degree of strength and hope through their family members and loved ones. Close friends and family members were seen as helpful in making lifestyle changes, a finding consistent with other research (see Rook and Charles 2017; Strom and Egede 2012).

Cultural Disconnection, Loneliness and Social Isolation Over 80% of participants (22 out of 27) in families in which diabetic women prepared traditional family meals stated that making dietary changes was a continual source of stress. For immigrants, family gatherings are connected with large traditional meals; often such gatherings and ceremonial meals are a matter of family heritage and pride because they symbolically link them with their homelands. Unfortunately, many traditional foods are very high in carbohydrates. Also, there is the "tarof" tradition among the Iranians, a cultural hospitality practice where food is repeatedly offered and the guest is eventually expected to accept the offered or risk offending the host. If a person does not consume large portions of food, it is perceived as a negative reflection on the cook or the host. It is not uncommon for hosts to continue to offer food to guests even when they are no longer hungry. The statement by Leila, 70, referring to her Iranian tradition, summarized some of her struggles:

> I love to get together with my family, my sisters and brother. We cook big pots of rice and eat a lot, drink a lot of tea with sugar cubes, and eat traditional sweets like baklava. It is hard to imagine not eating during these monthly get-togethers. I have even avoided a couple [of gatherings], but then I am miserable and lonely. I have finally tried to go, eat a little of everything, drink my tea without sugar, and focus on the family and the music; it

> is [not] working well, I miss enjoying all the food. I do not want to talk about being ill and worry everyone either.

Loneliness is a problem for those who struggle with a chronic condition, especially older immigrants. Thirty percent of the participants (1 man and 8 women) stated that their feelings of loneliness have increased significantly because of their diabetes inasmuch as they had had to cut back on social engagements, especially those that included alcohol and food. Nineteen (60%) participants stated that social gatherings centered on meals have become less pleasurable and even a source of stress. For example, Eliza stated:

> We have an Iranian community group. We get together every two weeks to eat, drink, and talk. Everyone brings food to share. We sit for hours and eat. I feel uncomfortable because now I cannot eat so much or drink since I am taking medicine. I have not gone for two months [and] I miss [going to the get-togethers]. On [such] evenings, I sit home alone and feel lonely and sad.

Satisfying social support helps reduce feelings of loneliness. Those who lived with a spouse or had children living nearby reported as being less influenced by decreased participation in social feasts. Interestingly, almost 60% (19/28) of the participants reported feeling that others treated them differently—as if they were more fragile; such treatment resulted in feelings of anxiety and discomfort. Three participants with additional health concerns reported feeling socially marginalized as a result of being treated differently.

An examination of open-ended responses to items from the UCLA Loneliness Scale (Russell et al. 1978) indicated that 70% of the participants reported that once pleasurable gatherings with close friends were no longer as enjoyable because of their preoccupation with managing diabetes. Overall, participants' responses suggest that pre-diabetes and Type 2 diabetes management negatively impacted their social integration making them feel isolated and lonely.

Participants, especially women, who traditionally did all the cooking for their families, indicated family relationships were now more problematic for them. Given that they were no longer able to eat foods they once enjoyed, they found it challenging to stay disciplined in regard to their own dietary needs, especially when they had to cook separate meals for themselves. Sixty-four-year old Karin's comments highlight this problem,

> Cooking has always been one of my accomplishments and pleasures. I love to cook. Since coming to America, I have received praise from everyone about my traditional meals. My family loves them and I do not want to disappoint them. So, I cook for them and while I love seeing them eat, it is so hard not to be able to enjoy the rice dishes myself. I eat some of it, more than I should, then I feel guilty.

The stress expressed by Karin was similar to comments made by 80% of the female participants. Given that cultural traditions are often infused with food, 75% of the participants (male and female) reported that their social and familial gatherings (which included large ethnic meals) were no longer as enjoyable because of the stress associated with exercising self-control to limit the intake of certain foods. Sara, an Iranian immigrant, said that her favorite food is Persian rice with Tadig (a crusty portion made with butter) found at the bottom of the cooking pot. Before being diagnosed as pre-diabetic, she made rice every day, but now she only makes it once a week or when she has company. She stated, "I can no longer make my favorite food to eat every day, I can only have it, at most, once a week."

Alan, a male with Type 2 diabetes, reported experiencing frustration from having to go a whole day without rice, sweet tea, and other foods that are intrinsic to culture and consumed daily. On a scale of 1–10, Alan rated his life satisfaction at 5 because he can no longer regularly enjoy rice and tea. He said he was 7 before being diagnosed with Type 2 diabetes. Thus, food serves as a cultural lubricant, providing comfort and connection, but diabetes presents a challenge for maintaining social connections and having to observe dietary restrictions, especially in family and social gatherings. Table 1 summaries presents an overview of the results.

Pre-Diabetes Versus Diabetes Diagnosis

Motivation for illness management was greater for those diagnosed with pre-diabetes than those with diabetes. Comparisons of reports of participants diagnosed with diabetes ($n = 13$) and pre-diabetes ($n = 15$) suggested that the latter group was more motivated to make lifestyle changes. Pre-diabetics reported making more dramatic changes in their diet and exercise than those who were diagnosed with Type 2 diabetes. Eileen, a pre-diabetic, said "I was worried about my numbers in relation to my pre-diabetes diagnosis, and they are coming down, which I am happy about, but I am striving to lose more weight which I believe will help also." Eileen, like other pre-diabetics, expressed motivation and determination to take steps to prevent the onset of Type 2 diabetes. While 11 of the 15 pre-diabetics expressed that they hope to reverse their diagnosis by bringing their A_{1c} levels back into the normal range, only 2 diabetics expressed such hope.

Gender and Coping with Illness

This study included 11 men and 17 women. Illness management and coping were related to gendered household roles and pre-retirement professional roles. None of the men in the sample had major responsibility for cooking. In general, they were able to make dietary changes more successfully because their spouses took the responsibility for cooking healthy meals appropriate for diabetics. Seven men reported relying on their significant others to manage their diet successfully. For example, Jacob shared "My wife measures out the quantities of food for me and I stopped stuffing my face."

In contrast, women typically found it more difficult to make changes. For example, 66-year-old Davann found it frustrating that even though she and her husband followed the same diet, he managed to lose weight and she did not. She reported having always been health conscious and when she learned about her diagnosis of pre-diabetes, she took immediate steps to measure healthy and smaller food portions for herself and her husband.

Conclusions

This study examined illness management and coping strategies of an older group of immigrant men and women from Middle-Eastern countries diagnosed with pre-diabetes or Type 2 Diabetes. The results indicate that successful illness management and coping depend on multiple intersecting influences. A person's prognosis depends heavily upon making significant changes in dietary and exercise habits and maintaining them—tasks that the older participants found daunting.

Table 1 Presentation of thematic analysis

Theme	Sub-Themes	Results
Vulnerability, anxiety, & stress associated with making lifestyle changes	Stress	All participants (*n = 28*) reported increased feelings of vulnerability as they attempted to cope with illness-associated stress & anxiety. Stress & anxiety resulted from managing diabetes and made it difficult to make the necessary changes to combat the disease.
	Personal Identity	90% (*n = 24*) reported increased feelings of loss of "sense of self", 8 women & 3 men stated their illness has shaken their views of themselves, 79% (*n = 22*) described how diabetes has impacted the activities they previously enjoyed
	Physical Activity	86% (*n = 24*) report increased stress due to efforts to increase physical activity, 55% (*n = 6 out of 11*) of men reported that increasing physical activity has been a major challenge, 48% (*n* = 13; 5 men and 8 women) reported successfully finding methods to increase physical activity on a regular basis
Relationship and social support challenges	Diet	90% of those who made diet and exercise changes found these lifestyle alterations to be a source of stress as they interfered with their relationships with family members and close friends.
	Social Support	39% (*n = 11*) viewed their diagnosis as a "wake-up call" that motivated them to change their diet, and one participant reported this lifestyle change is strengthening his relationship to his spouse. Some participants reported finding a degree of strength and hope through their family members.
Cultural disconnection, loneliness and social isolation	Challenges faced by women	80% (*n = 22*) in families from which diabetic women prepared traditional family meals stated making dietary changes was difficult and a continual source of stress.
	Loneliness	30% (*n = 9, 1 man & 8 women*) stated that their feelings of loneliness have increased significantly because of their diabetes in as much as they had to cut back on social engagements, especially those that included alcohol and food. 75% reported their social and familial gatherings were no longer enjoyable because of stress associated with exercising self-control to limit intake of certain foods.
	Socially Marginalized	60% (*n = 19*) feel that others treat them differently- as if they were more fragile; such treatment resulting in feelings of anxiety and discomfort, and 3 participants with additional health concerns reported feeling socially marginalized as a result of being treated differently.
	Isolation	70% of participants reported that once pleasurable gatherings with close friends were no longer as enjoyable because of their preoccupation with managing diabetes. Overall, participants' responses suggest that pre-diabetes and Type 2 diabetes management negatively impacted their social integration making them feel isolated and lonely.
Pre-diabetes versus Type 2 Diabetes diagnosis	Motivation	Comparisons of reports of participants diagnosed with diabetes (*n = 13*) and pre-diabetes (*n = 15*) suggest that the latter group was more motivated to make lifestyle changes. While 11 of the 15 pre-diabetes patients expressed that they hope to reverse their diagnosis, only 2 diabetics expressed such hope.

An unexpected negative consequence associated with illness management was a feeling of cultural disconnection that participants reported to be a direct result of making dietary changes that require giving up foods that they have long enjoyed as part of their cultural heritage. There are many factors that influence the motivation, commitment, and personal wherewithal to make necessary healthy lifestyle changes. An important factor that shapes illness management strategies is the patient's cultural and ethnic background. As one ages, cultural identity appears to make coping more challenging for those who are diagnosed with diabetes. With diet being a significant factor in managing diabetes, it is important to examine further as to how long-term cultural based food habits conflict with making appropriate changes.

The results of this study suggest that making dietary changes is not merely a personal challenge; it also creates stress in relationships with family members and friends. Participants shared their struggles focused on the need to make changes in their lifelong culturally shaped diets that connected them to their homes and cultures of origin. Thus, a consideration of cultural aspects is important for understanding how people manage their chronic illness. Cultural traditions may indeed help or hinder illness management efforts. Future studies should examine the ways that cultural values and customs and immigrants' levels of acculturation influence illness management. According to Campos and Kim (2017), "A better understanding of culture that is more comprehensive, nuanced, and inclusive of the great diversity of human relationship experience is likely to yield important new insights about the role of relationships in health" (p. 552).

The results of this study have implications for physicians, psychologists, and program planners who work with diverse older adults struggling with one or more chronic conditions that require lifestyle changes. Results suggest that clinicians should consider patients' cultural background in counseling them about difficulties in making lifestyle changes, especially about their family roles, cultural food habits, and exercise preferences. In some cases, family counseling may be needed.

Limitations

This study is not without limitations. The study focused on challenges faced by patients in making lifestyle changes, but it did not examine issues related to their problems in managing medical regimens. A future study examining both may provide broader insights into behavior regulation issues in illness management. Given the small sample size, the findings may not be generalized beyond the Middle Eastern participants included in the study. The participants were middle class, fluent in English, and had access to health care. To assume that all patients from a similar cultural background may have the same concerns is problematic. Immigrants face different sets of issues as they learn to live in their new adoptive cultures. The present study did not address to what extent these participants were encapsulated within their own communities and how that might have impacted their coping with their illness. Also, we did not address the extent to which the patients re-negotiated their relationships with their close family members to be able to engage in self-care activities. It may be interesting to study gender differences in the ability to negotiate particular roles in view of a chronic illness given that in the middle east cultures women tend to be the primary caretakers. Future studies may also examine if differences in language fluency and socio-economic background (especially those who are poor with limited social support) may be related to their coping abilities.

The results of the study are based solely on interviews with diabetic and pre-diabetic patients. Future studies should consider interviewing family members and close friends to

examine their perceptions of how they view the affected family members and their ability to manage the illness. We undertook a qualitative study with the hope of finding nuanced information about challenges faced by diabetic and pre-diabetic patients. It is possible that not all participants were fully open to sharing problems associated with managing their illnesses. A future study may include both qualitative and multiple quantitative assessment measures to gain a broader understanding about challenges faced by diabetic and pre-diabetic patients in managing their medical regimens and making lifestyle changes.

Compliance with Ethical Standards

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The research project was approved by the Institutional Review Board of West Chester University of Pennsylvania, West Chester, PA 19383.

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