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Diabetes detachment: How cultural, contextual, and personal barriers influence low-income young women with diabetes in Appalachia

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ABSTRACT

Aim: This study explored the experiences of young low-income women with type 2 diabetes (T2D) in Appalachia, Tennessee.
Background: Diabetes care remains suboptimal across the United States particularly in underserved communities.
Methods: The study employed a descriptive qualitative case study collecting data using in-depth interview of a group of low-income women in their 20s with T2D. Data was analyzed using qualitative content analysis.
Results: The findings identified three themes: "*frustration and stigma lead to detachment care*," "*frozen by fear and unable to overcome resource limitations*" and "*social support and an empowered perspective lead to a positive outlook*." Cultural barriers combined with contextual and personal barriers resulted in detachment from diabetes care among study participants.
Conclusion: Within Appalachia, leveraging the existing familism values along with culturally congruent education and support can help alleviating the burden of diabetes care.

1. Introduction

The increasing global prevalence of diabetes has placed the illness among the leading causes of death and disability, accounting for $827 billion in annual healthcare costs (World Health Organization [WHO], 2016). Worldwide, an estimated 425 million adults over age 18 have diabetes, of which T2D accounts for 90% of cases (International Diabetes Federation, 2017). The lifestyle factors of over nutrition, obesity, and physical inactivity remain primary contributors to the T2D epidemic (Lam & LeRoith, 2012). However, significant geographic variations in T2D incidence exist (Fu et al., 2014), with higher incidence among underprivileged populations and certain racial and ethnic groups (Dabelea et al., 2014).

In the U.S., Tennessee is firmly placed in the Centers for Disease Control and Prevention's (CDC) 'Diabetes Belt' and has the 5th highest rate of diabetes in the U.S. (14.9%); significantly higher than the national average (9.4%) (CDC, 2015). Approximately 817,852 of Tennesseans live with diabetes, and diabetes care costs the state $6.6 billion annually (American Diabetes Association, 2018). The rate of diabetes related death in Tennessee is 18%, 16.3% are uninsured, and the poverty rate is 18.6% in Appalachian Tennessee (ARC, 2018a).

T2D is emerging epidemic among youth and young adults (CDC, 2015). Although there is no consensus on T2D frequency in this population in Tennessee, available data supports the idea that young adults with T2D face unique challenges regarding clinical practice and research participation, all while navigating the transition to adulthood (Song, 2015; Unnikrishnan, Shah, & Mohan, 2016). Young adults often have limited access to care and support systems, suboptimal diabetes management (Agarwal, Hilliard, & Bulter, 2018; Dabelea et al., 2014), and lack of adherence with medication and follow-up appointments (Htike, Webb, Khunti, Khant, & Davies, 2015). These can place young adults at an increased risk for diabetes-related complications (Wise, 2017). Increasing T2D morbidity and mortality among Appalachian young adults further exacerbates health disparities related to isolation, poverty (Vance, Basta, Bute, & Denham, 2012, Vest et al., 2013), a culture of unhealthy behaviors, and mistrust of health care system (Borak, Salipante-Zaidel, Slade, & Fields, 2012).

There have been substantial efforts to enhance person-centered diabetes care and health outcomes in Appalachia. In 2015–2016, the National Institute of Diabetes and Digestive and Kidney Diseases at the National Institutes of Health and CDC invested $43,157,313 in diabetes research and $1,313,541 in diabetes education and prevention in

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Table 1
Target county characteristics.

County	Level (1)	Health outcome rank (1)	Diabetes (2)	Diabetes related death (2)	Poverty (3)	Uninsured (4)
Anderson	Transitional	34	12%	39.5%	17.2%	10.2%
Roane	Transitional	62	12%	23.2%	16.2%	11.2%
Morgan	Distressed	75	15%	28.4%	23.2%	10.8%

Tennessee (American Diabetes Association, 2018). Yet, previous work in Appalachia has focused on research or diabetes programs for adults or children with T1D or T2D (Abdoli, Hardy, & Hall, 2017). No studies focusing on low-income young adults in Appalachians with T2D were identified. The link between contextual and cultural factors on diabetes self-care in this population is unclear (Della, 2011). Additionally, while Appalachian women reported higher perceived risk of diabetes and higher rates of diabetes related mortality (Chopra & Chopra, 2017; Della, 2011), women are not well represented in diabetes research studies in Appalachia.

A research-based understanding of vulnerable, young low-income women valuing an “insider view” is crucial for the development of cost–effective, culturally congruent diabetes management strategies and age-appropriate educational and behavioral programs in Appalachia. However, engaging young adults in health research studies has proven to be a major challenge (Cantrell et al., 2018; Coday et al., 2016; Pedersen, Naranjo, & Marshall, 2017) particularly in Appalachia (Carpenter & Theeke, 2018).

This paper represents the main findings of a qualitative descriptive case study of young, low-income, Appalachian women with T2D. It addresses cultural, contextual, and personal barriers affecting diabetes self-care behaviors.

2. Methods

2.1. Study design

A qualitative descriptive case study approach (Yin, 2003) was used to investigate how a group of women in their 20's with low incomes describe their experiences of living with T2D in Appalachian Tennessee. This is an appropriate approach for providing in-depth description of the contextual factors relevant to the experiences of diabetes care in this population. The supposition for the study was that “young women in Appalachia with diabetes face unique challenges that often lead to poor diabetes control.”

2.2. Setting and sample

Criteria were established to reasonably focus the study sample in regard to age, sex, place, type of diabetes, and income. Eligible participants were women with T2D between 20 and 30 years of age, without a history of psychiatric disorders, who were born and live in Appalachian Tennessee with an annual income of less than $36,000. The criteria were selected based on the lack of scientific literature on diabetes care in this specific population. Recruiting Caucasian and African American women with different marital status and varied education level allowed a wider discovering of research question.

Purposeful sampling was used to recruit eligible participants for the study. Research flyers were distributed in local healthcare settings in East Tennessee as well as community centers, libraries, and churches. The research team distributed flyers via social media and local newspapers. Despite these efforts, no participants were recruited from March 15 to Dec 15, 2016. With Internal Review Board approval, flyers were mailed to more than 35 eligible individuals who had a T2D medical record at University of Tennessee Medical Center (UTMC) in Knoxville. This strategy resulted in three recruitments over the subsequent eight months. Two of the three participants rescheduled their interview appointments three and five times. All women cited the financial incentive as their main motivation for study participation.

2.3. Description of participants' residential county

Participants were from three rural Appalachian counties in East Tennessee (Anderson, Morgan, and Roane Counties). There are 150,625 residents living within the area. Of these, 40.5% live with incomes below 200% of the Federal Poverty Level (United State Census Bureau, 2017). Please see Table 1 for more information.

2.4. Procedure for data collection

The University of Tennessee Knoxville Institutional Review Board approved the study's data collection (#UTK IRB-16-02811-XP). All participants were informed about the study by the first author (S.A) and signed informed consent forms. S.A conducted in-depth interviews with the women, gathering their life stories and asking them open-ended questions. The interview started with a general question: “talk about your life with T2D” and continued following the intent of the research question based on participants' responses. Interviews, conducted in S.A's office, lasted between 60 and 90 min. All interviews were recorded and transcribed. S.A wrote theoretical field notes for each encounter.

2.5. Data analysis

The transcript and field note data were analyzed in NVivo pro12 software. Two qualitative researchers independently reviewed and coded the data. They refined the identified categories and themes and achieved a consensus on the appropriate labels for the identified themes. Data analysis was conducted “within cases” and “across cases” by linking data to the study proposition (Yin, 2003). The goal was to organize data into a meaningful whole that would enable readers to engage in the research process and determine the implications of findings in their practice.

Strategies including credibility, dependability, confirmability, and transferability were employed for establishing the rigor of this study. All five components of a case study (Yin, 1994) including the research question, proposition, unit of analysis, linking data to the proposition, and criteria to interpret the findings were addressed. Researchers shared the team interpretations with participants and a group of multidisciplinary qualitative researchers. For reliability, two researchers independently coded the data. They also used the process of double coding and after a period of 6 months coded the same data and compared the results. To assure transferability, the unit of analysis was defined to assist with replication and efforts at case comparison.

2.6. Findings

The study findings are discussed “within cases” and “across cases.” For “within cases,” findings were reported using exemplary quotes to illustrate the experiences of young low-income Appalachian women living with T2D and the researcher's interpretations of these experiences following Yin's approach for qualitative descriptive case study (Yin, 1994). Possible associations between common factors “across cases” (cultural, contextual and personal) and self-care behaviors in the women were analyzed and compared with the existing literature. These

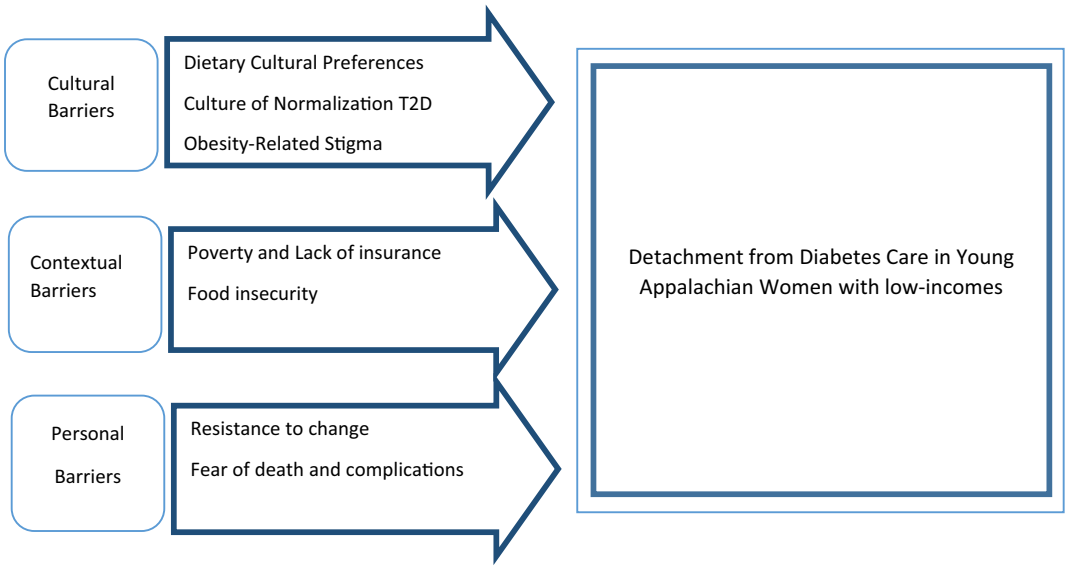

Fig. 1. Contributing factors to detachment behaviors from diabetes care.

findings are visualized in Fig. 1.

2.7. Findings-"within cases"

Within cases, three main themes—frustration and stigma lead to detachment care, frozen by fear and unable to overcome resource limitations and social support and an empowered perspective lead to a positive outlook—were identified. Discussions of the themes follow using pseudonyms to protect participants' privacy.

2.7.1. Sarah: frustration and stigma lead to detachment care

Sarah was an obese, Caucasian, 24-year-old single woman who was diagnosed with T2D at age 17. She was adopted 18 years ago and was pleased with the support that she received from her family. She reported a two-year interruption in her diabetes management and self-care behaviors due to the frustration and exhaustion of living with the daily demands of the disease. Sarah indicated her boyfriend was the main factor prompting her to resume diabetes management. She had just started working as a restaurant server making $10 per hour, which she reported was not always enough to cover her expenses. Sarah lived alone in an apartment and was responsible for her rent and living costs. Her mother paid for her medical insurance and diabetes supplies. Sarah said, "The insurance cost is out of the roof…Without [my mother] paying for it, I would not be able to afford it."

During the interview, Sarah discussed various psychosocial concepts related to diabetes including fear of complications/dying, fear of rejection, obesity-related stigma, and difficulty disclosing her illness to others. She also mentioned being passive in her diabetes care, struggling to make lifestyle changes, and having difficulty finding healthy, affordable foods. When asked to talk about her life with T2D, Sarah immediately started expressing her emotional frustration and exhaustion, "Having diabetes at the age of 24 is very overwhelming. Living with diabetes… is difficult, and also extremely frustrating."

Sarah mentioned her frustration with being different from her peers because of T2D. She was embarrassed to have T2D and perceived the illness as limiting her peer relationships: Honestly, it is a little embarrassing. When I should be hanging out with my friends, I am at home trying to keep my blood sugars level. There have been countless times when I have given up hanging out with friends because I just didn't want to have to explain why I was feeling sluggish, tired, and just not that into life. Going out to eat is horrible. You have to eat something based on how your sugars are reading.

Some of Sarah's difficulties living with T2D were associated with her inefficient strategies for coping with diabetes and her fear of the illness. She referred to diabetes as "something that has every potential to shut your body down." At different points of the interview, Sarah talked about her constant fears associated with diabetes and clearly expressed her dread of dying from it, "Living with a disease that you know can kill you at any point in time in your life is very tough."

From others, Sarah felt stigmatized, misjudged, and blamed for her obesity: When I was first diagnosed with Diabetes Type 2, I didn't want anyone to know. I knew as soon as I told them, the judgment would start to pile in. I knew the questions would roll in. And at the time I didn't want that, I still don't want that. When you go to tell someone you're living with diabetes, you are afraid of what their reaction will be. Going out in public to even go grocery shopping, I can feel the stares, going to eat, it's like I can hear people whispering about me because I am a bigger girl.

Because of such experiences, Sarah tried to keep her diabetes a secret. She expressed her discomfort before telling her boyfriend she had diabetes, referring to the disclosure as "getting over the bump of telling him." She added, "You don't want to lose the one person that makes you the happiest you have ever been… and you don't want to tell them something that could essentially ruin your relationship."

Fear of rejection was not limited to significant people in her life. Sarah also spoke of how difficult it was to disclose her illness to her employers: It's hard to decide what to tell employers…If you tell them you have this disease and they have to offer you insurance, then you probably won't be getting the job. But if you keep it to yourself, and you have issues with your blood sugar while at work, then you could lose the very job you wanted.

She portrayed her struggles with managing her blood glucose as her attempt to "keep a steady relationship with diabetes" and maintain "a healthy lifestyle." Healthy eating was the most difficult lifestyle change for Sarah. Sarah felt she "cannot afford healthy food." She also voiced her concerns related to the increasing amount of cheap fast food and junk food available: Look at what sells cheapest in the store—all the unhealthy foods. "It's easier for me to buy a box of ramen noodles and some Little Debbie's [snack cakes] for dinner than it is to actually get chicken and salad items. When you live paycheck to paycheck, you tend to buy what is cheap."

2.7.2. Stephanie: frozen by fear and unable to overcome resource limitations

Stephanie was an obese, 26-year-old, Caucasian, single mother who was diagnosed with T2D at age 24. She and her two-year-old daughter lived in subsidized housing near her grandmother, who offers her childcare support. The main points Stephanie mentioned during her interview were fear of dying from diabetes and its complications, struggling with lifestyle changes, and trying to balance diabetes care and family life on a limited income. Her fear of diabetes was related to her experience of losing her mother to Type 1 Diabetes (T1D) at age 12. She vividly remembered her mother's battle with gangrene in her foot and all the difficulties Stephanie had after her death. She spoke of the importance of diabetes self-care saying, "I need to do better and I know how it is to have a parent with diabetes." Despite knowing some of the things she should do, she reported difficulty balancing her diabetes needs (healthy food, gym membership, doctor appointments, and regular follow-up care) with her daughter's needs on a limited income (she has a $10 per hour job). She prioritizes her daughter's needs most of the time: "I have a daughter, so it's kind of just whatever is cheap for me to get at the store…what I work to have is to pay our bills (laughs). There is no, really, no extra cash for healthy food or gym membership. And if there is, it's um, having to buy clothes or shoes for my daughter."

Nonetheless, she spoke of her dread of dying from diabetes, going through the same ordeal as her mother, and leaving her daughter alone. Stephanie cried during most of the entire interview, seemingly from visualizing a tragic future with diabetes based on her prior experiences. She said, "I mean we all could die anytime… but (sniff) I guess to say that you died because you didn't [take] care of yourself would be a problem (sniff) so, it's about my biggest fears."

While Stephanie was scared of diabetes, she reported being passive in her diabetes self-care: canceling doctor appointments, eating unhealthy foods, and failing to test her blood glucose levels. When asked to explain her detachment from diabetes care despite being so afraid of it, she compared T2D with T1D that she believed was a more serious condition: "I guess I really don't care, because I don't do anything about it. To be honest, I mean to say that it really matters, it, it does, but it doesn't, because if it did, then I'd do something about it. It's not serious as T1D is. I mean because it's just a pill. It's not a serious matter."

Another challenging aspect of diabetes management for Stephanie was making healthy lifestyle changes, particularly her diet. She said, "I like food, and I love to eat, I love soda." She said healthy foods do not taste as good as unhealthy foods. Stephanie mentioned the high cost of healthy food and easy access to cheap junk food as barriers to her changing her eating habits. She said she did not know how to cook healthy foods and would value cooking classes on preparing tasty, healthy meals. Physical activity was also challenging for Stephanie. She mentioned that her sedentary lifestyle along with the cost of physical activity and childcare deter her from exercising. She added, "I could go work out, but I'm just like 'Oh ok. I'm tired. I'm done."

2.7.3. Ruth: social support and an empowered perspective lead to a positive outlook

Ruth was a married 19-year-old, African-American, obese woman who was diagnosed with T2D five years ago. She had a sister and a brother with T2D. She lived with her supportive husband. Ruth was a part-time student and earned $8 per hour at her job. She was a happy and pleasant and laughed frequently. She mainly talked about her support system, her positive mentality, and her T2D advocacy efforts. Besides physical activity, lifestyle changes were not challenging for her. Ruth pointed to the high prevalence of diabetes in East Tennessee as a "norm" that helped her manage her T2D effectively. When asked to tell her story of living with diabetes, she remembered approaching her diagnosis as way to live a healthier life: "When I was 13, I diagnosed with diabetes. In Tennessee, almost everybody has diabetes. It wasn't a big deal. I was calm and laid back. I knew it was gonna' help me in the end by eating healthy and doing exercise. Now, I've had it for so long, and I've been around so many people that's had it, I feel like I'm comfortable with it."

Instead of ignoring or fearing diabetes like Sarah and Stephanie, Ruth was "thankful to have diabetes" and tried to "maintain her healthy lifestyle" to prevent complications. She expressed excitement at successful weight loss and lifestyle changes related to healthy eating. Her big achievements were eliminating soda and trying to buy healthy foods whenever possible. Despite these changes, she reported struggling with staying physically active: "I lost 4 pounds in the past three months. It is just great… I want to eat healthier and I do not want to deal with kidney disease, which my sister has already had. I want to be healthier for myself and my family. But I still need to work on exercise. I do not know why I cannot keep myself motivated for exercise."

Ruth had a positive attitude about diabetes, and surrounded herself with supportive family, friends, and healthcare providers. She called her husband her biggest support. "My husband loves me. My family loves me. My friends love me, and I love them. So, it's like surround yourself with the positive people. They care about me.", "My doctors are caring and supportive. It's always something positive like, "You're doing a good job. Keep it up." It's nothing like putting you down." He's just, you know, he cares about my overall health, which is his job."

Ruth chose a proactive approach towards diabetes self-management and identifies as an advocate for community awareness of T2D. Ruth's described her interactions with people who perceived diabetes as being the "fault" of an obese people who are careless about their health, "I will not let people to put me down. I've never surrounded myself by ignorant people and, if it happens, I try to educate them about T2D and differentiate it with T1D, which is much more serious."

Ruth's attitude and strong support system positively affected her ability to live with T2D and improved her competency in managing it. She perceived herself and her husband as knowledgeable supporters that could help their kids if they ever face diabetes: "I'm confident on how to go about it 'cause I've had it, so I know what they should do… and since my husband has been around me for so long, you know he knows about it. He would just be an extra support system for when we do have kids."

2.8. Findings- "across cases"

Despite differing circumstances, these women revealed common experiences rooted in the Appalachian contextual factors including struggles with poverty, food insecurity, dietary preferences, obesity-related stigma, and strong support from family members and healthcare providers. They also described experiencing resistance to lifestyle changes and fear of diabetes complications.

These barriers can be reinforced by the dominant cultural assumptions that T2D is a "norm," "it is just a pill," and T2D is "less serious" than T1D. These women expressed relief at having what they perceived as a less serious form of diabetes which requires less vigilance and fewer interventions resulting inconsistent and less than optimal engagement in diabetes care. They, at times, reported a lack of diabetes self-care based on their frustrations. One participant ignored all aspects of diabetes care for two years while the others experienced inconsistency in self-care behaviors ranged from ignoring all aspects of care except medication to performing different aspects of self-care except exercise. Difficulty in recruitment of participants for this study may also be associated with individual's detachment from diabetes care. Family support was cited as an enabling factor. The study findings support the study proposition: "young women in Appalachia with diabetes face unique challenges that often lead to poor diabetes control."

3. Discussion

This qualitative descriptive case study of young women with low incomes explored the experiences of living with T2D in Appalachian Tennessee. In contrast with other studies (Carpenter, 2012; Carpenter &

Smith, 2018) the current study identified young Appalachian women struggling with cultural and contextual barriers who did not value diabetes care as a life priority. This combined with personal barriers resulted in detachment from diabetes care and suboptimal diabetes care. While no studies were found to identify diabetes burnout as a possible pattern in young low-income women with T2D, previous studies have indicated that diabetes care in Appalachia is suboptimal and non-compliance is a dominant presented behavior (Carpenter, 2012; Denham, Wood, & Remsberg, 2010; Sohn et al., 2016).

This study identified diabetes burnout and diabetes non-compliance as two common behavioral patterns in the study population and differentiated them from each other. Inconsistency in or ignorance of diabetes care following exhaustion and frustration with diabetes care can be viewed as "diabetes burnout" (Hoover, 1983; Polonsky, 1999; Abdoli, Hessler, Vora, & Stuckey, 2019) otherwise it is a form of disengagement. Both diabetes burnout and self-care disengagement were affected by cultural, contextual and personal factors. Diabetes burnout was significantly affected by fears of diabetes complications and inability to control diabetes. Disengaged behaviors were mainly rooted in underestimating T2D and a lack of diabetes knowledge. These findings corroborate other studies reporting the association between the perceived risk of diabetes with self-care behaviors (Carpenter, 2012; Chopra & Chopra, 2017; Della, 2011). The culture of normalization and underestimating T2D explained the disengaged behaviors of study participants.

The participants experienced social stigma, reporting that community members consider T2D a self-inflicted disease resulting from lack of self-control and obesity, similar to other studies (Browne, Ventura, Mosely, & Speight, 2014; Cullinan, 2013; Jones & Crowe, 2017). Social stigma affected the participants' disclosure of their diabetes status. One participant's avoidance of disclosing her diabetes was related to her fear of losing people or job opportunities. In contrast, the two other women did not see disclosure as necessary. These findings are supported by other studies related to diabetes-related stigma (Abdoli, Abazari, & Mardanian, 2013; Abdoli, Doosti-Irani, Parvizy, & Fatemi, 2017).

Lifestyle modification, including healthy eating and physical activity, plays a pivotal role in diabetes management and well-being (American Diabetes Association, 2015). However, sustaining dietary changes was a struggle for these participants. The women's barriers to dietary changes included losing the pleasure of particular tastes, losing the freedom to follow their personal and cultural preferences, and a lack of knowledge about healthy food planning and preparation. These findings resonate with other studies (Beverly, Ritholz, Wray, Chiu, & Suhl, 2018; Dabelea et al., 2014; Vanstone et al., 2017) that emphasize the essential role of dietary knowledge, social factors, personal and cultural preferences, and financial resources for diet control in T2D.

Other significant obstacles to healthy eating cited by the participants were lack of access to healthy foods and easy access to unhealthy foods. They believed they must choose between either allocating their limited incomes on family needs and basic expenses (i.e., rent) or on healthy, diabetes-friendly foods. This finding highlights the existence of food insecurity in Appalachia and its devastating effects on diabetes management (Cullinan, 2013).

The three young women also faced socioeconomic barriers to lifestyle changes related to physical activities. This finding is consistent with the results of Tennessee Diabetes Action Report in 2017, which identified physical inactivity and over nutrition as the leading factors for death in Tennessee. The costs of gym memberships and the child care needed for participation in structured physical activity proved too much for one participant's budget. The participants also expressed a lack of motivation for doing physical activity as another barrier which is consistent with other studies that have indicated access to free care will not increase self-care behaviors of Appalachian in physical activity domain (Carpenter, 2012).

Similar to other studies (Mendenhall & Norris, 2015), these women pointed to family as their main support system, as they lived in areas that lacked support groups or diabetes communities. The diabetes self-management support they received varied from financial support (e.g., paying for diabetes medications and supplies) to emotional support (e.g., expressing caring attitude).

3.1. Limitations of the study

Due to the sample size, the results from this qualitative descriptive case study cannot be thought to represent the experiences of all young women with T2D living in Appalachian Tennessee, other parts of the U.S., or worldwide. However, the information from these three women highlights some of the general characteristics of the lower socioeconomic population in Appalachia and identified diabetes burnout and diabetes non-compliance as two distinct self-care patterns in this population. Despite the sample size, the voices of these three young Appalachian women need to be heard to inform person-centered diabetes care and education in this region.

This study focused on young women with T2D and low-incomes. However, the perspectives of men with T2D, family members of those with T2D (particularly in the context of the Appalachian culture value of family), and health care providers could add needed insight.

3.2. Implications for practice and research

Both burnout and non-compliance are significant concepts in the context of diabetes care. A better understanding of the contexts in which "disengagement" and "diabetes burnout" occurs would lead to improved diabetes care in underserved populations and support the development and implementation of effective individualized interventions. A potential strategy to improve person-centered diabetes care should include a shift from the culture of normalization T2D (it is just a pill) to a culture of ownership of the illness (diabetes care is my responsibility) to engage young adults with T2D in their care plan.

There is also a need for improved community awareness through evidence-based education to increase society understanding of T2D in a fear and judgment free context. Empowering the community with necessary skills and knowledge related to healthy eating on a budget is a need in underserved areas struggling with poverty, such as Appalachia. Addressing food insecurity and making diabetes-friendly food accessible and affordable is another key strategy for improving diabetes care in Appalachia. Considering the high value placed on family in the Appalachian culture, and family members' impact on individuals' lifestyle and diabetes care choices, there is a strong need to provide a family-person-centered approach to diabetes care in this region.

4. Conclusion

Diabetes is common in Appalachia; however, there is a tendency for people to underestimate the importance of diabetes control in T2D compared to T1D, leading to suboptimal diabetes management and less willingness to participate in diabetes research studies. Proactively seeking insights from Appalachian residents with T2D could help promote the sustainability of future interventions for this population. Providing the best person-centered diabetes care and interventions for young Appalachian adults with T2D also will require developing innovative strategies for overcoming barriers to research involvement in this population. The information gained from this study provides insight into the challenges of young adults with T2D. However, more studies are needed to expand the current knowledge on diabetes care in Appalachia.

(1) Appalachian Regional Commission, 2018b.
(2) Tennessee Department of Health, 2018
(3) Country Health Ranking and RoadMaps, 2018.
(4) Data USA, 2018.

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