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PATIENT PERSPECTIVES ON ENHANCING TYPE 2 DIABETES HEALTH LITERACY:
PROVIDERS' DIRECTIVE AND FACILITATIVE ROLES

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Abstract

The present study explores patient perspectives about healthcare providers' effects on health literacy and type 2 diabetes (T2D) from patients' perspectives. As a result, the study gives specific communication and pedagogical strategies that healthcare providers can consider when teaching their patients how to manage their illness. Researchers interviewed or held focus groups with a total of 42 individuals living with T2D. All interviews and focus groups were recorded, transcribed verbatim, and analyzed using constant comparative qualitative techniques. The study shows that, according to patients, providers can both direct and facilitate T2D health literacy development in a number of ways including explaining T2D and how to manage it, considering the context of those explanations, tailoring T2D-related messages to individual patients, providing additional T2D educational resources, and following up with patients. This study extends current literature on patient-provider communication and health literacy by using patients' perspectives to identify specific strategies that healthcare providers can employ in their practices.

Introduction

According to the Centers for Disease Control and Prevention (CDC) (2008), type 2 diabetes (T2D) is a chronic illness that impairs the pancreas' ability to produce insulin, the enzyme that helps the human body process glucose. Risk factors for T2D often include physical inactivity, obesity, impaired glucose metabolism, and/or a family history of T2D (CDC, 2008), which make the disease and its associated conditions, or co-morbidities, preventable and manageable through healthy diet and exercise habits, glucose monitoring, and, if necessary, insulin uptake (CDC, 2008). The effects of T2D on the body can be severe, including blindness, kidney damage, heart disease, neuropathy, stroke, and death. T2D is the seventh leading cause of death in the United States (CDC, 2008). T2D is made all the more urgent by the rates at which the disease is increasing within the U.S (CDC, 2008). Given the high morbidity and mortality rates associated with T2D, along with increasing rates of T2D across the United States, the National Institutes of Health (NIH) (2008) include the improvement of T2D management as one of their key objectives.

Health literacy may be a key to understanding and improving morbidity and mortality outcomes among people living with T2D. The NIH defines health literacy (HL) as the ability to understand and use health information and services to make appropriate healthcare decisions (2008). HL contributes to the reduction of health disparities, including those associated with T2D; therefore, the NIH has also named health literacy as a health communication objective of Health People 2010. By identifying facilitators to the development of type 2 diabetes health literacy (T2DHL), individuals with T2D and their healthcare providers could adjust current T2DHL development strategies, leading to better T2D management and subsequent health outcomes. Given the considerable potential of provider-patient communication to facilitate

patient health literacy, the current study was undertaken to explore key communication and pedagogical strategies health care providers can employ that facilitate health literacy development for people living with Type 2 Diabetes (PLT2D). Toward this goal, the current study focuses on the perspective of patients diagnosed with T2D.

Background

Recent estimates from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) (2008) suggest that 23.5 million individuals in the United States over the age of 20 have some form of diabetes. Currently, Type 2 Diabetes (T2D), also known as adult-onset diabetes, accounts for up to 95% of all diagnosed cases of diabetes (CDC, 2008). In addition, T2D rates continue to increase, especially among ethnic minorities and low socioeconomic groups (CDC, 2008). These accelerating incident rates suggest that roughly one out of every three people born in 2000 will develop diabetes at some point in their lives (Boyle, Honeycutt, Narayan, *et al.*, 2001). T2D often leads to severe comorbidities, including kidney failure, heart disease, stroke, dental disease, lower extremity amputations, blindness, and death (Naughton, Dorn, Oberman, Gorman, & Cleary, 2000; Epstein, Paluch, Gordy, Saelens, Myers, & Dorn, 2000; Wu, Trevisan, Genco, Dorn, Falkner, & Sempos, 2000; Schüneman, Dorn, Grant, Winkelstein, & Trevisan 2000). More specifically, T2D is the leading cause for kidney disease and accounts for up to 44% of newly reported cases (NIDDK, 2008). In addition, 75% of PLT2D have high blood pressure and subsequently are up to four times more likely to suffer a stroke in their lifetime (NIDDK, 2008). Furthermore, 60 to 70% of PLT2D experience nerve damage in their hands and/or feet, which can lead to chronic wounds, infections, and limb amputations, 60% of which occur in PLT2D (NIDDK, 2008). T2D is also the leading cause of blindness for people ages 20-74 (NIDDK, 2008). Ultimately, PLT2D are more susceptible to many other illnesses and, once they acquire these illnesses, often experience less promising prognoses than those without T2D (e.g., Wu *et al.*, 2000). Overall, the risk of death for PLT2D is approximately twice that of someone without T2D, making T2D the seventh leading cause of death in the United States (CDC, 2008). The clinical severity and prevalence of unmanaged T2D has created a financial burden as well. According to the NIDDK

(2008), healthcare costs related to T2D co-morbidities, which include treatment costs, disability and work loss funds, and early death fees have reached \$174 billion in the United States.

T2D's negative health outcomes and related financial burden can be reduced through effective disease management, which involves adherence to healthy diet and exercise regimens, blood-glucose monitoring, and (where necessary) insulin intake via pill or injection (Congressional Diabetes Caucus, 2007). Management adherence rates among PLT2D, however, remain low, thus contributing to the increasing rates of clinical failure, co-morbidity, and mortality (Congressional Diabetes Caucus, 2007). Interventions to increase T2D regimen adherence rates have included the development of diabetes self-management education programs that inform PLT2D on how to properly manage their illness, efforts which have met with varying degrees of success (e.g., Boyle et al , 2001). Recent research, however, reveals that patients often still profess confusion about their illness, which serves to diminish proper self-care (e.g., Sakraida & Robinson, 2009). As such, understanding why individuals persist in failing to understand T2D and how to manage the disease may prove vital to addressing this national health crisis.

Health Literacy

According to the U.S. Department of Health and Human Services (2000), health literacy is “the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.” Several studies indicate patients with poor literacy skills have insufficient understanding and knowledge of chronic illnesses, including diabetes (e.g., Lee, 1999), which translates into poor self-management of one's disease and deleterious health outcomes. Specifically, PLT2D with poor health literacy skills are notoriously prone to insufficient self-management and poor treatment

adherence, resulting in unsatisfactory glycemic control (e.g., Schillinger et al., 2002). Not only are these individuals unlikely to properly manage their T2D, but they seek routine monitoring and assessments from health professionals less frequently, putting them at increased risk for developing T2D-related health complications (Simmons, Willis, Swan, & Haar, 2005; Zimmerman & Shenenberger, 2002). Understanding the prevalence and means with which to address health literacy may subsequently ameliorate these poor outcomes among PLT2D.

Given that part of accessing and understanding health information includes the ability to read health information, health literacy scores often parallel primary literacy skills (NIH, 2008). In 1992, the U.S. Department of Education found that approximately 25% of American adults scored in the lowest literacy level during the last national literacy assessment. More specifically, researchers estimate that up to 44 million Americans are functionally illiterate, while 50 million have only limited literacy skills (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). As a result, the National Center for Education Statistics (2003) report 47% of all American adults (approximately 90 million people) have difficulty accessing, reading, comprehending, and using healthcare information due to low literacy skills. Schillinger and colleagues (Schillinger, Grumbach, Piette, et al., 2002) suggest that a decreased ability to read, comprehend, and use medical information also contributes to T2D-related health disparities among disadvantaged populations.

Given the poor basic literacy rates across the country, it is unsurprising that poor health literacy is also common. For instance, Kutner, Greenberg, Jin, and Paulsen (2006) recently reported that over one third of adult men and women in the United States are categorized as belonging to the lowest level of health literacy. In addition, the report shows high rates of low health literacy among low-income adults and racial/ethnic minorities, populations that

experience high rates of T2D. In particular, the scores of more than one half of African Americans, the geriatric population, and adults without insurance coverage indicate basic or less than basic health literacy (Kutner, et al., 2006).

Volandes and Paasche-Orlow (2007) position health literacy in an ethical framework, labeling limited health literacy and poor health outcomes as forms of social injustice to patients. Specifically, they encourage change within the healthcare system to reassess expectations of patients' literacy skills, which would ultimately improve overall health literacy. In particular, they underscore the considerable potential of interpersonal encounters between patients and their providers for affecting and improving health literacy. During these encounters, health care providers can help educate patients about their illnesses, the importance of adherence, and the clinical outcomes related to each, whereas patients have the opportunity to ask questions and seek clarification about their health, treatment regimens, and illness trajectories. The interpersonal exchange of information and feedback within the patient-practitioner interactions complement each other, and both areas require specific strategies in order for patients to achieve optimal patient health literacy.

Finding both the means and the time during medical encounters to facilitate health literacy development is not without its challenges. Systematic healthcare delivery has changed over the years, leading to shorter hospital stays, more complex home-care, and increased community-based healthcare efforts (Mumford, 1997). These changes limit direct patient-provider contact within healthcare settings, which may diminish the opportunity to increase T2D health literacy via live instruction, consultation, and education. As such, there is need to identify key strategies that can both effectively and efficiently be employed by clinicians during their

limited time with patients that facilitate patients' understanding of T2D and its successful management.

According to Sellers, Thompson-Robinson, and Parra-Medina, et al. (2003), patient education is the process of helping patients get new health information and use it to change unhealthy behaviors to produce positive health results. Education facilitates the process. Friberg and Scherman (2005), however, view patients not as traditional 'students' or 'pupils,' but as "persons who must face a new situation due to illness" (p. 278); therefore, they suggest health professionals have some pedagogical knowledge to better understand the patient as a learning person. Ultimately, effective patient education requires a multi-level approach including interpersonal encounters. Although clinicians and researchers currently debate the value of more and less complex strategies for T2DHL-related patient-provider communication (e.g., simple language, speaking slowly, and teachback techniques; for review, see Schwartzberg, Cowett, VanGeest, & Wolf, 2007), little scientific literature exists on patients' perspectives on effective provider strategies for improving health literacy, including in the T2D context.

Patient-Provider Communication

Patient-provider communication represents the central area of scholarship in the field of health communication with research providing some insight on what facets of patient-provider interactions may affect patient health literacy development. Scholars define patient-provider interactions as a process leading to specific health outcomes as patients' needs, beliefs, and preferences emerge (Sharf & Street, 1997). Due to the vulnerability and uncertainty involved in health management, research shows that patient-provider interactions require patient understanding and provider sensitivity in a shared-power encounter (Cecil, 1998; Ellingson & Buzzanell, 1999; Smith-Dupre & Beck, 1996). Expanding on the benefits of face-to-face

communication, Cegala, McGee, and McNeilis (1996) report that patient perceptions of physician competence in shared-power medical encounters develop from behaviors that convey trust, support, care, concern, and interest. Upholding the benefits of direct interpersonal contact, Makoul (1998) reports that doctors can adapt their approaches according to patients' demonstrated control orientation during the interaction, a very important factor when interacting with a variety of patients each day.

As a result of increased awareness of patient-provider communication's importance, it has recently been incorporated into standard training for many health professions. For instance, the Accreditation Council for Graduate Medical Education (ACGME), the accrediting body for graduate medical schools, recently identified interpersonal communication skills as one of its core competencies (Duggan, 2006). ACGME specifies (a) creating and sustaining a therapeutic and ethically sound relationship with patients, (b) using effective listening skill and eliciting and providing information using effective nonverbal and explanatory questioning and writing skills, and (c) working effectively with others as member or leaders of a health care team or other professional group as important aspects of interpersonal communication. As research shows few positive training effects and many deficiencies in current curricula, Duggan (2006) suggests communication scholars intervene to measure, implement, and evaluate interpersonal communication training programs within the medical community. Improved interpersonal skills may help providers better educate their patients about diagnoses and how to deal with them. To establish evidence-based training programs for improved information sharing during interpersonal medical encounters, researchers must explore innovative, effective strategies.

Existing patient-provider research does shed light on some provider skill sets of likely importance for patient health literacy development. For instance, practitioner competence with

information exchange with patients has been examined in the extant literature and likely informs patient health literacy development. Cegala and colleagues (1996) define competence during information exchange as the ability to explain aspects of the health problem, verify patient understanding of the given information, and explain health information in understandable terms for the patient. Research shows, however, that patients value information about medical problems more than healthcare providers usually recognize, and both providers and patients agree that providers assume responsibility of the majority of informative work during an interaction (Cegala, et al., 1996). Therefore, providers must come to understand the significance of information exchange that directs and facilitates health literacy, as well as how to perform this crucial task. Patient insights on what information is needed to grasp T2D and its proper management could provide tangible tools with which to do so. The current study seeks to identify patient-centered strategies providers can use when educating their patients about T2D and introduces those strategies to the medical community.

Cecil (1998) notes the positive association between shared power and patient adherence and overall satisfaction. With less practitioner control, patients' self-efficacy increases, exemplifying one component of Janz, Champion, and Strecher's health belief model (Strecher & Rosenstock, 1997). Patient self-efficacy represents a major component of health behavior change. As such, patient engagement in medical encounters likely influences self-efficacy and, subsequently, health literacy. By feeling more empowered regarding the course of their clinical care and health maintenance, patients may engage more with their clinicians, ask more questions about their illness and self-management, and ultimately take more responsibility for their health. Such speculations appear supported by studies of patient engagement, such as that by Street and Millay (2001), who reports that patients who actively participate in medical interactions have

better health outcomes. Aside from the importance of active participation, however, research to date fails to identify specific power-sharing strategies that can help providers promote patient engagement during clinical encounters and, subsequently, develop their patients' health literacy skills.

Interactive Self-Management Education

Although the literature supports an interdisciplinary approach to diabetes education, it lacks current evidence regarding how patients best learn about self-management. Currently, the health literacy research available focuses largely on quantitative analysis of health literacy in terms of patient-provider interactions. Literature on what patients consider useful strategies to enhance health literacy, especially in the context of T2D, is lacking; therefore, exploring T2DHL development during patient-provider interaction may benefit individuals with other self-manageable chronic illnesses. In addition, exploration of T2DHL development will provide insight into how healthcare providers and other healthcare educators can best reach their patients.

Because several studies have already assessed health literacy levels (e.g., Lee, 1999; Schillinger, et al. 2002) and interpersonal components of patient-provider interactions during medical encounters (e.g., Cecil, 1998; Cegala, et al., 1996; Duggan, 2006; Ellingson & Buzzanell, 1999; Smith-Dupre & Beck, 1996; Street & Millay, 2001) this study takes a qualitative, exploratory approach to identify what happens during patient-provider encounters to develop patients' T2DHL. Specifically, the study evaluates patients' perceptions about desired provider T2DHL strategies. Empirical research has already identified potential weaknesses in current T2DHL development; however, little research has incorporated patient insights and ideas about effective health literacy development strategies qualitatively. The present study will provide richness and firsthand reasoning to the quantitative literature currently available.

Methods

This study includes a convenience sample of 42 individuals. Three participants took part in a semi-structured focus group during the initial phase of data collection. The remaining participants participated in face-to-face or phone interviews. Participation criteria included a T2D diagnosis and a minimum age of 18 years, as T2D primarily affects adults.

Recruitment

Recruitment involved passive solicitation via advertisements about the study in organizations associated with diabetes, ads posted to on-line diabetes and networking sites, and snow-ball sampling. To begin, investigators placed handouts about the study in the offices and waiting rooms of diabetes-related organizations and treatment centers in a mid-sized city in the Northeastern United States. Those interested in the study contacted the principal investigator, who then scheduled the individual for a focus group or interview convenient to the participants' schedules. Additional recruitment involved placing ads on the Craigslist website (www.craigslist.org) in the 20 largest cities in the United States. Again, participants voluntarily contacted the principal investigator to schedule an interview. Finally, the investigator recruited via snowball sampling and word of mouth. Several individuals in local social networks informally mentioned the study to friends and relatives living with T2D. Those individuals who willingly participated in the study often provided contacts for other people they knew who met the criteria for study inclusion. With permission from the prospective participants, an investigator contacted the individuals to set up a phone interview at the participant's convenience. All participants received \$20 as remuneration for their involvement in the study.

Informed Consent

All participants consented to involvement by signing the designated form. Only research team members have access to the consent forms and the rest of this study's data. The research team removed all identifying information from transcripts to ensure participant anonymity. In addition, the research team secured all material containing focus group or interview content in their designated offices.

Procedures

Using a grounded theory approach (Charmaz, 2002), investigators refined and restructured research questions as the study progressed in order to pursue promising lines of inquiry. Investigators presented the research questions during semi-structured focus groups and one-on-one interview sessions (either in-person or over the phone). Investigators asked four scripted, open-ended questions on the barriers and facilitators of T2DHL during patient-provider interactions and probed for further details, as needed, to facilitate discussion. Each session lasted between 15 and 90 minutes and was digitally recorded.

The interviews were then transcribed verbatim and distributed to the two members of the coding team. The coders analyzed all transcripts using latent content analyses (Strauss & Corbin, 1990). Coding consisted of two phases: First, the two coders independently coded the data to develop categorical schemes for describing the content of participant responses. Second, coders convened to share their categorical systems, compare similarities, and discuss discrepancies in their findings. Through consensus, the coders then developed a refined coding system for describing the content of participant responses and comments concerning health care providers' actions that help develop patients' T2DHL.

Results

Participants provided a large array of specific encounters with and strategies employed by their healthcare providers that affected their diabetes health literacy development. In addition, participants noted a variety of negative experiences or areas where they felt changes to patient-provider interactions could enhance T2DHL. Taken together, participants' insights were organized into two sets of general strategies, including (a) directive strategies (Table 1) and (b) facilitative strategies (Table 2). Directive strategies involved direct communication, action, or provision of information by health care providers that produced T2DHL. In contrast, facilitative strategies involved healthcare providers redirecting patients to other resources, such as support groups, informational sources, and other clinicians who further taught patients about their disease and how to effectively manage it. Each group is detailed below, including the specific strategies reported by patients as tools for facilitating T2DHL.

Directive Strategies

Participants described healthcare providers as usually being the first people involved in T2DHL development, as they reported diagnoses to their patients. In addition (and often during the same encounter), providers also prescribed the medications and apparatus necessary for T2D self-management. Collectively, these directive strategies involved the provision of specific information or support that explained to patients what T2D is and how it functions in the body, the specific components of T2D self-management, and the words of encouragement some participants needed to feel confident they could manage the disease. Participants uniformly reported appreciating these directives from their providers regarding T2D and self-management skills, whereas participants who did not receive these directives noted their desire for them. Each category of primary directives are described below, along with their corresponding components.

Explaining T2D-Specific Content

Participants reported several key issues discussed by their providers that helped them understand their disease and how best to manage it. Specifically, these involved explaining T2D, T2D regimen components, and the dangers of T2D, as well as encouragement that patients could manage the disease, which promoted T2D self-efficacy. Each of these content-specific areas is detailed below.

Explaining T2D

Following a T2D diagnosis, participants noted the importance of a clear explanation of T2D, its possible causes, and the effects it can have on the body. Such explanations helped patients understand the reality of their situation, the potential dangers of T2D, and the urgency with which they needed to take action to manage the disease. As one participant stated, “They kind of explained to me the health and that my body wasn’t able to keep up with the amount of insulin produced, that weight was the main key, and that nothing was physically wrong with my parts. It’s just that I gained a lot of weight, and it couldn’t keep up, so at least they explained to that extent it wasn’t like hereditary or a disease or something that happened from out of thin air. It was explainable at least.” The participant noted how much she valued her provider’s explanation of what caused her T2D and how this verbal direction from her provider gave her insight into what she needed to do to reduce her symptoms.

In contrast, another participant noted insufficient explanations from his providers. He explained, “[Healthcare providers] don’t talk to you about it at all. What I’ve learned, I’ve learned from reading, I’ve learned from my friends...” Although this participant found T2D information elsewhere, he expressed this frustration by way of explaining how providers can best promote T2DHL. Another participant felt lost upon his diagnosis when “I went in one day and they said ‘You’ve got T2D. Here, you’ve got to take this up to pharmacy, to check your blood.’ And that was

it!” For this participant, the absence of a more detailed explanation of T2D, its origins, or how it would affect his life confused and frustrated him during his initial stages of T2D diagnosis and T2DHL development.

Explaining T2D Regimen Information

Patients needed guidance as they learned to adapt their lifestyle for proper T2D self-management. Participants reported the need and appreciation for explicit verbal explanation and information on the four major components of T2D self-management, which include diet, exercise, glucose monitoring, and insulin uptake. Participant accounts of the importance of this information are detailed below.

Explaining Diet. For many of the study participants, diet was a major lifestyle change required after their T2D diagnosis. Participants expressed feeling confusion over the foods that were acceptable to eat and those they needed to avoid to properly manage their diabetes. Clear explanations about avoidance of simple sugars and starchy carbohydrates (as well as simple examples of starchy carbohydrates and their components) were key to participants understanding how to organize their diets. For example, one participant’s healthcare provider enlightened her by a direct explanation about sugar and carbohydrates, which led to considerable changes in her average sugar levels. As she explained, “In 2 or 3 weeks, I went for my sugar, 293 down to 196, because they told me, ‘Watch your carbohydrates. Watch your sugars.’ And I watched everything, I looked at everything, every can, every package I picked up, I looked at the carbohydrates.” A simple, yet thorough remark initiated T2DHL development and, in turn, a healthy change in the participant’s diet and subsequent improvement in her blood sugar outcomes.

While some participants’ healthcare providers thoroughly explained dietary recommendations, others left out important details that could have enhanced their patients’ T2DHL.

In a similar encounter, another participant recalled his provider's explanation about sugar consumption: "They told me; 'Check the sugar.' So, I checked the sugar, and it's like I did that for a while and then they said; "Oh, you've got to check carbohydrates too." And it's like, why? You know I check sugar so..." This participant adhered to the provider's explanation; however, the explanation did not include all of the necessary information. While some patients knew that carbohydrates were sugars, others did not. Failure to explain these dietary issues in simple, easily accessible terms not only hindered T2DHL, but confused and frustrated patients, as well.

Explaining Exercise. T2D self-management also includes exercise, which helps regulate blood-glucose levels. Multiple participants expressed a need and appreciation for providers who discuss incorporating exercise and other healthy activities into patients' lives that can help manage blood sugar. To begin, these were discussions could be broad and detail the importance of physical activity for PLT2D, which are then followed by exploration of options for physical activity to fit a patient's preferences and abilities. As one participant explained, "They tell me to exercise a lot, to keep myself active. So they say, 'you want to be in the best shape that you can. You want to be active, and exercise is good for your heart, too. Nothing too strenuous.'" Following this, the participant and her providers discuss exercises and activities that appeal to her and what she feels are within her capabilities.

In contrast, some providers failed to properly tailor exercise activities and exercise to participants. For instance, a focus group participant, who was morbidly obese, had trouble keeping her balance for any amount of time, but her healthcare provider told her she should begin walking for exercise. Upon hearing this, another focus group participant questioned, "how can she make the effort to try and walk when she knows she's going to fall?" The provider's declaration that the patient become active by walking limited her activity options to one she could not perform, leaving

her unaware of other appropriate options available to her. Providers, therefore, need to explain exercise options and leave several possibilities for patients to increase their activity levels.

Explain Glucose Monitoring. Glucose (blood sugar) monitoring is invasive and sometimes painful, as patients need to draw drops of blood from fingertips and test the blood in small meters. Participants described the importance of advice and instruction given by providers about to test blood sugar, the steps of this process, and tricks for minimizing the discomfort of this procedure. For instance, one participant explained, “He [his physician] always tells me, ‘don’t always test your blood in the same place. Go to different fingers, it doesn’t hurt you as much.’ Because my finger tips bruise very easily, so he says to me, ‘don’t do the same finger constantly. You are going to get turned off.’” This participant’s provider gave detailed instructions that not only eased the discomfort associated with this process and, in doing so, may have increased the odds of the patient consistently monitoring his blood sugars rather than getting ‘turned off’ by the process.

Not only did patients need to know how to physically test their glucose levels, but they needed to know how to read the numbers that their meters showed and what measures to take if those numbers were too high or low. One participant, who knew how to use her meter, still felt confused about glucose monitoring due to a lack of information from her provider. She said, “I wish he would’ve gone into a little more things that I could do to keep my blood sugar stable and not have the highs and the lows that I do have.” While this participant understood how to get readings from her meter, she did not understand what she needed to do when her numbers were too high or low. As such, providers need to offer detailed explanations about how to monitor blood glucose levels, but also what to do following these readings.

Explaining Insulin Uptake. Many individuals with T2D also needed to learn not only how to take insulin to manage their glucose levels, but also when to take it and at what dosages. One

participant had specific questions about how to “...deal with my insulin. Not how to take it, cause I know that. I mean, like tricks to make sure I take it when I’m supposed to. If they have any tricks, let me know.” Although some people living with T2D took insulin in pill form, this participant required the insulin injection. Like drawing blood for glucose monitoring, insulin injections were invasive, and repeated injections are painful. Patients need to know the best ways to take insulin, and providers need to explain strategies for continuous uptake over time.

Explaining the Dangers of Non-Adherence. Because some patients had difficulty understanding aspects of self-management, they also had difficulty adhering to their management regimens. Providers, therefore, need to communicate the risks of non-adherence and the comorbidities that may exacerbate T2D symptoms and other health problems. This participant’s provider explicitly warned her that not following a healthy diet regimen can cause dangerously high blood sugar levels. She explained, “[My doctor] talked me through it and she wasn’t afraid to tell me the danger zones and not soften it up and make it all nice and creamy. I also said there are things that you need to be concerned about and these are the things that we are going to take the steps and the approach this is the plan and we will take it day by day.” Her provider addressed the health concerns involved with consuming too much sugar and how to avoid those problems on a daily basis.

In contrast, other participants described providers who failed to provide these warnings. In retrospect, participants wished their providers would have warned them of both the short term health effects of T2D, such as unstable blood sugar levels, and the long term health effects, such as amputation and kidney disease. For instance, this participant wished his provider would have informed him of these risks earlier. Even though this participant was relatively healthy at the

point of his interview, he wanted to learn how to avoid any health risks related to T2D long term. He stated:

I guess I would've liked them to scare me more, earlier. I'm fairly healthy, so I only go in to see my doctor maybe 2 or 3 times a year, so I think that if he had told me – He didn't tell me about losing limbs and that kind of stuff, about the long term effects, and I think that if I had – probably the thing that really hit me from that special I saw is I didn't know that you could have organ failure. I think that's something important to tell people [laughs] because it – one of the things they stressed was, you're sitting and you're on dialysis, and you may find a replacement, and you may not. I don't want to live my life like that. I would not want to live my life hooked up to a machine, so I think that's a big piece of information that nobody gave me that I found out on my own.

Providers needed to consider how to present this information. One participant appreciated the way in which her provider conversed with her about future T2D- related health risks. She said, “[My healthcare provider] also said there are things that you need to be concerned about and these are the things that we are going to take these steps and this approach. This is the plan and we will take it day by day.” Not only did her provider enhance her T2DHL, she did so in an unthreatening way by approaching regimen strategies gradually.

Creating T2D Patient Self- Efficacy. Because participants managed T2D regimens themselves, they needed to develop self-efficacy. According to participants, providers enhanced self-efficacy via T2DHL development. One participant expressed her appreciation for her provider's explanation regarding her regimen, but also her attitude. She stated, “They taught me basically about taking the proper steps in order to maintain an orderly daily life. They told me to

maintain a positive attitude and maintain an equal mental and physical balance, because that is key. I mean, if you don't have an equal mental/physical balance in your daily life, that can defeat anything, even if you are taking the right steps. That is huge." It was helpful for providers to communicate in a way that acknowledged that balance through encouragement and positivity. By teaching their patients to handle the physical aspects of T2D, patients felt more capable mentally, which contributed to better T2DHL.

Considering Context

Every patient is different. As such, some will understand and learn about T2D at different rates than others. Therefore, providers need to be able to recognize the unique pedagogical context of every patient, rather than employing a blanket approach to T2D patient education. Participants provided a range of strategies used by their providers that accomplished this task, many of which are simple and easily employed across patient-provider encounters. These include tailoring messages to individual patients, simplifying explanations, demonstrating self-management tasks, using models and visual aids, conversing with patients, being available, and allowing adequate time for a thorough interaction.

Tailoring Messages to Individual Patients

Each individual living with T2D experienced that illness differently. Participants verbalized their desires to get information from their healthcare providers that specifically pertained to their individual experiences of T2D because, as one participant stated, "it is more of a routine script that they have." Tailoring T2DHL development to the needs of each patient was very important for physiological, preferential, and educational reasons. Physiologically, T2D manifested itself differently in each patient; therefore, each patient needed to learn to manage different symptoms. Also, individual patients often responded best to and preferred different

communication styles and types of information. Finally, different patients had different levels of understanding due to past experiences and/or years of education. For all these reasons, the participants in this study stated their desire for tailored approaches to T2DHL development.

Tailoring to Physiological Uniqueness

Two participants in this study were sisters, who lived together, both of whom have T2D. While one sister struggled to deal with open, chronic wounds on her feet, the other sister managed the effects of T2D on her heart and eyes. "...With me, it doesn't show what I have [T2D], but with them it shows... With me, I don't feel as bad as they are right now because mine is like the heart. I can control it well. With medication, I can control it. And with my eyes – that's the part that's scary for me, my eyes. And with my sisters, I just see, like [my sister], she's been through so much with her feet, never being able to walk again, and I've been taking care of her." Each sister's manifestation of her illness was very different; therefore they needed to learn different T2D self-management skills. In these sisters' cases, they continued to manage their different T2D symptoms in their own ways because they had healthcare providers who instructed them.

Individuals who never experienced that type of individualized T2DHL development made note of their desire for it. One participant stated,

"I think that sometimes the dietary or the dietician education is not helpful because it's not always tailor made. I think people react differently to different things, and I've kind of found out on my own with my blood sugars what I have to stay away from that might be something that I was encouraged to have through a dietician consult regarding diabetes, and it's not something that really works for my blood sugars."

This provider needed to realize that, not only did patients have different manifestations of T2D, but their bodies also reacted differently to treatments; therefore, providers needed explain to their patients their unique physiological situations and how to properly manage them. This approach tailors T2DHL development to the needs of the individual.

Tailoring to Educational and Experiential Levels

Patients appreciated different educational approaches by providers due to differences in educational and/or experiential levels. Some patients previously witnessed others managing T2D, which may or may not have increased their baseline level of T2DHL. Other patients had no foundation of T2D experience upon which to build their T2DHL. Finally the understanding of medical jargon affected patients' T2DHL development. While some patients understood the complex medical terms their providers use, others responded better to simplified explanations. Providers needed to adapt their T2DHL communication strategies to meet the needs of their patients.

Patients' past experiences contributed to their baseline level of T2DHL; however, some providers assumed that patients with prior experience of T2D had more T2DHL than they actually did. One participant recalled learning about T2D health risks when he was a young boy as his grandmother dealt with the illness. He stated, "Sometimes she wouldn't eat at all, and she'd shock, and when you're small, around 10 or 11 years old, it sort of burns right into your brain that this is nothing to fool with." He retained this information since childhood and it continued contributing to his T2DHL in the present. Regardless of past experience with T2D, however, some patients still needed more information than providers expected. Another participant, a former nurse, got little explanation of T2D from her provider. She stated, "They would've [explained more], I'm sure, but when you're a nurse they just take it for granted that

you know what to do.” Providers’ assumptions regarding patients’ underlying T2DHL prevented adequate T2DHL development.

Additionally, patients experienced confusion when their providers used medical jargon to explain T2D and its management. Describing his experience with providers’ use of jargon, one participant advised providers to, “Put it in laymen’s terms. I don’t need your high-tech information.” He deemed the jargon unnecessary. Another participant expanded on this, saying, “...don’t use so much jargon. In the beginning, especially, don’t use so much jargon. If you can’t understand what they are telling you, don’t bother.” Again, this participant found the complex medical terminology detrimental to T2DHL development as the jargon was ineffective, especially for those newly diagnosed.

Simplifying Explanations

Avoiding medical jargon contributed to the next effective aspect of directive T2DHL development, which is simplifying verbal explanations. Because T2D information is confusing for some patients, simplification of T2D explanations can facilitate patient T2DHL. According to one participant, a retired nurse, simple verbal explanations would help enhance T2DHL. She said, “I have a principle. You eat less and move around more. If [providers] would just put it that simply, I think people would pay more attention to it.” Her remark simplified diet and exercise regimen information and may help enhance T2DHL for those newly diagnosed. Another participant addressed simplification more specifically related to diet. His provider’s explanation of a T2D-friendly diet summed up into one sentence. He explained, “...[My doctor] said mostly when it comes to something white he only wants me to eat fish and cauliflower.” One statement from a doctor increased this participant’s T2DHL enough to know what he should and should not

eat to manage his starch intake. Simpler ways of communicating about T2D regimens helped enhance T2DHL development.

Analogies also helped patients understand providers' explanations of T2D management. One participant noted a helpful analogy that a nurse told him to explain the effects of smoking on his body in terms of T2D self-management:

...A woman said if you're a smoker and you're diabetic and you're taking any type of medication at all for anything, the pill that you take will have a wall of smoke in your body. By the time that pill breaks through that wall of smoke or that air, it'll lose like half the effectiveness of the pill. So that's why I don't smoke anymore.

The nurse's analogy about the "wall of smoke" enhanced this participant's T2DHL by explaining how smoking effects his medications' ability to perform. Not only did this analogy increase his T2DHL level, it motivated him to quit smoking, a healthy behavior change that yields positive T2D-related health outcomes.

Using Interactive Learning

Another helpful aspect of direct verbal explanations was interactive learning. Demonstrations and the use of learning aids or models helped patients learn how to use T2D self-management equipment. Conversational exchange between patients and providers allowed them to share power during the interaction. Both enhanced patients' T2DHL through their involvement in the learning process, which contributed to T2DHL development.

Using Learning Aids and Demonstrations

Demonstrations helped patients develop T2DHL, especially when learning to use glucose monitors. One participant said, "[My providers] showed me how to test my sugar at home with

the kit that I had bought from the pharmacy. You put your hand on the kit. It's not that painful, but they showed me how to test my blood sugar levels. That was helpful... I'm doing it, but they're walking me through the process." She learned how to manage her blood sugar monitor independently with initial assistance from her providers. Her providers showed her how to test her glucose levels herself and guide her through the process. Their demonstrations helped her develop the T2DHL necessary to test her glucose levels on her own at home.

Demonstrations with models and other learning aids also enhanced T2DHL development. Patients needed visual, hands-on approaches to grasp information about T2D; therefore, learning aids helped providers deliver a more clear explanation of the illness to their patients. One participant expressed his desire for the inclusion of learning aids during a T2D education seminar to help him understand the effects of T2D on the heart and eyes. He said, "It would be even more helpful if they had those, you know you see those things at the doctor of the human eye-ball or human heart that you can take apart. If they had something like that at these workshops that you could actually point to or feel or pick up, that would help." Interactive learning via models and learning aids helped providers enhance their patients' T2DHL by showing concrete evidence of the things providers communicated verbally. Additionally, one participant mentioned his appreciation of his provider's visual learning aids during a visit. He stated, "[My providers] had diagrams that they were drawing. The doctor drew diagrams...and it was actually hands-on." This participant affirmed that something as simple as a drawing by his doctor helped enhance T2DHL. Visual models and learning aids helped develop an interactive learning environment for T2DHL development.

Conversing with Patients

In addition to learning aids, conversational exchange contributed to patients' T2DHL development. In fact, learning aids helped generate communicative exchange between patients and providers. The participant mentioned above described the interaction between him and his providers while they used the visual learning aids his doctor drew when he said, "... you could stop them and ask them how does this work with this or that..." Patients benefited from an environment in which they openly asked questions and got answers throughout medical encounters. Patients often developed questions outside of medical encounters. Another participant stated, "If I have any questions, I can absolutely ask him in the future or ask for him to come in when he's got some time and he can go into more details for me." Patients benefited from conversational exchange.

Being Available

Conversational exchange and hands-on learning took time and provider availability, something patients deemed vital to their own T2DHL development. Participants expressed their need for adequate time with their providers in order to ask questions and get effective answers from their providers. One participant discussed how the amount of time her doctor spent with her made that doctor stand out among others in terms of T2DHL development. She said, "She talks to me one-on-one. We spend like an average of like 30 minutes, and usually doctors don't spend that long with their patients, between the average of 30 minutes about the questions I may have about the brochures she gave me or about...the nutrition plan." This participant learned more from her provider due to the amount of time her provider allowed for the two of them to converse. Even if the patients preferred less conversation and more direct explanation from their providers, patients still appreciated their providers' time spent explaining T2D concepts. One participant confirmed this when he said, "[My provider] sits down and takes time with me, and

explains, you know, what's going on and how it works." Taking time to explain T2D-related issues without rushing through explanations bolstered T2DHL development for patients.

In addition to time spent with patients within healthcare environments, patients also appreciated providers' availability when they were not in healthcare settings. One participant mentioned her provider's availability to answer questions at any time. She said, "[My provider] says, 'I want you to call me,' and he says to me, 'anytime you need me, I'm always there for you, you are my patient.'" This participant felt welcome to ask questions any time, and her doctor was an available T2DHL resource for her. The availability of providers' expertise bolstered T2DHL development.

Healthcare providers had a direct role in T2DHL development. They bolstered T2DHL development by directly explaining T2D's causes, T2D self-management regimen information, and the health risks associated with T2D. Providers' verbal explanations benefited patients most when they included a tailored, simplified message, demonstrations, visual models and/or learning aids, conversation, and adequate time.

Facilitative Strategies

In this study, providers' roles extended far beyond direct T2DHL development. Their actions facilitated patients' independent development of T2DHL. Patients further enhanced their own T2DHL when providers offered additional resources, whereas patients responded negatively when providers did not. Beneficial resources offered by providers included patient education materials, referrals to other providers or specialists, online information, T2D classes or workshops, and peer support. In addition, providers' follow-up phone calls or mailings motivated patients to continue their T2DHL development as they tried to maintain their self-management regimens over time.

Providing Additional Resources

Healthcare providers gave more than just medical care to their patients. They also provided more information about their patients' conditions. In terms of T2D, when healthcare providers made additional resources about T2D available to their patients, they facilitated T2DHL development. The following are the resources participants found most beneficial.

Providing Patient Education Materials

Providers gave written patient education materials as references that patients took home. They provided further details about T2D that may or may not have been verbalized during the medical encounter. Patient education materials, therefore, supplemented medical encounters. They included details of T2D in written form as informational resources for patients to have outside of their health facilities. Some patients easily understood supplemental reading materials about T2D, while others had difficulty doing so. Tailoring facilitative approaches, therefore, was also important.

According to one participant, he gained some T2DHL from patient education materials, but he also knew how his mother managed T2D, which provided insight into self-management. He stated, "They did give me some booklets that I kind of look through and read part of it. I have to admit, I didn't read it from page to page. I think that is probably about it. I did tell him that my mother was diabetic and I pretty much knew most things. I can't say I know everything but from watching it over—she has been diabetic for probably 25 or 30 years so—I pretty much have seen everything." This participant's past experiences with his mother's T2D contributed to his understanding of the patient educational materials and/or the fact that he did not thoroughly read each page.

While some participants valued the written information in patient education materials, others expressed frustration with patient education materials, as they did not have the background information or the necessary literacy levels to bolster their understanding. One focus group participant, whose husband also had T2D, stated, "...We both can't read." Another participant responded, "And they give you these pamphlets, but if we can't read, who is going to read them?" Without tailoring approaches to T2DHL development to adapt to these individuals' literacy levels, they never received the information they needed to manage T2D. Adaptation to patients' literacy levels could enhance T2DHL development by allowing patients of all educational backgrounds the necessary information about T2D in a form that they can understand.

Participants who preferred not to read these materials suggested several other forms of learning aids instead of written educational materials. Some providers even had these types of materials on hand to provide upon request. One participant stated, "because I can't read them. I told them I can't read, and [the doctor] said, 'I have it on tape for you.' ...now I can listen to it, and I don't have to guess at a word." This participant got the necessary information in a format she can use.

Providing Referrals

Referring Patients to Other Providers

Providers also offered their patients more opportunities for T2DHL development by referring them to other healthcare providers or specialists. Like patient education materials, specialists provided details about T2D and were resources for future T2DHL development as self-management progressed. Participants noted their primary healthcare providers' referrals to providers with more specialized expertise as especially helpful to increasing their T2DHL.

Patients, therefore, gained T2DHL via a team approach to learning. One participant said that one of the most helpful things her provider did to help her gain T2DHL was send her to a nutritionist. She stated, “Initially they had sent me to a dietician to prepare me for what kinds of foods I should be eating.” This participant learned how to manage her diet from someone trained to teach individuals to do so. Specialists expanded on the information primary healthcare providers gave their patients.

Participants desired diabetes educators, people specialized in educating people who have been newly diagnosed with T2D, to provide detailed, understandable information about the illness. According to one participant, he wanted someone to play that role in his T2DHL development. He wondered, “if they could have someone else that just knows about diabetes instead of a doctor or a nurse. I don’t know what they would call that, a diabetic educator or something that you could just sit down and talk to when you’re first diagnosed.” Healthcare providers with specialized expertise provided a more focused perspective on aspects of T2DHL and self-management skill development. They enhanced patients’ T2DHL, especially upon diagnosis. Again, patients who did not experience diabetes educators or providers with detailed concentrations in T2D topics wished for those opportunities. One participant got a referral to a T2D educator; however, scheduling conflicts limited his access. He stated his loss:

They set me up with the diabetes health professional at this clinic that they recommended. I went there twice and being told that they were overbooked, something came up even though I was booked. The second time, they were overbooked and they had people coming in that they didn’t expect, and even though you came when they expected you, they wouldn’t be able to see me.

When providers referred patients to specialists and those encounters did not happen, patients missed helpful information that could have increased their T2DHL. Specialists benefited patients T2DHL development, and patients who did not get specialized information unknowingly overlooked it.

Referring Patients to On-line Resources

According to participants, the internet was a beneficial resource for T2DHL development as it made information easy to access on their own. Since many people enjoyed searching the internet, it was a great way to facilitate T2DHL development. Patients, however, sometimes needed guidance in terms of where to begin with T2D online resources. Healthcare providers gave patients specific websites where they began accessing T2D information independently. The following participant appreciated his doctor's website recommendation. He stated, "I love my doctor. My doctor is fantastic... There are plenty of things you can read on. He says go into the computer go into Web MD." By providing a specific website where this participant began his search for T2D information, his provider facilitated T2DHL development. Another participant noted how her doctor guided her through websites with T2D information that she accessed later as well. She stated, "She just talks about a lot of stuff. And me and her go online. She has a computer. We go online searching how to manage the disease." Her doctor made sure she knew where to look online and guided her through the recommended sites, which gave her more opportunity to enhance her own T2DHL because she knew exactly where to look for credible information specific to T2D topics.

Referring Patients to T2D Classes

Because patients needed specific information related to T2D, patients benefited from providers' referrals to T2D classes or workshops. Patients may not have found these classes

without the help of their healthcare providers, and these classes bolstered opportunities for patients to enhance their T2DHL. By recommending classes specific to T2D, providers facilitated further T2DHL development. One participant explained her experience with her provider's referral to a T2D class. She said, "When I was first diagnosed with it, [my doctor] did get me signed up right away in a diabetes class. That told me that she did show some kind of interest in her patients because she didn't wait around she just told me that I would be attending the class." Not only did this participant's provider facilitate T2DHL development, her provider communicated concern for her patients' well-being by doing so.

Additionally, one participant recognized her provider's referral to T2D classes as helpful, not only because of the information, but because of the opportunities to talk to other people about T2D. He explained, "When I was sent to the diabetes clinic, they put me through like an educational – I think I went for 4 weeks for class, and that was helpful. Having somebody else to talk to was nice in the beginning." Although, the information in the classes helped this participant learn about his condition, he also appreciated the opportunity to communicate about T2D with people other than his healthcare provider during the T2D classes.

Referring Patients to T2D Peers

Communicating with others about T2D was a vital part of learning to manage it, and information from others with T2D helped people with T2D learn outside their health facility. Healthcare providers facilitated the learning process by referring their patients to T2D peers for information and support. One participant noted how his providers' recommendation to contact others with T2D helped him develop T2DHL. He stated, "There were examples of other people who lived with it for years and manage it successfully, they where a small groups of people that

[my providers] put me in contact with.” Healthcare providers initiated their patients’ contact with others living with T2D, and that facilitated T2DHL development.

Patients needed their providers to equip them with the necessary resources to facilitate continuing T2DHL development. Beneficial resources included patient education materials, other providers or T2D specialists, online information, T2D classes, and others individuals with T2D. Patients learned new information about T2D independently via these resources, which contributed to bolstering T2DHL.

Following Up With Patients

Healthcare providers facilitated T2DHL development by following up with their patients via telephone call and/or informative mailings. Telephone calls put providers in contact with patients to ask if they needed further information or help. If so, providers offered the necessary resources that their patients may not have requested otherwise. Similarly, providers supplied facilitative T2D information through mailings. Patients then referenced the materials mailed to them if and when necessary.

Making Telephone Calls

Follow-up telephone calls from providers gave patients opportunities to learn more about T2D. These telephone calls facilitated T2DHL development, rather than direct it, because the phone calls were outside of direct medical encounters and were usually of an interrogative nature. Patients, therefore, had control of the option of whether or not they receive T2DHL bolstering information or use that provided to them. One participant explained her appreciation of follow-up telephone calls from a nurse in her neighborhood. She said, “I have a nurse who works with my doctor, and she’s a friend of mine, so she’ll call me up and ask me how I’m doing, check on me if I need anything. She does that for [my sister] and I. And I think that’s

caring, you know, being a nurse and a friend, too. She makes sure we understand that and how to take care of ourselves. I think that part's good." This participant had a positive appraisal of her nurse's follow-up telephone call in terms of the information her nurse offered and the impact it had on their patient-provider relationship. Regardless of whether or not patients received further information from these follow-ups, they had a chance to increase their T2DHL from their providers' telephone calls.

Sending Informative Mailings

In addition to telephone calls, mailings from providers facilitated T2DHL development for patients. After healthcare providers sent the information to patients, the patients had control of the information and how they used it. Providers gave patients the opportunity to learn more about T2D, but the patients choose whether or not to do so. When asked what his provider did that helped his development of T2DHL, one participant replied, "They'll send you information in the mail about managing diabetes." This participant found the mailings useful for his own knowledge regarding the continuation of his T2D self-management regimen. Informative mailings from providers benefited patients' T2DHL levels.

Providers both directed and facilitated their patients' T2DHL development. Both providers and patients had a key role in enhancing T2DHL. Providers' verbal explanations and specific aspects of those explanations impacted patients' understanding of T2D. Providers needed to consider how they verbally present important information about all the components of T2D self-management. Beyond the healthcare facility, patients had to take responsibility for their own T2DHL development with continuing help from their providers. By supplying patients with additional resources and reference materials on T2D, they gave patients opportunities to utilize those materials to influence their knowledge of T2D and their continuing self-management skills.

Follow-up telephone calls and mailings also facilitated patients' T2DHL development and maintenance.

Discussion

This study shows that healthcare providers play key roles in their patients' T2DHL development in both direct and facilitative ways. Providers educate their patients about T2D through interaction by explaining the different elements of the illness and self-management and creating patient self-efficacy. They also facilitate further T2DHL when they provide additional resources about the illness. Supplemental resources include patient education materials, specialists, T2D classes and peers, and follow-up information. These findings support and extend current literature about patient-provider communication and health literacy.

The patient-provider communication themes regarding tailored messages and providers' facilitative roles in T2DHL development relate to new literature on shared decision-making and collaboration in healthcare settings. Dolan (2008) has developed the Analytic Hierarchy Process (AHP), which incorporates the patient's working knowledge base with his/her values and the clinical circumstances. The AHP, therefore, requires the provider to foster the patient's self-disclosure and overall involvement in the encounter by sharing their current knowledge and preferences of roles. Patient self-disclosure gives providers feedback about what their patients may or may not understand, allowing providers to further explain important information or supply appropriate supplemental materials. When providers understand patients' current level of knowledge via self-disclosure, they can more effectively educate their patients, thus increasing patients' T2DHL. In addition, the AHP allows the provider to consider clinical circumstances, including available time, and prioritize information and T2DHL development accordingly. For example, if a provider has a limited amount of time to converse with a patient during one visit,

he or she might give the most crucial information for that patient immediately, then give peripheral information later. The AHP has increased perceived quality of care for patients (Dolan, 2009); however, not all providers have the skills necessary to implement a process like this. Some of those skills include asking probing questions and actively listening to the answers that the patients provide. Although providers' time may be limited, two current conversational models may allow for a more efficient use of time and conversation during medical encounters

One proven method of effectively initiating patient involvement and uncovering patient preferences is via a counseling technique called motivational interviewing (MI) (Miller & Rollnick, 2002). MI is a client-centered approach to prompting behavior change by resolving confusion. When applying MI to health behavior change, Rollnick, Miller, and Butler (2008) suggest MI be used as a goal-oriented form of guiding in which practitioners lead a discussion with their patient, "paying particular attention to how to help the patient make his or her own decisions about behavior change" (p.18). Health professionals can do so by taking time to develop an understanding of the patient's knowledge of T2D and related problems, practicing active listening, and informing the patient about an appropriate range of facts, diagnoses, and recommendations (Rollnick, Miller, & Butler, 2008). MI offers patients an opportunity to share their preferences and barriers to T2DHL with providers. Providers can then use the patients' comments to gear T2DHL information toward patient preferences and knowledge levels. When providers give patients a chance to identify for themselves what confuses them, providers can better prioritize the information they give in the amount of time that they have, which would efficiently bolster T2DHL development opportunities. MI requires providers' adaptability and active listening. According to McCornack (2007), listening is a five step process, which includes receiving the message, attending to it, understanding it, responding to it, and recalling it later.

Without active listening, MI and APH would be ineffective. Providers must listen to patients' responses during MI to know how to direct APH. MI and active listening guide T2DHL development as they allow providers insight into their patients' levels of understanding. When providers listen to and consider their patients' input, they can efficiently approach T2DHL development for each individual patient. One key issue of confusion for many patients, however, is the use of medical jargon.

Current research on the overuse of medical jargon during providers' verbal explanations upholds the participants' comments on simple explanations. Participants had difficulty understanding medical details of T2D topics that their providers included during their appointments. The complex vocabulary and scientific knowledge required to understand T2D medically is beyond what most patients know, and participants appreciated simpler explanations.

According to one study by Castro, Wilson, Wang, and Schillinger (2007), 81% of medical encounters have at least one unclarified medical term. Understandably, it is difficult for providers to stray from the medical language they use and understand so well. Quite often there are few if any simple alternative vocabulary for medical terminology. Little research has been done on exactly how providers can avoid medical jargon; however, current recommendations involve avoiding medical jargon, if possible, and concentrating on the sensations patients might experience (Thompson, 2000). For example, instead of providers telling patients that they might experience nausea and tachycardia during a hypoglycemic episode, they might instead tell them that if their blood sugar is too low, they might experience an upset stomach and rapid heartbeats among other things. Since many patients are not fluent in medical language, providers may increase their patients' T2DHL by giving patients sensory information with which they may better relate. The movement toward emphasizing sensation rather than scientific information also

speaks to the participants requests for demonstrations and visual learning aides rather than straight facts. Participants enjoyed and responded positively to hands-on learning experiences during T2D classes. Some noted how, for example, incorporating models of the eye would help them better understand how T2D can cause blindness. Demonstrations and visual learning aides allow patients to have a sensory learning experience, which can increase T2DHL.

Additionally, participants requested the inclusion of peer experiences in current patient education materials and in the facilitative resources their providers offer. Peer experiences, whether they be written or interactive, would give patients insight from others with whom they can relate visually, socially, and emotionally. This parallels Bandura's Social Cognitive Theory (1989), which involves one's emotional coping response according to elements of his or her environment. Similar others provide observational learning opportunities, expectations, incentives, and emotional insight into T2D experiences, much like the participant who learned about how to deal with T2D by watching his grandmother. The recommendations from this study's participants could be incorporated into future patient education materials and social support groups.

In addition to the interactive component of T2DHL development, printed patient education materials supplement the direct medical encounter, and seem to have a greater effect when patients use their senses and relationships to learn about T2D. The participants call for more graphics and audiovisual aides to see and/or hear their new information on T2D. Some participants suggested using informative DVDs and audio recordings of printed materials instead of text-based information. According to Walsh & Shaw (2000), healthcare providers rely on print materials as adjuncts to educational verbal communication regarding patients' health due to decreased interpersonal time with patients within the healthcare system.

Despite the benefits of direct patient-practitioner interactions, Schillinger, Piette, Grumbach, et al. (2003) report that patients with T2D comprehend or recall approximately half of the information practitioners convey during a medical encounter. Practitioners, therefore, distribute printed health materials to reinforce the content of the encounter; however, the materials are useless to patients who do not have the necessary literacy skills to read, understand, and use the information (Schwartzberg, et al., 2007).

Due to the mass distribution of health information materials to patients, NIH (2008) identifies literacy a key factor in achieving functional health literacy. Patients need to navigate the healthcare system through health documents, forms, labels, and other informative materials such as brochures. According to the results of this study, however, many patients do not or cannot read making text-based materials ineffective.

Sellers et al. (2003) report that printed health education materials require a fifth grade reading level or below on the SMOG formula scale (McLaughlin, 1960) to accommodate the general public. Sellers et al. state 59% of the evaluated health information materials yield scores within the fifth to ninth grade reading levels, a range too high for most Americans. Additionally, few of the materials incorporate cultural sensitivity, and comfortable formatting schemes. Overall, 2% of the evaluated materials pertain to the masses. Similarly, French and Larabee (1999) report health education materials with SMOG scores above the 12th grade reading level. Expanding on health material limitations, Chao (2005) shows after a content analysis of health information materials, 58% provide a contact telephone number, and 23% contain information for patient advocacy. With the limitations of patient education materials comes a need for more patient-friendly printed education materials and interactive T2DHL development strategies.

Printed patient education materials need to reach a variety of patients at various levels of literacy and health literacy. One potential pedagogical strategy to increase the T2DHL of a greater patient population would be to implement the Principled Science Assessment Design for Students with Disabilities (PADI-SE) (Mislevy, 2008). The PADI-SE uses the Universal Design for Learning (UDL) to produce science assessment models in schools. The UDL removes barriers and facilitates learning for all students, and a universal design for T2DHL could remove barriers and facilitate health literacy development for patients of all knowledge levels. It would increase knowledge access without stigmatizing patients without extensive T2DHL. For example, patient education materials using UDL would incorporate graphics and sensory accounts, rather than just text. Patient education materials, however, cannot replace the value of direct patient-practitioner interaction and educational opportunities in it. UDL could guide interactive learning experiences during patient-provider interactions 2D classes.

Through this research, T2D classes surfaced as another opportunity for T2DHL development. They combine to form a multidimensional approach to education. The application of pedagogical theory to T2D healthcare settings comes together in many new diabetes education programs, including the Diabetes Education and Self Management for Ongoing and Newly Diagnosed (DESMOND) program (Davies, Heller, Skinner, Campbell, Carey, & Craddock, et al., 2008). In a systematic review of diabetes education literature, Loveman, Frampton, and Clegg (2008) reveal that multidimensional diabetes education programs yield inconsistent results; however the programs that last the longest and involve a variety of educators and healthcare providers were most effective. Not only does this speak to the participants' call for T2D education classes; it also upholds their need to consult other specialists beyond their primary healthcare provider. In this study, participants mentioned the importance of specialized educators

and healthcare providers for their own T2DHL development. Despite the inconsistencies of the quantitative results of T2D pedagogical studies, the results of this qualitative study support a multi-dimensional approach to T2DHL development.

This study suggests that nothing can fully replace the basic educational interaction between patients and providers; however, patients need their providers to direct and facilitate T2DHL development in ways that best suit each individual patient. Additionally, audio-visual media, technology, and other interactive approaches combined bolster T2DHL. By incorporating new media and methods into the basic approaches to T2DHL development, more patients might increase their T2DHL.

Implications and Future Research

Due to the current study's focus on patients, future research could involve providers' perspective of facilitators and barriers to strategies they use to increase their patients T2DHL. Future research endeavors on T2DHL might also include a manifest content analysis of follow-up qualitative data to determine the quantitative value of participants' responses as some may be mentioned more than others. The results could inform the development of a validated framework of T2DHL communication strategies for healthcare providers. Although this study suggests that healthcare providers must adapt and tailor their communicative approaches to the needs of each patient, a framework of strategies might provide a foundation from which to build all T2DHL messages at the interpersonal level. Quantitative and qualitative evaluation of such strategies would add to the available knowledge on such topics.

In addition, development and evaluation of patient education materials using all the recommendations from this study's participants could build on the current literature. This may provide insight into how publishers of such materials can tailor their messages to different

populations, demographics, including those newly diagnosed with T2D, those who have been living with T2D for a period of time, and/or those who are at risk of developing it.

Similarly, future research may include the evaluation of current T2D education programs, such as the classes mentioned in the results of this study. Evidence-based implementation and evaluation of new T2D education programs based on current findings will add to the available literature on T2DHL as well. Development and empirical evaluation of new technologies, interactive exercises, and/or experiential demonstration strategies may increase the development of T2DHL multi-dimensionally. Planning, implementation, and evaluation of such topics, both qualitatively and quantitatively, will add to current literature on T2D education.

Aside from the channels of T2DHL development, this study's data also includes interesting content about patients' motivation to learn and develop their own T2DHL. Although motivation is beyond the scope of this paper, future research could evaluate patients' specific motivating factors for T2DHL. Research in this area might allow others to influence patients' self-efficacy to learn more about T2D management. More self-efficacy can translate into more skills and knowledge, which may lead to successful T2D management and better health outcomes.

Other concerns from the current study involve cognitive load. Although participants desired the receipt of large amounts of T2D-related information, researchers must explore how much of this information patients should receive at one time and in what order. Future studies on cognitive load during medical encounters could add to current T2DHL research.

Beyond health literacy, many of the participants' remarks sparked interesting ideas about social support and uncertainty management and how these things can influence, not only T2DHL, but also adherence and motivation to change unhealthy behaviors. Although social

support and uncertainty management are beyond the scope of this paper, analysis of this paper's additional data could contribute to the current literature on those topics as well. More research on all topics related to T2D might influence the development of better treatment and prevention of the United States' growing problem with T2D.

Conclusion

With a growing number of Americans developing T2D, research on bolstering T2D education is paramount. In order to successfully manage T2D, individuals must first gain the T2DHL. Healthcare providers help bolster their patients' T2DHL development in both direct and facilitative ways. This paper lists the elements of T2DHL direction and facilitation that patients value the most and have found most helpful in their own experiences. This study is a starting point for future research on T2DHL and management.

Table 1: Directive Strategies

DIRECTIVE STRATEGIES	DESCRIPTIONS	QUOTES
Explaining T2D-Specific Content		
<i>T2D</i>	Explaining what T2D is and how it affects the body	“They kind of explained to me...that my body wasn’t able to keep up with the amount of insulin produced...It was explainable at least.”
<i>T2D Regimen Information</i>	Explaining the details of how to manage T2D with diet, exercise, glucose monitoring, and insulin uptake	
<i>Diet</i>		“In 2 or 3 weeks, I went for my sugar, 29 down to 196, because they told me, ‘Watch your carbohydrates. Watch your sugars.’ And I watched everything.”
<i>Exercise</i>		“How can she make the effort to try and walk when she knows she’s going to fall
<i>Glucose monitoring</i>		“He always tells me, ‘Don’t always test your blood in the same place. Go to different fingers, it doesn’t hurt you as much...don’t do the same finger constantly. You are going to get turned off.’”
<i>Insulin uptake</i>		Explain how to “...deal with my insulin. Not how to take it, ‘cause I know that. I mean, like tricks to make sure I take it when I’m supposed to. If they have any tricks, let me know.”
<i>Dangers of Non-Adherence</i>	Explaining negative health outcomes that result from improper self-management	“...She talked me through it and she wasn’t afraid to tell me the danger zones and not soften it up and make it all nice and creamy...”
Creating T2D Self-Efficacy	Encouraging patients that they can make the necessary health behavior changes	“They taught me basically about taking the proper steps in order to maintain an orderly daily life. They told me to maintain a positive attitude and maintain an equal physical and mental balance...”
Considering Context		
<i>Tailoring Messages</i>	Adjusting T2DHL approach to individual patients’ physiological	

	and educational/experiential differences	
<i>Physiological uniqueness</i>		“I think that sometimes the dietician education is not helpful because it’s not always tailor made...People react differently to different things...”
<i>Educational and experiential uniqueness</i>		“They would’ve [explained more], I’m sure, but when you’re a nurse they just take it for granted that you know what to do.”
<i>Simplifying Explanations</i>	Using simple language	“My doctor said mostly when it comes to something white he only wants me to eat fish and cauliflower.”
<i>Using Interactive Learning</i>	Exchanging information using different tools and communication skills	
<i>Using learning aids/demonstrations</i>		“[My providers] showed me how to test my sugar at home with the kit...That was helpful. I’m doing it, but they’re walking me through the process.”
<i>Conversing with patients</i>		“...You could stop [my providers] and ask them how does this work with this or that...”
<i>Being available</i>		“We spend like an average of like 30 minutes, and usually doctors don’t spend that long with their patients...”

Table 2: Facilitative Strategies

FACILITATIVE STRATEGIES	DESCRIPTIONS	QUOTES
Providing Patient Education Materials	Providing supplemental material that patients can use to get information outside the healthcare facility	“And they give you these pamphlets, but if we can’t read, who is going to read them?”
Providing Referrals	Referring patients to other sources of information outside the healthcare facility	
<i>Online Resources</i>		“I love my doctor. My doctor is fantastic... There are plenty of things you can read on. He says go into the computer go into WebMD.”
<i>Other Specialists/Educators</i>		“Initially they had sent me to a dietician to prepare me for what kinds of foods I should be eating
<i>T2D Classes</i>		“When I was first diagnosed with it, [my doctor] did get me signed up right away in a diabetes class. That told me that she did show some kind of interest in her patients because she didn’t wait around...”
<i>T2D Peers</i>		“There were examples of other people who lived with it for years and manage it successfully, they were a small groups of people that [my providers] put me in contact with.”
Following Up With Patients	Contacting patients to give them the opportunity to get increase their T2DHL outside the healthcare facility	
<i>Making Telephone Calls</i>		“I have a nurse who works with my doctor... she’ll call me up and ask me how I’m doing, check on me if I need anything... She makes sure we understand that and how to take care of ourselves.”
<i>Sending Informative Mailings</i>		“They’ll send you information in the mail about managing diabetes.”

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