Pharmacist-Patient Relationship as a Method for Promoting Behavioral Changes and Improved Outcomes in Diabetic Patients

Dr. Lori A. Demeter
School of Public Policy and Administration
Walden University
Minneapolis, MN, USA

Catalina Cross, PhD
School of Public Policy and Administration
Walden University
Minneapolis, MN, USA

Abstract

Using a qualitative phenomenological approach, the purpose of this study was to examine characteristics of the pharmacist-diabetic patient relationship that have the potential to lead to behavioral changes and improved clinical outcomes. Bandura's self-efficacy model served as the theoretical framework. Interviews were conducted with 12 participants diagnosed with diabetes regarding their lived experiences and their community pharmacist. Data were analyzed to identify characteristics related to behavioral changes and improved glycated hemogobin (A1C) levels. Clinical outcomes were measured by A1C levels documented over a 6-month period. Study results indicated 20 influential factors and 30 influential characteristics from the diabetic patient's side of the dyad and 26 influential factors and 17 influential characteristics from the pharmacist's side of the dyad. The main policy implication is to raise awareness of the pharmacist-diabetic patient relationship's potential as a method to improve the health outcomes of those living with diabetes.

Keywords: pharmacist intervention, community pharmacist, diabetes, health outcomes, and medication therapy management (MTM)

1.0 Introduction

Health care expenditures have increased in the United States and are projected to reach $4.6 trillion by the year 2020 (Centers for Disease Control and Prevention [CDC], 2014) from an estimated $2.9 trillion in 2012 (CDC, 2014), an increase of 59%. In response to the rising health care costs and lack of access to health care for many people in the United States, Congress passed the Patient Protection and Affordable Care Act (PPACA, 2009). The purpose of the PPACA is to improve the quality of care, reduce costs, and increase access to care for people in the United States.

Medication therapy management (MTM) is a component of the PPACA legislation. The overall goal of MTM is to improve quality of care, improve clinical outcomes, and reduce health care costs. The term outcome is related to the patient's quality of life as the result of a medical intervention (Agency of Healthcare Research and Quality [AHRQ], 2015). MTM is the management of prescribed medications by a medical professional or team of medical professionals targeted for patients who (a) take four or more prescribed medications (including over-the-counter and dietary supplements), (b) take any high-risk medication, (c) have two or more chronic diseases, as identified by the Secretary of Health and Human Services, or (d) have undergone a transition of care, or other factors, as determined by the Secretary, that are likely to create a high risk of medication-related problems (PPACA, 2009).

The intent of MTM sessions is to establish a cross-professional disciplinary team to manage a patient's medications. In this setting, a licensed pharmacist takes a lead role within the interdisciplinary team to administer MTM sessions. The PPACA lays the foundation to use clinical pharmacists as a component in improving the quality of care, improving clinical outcomes, and reducing health care costs through MTM programs. There is an opportunity to replicate influential factors and characteristics uncovered in this research study to establish similar MTM diabetic programs in communities across the United States to support the intent of the PPACA legislation.

2.0 Literature Review

After conducting a literature review to identify studies centered on MTM administered by pharmacists, three themes emerged: (a) improved clinical outcomes, such as improved glycemic control in diabetic patients and decreased systolic/diastolic measurements (blood pressure) for patients with hypertension; (b) reduced occurrences of adverse drug events (ADEs) or an adverse drug reactions (ADRs); and (c) decreased health care costs. Overall, researchers indicated that such intervention results in improved clinical outcomes, reduced ADEs and ADRs, and reduced health care costs (Chrisholm-Burns et al., 2010; Cranor, Bunting, & Christensen, 2003).

2.1 Improved Clinical Outcomes

Engaging pharmacists in the management of diabetes in various health care settings is related to improved clinical outcomes (Bunting & Cranor, 2006; Bunting, Lee, Knowles, Lee, & Allen, 2011; Bunting, Smith, & Sutherland, 2008; Cranor et al., 2003; Fera, Blumi, Ellis, Schaller, & Garrett, 2009; Fox, Ried, Klein, Myers, & Foli, 2009; Jameson & Baty, 2010; Johannigman et al., 2010; Pinto, Bechtol, & Partha, 2012). Pharmacists are health care professionals who are positioned to provide consulting services and monitor a diabetic patient's disease state. Pharmacists work within most communities across the United States. Pharmacists provide services in community health centers, ambulatory settings, health clinics, hospitals, retail chains, and independent pharmacies. Pharmacists may specialize in various aspects of health care such as geriatrics, nuclear pharmacy, nutrition support, oncology pharmacy, pharmacology, and psychiatric pharmacy. Pharmacists may also obtain additional training in other health disciplines, such as diabetic education. Pharmacists are able to discuss medication regimens, monitor adherence, and collaborate with other medical providers to monitor patients' clinical outcomes either independently or as part of an interdisciplinary team (PPACA, 2009).

Pharmacists are able to interact with patients through various means to manage patient outcomes. According to Smith, Bates, Bodenheimer, and Clearly (2010), pharmacists are positioned to play a role in a medical home environment. Pharmacists are able to access medication effectiveness, risk of adverse drug reactions, and costs associated with therapies (Smith et al., 2010). In a pharmacist-led management care program for high blood pressure, pharmacists interact with patients through phone calls and an online monitoring program. Patients involved in the pharmacist-led program are twice as likely to experience improved blood pressure compared to those not in the program (McCarthy, Mueller, & Tillman, 2009).

2.2 Reduction in Adverse Drug Effects

Pharmacist intervention programs addressing adverse drug events (ADEs) have resulted in decreased ADEs. According to the United States Department of HHS' Food and Drug Administration (FDA, 2009), "adverse events from drug use result in more than 4 million visits to emergency departments, doctors' offices, or other outpatient setting annually" (p. 2). Of these ADEs, 1.5 million are preventable and account for $4 billion in avoidable costs to the health care system (FDA, 2009). The FDA reported that prevalence of preventable ADEs are higher for patients in long-term care facilities. There are also cases of adverse drug reactions (ADRs). The CDC (2010) reported that older adult patients (ages 65 and older) are at a higher risk of experiencing an ADE compared to younger adult patients (between the ages of 18 years and 65 years). Neyens et al. (2009) found that ADRs in older adults have not declined in recent years. Neyens et al. reported that admissions to hospitals as a result of ADRs are 16.6% for older adults compared to 4.1% for younger patients. Neyens et al. stated that 88% of the ADRs were preventable. The CDC (2011) recommended that older patients consult with a physician or pharmacist to discuss prescribed medications as a preventative measure to avoid ADRs. There is the potential to reduce ADRs by 88% (Neyens et al.) if adults (ages 65 and older) would take the advice of the CDC to consult with a physician or pharmacist to discuss prescribed medications (CDC).

2.3 Reduced Health Care Costs

Bunting et al. (2008; 2011), Bunting & Cranor (2006), Cranor et al. (2003), Johannigman et al. (2010), Pinto et al. (2012), and Smith, Giuliano, and Starkowski (2011) found that a community-based collaborative approach to disease management that included a pharmacist was related not only to improved clinical outcomes for patients but also a reduction in health care costs. For example, Smith et al. (2011) conducted their study in Connecticut with 88 adult participants (average age of 51 years) who had chronic medical conditions including diabetes. Smith et al. found that a pharmacist's interaction with a patient's management of medication resolved about 80% of drug-related problems and resulted in an estimated annual savings of $1,123 per patient on medication claims because the pharmacist discontinued unnecessary medications and replaced them with less expensive medications. Overall, Smith et al. found that health care costs were reduced and ADEs were prevented as a result of the pharmacist's interaction with patients through MTM sessions.

2.4 Gap in Literature

A gap exists in the empirical and theoretical literature on influential characteristics and factors of the pharmacist-diabetic patient relationship related to improved diabetic outcomes. Researchers have primarily focused on clinical outcomes of MTM programs (Chrisholm-Burns et al., 2010; Cranor et al., 2003). While research on clinical outcomes is important in assisting the medical community in identifying effective MTM programs, understanding influential characteristics and factors of the pharmacist-diabetic patient relationship may contribute to existing knowledge to further improve MTM programs. Therefore, the intent of this qualitative research study was to investigate the significance of the pharmacist-diabetic patient relationship as it related to behavioral changes and improved outcomes for the diabetic patients.

2.5 Theoretical Foundation

Bandura's self-efficacy theory (1994) was utilized as the theoretical framework for this qualitative research study. Bandura's theory is based on the premise that a person's belief in her or his ability to initiate change is an underlying factor in behavioral change. Self-efficacy theory provided me with a framework explore the influence of the pharmacist-diabetic patient relationship on the diabetic patient's behavioral changes that are related to improved outcomes.

The self-efficacy theory enabled Lugwig & Deaton (2011), Nouwen et al. (2011), Nouwen, Law, Hussain, McGovern, and Napier (2009), Polnikoff, Lippke, Courneya, Birkett, & Sigal (2008), and Romanowich, Mintz, & Lamb (2009) to expand their understanding of behavioral changes in patients faced with medical conditions. Researchers have shown that self-efficacy is a statistically significant factor in a patient's ability to manage chronic disease outcomes (Lugwig & Deaton, 2011; Nouwen et al., 2009, 2011; Polnikoff et al., 2008; Romanowich et al., 2009).

3.0   Methods

The purpose of the qualitative research study was to examine influential characteristics and factors of the pharmacist-diabetic patient relationship that have the potential to relate to behavioral changes and improved outcomes for the diabetic patients. The research design, rationale and methodology are discussed in this section.

3.1 Phenomenological Approach

A qualitative phenomenological approach was identified as the best option to describe and examine influential characteristics and factors of the pharmacist-diabetic patient relationship (Creswell, 2009). Furthermore, a qualitative phenomenological approach provided a framework to explore and identify patterns and themes related to influential characteristics and factors experienced by diabetic patients and their pharmacist as a result of interactions during the MTMs (Creswell, 2009).

3.2 Participant Selection

Participants for this qualitative research study were selected via purposive sampling. Participants were selected from a population of diabetic patients who participated in the MTM program at the participating pharmacy in San Francisco, California. This population was chosen because of the participating pharmacist's interest in the qualitative research study and access to the population. Other than knowing the community had a prevalent Russian and Middle Eastern population, no additional characteristics of the patients who engaged with the participating pharmacist were known prior to study. The pharmacist who participated in this research study owned the pharmacy and administered an MTM program to diabetic patients in San Francisco, California.

The pharmacist was established within the community and was chosen to participate in the study because of his passion for providing MTM services to diabetic patients. The pharmacist was responsible for selecting diabetic patients ($n = 12$) for this research study who met the research criteria. Research criteria were that participants 1) had to be 18 years of age and older, and 2) were currently in the MTM diabetic program at the pharmacy.

3.3 Instrumentation and Data Collection

A series of interview questions were used as the primary data collection instrument (Appendix A). A pilot study was first conducted ($n = 2$, who were then excluded from the study) to validate interview questions. According to Yujin (2010), receiving initial feedback from survey questions and transcripts helps to identify potential cultural interpretation issues. Minor wordsmithing was utilized based upon pilot study feedback.

The pharmacist posted an invitation in the pharmacy for the research study. The invitation was directed to the pharmacist's diabetic patients who participated in the MTM diabetic program at the pharmacy. The pharmacist provided a list of diabetic patients who expressed interest in participating in the research study. The pharmacist set up an appointment to introduce each diabetic patient. During the meeting, the objective of the qualitative research study was explained. Patients who remained interested in participating were selected as potential participants, and they signed an informed consent agreement. The pharmacist remained present during the interviews and served to translate if needed.

One-on-one interviews were conducted with each participant. Interview times ranged from 20 minutes to one hour. An audio-tape device was utilized to capture recordings of interviews, and the interviews were then transcribed. These transcriptions were reviewed with the participant to obtain feedback. I discussed interpretation concerns from the participant or me and modified interview questions as needed.

3.4 Data Analysis

NVivo software was used to code, organize, and analyze the data. Participant names were assigned numeric codes to protect anonymity, and these numeric codes were used in all documentation. Themes were identified within each participant's recorded experiences. They were then categorized and coded as themes emerged from the data. A separate analysis was conducted to identify influential characteristics and factors of the relationship that may emerge.

Special attention was given to abiding by HIPAA regulations regarding the protection of patient record information as a means of ensuring confidentiality of the data collected. Only the pharmacist had access to the patients' identity and his or her respective medical record information. The pharmacist recorded the participant's actual A1C levels at the onset of the patients' participation in the MTM program and again at 6 months. The A1C indicates what percentage of hemoglobin is glycated, or coated with sugar (Mayo Clinic, 2014). To test for A1C levels the patient has blood drawn at a lab or through a finger prick by a medical professional. The blood sample is analyzed to determine A1C levels. Higher A1C levels increase risk of adverse effects associated with diabetes. Test results can be skewed if a patient has experienced heavy bleeding, depleted iron levels, or an uncommon form of hemoglobin (Mayo Clinic, 2014). The pharmacist recorded pretest and posttest A1C levels of each participant. Outcome improvements were noted as A1C levels dropped.

4.0   Results and Discussion

All participants (100%) experienced improved clinical outcomes; that is, a decrease in A1C levels. Clinical outcomes related to pharmacist-patient engagement in this research study are representative of other research studies. For example, Chrisholm-Burns et al. (2010) and Cranor et al. (2003) reported improved outcome as a result of pharmacist intervention.

Bandura's (1994) self-efficacy theory provided a framework to explain how factors and characteristics influenced the diabetic patient participant's self-efficacy. According to Bandura, beliefs play a role in a person's ability to cope with and overcome failures in life. In some cases, a person may be overwhelmed by emotions and have difficulty coping when he or she learns about his or her diabetic state. As one participant shared in an interview, "The doctor told me that I have diabetes and I went to my car and cried." Later in the interview, the patient explained that the pharmacist convinced her that she could, in fact, take action to control and manage her diabetic state.

The participating pharmacist played a role in influencing diabetic patients' self-efficacy by building trusting relationships and educating patients to the point where they were better able to cope with the disease and take action to change behaviors to improve outcomes.

The following are quotes from several participants directly related to the influence of the pharmacist-diabetic patient relationship on the patient's self-efficacy. "[The pharmacist] makes you, ahh, well makes you believe you can do it" (A03). "He [the pharmacist] stresses strongly what really is important, and what you need to do. He basically puts it on your shoulders. You are the one that is going to have to do it. It makes you think about it. So I actually started doing the exercise" (A01). "His [the pharmacist] actions and his interest are very inspiring to the patient and I really do believe that I hit the point in my left where I am not happy with my health and I am really ready to start moving forward" (A04). "He [the pharmacist] focused me; he gave me knowledge. He was checking my sugar. I started checking my sugar" (A06). The participating pharmacist activated diabetic patients' self-efficacy to the point where they believed they were capable of taking action to better control their diabetes.

4.1 Influential Factors and Characteristics - Diabetic Patient Perspective

Influential factors and characteristics emerged from the pharmacist-diabetic patient dyad. Findings from the exploration of the pharmacist-diabetic patient relationship through the lived experience of the diabetic patient side of the pharmacist-diabetic patient dyad revealed 20 influential factors (Table 1). Upon further analysis of this data, particular factors and characteristics were found to be prevalent among participants. Six influential factors were common to 50% or more of the participants. These included: (1) pharmacist knowledge of how exercise directly affects diabetic conditions, (2) pharmacist knowledge of diabetic stages and how it progresses, (3) environment that allows for continuity of health care (pharmacist, patient, physician), (4) physician referral, (5) patient has positive experience with program, and (6) environment that allows patient to comfortably talk about their health.

Initially 30 characteristics emerged from the pharmacist-diabetic dyad (Table 2). Upon further exploration, 10 influential characteristics were common to 50% or more of the participants. These included: (1) ability to gain respect from patient through knowledge of medications and diabetes (2) ability to establish meaningful relationship with patient (3) ability to explain medical conditions, purpose of medications, and effects of medications in an understandable way (4) ability to educate patient on how to control outcome through nutrition and diet (5) ability to establish trust (6) attractive personality/good person: cheerful, credible, engaging, entertaining, genuine, gregarious, welcoming (7) ability to motivate patient to take action to control diabetes (8) passionate/genuine concern for patient outcome (9) ability to create a supportive environment (10) ability to communicate in terms that the patient can relate.

4.2 Influential Factors and Characteristics – Pharmacist Perspective

Findings from the exploration of the pharmacist-diabetic patient relationship through the lived experience of the pharmacist side of the pharmacist-diabetic patient dyad revealed 26 influential factors and 17 influential characteristics (Tables 3 and 4, respectively). However, it is most important to note that 12 factors and 13 characteristics were common among both the diabetic patient participants and the pharmacist (Tables 5 and 6, respectively). The fact that there exists factors and characteristic common to both sides of the pharmacist-diabetic patient dyad may be of particular significance as they relate to the pharmacist-diabetic patient relationship. Finally, all findings presented from both sides of the pharmacist-diabetic patient dyad were found to have influenced positive behavioral changes in the diabetic patient and improved outcomes.

4.4 Overarching Emergent Themes

Three overarching themes emerged. The overarching themes were: (1) environment, (2) knowledge, and (3) relationship. The number of factors and characteristics that fell into each overarching theme compared to the total is as follows: Environment 5 out of 50 (10%); Knowledge 15 out of 50 (30%), and Relationship 30 out of 50 (60%). Each of the 50 factors and characteristic fell into one of these three categories. The following is a brief examination of each theme.

4.41 Environment

The *environment* served as one of the three overarching themes. Participants specifically identified the environment as it relates to a place where he or she can comfortably talk about his or her health; a place that allows for the continuity of care. Patients also spoke about the importance of a supportive environment. In this sense, the pharmacy environment was an overarching theme in regard to influential factors and characteristics shared by the participants.

Other researchers have found that the environment in which pharmacist interact with patients are related to improved outcome.

According to Cranor et al. (2003), patients visit pharmacies more often compared to other medical providers. Pharmacists were able to interact with patients often enough to effectively manage medications (Cranor et al.). Iyer et al. (2010) discussed the importance of providing an environment that allows for the pharmacist to take a humanistic approach to manage a patient's disease state, by providing face-to-face consultation for patients. This supports what participants reported in this study in regard to the significance of an environment that allows for face-to-face consultation with the pharmacist.

4.42 Knowledge

I identified *knowledge* as the second overarching theme. I coded a factor or characteristic as *knowledge* when the participant spoke about the importance the knowledge level of the pharmacist and its positive impact on their perceptions of the pharmacist. Participants spoke of the participating pharmacist's knowledge of various subjects as important in their relationship with him. Subjects included: A1C and glucose levels, administering injections, consequences of neglect, general knowledge, how exercise and diet relates to diabetic conditions, and stages of diabetes. Patients also expressed respect for the pharmacist's level of knowledge. Patients identified characteristics and factors related to knowledge as influential in changing behaviors which resulted in improved outcomes.

Researchers have reported the significance of pharmacist's knowledge as it relates to patient interaction and improved outcome. Smith et al. (2010) discuss the significance of the pharmacist's knowledge of medication related problems that may impact patient outcomes. Johanningman et al. (2010) discussed the impact of pharmacists trained in MTM and health education as it relates to improved health outcomes. Such research supports this studies overarching theme of the significance of the pharmacist knowledge as it relates to improved outcome.

4.43 Relationship

Participants spoke of various types of relationships that had an influential impact on his or her behavior and/or health outcome. Participants noted of the importance of the relationship between his or her physician and the pharmacist. For example, several participants said their physician referred him or her specifically to the pharmacist by name. Participants spoke of his or her comfort level in speaking with the pharmacist because he spoke their language and made them feel comfortable. Some participants shared the longevity of his or her relationship with the pharmacist and that he always took time to speak with them. Participants shared that his or her trusted relationship with the pharmacist was motivational factor.

Fox et al. (2009) reported that a MTM model that includes a collaborative relationship between physicians and pharmacists had a positive impact on outcomes. I would like to point out that the relationship theme was the most significant amongst all overarching themes. In this study 60% of influential factors and characteristics where related to the relationships this supports the need for further research in this area.

4.5 Limitations of the Study

A limitation of this research study was the inherent limitation of a qualitative approach in determining the cause and effect correlation. In this research study, the independent variable was the participants' participation in the MTM diabetic program as it related to interactions between the pharmacist and diabetic patient; the dependent variables were behavioral changes and improved outcomes for the diabetic patients. In addition, the results were reflective of a small portion of the population and may not represent the greater population. Finally, the ethnicity of the diabetic participants was mostly Russian. Seven of the 12 participants (58%) were Russian. This phenomenon may be a limiting factor in that the research study may not represent other ethnic groups.

In addition, the fact that the pharmacist spoke seven languages and was able to speak comfortably with patients in their primary language may have been a limiting factor to this research study. Participants shared that the pharmacist made them feel welcome and they felt comfortable in discussing medical conditions with the pharmacist. The ability for a pharmacist to communicate and relate to patients in their primary language may be a significant factor. This could be a limiting factor in this research study because this phenomenon was not explored.

5.0 Recommendations

5.1 Practical

Influential factors and characteristics of the pharmacist-diabetic patient relationship that related to behavioral changes and improved outcomes were found for the diabetic patients who participated in the research study.

Based on these findings, community pharmacists are encouraged to take a leadership role in building collaborative relationships with physicians and diabetic patients to implement similar MTM diabetic programs within the communities they serve. This is important for those pharmacists who share similar characteristics as the pharmacist who participated in this research study and pharmacists interested in patient outcome and who have the ability to educate patients.

CMS, private health insurance providers, and health care organizations should simultaneously collaborate to strengthen the delivery of health care structure to support the growth of collaborative MTM diabetic management programs that include pharmacists. Though this aspect was beyond the scope of this research study, collaborative MTM models that include a pharmacist result in improved outcomes and a reduction in medical costs. For example, Cranor et al. (2003) found that patients who participated in community-based pharmacy diabetes care programs experienced improved A1C levels (< 7.0%, "normal"). Bunting et al. (2011) also conducted a quantitative study focused on reduced health care costs and improved outcomes for diabetic patients who participated in an MTM program and reported a $2,704 decrease in health ccare costs per patient per year. Bunting et al. and Cranor et al. found collaborative MTM models that included pharmacists to be effective in improving outcomes and decreasing health care costs.

There are more than 50,000 community pharmacies throughout the United States (Klepser et al., 2011). A collaborative effort from CMS, private health insurance providers, and health care organizations to tap into the existing pool of community pharmacists could accelerate the implementation of such MTM diabetic program models throughout the United States. This is a practical means of improving health outcomes for the diabetic population within the United States.

5.2 Academic

Further qualitative and quantitative research should be conducted to investigate influential factors and characteristics of the pharmacist-diabetic patient relationship as revealed in this research study. A similar qualitative research study set within a different ethnic population would broaden the scope of the phenomenon and strengthen the validity of this research study. A quantitative research study is also recommended to investigate if there are statistically significant correlations between the factors and characteristics identified in this research study as they relate to behavioral changes and improved outcomes.

Finally, it is recommended that the American Association of Colleges of Pharmacy (AACP) and Accreditation Council for Pharmacy Education (ACPE) take action to further investigate influential factors and characteristics of the pharmacist-diabetic patient relationship revealed through this research study. The AACP and ACPE may determine that the influential factors and characteristics of the pharmacist-diabetic patient relationship discovered through this research can be taught as part of the clinical pharmacist training curriculum. Enhancing the pharmacist academic training by adding awareness to these influential factors and characteristics may help to accelerate the development of collaborative MTM diabetic programs throughout the United States.

6.0 Conclusion

The purpose of the qualitative phenomenological research study was to explore and examine influential characteristics and factors of the pharmacist-diabetic patient relationship that have the potential to relate to behavioral changes and improved outcomes for the diabetic patients. Factors and characteristics of the pharmacist-diabetic patient relationship naturally emerged through participants sharing of their lived experiences. Findings from this research study revealed 20 factors and 30 characteristics that influenced behavioral changes and improved outcomes for diabetic patient participants. Readers of this research study may be particularly interested in the six influential factors and 10 influential characteristics that were common to 50% or more of the participants. Further exploration into these factors and characteristics may prove to be beneficial in helping the medical community and diabetic patients manage diabetes more effectively.

Strengthening structural capabilities of health care organizations, CMS, and private insurers to implement effective MTM diabetic programs is important because historical methods of managing diabetes have not stopped the dramatic rise in diabetes in the United States. Diabetes increased 138% from 8.8 million to 20.0 million between 1980 and 2010 (CDC, 2011); health care costs related to diabetes have increased 32% from $132 billion in 2002 (CDC, 2011) to $174 billion in 2007 (CDC, 2011) and are projected to reach $336 billion by 2034 (Hung, Basu, O'Grady, & Capretta, 2009).

Therefore, it is important to seek out alternative methods to better manage diabetes, such as the MTM diabetic program implemented by the pharmacist who participated in this research study.

Given the magnitude of the problem, replicating the MTM diabetic program model developed by the participating pharmacist in San Francisco may be a solution to reversing the rapid growth of diabetes and health care costs associated with diabetes in the United States. The pharmacist and diabetic patients who shared their lived experience through this research study have provided the reader with insight into how the pharmacist-diabetic patient relationship can create positive social change that results in improved health outcomes.

5.0   References

Agency for Healthcare Research and Quality. (2015). *Outcomes research.* Retrieved from http://www.ahrq.gov/clinic/outfact.htm

American Diabetes Association. (2011). *Diabetes statistics*. Retrieved from http://www.diabetes.org/diabetes-basics/diabetes-statistics/

Bandura, A. (1994). *Self-efficacy*. New York, NY: Academic Press.

Bunting, B., & Cranor, C. (2006). The Ashville Project: Long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *Journal of the American Pharmacists Association*, *46*(2), 133-147. doi:10.1331/154434506776180658

Bunting, B., Lee, G., Knowles, G., Lee, C., & Allen, P. (2011). The Hickory Project: Controlling healthcare costs and Asheville outcomes for diabetes using the Asheville Project model. *American Health & Drug Benefits*, *4*(6), 343-350. Retrieved from http://www.AHDBonline.com

Bunting, B., Smith, B., & Sutherland, S. (2008). The Ashville Project: Clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia. *Journal of the American Pharmacists Association*, *48*(1), 23-31. doi:10.1331.JAPhA.2008.07140

Centers for Disease Control and Prevention. (2010). Medication safety program. Retrieved from http://www.cdc.gov/MedicationSafety/program_focus_activities.html

Centers for Disease Control and Prevention. (2011). Adults and older adult adverse drug events. Retrieved from http://www.cdc.gov/MedicationSafety/Adult_AdverseDrugEvents.html

Centers for Disease Control and Prevention. (2014). Updated and extended national health expenditure projections 2010-2020. Retrieved from http://www.cms.gov/NationalHealthExpendData/downloads/proj2010.pdf

Centers for Medicare & Medicaid Services. (2011). 2011 Medicare Part D medication therapy management (MTM) programs. Retrieved from http://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/downloads/MTMFactSheet2011063011Final.pdf

Centers for Medicare & Medicaid Services. (2012). Drug coverage (Part D). Retrieved from http://www.medicare.gov/sign-up-change-plans/get-drug-coverage/get-drug-coverage.html

Chrisholm-Burns, M., Zivin, J., Lee, J., Spivey, C., Slack, M., Herrier, R., & Palmer, J. (2010). Economic effects of pharmacists on health outcomes in the United States: A systematic review. *American Journal of Health-System Pharmacy*, *67*(19), 1624-34. doi:10.2146/ajhp100077

Cranor, C., Bunting, B., & Christensen, D. (2003). The Asheville Project: Long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *Journal of the American Pharmacists Association*, *43*(2)*,* 173-84. Retrieved from http://www.pharmacist.com

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Fera, T., Blumi, B., Ellis, W., Schaller, C., & Garrett, D. (2009). The Ten City Challenge: Final economic and clinical results. *Journal of the American Pharmacists Association*, *49*(3), 181-190. doi:10.1331/JAPhA.2009.09ol5

Fox, D., Ried, D., Klein, G., Myers, W., & Foli, K. (2009). A medication therapy management program's impact on low-density lipoprotein cholesterol goal attainment in Medicare Part D patients with diabetes. *Journal of the American Pharmacists Association*, *49*(2), 192-199. doi:10.1331/JAPhA.2009.09ol6

Hung, E., Basu, A., O'Grady, M., & Capretta, J. (2009). Projecting the future diabetes population and related costs for the U.S. *Diabetes Care, 32*(12), 2225-2229. doi:10.2337/dc09-0459

Husserl, E. (1931). *Ideas: General introduction to pure phenomenology* (D. Carr, Trans.). Evanston, IL: Northwestern University Press.

Iyer, R., Coderre, P., McKelvey, T., Cooper, J., Berger, J., Moore, E., & Kushner, M. (2010). An employer-based pharmacist intervention model for patients with type 2 diabetes. *American Journal of Health-System Pharmacy*, *67*(4), 321-315. doi:10.2146/ajhp090047

Jameson, J., & Baty, P. (2010). Pharmacist collaborative management of poorly controlled diabetes mellitus: A randomized controlled trial. *The American Journal of Managed Care*, *16*(4), 250-255. Retrieved from http://www.ajmc.com/publications/issue/2010/2010-04-vol16-n04/AJMC_10apr_Jameson_250to255

Johannigman, M., Leifheit, M., Bellman, N., Pierce, T., Marriott, A., & Bishop, C. (2010). Medication therapy management and condition care services in a community-based employer setting. *The American Journal of Health-System Pharmacists*, *67*(16), 1362-1367. doi:10.2146/ajhp090583

Lugwig, N., & Deaton, C. (2011). What can we learn from patients with heart failure about exercise adherence? A systematic review of qualitative papers. *Health Psychology*, *30*(4), 401-410. doi:10.1037/a0022848

Mayo Clinic. (2014). Definitions. Retrieved from http://www.mayoclinic.com/health/A1C-test/MY00142

McCarthy, D., Mueller, K., & Tillman, I. (2009). Group healthcare cooperative: Reinventing primary care by connecting patients with a medical home. *Organized Healthcare Delivery System*, *1283*(18). Retrieved from http://www.commonwealthfund.org/~/media/Files/Publications/Case%20study/2009/Jul/1283_McCarthy_Group%20Health_case_study_72_rev.pdf

Neyens, J., Dijcks, B., Twisk, J., Schols, J., van Haastregt, J., van den Heuvel, W., & de Witte, L. (2009). A multifactor intervention for the prevention of falls in psychogeriatric nursing home patients, a randomized controlled trial (RCT). *Oxford Journal: Age Ageing*, *38*(2), 194-199. doi:10.1093/ageing/afn297

Nouwen, A., Ford, T., Andreea T., Twisk, J., Ruggiero, L., & White, D. (2011). Longitudinal motivational predictors of dietary self-care and diabetes control in adults with newly diagnosed type 2 diabetes mellitus. *Health Psychology*, *30*(6), 771-779. doi:10.1037/a0024500

Nouwen, A., Urguhart Law, G., Hussain, S., McGovern, S., & Napier, H. (2009). Comparison of the role of self-efficacy and illness representations in relation to dietary self-care and diabetes distress in adolescents with type 1 diabetes. *Psychology and Health*, *24*(9), 1071-1084. doi:10.1080/08870440802254597

Patient Protection and Affordable Care Act, 111 U. S. C. § 3590. (2009). Retrieved from http://www.govtrack.us/congress/bill.xpd?bill=h111-3590&tab=reports

Pinto, S., Bechtol, R., & Partha, G. (2012). Evaluation of outcomes of a medication therapy management program for patients with diabetes. *Journal of the American Pharmacists Association*, *52*(4), 519-523. doi:10.1331/JAPhA.2012.10098

Polnikoff, R., Lippke, S., Courneya, K., Birkett, N., & Sigal, R. (2008). Physical activity and social cognitive theory: A test in a population sample of adults with type 1 or type 2 diabetes. *Applied Psychology*, *57*(4), 628-643. doi: 10.1111/j.1464-0597.2008.00344.x

Romanowich, P., Mintz, J., & Lamb, RJ. (2009). The relationship between self-efficacy and reductions in smoking in a contingency management procedure. *Experimental and Clinical Psychopharmacology*, *17*(3), 139-145. doi:10.1037/a0015842.

Smith, M., Bates, D., Bodenheimer, T., & Clearly, P. (2010). Why pharmacists belong in the medical home. *Health Affairs*, *29*(5), 906-913. doi:10.1377/hlthaff.2010.0209

Smith, M., Giuliano, M., & Starkowski, M. (2011). In Connecticut: Improving patient medication management in primary care. *Health Affairs*, *30*(4), 646-654. doi:10.1377/hlthaff.2011.0002U.S.

Yujin, K. (2010). The pilot study in qualitative inquiry: Identifying issues and learning lessons for culturally competent research. *Qualitative Social Work*, *10*(2) 190-206. doi: 10.1177/1473325010362001

Table 1

All 20 Influential Factors Identified by Diabetic Patients

	Influential factors
	Pharmacist knowledge of how exercise directly affects diabetic conditions
	Pharmacist knowledge of diabetic stages and how it progresses
	Environment that allows for continuity of health care (pharmacist, patient, physician)
	Physician referral
	Patient has positive experience with program
	Pharmacist takes time with patient
	Environment that allows patient to comfortably talk about their health
	Pharmacist documentation of glucose & A1C levels and visual charting (added glucose)
	Pharmacist knowledge of all medical conditions
	Pharmacists knowledge of nutrition as it relates to diabetes
0	Pharmacist knowledgeable
1	Longevity of the relationship
2	Mutual respect between pharmacist-physician
3	Patient trust in pharmacist
4	Multicultural/multi-linguistic environment, Eastern European cultures
5	Pharmacist explains consequences of neglect in meaningful way
6	Pharmacist knowledge of all medications
7	Pharmacist works with patient to set goals
8	Pharmacists knowledge and experience in administering injections
9	Pharmacy provides easy access to care
0	

Table 2

All 30 Influential Characteristics Identified by Diabetic Patients

	Influential characteristics
1	Ability to gain respect from patient through knowledge of medications and diabetes
2	Ability to establish meaningful relationship with patient
3	Ability to explain medical conditions, purpose of medications, and effects of medications in an understandable way
4	Ability to educate patient on how to control outcome through nutrition and diet
5	Ability to establish trust
6	Attractive personality/good person: cheerful, credible, engaging, entertaining, genuine, gregarious, welcoming
7	Ability to motivate patient to take action to control diabetes
8	Passionate/genuine concern for patient outcome
9	Ability to create a supportive environment
10	Ability to communicate in terms that the patient can relate
11	Ability to motivate patient to exercise
12	Ability to act as a coach (being there when questions or concerns arise) in providing support to patients in administering injections (or somehow ease patients concerns)
13	Ability to convince patient that they can better control glucose (A1C)
14	Ability to convince patient to measure glucose
15	Ability to help patient cope with fears
16	Ability to explain the progression of the disease and how it will impact the patients quality of life
17	Ability to help patient build confidence that they can take control and manage diabetes
18	Ability to instill fear of neglect of the disease
19	Ability to motivate patient to set goals (nutrition, exercise, A1C)
20	Ability to help patient build confidence that they can take control and manage diabetes
21	Ability to make patient realize how serious diabetes can affect their quality of life if it is neglected done in a way that motivates the patient to want to take ownership over their condition
22	Ability to gain trust, so patient believes in results
23	Ability to motivate patient to reach goals
24	Ability to motivate patient to change eating behaviors
25	Ability to encourage patient by sharing A1C results and correlating with behavioral changes
26	Ability to help patient improve quality of life
27	Ability to identify conflicts with medications
28	Ability to inspire patient
29	Ability to motivate patient to change diet
30	Development of a nurturing and understanding relationship between patient-physician-pharmacist

Table 3

All 26 Pharmacist Influential Factors

	Influential factors from pharmacist
1	As patients begin to understand they see hope
2	Common platform needed to retrieve patient medical information
3	Elderly mediation adherence challenges
4	Elderly people take more medications
5	Elderly population increasing exponentially
6	Haves and have-nots
7	Ignorance is at the core of fear
8	Instill hope in patient in showing changes of improving outcome
9	Lack of continuity of care
10	Lack of continuity of care impacts ability to measure outcome
11	Lack of continuity of care is related to lack of insurance, medical coverage
12	Lack of continuity of care is related to patients changing plans
13	Lack of follow up
14	Lack of time for physicians to spend with patients
15	Medical community showing dissatisfaction
16	Need for pharmacist to manage patients with multiple medications to provide continuity of care and improve quality of life, improved outcome
17	Need for pharmacists to get paid for services
18	Number of prescriptions each patient takes
19	Nurses do not have the time to discuss with patients
20	Patient comes in depressed
21	Patients need someone to help them understand
22	People who experience declining outcome are more often those who are mentally disabled, have no caregiver, and/or are economically disadvantaged
23	Physician extends Patient-physician trusted relationship to include pharmacist
24	Physicians turning to concierge type practices (do not accept private insurance)
25	Society where everyone wants everything for nothing
26	Upon understanding, and seeing hope patient becomes happier

Table 4

All 17 Pharmacist Influential Characteristics

	Influential characteristics from pharmacist
	Affluent relationship with pharmaceutical industry
	Built trusting relationship with physicians
	Clinical pharmacist trained to educate patients
	Develop business and expand clinical services
	Engaging debate between physician & pharmacist on patient medication treatment
	Enjoy the work
	Intellectual physician-pharmacist relationship
	Need for pharmacist to get involved with physicians
	Organize to create a good work life balance
	Pharmacist engagement with MTM
0	
	Pharmacist interest in outcome
1	
	Pharmacist interest in patient care
2	
	Pharmacist intervention
3	
	Physician, Pharmacist shared interest in patient outcome
4	
	Physicians look at pharmacist as a partner
5	
	Willingness to continuously learn
6	
	Willingness to extended work hours (Sunday)
7	

Table 5

Influential Factors Common Across the Pharmacist-Diabetic Patient Dyad

Factors from pharmacist	Influential factor from diabetic patient participants
Lack of continuity of care	Environment that allows for continuity of care
Lack of continuity of care impacts ability to measure outcome	Platform for communication between pharmacist, patient, and physician
Lack of follow up	Platform for communication between pharmacist, patient, and physician
Lack of time for physicians to spend with patients (no time to discuss medications)	Pharmacist takes time with patient
Need for pharmacist to manage patients with multiple medications to provide continuity of care and improve quality of live, improved outcome	Pharmacist knowledge of all medications Involvement in patient relationship and service Platform for communication between pharmacist, patient, and physician
Number of prescriptions each patient takes	Pharmacist knowledge of all medications
Nurses do not have the time to discuss with patients	Pharmacist takes time with patient
Patients need someone to help them understand	Pharmacist knowledge of diabetic stages and how it progresses
Physician extends patient-physician trusted relationship to include pharmacist	Physician referral Patient trust pharmacist
Patients need someone to help them understand	Pharmacist knowledge of how exercise directly affects diabetic conditions
Physician extends patient-physician trusted relationship to include pharmacist	Physician referral Patient trust pharmacist
Upon understanding, and seeing hope patient becomes happier	Pharmacist knowledge of how exercise directly affects diabetic conditions Pharmacist knowledge of diabetic stages and how it Progresses Pharmacist knowledge of nutrition as it relates to diabetes

Table 6

Influential Characteristics Common Across the Pharmacist-Diabetic Patient Dyad

Characteristics from pharmacist	Influential characteristic from diabetic patient participants
Built trusting relationship with physicians	Development of a nurturing and understanding relationship between patient-physician-pharmacist
Clinical pharmacist trained to educate patients	Ability to educate patient on how to control outcome through nutrition and diet
Develop business and expand clinical services	Development of a nurturing and understanding relationship between patient-physician-pharmacist
Engaging debate between physician & pharmacist on patient medication treatment	Development of a nurturing and understanding relationship between patient-physician-pharmacist
	Willingness to coordinate care with physician
Enjoy the work	Passionate/Genuine concern for patient outcome
Intellectual physician-pharmacist relationship	Willingness to coordinate care with physician
Need for pharmacist to get involved with physicians	Willingness to coordinate care with physician
Pharmacist engagement with MTM	Ability to explain medical conditions, purpose of medications, and effects of medications in an understandable way
Pharmacist interest in outcome & Patient Care	Passionate/genuine concern for patient outcome
Pharmacist intervention	Ability to act as a coach (being there when questions or concerns arise) in providing support to patients in administering injections
Physician, pharmacist shared interest in patient outcome	Willingness to coordinate care with physician
Physicians look at pharmacist as a partner	Development of a nurturing and understanding relationship between patient-physician-pharmacist
Willingness to continuously learn	Ability to gain respect from patient through knowledge of medications and diabetes