

Team-Based Care in the Management of Type 2 Diabetes with Consideration for Social

Determinants of Health

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### Abstract

The reactionary nature of the current healthcare delivery system in the United States has led to increased healthcare spending from acute exacerbations of chronic disease and unnecessary hospitalizations. Those who suffer from chronic diseases are particularly at risk. The dynamics of health care must include grappling with the complexities of where and how people live and attempt to manage their health and disease. Team-based care may offer a solution due to its interdisciplinary focus on proactive, preventative care delivered in outpatient primary care. Studies examining the effects of team-based care have shown improvement in; HbA1c, blood pressure, lipids, healthcare team morale, patient satisfaction rates, quality of care, and patient empowerment. In an effort to improve type 2 diabetes health outcomes and patient satisfaction a team based care project was implemented. The setting was an outpatient primary care clinic where the patients are known to have limited social resources. The healthcare team was comprised of a DNP Student, Master of Social Work Student, Clinical Pharmacist, and Primary Care Physician, who discussed patient specifics during informal meetings and referral processes. Adult patients whose HbA1c level was greater than 6.5% were eligible to participate, 183 were identified and invited. Fourteen (14) agreed to participate and seven (7) completed the initial screening with a mean HbA1c of 9.7%. Significant social needs were identified using the Health Leads Questionnaire. The diabetes and social needs were addressed by members of the team who met individually with patients monthly over the course of three months. Of those who completed the initial evaluation only two (2) returned for a follow-up and had a repeat HbA1c. Both participants had important improvements in their A1C with a decrease of 2.3%, and 3.4%. The others were lost to follow up for unknown reasons. Despite the small numbers of participants this project suggests that patients can benefit when an interdisciplinary team addresses their needs and this could improve health outcomes.

*Keywords:* Team-based care, Type 2 Diabetes, A1c, health outcomes, social determinants of health

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Various issues exist related to the delivery and quality of care in chronic diseases like diabetes, hypertension, Chronic Obstructive Pulmonary Disease (COPD), Congestive Heart Failure (CHF), dyslipidemia, and psychological issues like depression. Chronic diseases are manageable, and yet the current model of care leads to increased cost, poor outcomes, and ineffective organization of care (Arizona Health Survey, 2009). Employing the use of a multidisciplinary team based approach to healthcare has been shown to improve patient outcomes in various disease processes by improving quality of healthcare (Harris et al., 2011; Shortell et al., 2004).

### **Problem Statement**

The current health model exists to treat acute issues related to chronic diseases (Cramm & Nieboer, 2014a). Patient's limited understanding of their disease process leads to acute disease exacerbations, unnecessary emergency department visits or hospitalizations, and emergency medical situations. Because of this, the cost of managing a chronic disease is seven times more expensive than for the average healthy adult (Akinci & Patel, 2014). In 2012, it was estimated that half of all adults in the US suffer from at least one chronic disease, and 25% had two or more (Centers for Disease Control and Prevention [CDC], 2014). In circumstances where the cost of healthcare is already high for those with chronic conditions, the total cost of both primary and secondary healthcare expenditures increases with each additional comorbidity, regardless of age, gender, or socioeconomic status (Glynn et al., 2011).

Arizona ranks higher than the national average in prevalence rates of adults aged 18 years or older diagnosed with diabetes, chronic kidney disease, and COPD (Centers for Disease Control and Prevention [CDC], 2013). The Arizona Health Survey from 2008 found that 2.7 million adults over the age of 18 are living with a chronic medical condition (2009). Fourteen percent of those

have three or more chronic conditions (Arizona Health Survey, 2009). All of this suggests the need for exploring creative, integrative solutions to improve the quality of healthcare for some of the most vulnerable populations.

### **Background/Significance**

The current health model, with its basis in reactivity instead of proactivity, is inadequate in meeting the needs of a continually aging population. A better option that focuses on preventative measures to improve chronic disease outcomes exists. It takes improved efforts by the healthcare community in supporting the needs of those suffering from complex chronic diseases. Social determinants of health, including access to medication, money for healthcare appointments, transportation, food, and safe housing, may also influence a patient's ability to manage their chronic disease.

Evidence supports the implementation of team-based care. It points to improvements that can be measured in patient outcomes, including HbA1c, BP, cholesterol, and depression levels, as well as reported patient improvements of increased knowledge, satisfaction rates, and empowerment. It also demonstrates the link between team-based care and improved office morale, satisfaction, teamwork, and effective team interactions (Harris et al., 2011; Shortell et al., 2004). These factors validate the benefits of and support the implementation of team-based care.

### **PICOT Question**

Chronic diseases can have devastating effects for patients' quality of life. Chronic disease exacerbations have become a detriment to the modern healthcare system in the US due to increased spending and cost. As the population continues to age, these problems only serve to become worse, as more Americans develop more chronic diseases and comorbidities. By providing opportunities for the healthcare team to engage the patient and become a motivated

participant in their own care, the quality of healthcare, patient satisfaction rates, and the cost of healthcare all stand to be improved. This culminates to the final PICOT question: In adults (>18 years old) with type 2 diabetes, how does a multidisciplinary team-based approach compared to independent primary care provider practice affect diabetes management?

### **Search Sources and Process**

A multi-database search was conducted to answer this question. The databases searched included PubMed, CINAHL, and PsychINFO. The term “*chronic illness*” was searched in all databases, along with various MeSH terms including *interdisciplinary health team*, *medical care team*, and *healthcare team*. The term *Chronic Care Model* was included in the search in PubMed and CINAHL. Hand searching through reference lists from certain articles lead to further article discovery through ancestry methods. This method provided the articles by Arevian (2005), Litaker et al. (2003), and Shortell et al. (2004). While these studies were published greater than five years ago, they provided valuable information and were thus included in the literature review.

### **Final Yield**

The final yield for the search as described included 10 total studies that were critically evaluated and included based on their applicability to practice and quality of the studies. The included studies are mostly of high Levels of Evidence (LOE), with seven studies from either LOE I or II. These studies are either systematic reviews (SR) or Randomized Control Trials (RCT). There is one study each from LOE IV, V, and VI. These were a cross sectional cohort analysis, qualitative SR, and descriptive study. They were included as they provided insight into methods for team-based care implementation and the benefits that were a direct result of its implementation. Studies were included if they addressed chronic disease processes, team based care, or the Chronic Care Model.

### **Conclusions Based on the Evidence**

Collaborative, team-based care can have reaching positive effects for patients, practitioners, and monetarily, for the healthcare system as a whole. There is evidence that a patient-centered, multidisciplinary approach to chronic disease management benefits those suffering from chronic illnesses by: improving patient understanding of their disease, empowering and motivating patients to engage in health maintenance activities, and decreasing instances of exacerbations (Cramm & Nieboer, 2014a). A team-based approach can change the current health model from one of reactivity to a more proactive and patient tailored approach (Cramm & Nieboer, 2014b). Team care has been shown to improve patient adherence, decrease healthcare costs, improve health maintenance outcomes, reduce hospital admission rates, and improve office morale of those participating in the care team (Arevian, 2005).

There are a variety of team approaches to consider. A team could be composed of a primary care physician/medically supervised nurse team, or use a general practitioner, diabetic educator, dietician, nurse, and a public health officer who acted as a point of contact for patients on a one to one basis (Arevian, 2005; Katon et al., 2010). The addition of a Social Worker could improve access to care by empowering the patient to participate in care and find a means around the challenges they may face on a day-to-day basis while living with a chronic disease (Findley, 2014).

The studies mentioned previously address team-based care and its impact on diabetes. The following measures showed improvement: HbA1c (Arevian, 2005; Litaker et al., 2003; Katon et al., 2010); improved HDL and LDL levels (Litaker et al., 2003; Katon et al., 2010); lower systolic blood pressures (SBP) (Katon et al., 2010); improved continuity of care, and decreased cost (Arevian, 2005); and improved patient satisfaction with care (Litaker et al., 2003). Team-based care also improved depression scores (Katon et al., 2010) (Appendix A).

### **Purpose and Rationale**

The purpose of this project is to identify the best method(s) to implement team-based care, and to identify its efficacy and use in the modern primary care office. The current system of care addresses only the presenting medical problem. Team-based care offers the opportunity to address a broader spectrum of issues, such as those related to the social determinants of health.

### **Evidence Based Practice Model**

The Iowa Model of Evidence-Based Practice served as a means for transitioning this research into a practice change. This model calls for a team formation to implement a practice change that is of importance to the organization (Brown, 2014). It calls for a logical stepwise approach to research implementation that requires identification of an interdisciplinary care team who function as stakeholders in the application of the proposed project (Brown, 2014). The team assesses the research and forms a PICOT, conducts a literature review and critique, and eventually implements the practice change in a pilot change (Brown, 2014). This EBP model fits well with the CCM theoretical framework and the ultimate goal in focus: team-based care implementation in chronic disease management (Appendix B).

### **Theory and How It Relates to the Evidence**

The Chronic Care Model (CCM) served as the theoretical basis for this project. The CCM is based on six areas of focus: 1) the health system and organization of health care; 2) self-management support for patients to participate in managing their own care; 3) delivery system design that supports proactive decision making for addressing health care needs; 4) decision support for the health care providers that is based on evidence-based practice; 5) clinical information systems that allow access to patient population data; and 6) linkages to community resources to facilitate care beyond the scope of the clinical environment (Cramm & Nieboer, 2014a; Findley, 2014). It provides a framework for implementation of care that focuses on



proactive rather than reactive methods of chronic disease management to reduce negative disease-related outcomes (Cramm & Nieboer, 2014a). The CCM suggested practice changes in areas to improve the care of patients with chronic diseases, one of which was to make care delivery more team-based (Coleman, Austin, Brach, & Wagner, 2009). The systems changes, which also included education to further provider's knowledge and skills, education and support for patients, and useful practice in the registry information system, was further validated by Cochrane review (Coleman et al., 2009). Recent additions to the Model allowed for inclusion and consideration for patient safety, cultural competence, improved care coordination, community policies, and case management when working with chronic disease patients (Findley, 2014).

## **Methods**

### **Statement of Ethical Approval**

This project obtained ethical approval by Arizona State University's Institutional Review Board, as well as the Privacy Board for the project implementation site. All study participants gave informed consent prior to taking part in the study.

### **Participants and Setting**

This project was implemented in a primary care practice in the Southwestern United States. Patients were eligible to participate in the project if they listed two specific Providers as their Primary Care Provider, if their hemoglobin A1c was above 6.5%, if they spoke English, and if they were older than 18 years of age.

### **Study Design and Intervention**

Participants were screened based on the eligibility criteria listed previously. Eligible, patients were contacted via telephone and read an approved Cover Letter with project details and specifics. If they agreed to participate, an initial appointment was scheduled with the Project

Lead to review the Written Consent and the Health Leads Screening Questionnaire form. The participant also received additional diabetes counseling during the first meeting. The DNP Student assisted the participant in setting goals to work towards for their next interaction. The participant was then referred to the Masters of Social Work Student, who reviewed answers from the Health Leads Screening Questionnaire and offered social resources. The Clinical Pharmacist provided medication review and if needed modified medications based on the client's most recent HbA1c. Participant specifics were discussed with the Primary Care Provider.

The Health Leads Screening Questionnaire was developed using guidelines from the Institute of Medicine, Centers for Medicare and Medicaid Services, and Centers for Disease Control with support by the Robert Wood Johnson Foundation (Health Leads, 2016). As a tool that was developed and released in July 2016, the reliability and validity of the screener as a whole has not yet been determined. However, each question included in the screening tool was pulled from clinically validated health questionnaires, (USDA Household Food Survey, the Veterans Administration questionnaire, Children's Health Watch Survey, Behavioral Risk Factor Survey, The Impact of Competing Subsistence Needs, U.S. Department of Justice's Exposure to Violence Instrument, and the Survey of Income and Program Participation) (Health Leads, 2016). With ten total questions, this screening questionnaire is filled out by patients and can be completed in five minutes or less (Health Leads, 2016). The questions included are simple yes/no questions.

Patients were contacted at least once per month by the DNP Student, or more if they requested. The patient was free to schedule appointments with their Primary Care Provider as they saw fit. Both the MSW Student and the Clinical Pharmacist contacted the patient as much as they deemed was necessary based on their own assessments. Collaboration between the team members was done on a weekly basis as updates occurred.

A post-implementation hemoglobin A1c was measured at the end of the three-month period. Participants were asked to complete a satisfaction survey and a questionnaire asking them about their use of the resources offered during the project. The second screening questionnaire selected was the Patient Experiences Questionnaire. This is a short survey that contains 18 total questions answered via Likert scale. The validity and reliability of the screening form is excellent, with a Cronbach's alpha for all 18 items of 0.82 (Steine Finset, & Laerum, 2001).

### **Results**

Out of a total 183 potential participants, 14 agreed to participate. Two of the participants were male (14.3%), and twelve were female (85.7%). A majority of the participants were Hispanic (n = 5, 35.7%), followed by Caucasian (n = 4, 28.6%) and African American (n = 4, 28.6%), and finally Native American (n = 1, 7.14%). Participant age ranged from 48 to 89, with a mean age of 64 (Appendix C).

Seven of fourteen participants came for their initial appointment with the Project Lead. The most common issue on the Health Leads Screening Questionnaire identified by participants was "Have you needed to see a doctor, but could not because of cost?", with 42.9% answering positively. Other issues identified were "Did you ever eat less than you felt you should because there wasn't enough money for food?" (28.6%), "Have you ever had to go without health care because you didn't have a way to get there?" (14.3%), and "Do you ever need help reading hospital materials?" (14.3%). The participants were referred to the MSW Intern for assistance with these issues, who offered them different community resources to assist with their needs.

Pre and post intervention HbA1c were measured. Pre intervention HbA1c ranged from 7.5% to 14.7%. The mean HbA1c was 9.7%, with a median of 9.0% and a mode of 10.6%. Participants were lost to attrition in this project, which resulted with a final n of 2. Because of this, the final results were not statistically significant. However, there was significant change in

the pre and post HbA1c for the final participants of the study. One participant's initial HbA1c was 8.8%, with a final of 6.5% as reported by the patient. This was with diet and lifestyle changes alone. The other began with a HbA1c of 11.6%, with a final of 8.2%. This patient was started on pioglitazone at the beginning of the project by the clinical pharmacist involved in the project. When used as an adjunct therapy, pioglitazone has been shown to reduce HbA1c by 0.8 to 1.7% over the course of 24 weeks when used in combination with a sulfonylurea or metformin (Tran, Delate, & Bachmann, 2008). This participant's HbA1c decreased by 2.6% in 12 weeks. Because of the significant improvement in the two final participant's HbA1c, this project could be considered clinically significant.

None of the participants returned the Patient Experiences Questionnaire.

### **Discussion**

One of the limitations of this project was its low recruitment. This is likely due to cold calling eligible patients. Half of the recruited participants were referred to the Project Lead as potential participants from the Primary Care Providers. The rate of recruitment was much higher in instances where there was a warm hand off and direct referral from the provider, versus when the patient was called and invited to participate with no prior introduction by other members of the healthcare team.

As this project showed clinical significance, it is being continued by another DNP student. The lack of statistical significance was due to the high attrition rate. Changes to the project will include universal screening, including Spanish speaking patients, in an effort to increase participant recruitment. Additional changes will include a warm handoff from the Primary Care Provider to the Project Lead.

### **Conclusion**

While this project was not statistically significant, it demonstrates the need for team-based care, increased education and face time, and attention to social determinants of health. With the continuation and alteration of some aspects of the project, there may be statistical significance that would confirm the need for continued interdisciplinary management of chronic disease patients. Particularly with the aging population, it is becoming increasingly important to develop and identify new strategies to more adequately and effectively manage chronic diseases patients.

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