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Evaluating the Impact of Pre-Visiting Planning on the Effectiveness of Primary Care Appointments for Patients with Type Two Diabetes

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Abstract

Background and Significance: Type two diabetes (T2DM) is a complex chronic medical condition affecting approximately 21 million Americans and the cost in the United States for managing T2DM is over \$300 billion annually.

Purpose, Aims, and Objectives: The purpose of this DNP project was to evaluate the impact of pre-visiting planning on the effectiveness of appointments for T2DM. The Aims/Objectives were to implement and evaluate a pre-visit planning intervention for patients with T2DM and then to provide practice recommendations for the use of pre-visit planning.

Theoretical Framework: This study was guided by the Patient-Centered Care model of care. This theory focuses on the whole patient which is necessary for addressing the complexity of T2DM management.

Methods and Design: A quantitative quasi-experimental design was used to evaluate patients' opinions on the effectiveness of utilizing the American Academy of Family Physicians (AAFP) Diabetes Assessment Form for pre-visit planning for T2DM appointments.

Results: Twenty-one post-intervention surveys were received. The majority of respondents reported the intervention was helpful, easy to complete, and made the appointment more effective. Responses varied for whether they would want this intervention to be used in future appointments.

Conclusion: Pre-visit planning can be an effective intervention to improve care and decrease costs. This study does not support the use of the AAFP Diabetes Assessment Form for pre-visit planning.

Future Implications and Recommendations: Further studies are needed to identify an effective tool for pre-visit planning for patients with T2DM to improve the health of this population.

Keywords: Effective appointments; Patient-centered care; Pre-visit planning; Type two diabetes

Introduction

Type two diabetes (T2DM) is a complex medical condition that can significantly impact an individual's morbidity and mortality (World Health Organization) [1]. T2DM management is also complex, and there are often multiple specialists involved in the care of each of these patients that can include their primary care provider, an endocrinologist, a nutritionist, a podiatrist, an ophthalmologist, a neurologist, and a cardiologist [2]. Patient-centered care (PCC) can be effective for managing these types of complex patients as it is a model of care that focuses on the specific needs of each patient and can provide more coordinated, comprehensive, and personalized care for patients (American Academy of Family Physicians) [3]. Patient engagement is a key component of PCC and could be supported through the use of pre-visit planning [3]. Pre-visit planning involves either the patient, the provider, or both parties being involved in preparing for an appointment ahead of time [3]. To improve the healthcare of these patients with T2DM in the primary care setting, pre-visit planning could be added to their routine visits with primary care providers to increase the effectiveness of each appointment.

Background

Type two diabetes is a chronic medical condition where the regulation and utilization of glucose are impaired which leads to significant damage to the body including the cardiac, nervous, and immune systems (WHO, 2021). The prevalence of T2DM in the adult American population in 2016 was 8.6% which equates to approximately 21 million people [2] and worldwide there has been an increase in premature mortality related to DMII of 5% between 2000 and 2016 (WHO, 2021). In the United States in 2017 the medical costs of T2DM along with the loss in productivity were estimated at \$327 billion which is a 26% increase since 2012 when the cost was \$245 billion (American Diabetes Association) [4]. Interventions are needed to improve the management of T2DM to manage the morbidity and mortality risks for individual patients and minimize the significant financial impacts on the healthcare system.

Pre-visit planning is a patient engagement intervention that could have positive effects both personally for patients, as well as the healthcare system through improved effectiveness of appointments and decreased overall use of the healthcare system through improved health in these individuals [5]. Pre-visit planning is a broad term that can be implemented in various ways, but the basic concept is that the patient and/or provider engage with their healthcare information before appointments occur. Pre-visit planning can include actions such as reviewing labs/imaging, reviewing any emergency room visits or consultations, visit reminders, visit instructions on what to expect/bring, or any other appointment requirements [3]. Engaging patients through pre-visit planning has been shown to improve the patients' experience, decrease the rates of missed appointments, and increase the effectiveness of appointments from both patient and provider perspectives [6].

Project Purpose, Aim, and Objectives

The purpose of this Doctor of Nursing Practice (DNP) project was to quantitatively evaluate the impact of implementing pre-visiting planning before routine visits for patients with T2DM receiving care at the EAFP on the effectiveness of those appointments from the perspective of the patients. This DNP project aimed to increase the level of engagement for patients with T2DM with their healthcare and to increase the effectiveness of their medical appointments. Project objectives were: 1) conduct a literature search to evaluate the current knowledge related to pre-visit planning for patients with T2DM and identify an appropriate pre-visit planning tool; 2) create a survey for post-intervention feedback from the patients; 3) identify patients with appointments during the study timeframe and generate a list of those patients to be included; 4) provide those identified patients with study packets when they check-in for their appointments; 5) compile and review the data from the post-intervention surveys; 6) provide recommendations for further use of this pre-visit planning tool in the primary care setting based on the literature review and the results of this study.

Project Contributions to Advanced Practice Nursing Scholarship and Practice

This DNP Project contributes to advanced practice nursing scholarship and practice by evaluating the impact of pre-visit planning on the effectiveness of primary care appointments. Following the analysis of the post-intervention surveys completed by the patients, recommendations are made that could affect how pre-visit planning is implemented in the primary care setting with the goal of increasing the effectiveness of appointments for patients with T2DM.

Theoretical Framework

The patient-centered care (PCC) model was used as the theoretical framework for the development of this DNP project. Carl Rogers in the 1940s is credited with beginning to transition the focus of healthcare from practitioner-centered care to PCC through his work as a clinical psychologist [7]. The core components of Roger's work were accepting the client as they are, empathy, and the development of an authentic relationship [7]. It was Edith Balint, [8], who first coined the term 'patient-centered care' and it was her work that led to the model of care which is still in use today. Balint [8] emphasized the need for "understanding the patient as a unique human being" and focusing on them as a whole person instead of practicing illness-oriented medicine. In 2001 the Institute of Medicine [9] published its seminal report, *Crossing the Quality Chasm*, a groundbreaking piece that brought to light issues within the current healthcare system and suggestions on how to improve those areas (Institute of Medicine (US) [9] Committee on Quality of Health Care in America [9]). The IOM identified patient-centeredness as one of its six aims for improvement, emphasizing how integral patient-centered care is for quality healthcare [9].

Patient-centered care considers not only a patient's health status or illness but also their experience with that condition (IOM, 2001). It is through communication and developing a positive working relationship between a patient and their provider that patient needs can be truly understood which is the necessary groundwork for providing patient-centered care. The IOM includes 6 dimensions that have been identified for PCC; 1) respect for the patient's values, preferences, and expressed needs, 2) coordination and integration of care, 3) information, communication, and education, 4) physical comfort, 5) emotional support- relieving fear and anxiety, and 6) involvement of family and friends [9].

Respect for the patient's values and expressed needs is the initial dimension of PCC and it guides the practitioners to provide care in a way that considers the various aspects of a patient's want, needs, and preferences including but not limited to; their physical and emotional needs, cultural preferences, risk tolerance, preferred level of involvement in their care [9]. All the above factors can change over time and need to be reassessed on an ongoing basis to ensure continued optimal care [9].

The second dimension of PCC is the coordination and integration of care. Providers are in a position where they have a responsibility to assist patients with coordinating necessary care promptly such as imaging, tests, and consultations, and ensuring that results are disseminated to other providers as required [9]. This coordination is especially important for those suffering from physical or emotional issues as that can impact their ability to perform these functions independently [9]. Primary care providers are well-situated to assist patients with this task. Information, communication, and education are the third dimension of PCC. For a patient to make informed decisions for their health care they must first have a good understanding of their health condition and the available treatment options [9]. This information must be available to patients in a way that is accessible, in an appropriate language and format, and at a level that they understand [9].

The fourth and fifth dimensions of PCC are related to comfort and support. The fourth dimension is physical comfort, and the fifth dimension of PCC is emotional support- relieving fear and anxiety. This includes the timely, tailored, and expert care of physical discomforts such as pain, shortness of breath, and others, as well as addressing their emotional and spiritual needs [9]. The sixth and final dimension of PCC is the involvement of family and friends. This involves including, at the direction of the patient, friends, and family members that they would like to have involved in the decision-making and management of their health care, supporting those individuals as caregivers, and acknowledging their needs and involvement [9]. For this DNP project, the patient-centered care model was utilized to inform decisions on the choice of the pre-visit planning questionnaire, the implementation of the intervention, and the development of the post-intervention survey for the patients. The results from this project's intervention along with the findings from the review of evidence-based literature were incorporated to support practice recommendations for further use of pre-visit planning for patients with T2DM in the primary care setting.

Review of the Literature

A literature review was conducted exploring the use and the effectiveness of pre-visit planning with patients with T2DM using the following keywords both singularly and in multiple combinations; type two diabetes, type 2 diabetes, type ii diabetes, t2dm, type 2 diabetes mellitus, NID-DM, chronic illness, chronic condition, chronic, pre-visit, pre-visit planning, pre-appointment planning, visit planning, appointment planning, diabetes assessment form, effective appointments, compliance, time-saving, and efficient. Databases searched included CINAHL Plus with Full Text, PubMed, and Web of Science. The database search was limited to the years 2018 to 2023 to ensure that only the most current evidence-based research on this topic was included. Duplicate articles were removed, then the remaining titles and abstracts were reviewed for relevance. Full-text articles were then reviewed for inclusion and a total of 10 articles were included in the literature review. The literature review identified three main concepts: patient engagement, cost benefits, and time management. A synthesis of the literature is presented.

Patient Engagement

The first theme identified through the literature review was patient engagement. The use of pre-visit planning was found to be an effective method for increasing patient engagement with their health care [10-13]. Vo et al. [13] used an email-based method of communication to have patients identify their top 1-2 priorities for upcoming visits, and this one action was found to increase patients' reported satisfaction with their care experience and improved patient-provider communication. This study by Vo et al. [13] however did not find that the DM clinical outcomes were improved. Health information technology was used effectively in the waiting room for patients in the study by Grant et al. [14] to identify their appointment priorities, and this intervention resulted in patients feeling more prepared for their appointments and more likely to communicate their priorities. This intervention by Grant et al. [14] also did not show an improvement in clinical outcomes. Both Vo et al. [13] and Grant et al. [14] concluded that perhaps a more in-depth approach to pre-visit planning would be needed to see the improvements in T2DM clinical outcomes. Glenn et al. [12] completed a study with adolescents and young adults with chronic kidney disease and found that higher levels of patient engagement were associated with higher post-visit adherence to treatment plans. While this is a positive finding, the age and condition of those studied may affect the transferability of these findings. The use of patient engagement in the above studies overall showed a positive impact on patient experiences but varying rates of success in improving the clinical measures of T2DM.

Cost Benefits

Cost benefits were the second theme identified from the literature review. Burton et al. [10] conducted a review of claims to identify components of PCMH that were associated with decreased spending and healthcare utilization from Medicare beneficiaries. These authors identified six activities that showed a cost-saving; using the registry for reminding patients due for preventative services, using the registry for pre-visit planning and clinician reminders, monitoring patients during hospital stays, developing referral protocols, and using quality improvement approaches [10]. Most notable for this DNP project proposal is that utilizing the registry for pre-visit planning and clinician reminders showed a cost savings of \$29.31 per beneficiary per month [10]. Bodenheimer & Willard-Grace [15] conducted a review that showed the utilization of ancillary healthcare team members such as nurses, pharmacists, and social workers for planned diabetes management visits decreases the cost of their care and also improves their glycemic control. Matulis & McCoy [16] identified that utilizing the PCC model for appointment scheduling could improve efficiency and both patient and clinician satisfaction. Changes to achieve this include entrusting scheduling to the primary care team, pre-visit planning, engaging the ancillary team, and utilizing technology such as telehealth and artificial intelligence in the scheduling process [16]. The above efforts contributed to cost savings through a decrease in the number of return visits for unaddressed concerns [16]. Implementing PCC through the multidisciplinary approach to diabetes management and inclusion of pre-visit planning in the care of patients with diabetes, and in the scheduling process, was shown to decrease overall healthcare costs [10,15,16].

Time Management

The third theme identified through the literature review was time management. Pre-visit planning was found to be an effective method for improving time management for the care of patients with T2DM [13,17,18]. Patient-centered scheduling using pre-visit planning was an intervention that was found to be an effective way to improve time management in the primary care setting and resulted in improved efficiency of appointments and increases in both patient and provider satisfaction with appointments [16]. The lack of time to address T2DM care management in primary care was cited as a concern in several papers, and the practice of incorporating other members of the healthcare team such as nurses, pharmacists, social workers, endocrinologists, and diabetes educators, is an intervention that can help to support the primary care provider in their management of patients with T2DM [15,19]. Utilizing ancillary healthcare team members for aspects of the care that can be delegated such as nutrition education, medication education, and management, case management can decrease the amount of information that needs to be addressed during a primary care visit and can allow more thorough discussion and evaluations into areas of concern [15,19]. In the study by Davis et al. [19] endocrinologists and diabetes educators developed a care management plan and provided that to the patient's primary care provider, this intervention was shown to increase compliance with medications and result in a sustained reduction in A1C of 1.2% for at least 12 months [19]. The above interventions of using patient-centered scheduling and involving other healthcare team members in managing care for patients with T2DM were effective strategies to improve the efficiency of appointments.

Project Methods and Design

Project Design

This DNP project used a quantitative quasi-experimental design to evaluate patients' opinions on the effectiveness of utilizing the AAFP Diabetes Assessment Form for pre-visit planning before their routine DMII appointments. A quasi-experimental study is a type of research design that is non-experimental as there is no control or comparison group required, and there is no randomization of participants as there would be in a randomized controlled trial [20].

Project Setting

The project setting was the East Aurora Family Practice (EAFP), a private family practice located at 112 Olean St, Suite 220 in East Aurora, NY, 14052. The EAFP is a Patient-Centered Medical Home, which means the practice implements specific interventions to improve patient-centeredness [3]. East Aurora is a small village just south of Buffalo, NY with a population of 5998 individuals as reported on the 2020 census results [21,22]. The EAFP serves the Village of East Aurora and the surrounding area with a total patient census of 8780. This practice consists of 4 family physicians, 2 nurse practitioners, 3 physician assistants, 4 licensed practical nurses, 2 medical assistants, and 8 administrative staff. The electronic medical record software used by this practice is EClinical.

Participants or Subjects

Participant eligibility for this study was based on the following inclusion criteria; they must be a current patient of the East Aurora Family Practice, they must have a current diagnosis of T2DM, they must be 18 years of age or older, and they must be scheduled for a routine appointment during the study time frame of September 18th to October 6th, 2023. Exclusion criteria would include those who have no diagnosis of DMII, those under the age of 18 years old, and those either without an appointment during the study timeframe or those with an acute/sick visit during the study timeframe. A registry review was conducted within the electronic medical record of the practice to identify eligible participants. The search criteria included patients with an International Classification of Diseases, 10th revision (ICD 10) code: E11.00 through E11.9 to capture all patients of the East Aurora Family Practice with a diagnosis of type two diabetes, as well as the above-described age and appointment parameters. The registry review will be conducted by the DNP student utilizing the above-specified criteria.

Data Collection

Before commencing this DNP project, Institutional Review Board (IRB) approval was obtained through the University at Buffalo and can be viewed in Appendix A. A registry review was conducted as described in the above section. The list of eligible participants identified as fitting the study criteria was printed and that list was provided to staff responsible for checking patients in for their appointments. Upon checking in for appointments, those individuals identified received a study packet. The study packet was comprised of a recruitment letter explaining the study and the option to participate (Appendix B), the AAFP Diabetes Assessment Form (Appendix C), and the Post-Intervention Survey (Appendix D). Permission has been granted by the AAFP in a written statement on the form itself for the use and reproduction of the AAFP Diabetes Assessment Form for use in practice. The reliability and validity of this tool are not published; however, the results of this questionnaire are not to be part of the data to be included in the results section of this study, it is only to be used as the pre-visit planning tool.

Patients who chose to participate in the study completed the AAFP Diabetes Assessment Form while waiting for their appointment. This form was then reviewed with them by their provider during their scheduled appointment time. After completing the appointment, the patient completed the brief post-intervention survey to provide feedback on using the pre-visit planning questionnaire and its impact on their appointment. The post-intervention survey was then collected from the patient while they checked out from their appointment.

Protection of Human Rights/Ethical Considerations

There were several processes in place to protect the participants involved in this study. Prior to the implementation of the study, IRB approval was received through the University at Buffalo. Reviews of patient charts were completed as described above to identify potential participants, but no information from any of the medical records was included in the study. The eligible participants were provided a letter explaining that their participation is entirely voluntary, that their responses will be submitted anonymously, and that by completing the post-intervention survey they are providing their consent to be included in the study. The post-intervention surveys were submitted anonymously with no patient identifiers on them and collected in blank sealed envelopes. All data related to this study will be stored per the approved IRB protocol.

Results/Findings

During the study time frame of September 18th to October 6th, 2023, a total of 90 eligible participants were identified based on a review of the EAFP medical records. Each of these eligible participants were offered the study packets at their scheduled appointments and a total of 21 surveys were completed and all those were included in this project. The data collected from the post-intervention surveys was entered into Statistical Package for Social Science (SPSS) version 29 for statistical analysis. The data was coded manually for entry into SPSS and analysis. The data was examined initially for missing data which was addressed using appropriate methods. Descriptive statistics were calculated to describe our samples. All statistics were evaluated using a significance of 0.05.

The post-intervention surveys included three demographic questions; gender, age, and how many years the patients have had diabetes. From the completed surveys, the gender of the participant was indicated to be male in 12 surveys, female in seven surveys, none of the participants chose 'Prefer to not answer', and two participants did not indicate their gender. The ages of participants completing the surveys included a total of eight participants between the ages of 40-59 years, 11 between the ages of 60-79 years, and two participants over the age of 80 years old. The years that participants have had the diagnosis of diabetes included seven participants that had had T2DM less than five years, seven participants had had T2DM between 6 and 10 years, and five participants had had T2DM for over 10 years.

The post-intervention surveys also included six questions that used Likert scales to gauge patients' experiences with the study's pre-visit planning intervention. (Table 1) summarizes the responses to survey questions one through six. In the first question, the participants did indicate that sufficient time was available to complete the questionnaire with 90% of participants agreeing or strongly agreeing, and in the second question, 95% of participants indicated by agreeing or strongly agreeing that the survey was easy to complete. For the third question about whether the survey was helpful 71% of the participants either agreed or strongly agreed, whereas only 61% of the participants agreed or strongly agreed that the pre-visit planning intervention made their appointment more effective. Question five showed the widest range of responses to the question of whether this would be helpful in future appointments with 57% either agreeing or strongly agreeing, 19% undecided, and 14% disagreeing. Question six did show that 81% of participants were satisfied with their appointments by either agreeing or strongly agreeing.

	Strongly Agree	Agree	Undecided/ N/A	Disagree	Strongly Disagree	Total (N)
Question 1	10 (47%)	9 (43%)	1 (5%)	1 (5%)	0 (0%)	21 (100%)
Question 2	11 (52%)	9 (43%)	0 (0%)	0 (0%)	1 (5%)	21 (100%)
Question 3	7 (33%)	8 (38%)	5 (24%)	1 (5%)	0 (0%)	21 (100%)
Question 4	8 (38%)	5 (24%)	5 (24%)	1 (5%)	0 (0%)	19 (90%)
Question 5	7 (33%)	5 (24%)	4 (19%)	3 (14%)	0 (0%)	19 (90%)
Question 6	12 (57%)	5 (24%)	1 (5%)	0 (0%)	0 (0%)	18 (86%)

Table 1: Summary of post-intervention survey results.

A one-way ANOVA and a Chi-Square test were both used to analyze the data and it was determined that the number of years the participant has had T2DM did not significantly impact how they responded to the post-intervention survey.

Discussion

Pre-visit planning has been shown through multiple studies to be an effective intervention for improving patients' care. These studies have shown improvement in patient engagement with their healthcare, the costs related to patient care, and time management related to appointments [10,11,13]. As the EAFP does not currently have practice-wide pre-visit planning interventions for their patients, implementing such an intervention could be beneficial to improving the care of their patients with T2DM. This study's pre-visit planning intervention utilizing the AAFP Diabetes Assessment Form was a helpful exercise to gain more information regarding pre-visit planning for this population. Patients indicated that they had sufficient time to complete the study intervention and that the survey was easy to complete with over 90% agreeing or strongly agreeing to those statements. This shows that the AAFP Diabetes Assessment Form is appropriate for use in pre-visit planning from an ease-of-use perspective. Despite the patient's positive reports for completing the tool itself, the greatest variation in survey responses was noted to the question regarding whether it would be helpful to use the AAFP Diabetes Assessment Form for future appointments. Only 33% of patients strongly agreed, 24% agreed, and 33% undecided or disagreed. This spread in responses does not positively support the future use of this tool from the patients' perspective. Further studies with larger sample sizes, as well as utilizing other available pre-visit planning tools for patients with T2DM or even the creation of a new tool that may be better suited for pre-visit planning would be of benefit to increase patients' satisfaction with the intervention and continued interest in participating in pre-visit planning activities.

Patient-centered care was an appropriate theoretical framework for this intervention as the basis of PCC is that the whole person is considered when providing care (IOM, 2001). The use of this pre-visit planning tool provided the providers with a much fuller understanding of the patient including their, understanding of T2DM, readiness for change, current lifestyle habits, current diabetic care, interventions, and health care [3]. Having all of this information present at the beginning of the appointment gives the provider a better understanding of where the patient is coming from so that their interventions will be geared toward that patient and their situation. As stated above, to ensure quality care for a patient, care must be patient-centered, and using a pre-visit planning intervention can contribute to that outcome (IOM, 2001).

Project Strengths and Limitations

Various strengths and limitations are present in this study aimed at improving the care of patients with T2DM through implementing a pre-visit planning intervention. A strength of this study is that both the design of the study and choice of pre-visit planning tool were chosen intentionally to minimize the effort and involvement needed from patients with the goal of increased ease of patient participation and engagement. With these efforts, there was a 23% response rate for the study.

One limitation of this study was the small sample size as only 21 completed post-intervention surveys were received. This smaller sample size limits the interpretation and generalizability of the results. A lack of specificity in the post-intervention survey questions also limited the interpretation of the results. For example, the final question related to satisfaction with their appointment did not specify satisfaction with their appointment as a result of the study intervention, and thus, it does not provide as much information as could otherwise have been gleaned from the survey. The lack of input from the providers in this intervention also limited the amount of information that was gained from this project. Including the opportunity for providers to provide input, possibly with open-ended questions for those completing the visits with the T2DM patients, could have provided additional data and resulted in a greater depth of understanding of the effectiveness of the interventions and aided in directing future interventions.

Future Implications and Recommendations

Both the literature review and the results of this study's intervention show very positive responses to and results from pre-visit planning. Due to the complexity of the disease of T2DM and its management, these patients could significantly benefit from the pre-visit planning interventions. Benefits from pre-visit planning as described above include increased patient engagement, cost benefits, and improved time management which could all be advantages to patients with T2DM. While it is recommended, based on both a review of the literature and the data from this study, to utilize pre-visit planning interventions for patients with T2DM, further studies should be directed towards the identification or development of an effective pre-visit planning tool for the T2DM population.

Conclusion

Type two diabetes is a disease that can cause significant morbidity and mortality and requires complex management [2]. Patient-centered care as a framework can be used to improve the management of patients with type two diabetes by implementing pre-visit planning. A review of the literature found three main themes related to pre-visit planning; patient engagement, the cost benefits associated with pre-visit planning, and how pre-visit planning can impact time management. While the benefits of pre-visit planning have been shown in various settings, the EAFP does not currently implement routine pre-visit planning. The AAFP Diabetes Assessment Form was used in this intervention for pre-visit planning with overall positive responses from patients. The post-intervention surveys did not however support the continued use of this tool for pre-visit planning in future appointments. Following the collection and analysis of the data, these findings were compiled and presented to the providers of the East Aurora Family Practice in the form of a printed letter for their review. Based on the results of the literature review, and the data from this study, there is a positive reception from T2DM patients to pre-visit planning, and there is a need for continued efforts to identify effective interventions for pre-visit planning for patients with T2DM.

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