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Diabetes Education Benchmark Study

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Diabetes Education Benchmark Study

A Paper Submitted in Partial Fulfillment of the Requirements

For NURS 5382: Capstone

In the School of Nursing

The University of Texas at Tyler

by

Caitlyn Wildey

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I would like to take the time to thank all of those that have helped me to reach this point in my educational journey. Thank you to Dr. Greer and Dr. Marzilli for all the guidance and feedback throughout this project. I also want to thank all my professors throughout my graduate program for being available, encouraging, and inspirational. I also want to thank my husband Wyatt for all his encouragement throughout my graduate studies, he has been a huge motivator when I seemed burnt out and stressed from work and school commitments.

Executive Summary

The incidence of type two diabetes mellitus increases each year (Cradock et al., 2017). The number of people being diagnosed with type two diabetes is growing due to lifestyle and environmental changes. According to Healthy People 2020, diabetes mellitus is the seventh leading cause of death and affects almost thirty million people in the United States. Type two diabetes is important because of the increasing incidence of the disease and the complications that come if not managed. Some of the complications associated with type two diabetes include heart disease, kidney disease, neuropathy, retinopathy, and diabetic foot ulcers. Research shows that successful lifestyle changes in diet and exercise are beneficial in preventing or delaying the onset of type two diabetes (Diabetes, n.d.). In 2017, the total costs of those diagnosed with diabetes were \$327 billion, with \$237 billion being in medical costs alone (Diabetes Care, 2018). Programs that involve a healthy diet, physical activity, and stress management have shown a reduction in hemoglobin A1C levels, improved quality of life, lower associated healthcare costs, and reductions in complications (Diabetes Care, 2018). Early prevention or treatment of this disease is key as it will lead to better long-term outcomes.

Through dietary changes and physical activity, type two diabetics can achieve lower hemoglobin A1C levels as well as tighter blood glucose control. The PICOT question driving the project is: In patients with type two diabetes (P), how do exercise and a low-calorie diet (I) compared to no exercise and diet (C) affect A1C levels (O) over three months (T)? The proposed benchmark project is a diabetic education packet in an inpatient hospital setting. The proposed change will promote education on diabetes management with the goal to increase type two diabetics' quality of life and decrease the amount and or length of hospital stays due to the complications that come with this disease.

Rationale for the Project

Diabetes mellitus is a disease that happens when the body does not produce enough insulin or does not respond to insulin. Type two diabetes happens when there isn't enough insulin produced in the body, when there is resistance to the action of insulin in the body, or when the body does not use the insulin produced properly (Type 2 Diabetes, n.d.). Type two diabetes is important because of the increasing incidence of the disease and the complications that come if not managed. Some of the complications associated with type two diabetes include heart disease, kidney disease, neuropathy, retinopathy, and diabetic foot. The goal is to help this population delay or prevent long-term complications through diet and exercise.

According to Healthy People 2020, diabetes mellitus is the seventh leading cause of death and affects almost thirty million people in the United States. Research shows that successful lifestyle changes in diet and exercise are beneficial in preventing or delaying the onset of type two diabetes (Diabetes, n.d.). Another important factor to consider is the cost of living with diabetes. In 2017, the total costs of those diagnosed with diabetes were \$327 billion, with \$237 billion being in medical costs alone (Diabetes Care, 2018). Programs that involve a healthy diet, physical activity, and stress management have shown a reduction in hemoglobin A1C levels, improved quality of life, lower associated healthcare costs, and reductions in complications (Diabetes Care, 2018). The long-term effects of this disease can be delayed or prevented through diet and exercise. Early prevention or treatment of this disease is key as it will lead to better long-term outcomes.

The proposed benchmark project is a diabetic education packet in an inpatient hospital setting. Most hospitals either have a diabetic educator, dietician, or nurse to perform the teaching. Some hospitals do not have an educator at all, or they only work certain hours and

usually do not work weekends. There needs to be a packet of educational materials for newly diagnosed patients with diabetes or for someone already diagnosed who needs reinforced teaching. The current hospital of interest does not have a diabetes educator at all.

Literature Synthesis.

Guided by the clinical question, a systematic search was conducted, and multiple studies and articles were found. A total of 12 studies were synthesized and reviewed: Cradock et al. (2017), Faroqi et al. (2018), Gopalan et al. (2018), Johansen et al. (2017), Lean et al. (2018), Martenstyn et al. (2020), Martin et al. (2021), and Snorgaard et al. (2017) found results of lowered hemoglobin A1c levels were accomplished through diet and exercise. Exercise or some form of physical activity is an important factor in type two diabetes treatment and over a quarter of type two diabetics do not even exercise at all (Faroqi et al., 2018; Martin et al., 2020). Snorgaard et al. (2017) found that a low carbohydrate diet resulted in a reduction in A1c levels while Gopalan et al. (2018), Lean et al. (2018), and Martenstyn et al. (2020) found reductions in A1c levels due to a low-calorie diet. Researchers found that results were promising after three to six months (Cradock et al., 2017; Martenstyn et al., 2020) and even better results in lowered A1c levels at twelve months (Cradock et al., 2017; Johansen et al., 2017; Lean et al., 2018). From the information found in the studies, there is useful information that could be used to help develop an effective physical activity program (Martenstyn et al., 2020; Martin et al., 2021). The long-term effects of this disease affect the major organs in the body if not controlled. It can damage one's brain, eyes, heart, kidneys, and nerves. Hemmingsen et al. (2017) was a beneficial study as it assessed the effects of diet and exercise on both the prevention or delay of type two diabetes and the associated complications for those at risk for developing type two diabetes.

Through an educational-based program, Azami et al. (2018), Tachanivate et al. (2019), and Yu et al. (2022) found that a strong program with an emphasis on physical activity and exercise shows great benefits to lower hemoglobin A1c levels. Azami et al. (2018) and Yu et al. (2022) assessed a nurse-driven education program while Tachanivate et al. (2019) was a program driven by self-management of diabetes. All three programs showed a decrease in hemoglobin A1c levels, body weight, and medication utilization and costs. The studies also showed benefits in self-management behaviors.

Project Stakeholders

The stakeholders in this proposed project are patients with type two diabetes mellitus, or newly diagnosed. It would also include healthcare professionals such as nurses, physicians, and dieticians. The inter-professional collaborators that would be beneficial to the team are unit change champions, dieticians, physical therapists, and endocrinologists who could put together a committee to help type two diabetics better learn to manage this disease. Physical therapists can help with what beneficial exercises for this population are and dieticians' expertise in nutrition can help with what foods to eat as well as what foods to avoid. An endocrinologist's knowledge of the disease will aid in expressing the science behind dieting and exercising with its effects on blood glucose levels.

Implementation Plan

To implement this proposed project, a few steps need to be completed. The first step is gathering educational materials for various categories. The categories include type two diabetes, diet, exercise, sick days, blood sugar monitoring, and other resources. The packet is what could be given to patients newly diagnosed or those needing reinforced diabetic education. The packet would be visually appealing with pictures and charts. Nurses who are part of the team and

familiar with the packet, as well as its content, would be the ones to bring it to the patients to go over the educational materials with them.

There are many challenges when trying to implement change. Barriers to implementation include lack of knowledge and skills, lack of funding, lack of support, and absence of social and organizational guidance (Melynk & Fineout-Overholt, 2019). The specific barriers to this project would be the time, support, and workload needed for implementation. Of course, with all the changes, it is expected that there will be staff pushback and resistance to the change. Negative attitudes and perspectives towards evidence-based practice and research can make it difficult to get staff on board to change (Melynk & Fineout-Overholt, 2019). Barriers could be eliminated by starting a committee for this project to help get support and others involved to take some of the workload off. Another way barriers could be eliminated is the support and guidance from the multidisciplinary team such as an endocrinologist, dieticians, physical therapists, and change champions from each unit in the hospital. One other way to have staff support for the utilization of the education packet is to be persistent and to keep encouraging staff to utilize this resource when performing diabetes education and to ask for nurses' feedback on the packet to make adjustments as needed to make the project successful. A study by Trujillo et al. (2022) discusses the evaluation after implementing a diabetes self-management education program. This study found was successful that this program showed increased results in self-management behaviors that ultimately resulted in decreased HbA1c levels (Trujillo et al., 2022).

Timetable/Flowchart

The implementation process will ideally be a total of twelve weeks. Week one would involve the process of gathering as much educational information on each category to be included in the packet. Weeks two through three would be developing a rough draft of the packet

and setting up meetings with those who would be assisting in the development of the packet such as change champions for each unit along with managers, directors, and any other staff members who would like to be apart of the team. Also, during these two weeks, a rough draft of the packet will be put together. During weeks four through five will include attending the meetings and handing out flyers made on the evidence-based education packet. During weeks six through seven, the committee would meet with those who are part of the project and make changes to it. The team would also attend meetings/education sessions with specialists for input on changes. The specialists would include dieticians, endocrinologists, and physical therapists. Weeks eight through ten would be piloting the packet on a unit or two by giving it to patients and going through the information one on one with them. Finally, weeks eleven through twelve would be sending out surveys to evaluate the packets' effectiveness and to gain insight from the patient's points of view and their thoughts.

Data Collection Methods

To evaluate the effectiveness of the project, surveys could be sent out to patients that depict their point of view on how helpful it was for them and to evaluate the individual who performed the teaching. Also, a follow-up phone call would be done to further evaluate the packet from the patient's perspective. To evaluate the change process, hospital statistics would be gathered that include the number of patients with type two diabetes admitted for uncontrolled diabetes or related complications of the disease. The team would analyze the results and then present them to the key stakeholders.

Cost/Benefit Discussion

The estimated start-up cost for this project is \$7,580. The resources needed would be those part of the interprofessional team such as endocrinologists, dieticians, physical therapists,

and nurses. Office supplies such as paper, pens, and binders will average about \$150 for startup costs. The diabetes educator or specially trained staff members who will be implementing the education and developing the packet would get paid \$40/hour. Ideally, there would be a total of two educators for the start of the project. This would cost an estimated \$3,200 for the two educators for a week. Also needed would be three additional staff nurses who would like to take part in the project. They would be paid \$34/ hour with a total of 40 hours a week for their research and helping put together the education packet. The total estimated cost for one week would be \$4,080. Technology costs are also included and are estimated to be \$150/ month. The benefits of this project could be such a great benefit not only for the diabetes patient population but also for the hospital as the goal is to reduce the readmission rates and overall diabetes costs. also the hospital as the goal is to reduce the readmission rates and overall diabetes costs.

Discussion of Results

The project is not something that can be implemented at my facility due to many challenges including factors such as covid-19 restrictions in my clinical facility and the clinical facility being an acute care hospital. This project would be easier implemented in a clinic type of setting. Therefore, a benchmark project is being submitted.

Through this project, a lot has been learned about diabetes management through exercise and a healthy diet. Also learned has been the benefits of a diabetes program. The outcome of this project is to have a decrease in hemoglobin A1c levels and better glucose control. The goal is to specifically have a one-point decrease or more in A1c levels. To evaluate the effectiveness of the project, surveys could be sent out to patients that depict their points of view on how helpful it was for them. To statistically evaluate the change process, hospital statistics would be gathered that include the number of patients with type two diabetes admitted for uncontrolled diabetes or

related complications of the disease as well as the hemoglobin A1c level before and three months after the performance of the education. A study by Sharpless et al (2021) compared two educational methods for diabetic patients and found that a combination of interactive and traditional teaching was most effective on hemoglobin A1C levels. Another study by Woodard et al (2022) found that a collaborative approach with motivating teaching showed results in lower hemoglobin A1C levels, but better results in patient satisfaction.

Conclusions/Recommendations

The evidence supports the benefits of diet and exercise in type two diabetics. The evidence found that interventions of physical activity and healthy foods decrease hemoglobin A1c levels. One study demonstrated patients coming off diabetic medications. The project of diabetic education being proposed will help type two diabetics prevent or delay the complications that are caused by diabetes and overall reduce the amount of hospital stays. The proposed project is significant as it will improve patients' quality of life and provide them with the resources they need to care for this disease. . The next steps include bringing the research/knowledge found during this benchmark project and plan to get approval to implement the project at the facility where I work at next.

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Appendix A

Evaluation Table

Citation: Author, Date of Publ. & Title	Purpose of Study	Conceptual Framework	Design / Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Worth to Practice: LOE Strengths/Weaknesses Feasibility Conclusion RECOMMENDATION
(Study #1) Cradock, K. A., O'Laighin, G., Finucane, F. M., Gainforth, H. L., Quinlan, R. R., & Martin Ginis, K. A. (2017) Behaviour change techniques targeting both diet and physical activity in type 2 diabetics.	To identify behavior change technique & intervention features of dietary and physical activity interventions for patients T2DM that are associated with changes in HbA1c and body weight	A change in diet and exercise is a foundation concentration for type two diabetes treatment, but changing behavior is hard.	SR with MA Databases searched: The Cochrane's Library, Cinahl, Embase, Pubmed, PsycINFO, and Scopus.	N= 13 RCTs.	IV: Behavior change techniques of diet and physical activity interventions. DV1: HbA1c levels DV2: Weight in kg	DV1: Hemoglobin A1c levels were measured at 3, 6, & 12 months. DV2: Weight was measured in kg at months 3, 6, & 12.	Statistical analysis M +/- SD	Overall reductions in HbA1c: -0.53 % (95% CI - 0.74 to - 0.32) Overall reductions in weight: -3.73 kg (95% CI - 6.09 to - 1.37 kg) 42 BCTs were identified.	Level I evidence Strengths: The risk of bias was low. Weaknesses: Due to strict inclusion criteria, only 13 studies were used. Conclusion: The study gives meaningful results of reduced Hgb A1c levels and weight reduction in Type 2 diabetics as well as BCTs that correlated with lower Hgb A1c levels. Recommendations: Continued research to determine the long-term effectiveness of diet and exercise on HbA1c and weight reduction.

BCT: Behavior Change Technique; BMI: Body Mass Index; CG: Control Group; CI: Confidence Interval; DV: Dependent Variable; FBS: Fasting Blood Sugar; FI: Fasting Insulin; HbA1c: Glycosylated Hemoglobin A1c; HomaIR: homeostatic Model Assessment for Insulin Resistance; IG: Intervention Group; IV: Independent Variable; M: Mean; MA: Meta-analysis; N: Number; PA: Physical activity; PROs: patient-reported outcomes; QS: Qualitative Study; RCT: Randomized Controlled Trial; RR: Risk Ratio; SD: Standard Deviation; SR: Systematic Review; T2DM: Type II Diabetes Mellitus

Citation: Author, Date of Publ. & Title	Purpose of Study	Conceptual Framework	Design / Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Worth to Practice: LOE Strengths/Weaknesses Feasibility Conclusion RECOMMENDATION
<p>(Study #2) Faroqi, L., Wong, M., Bonde, S., Wong, C. W., Walai, K., West, W., Goni, D. T., Araya, S., Azamey, S., Nacif-Coelho, C., Raghuram, S. S., Vera, K., Mittal, A., Groppo, L., Christensen, M., Johannsen, N., Haddad, F., Moharir, M., & Palaniappan, L. (2018) Evaluating the clinical implementation of structured exercise: A randomized controlled trial among non-insulin dependent type II diabetics.</p>	<p>To determine the optimal and feasible level and weekly frequency of structured contact in a clinical setting needed to initiate and maintain physical activity recommendations long-term.</p>	<p>Structured exercise has shown proven results in reducing Hgb A1c levels however, more realistic approaches are needed to convert into practice.</p>	<p>RCT</p>	<p>N= 345 participants</p>	<p>IV: Exercising once a week, exercising twice a week, and the control group. DV: HgbA1c levels</p>	<p>DV: weight measurements, Hgb A1c levels, abdominal circumference, and questionnaires on diet, physical activity, quality of life, and satisfaction.</p>	<p>Statistical analysis was used. Univariate and multivariate analysis.</p>	<p>-0.5% Hgb A1c levels of baseline 6.5%</p>	<p>Level II evidence Strengths: Sample size, methods, and analysis of the study. Weaknesses: Not enough information discussing the results of the study. Conclusion: Short-term of exercising multiple times a week shows reduction in Hgb A1c levels. Further research needed to determine the results of exercising long-term on Hgb A1c levels. Recommendations: Further research needed to determine the long-term results and the effectiveness of the study.</p>

BCT: Behavior Change Technique; BMI: Body Mass Index; CG: Control Group; CI: Confidence Interval; DV: Dependent Variable; FBS: Fasting Blood Sugar; FI: Fasting Insulin; HbA1c: Glycosylated Hemoglobin A1c; HomaIR: homeostatic Model Assessment for Insulin Resistance; IG: Intervention Group; IV: Independent Variable; M: Mean; MA: Meta-analysis; N: Number; PA: Physical activity; PROs: patient-reported outcomes; QS: Qualitative Study; RCT: Randomized Controlled Trial; RR: Risk Ratio; SD: Standard Deviation; SR: Systematic Review; T2DM: Type II Diabetes Mellitus

Citation: Author, Date of Publ. & Title	Purpose of Study	Conceptual Framework	Design / Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Worth to Practice: LOE Strengths/Weaknesses Feasibility Conclusion RECOMMENDATION
(Study #3) Gopalan, A., Kellom, K., McDonough, K., & Schapira, M. M. (2018). Exploring how patients understand and assess their diabetes control.	To identify the information patients use to judge their current level of diabetes control and investigate patient-perceived barriers to understanding hemoglobin A1c levels.	Patients may use different information than providers to assess their diabetes control.	QS	N= 25	IV: Patients with diabetes. DV: How patients assess their diabetes control.	DV: Multiple interviews	Thematic synthesis	22/25- heard of Hgb A1c in the past 16/25- understood Hgb A1c greatly 6/25- need more diabetes-related education 8/25- need better provider communication 11/25- use numerical data to assess their	Level VI evidence Strengths: Gave good insight to how patients perceive their diabetes control. Weaknesses: Sample size small, the population was from West Philadelphia, there was not a structured interview script used, and the participants were not asked if they had type 1 or 2 diabetes. Conclusion: Health care providers can become more aware of the factors that influence patients views on their own diabetes control to be able to better

BCT: Behavior Change Technique; BMI: Body Mass Index; CG: Control Group; CI: Confidence Interval; DV: Dependent Variable; FBS: Fasting Blood Sugar; FI: Fasting Insulin; HbA1c: Glycosylated Hemoglobin A1c; HomaIR: homeostatic Model Assessment for Insulin Resistance; IG: Intervention Group; IV: Independent Variable; M: Mean; MA: Meta-analysis; N: Number; PA: Physical activity; PROs: patient-reported outcomes; QS: Qualitative Study; RCT: Randomized Controlled Trial; RR: Risk Ratio; SD: Standard Deviation; SR: Systematic Review; T2DM: Type II Diabetes Mellitus

Citation: Author, Date of Publ. & Title	Purpose of Study	Conceptual Framework	Design / Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Worth to Practice: LOE Strengths/Weaknesses Feasibility Conclusion RECOMMENDATION
								diabetes control 4/25-reported routine contact with their provider 14/25-presence of diabetes-related symptoms , meant "bad" control	communicate with patients. Recommendations: Further research is needed with a larger sample size to be able to give better results.
(Study #4) Johansen, M. Y., MacDonald, C. S., Hansen, K. B., Karstoft, K., Christensen, R., Pedersen, M., Hansen, L. S., Zacho, M., Wedell-Neergaard, A. S., Nielsen, S. T., Iepsen, U. W., Langberg, H., Vaag, A. A., Pedersen, B. K., & Ried-Larsen, M. (2017). Effect of an Intensive Lifestyle Intervention on Glycemic Control in Patients With Type 2 Diabetes: A	To determine if an intensive lifestyle intervention compared with standard care has same results as well as leads to a reduction in medication in those with T2DM.	Intensive diet and exercise can lead to control of HbA1c levels in T2DM.	RCT	Lifestyle group N= 64 Standard care group N= 34	IV: T2DM patients diagnosed less than ten years. DV1: HbA1c	DV1: Mean change in HbA1c levels from baseline to 12-month follow-up	Statistical analysis.	-0.26% [95% CI, -0.52% to -0.01%]	Level II evidence Strengths: Study described each step of the study very well. There was also an Weaknesses: Sample size is too small. Conclusion: The results did not show significant change between the

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Randomized Clinical Trial. <i>JAMA</i> , 318(7), 637–646. https://doi-org.ezproxy.uttyler.edu/10.1001/jama.2017.10169									intervention and control groups. Recommendations: More research is needed to see if the results can be reproduced and if they are reliable. Longer than 12 months is needed to produce more adequate results.
(Study #5) Lean, M. E., Leslie, W. S., Barnes, A. C., Brosnahan, N., Thom, G., McCombie, L., Peters, C., Zhyzhneuskaya, S., Al-Mrabeh, A., Hollingsworth, K. G., Rodrigues, A. M., Rehackova, L., Adamson, A. J., Sniehotta, F. F., Mathers, J. C., Ross, H. M., McIlvenna, Y., Stefanetti, R., Trenell, M., Welsh, P., ... Taylor, R. (2018). Primary care-led weight management for remission of type 2 diabetes	To assess if effective weight control could lead to sustained remission of T2DM.	Previous studies involving weight reduction have been shown to achieve normalisations of blood glucose, but none focused on dietary	Open-label, cluster-randomized trial.	IG: N=23 CG: N=26	IV: Intervention group and control group DV1: Weight loss DV2: HgbA1c DV3: Quality of life	DV1: Weight measurements in kg DV2: blood tests & measured in mmol/mol as well as in %.	Statistical analysis. Weight measured in kg, quality of life measured using EuroQol Dimension s visual	Diabetes remission: 95% CI 7.8–49.8; p<0.0001). Reduction in body weight: 95% CI -10.3 to -7.3; p<0.0001)	Level II Evidence Strengths: Interventions used and the study design. Weaknesses: A detailed body composition was not assessed and patients were aware of which group they were in.

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(DiRECT): an open-label, cluster-randomised trial. <i>Lancet (London, England)</i> , 391(10120), 541–551. https://doi-org.ezproxy.uttyler.edu/10.1016/S0140-6736(17)33102-1		change has assessed sustained disease remission as a primary outcome.			DV4: Serum lipids DV5: physical activity	DV3: EuroQol 5 Dimension s (EQ-5D) DV4: blood tests & measured in mmol/l DV5: Light, moderate & vigorous activity measured in min/day.	analogue scale.	Quality of life: 95% CI 2.5–10.3; p=0.0012	Conclusion: Those with T2DM of 6 years or less can achieve remission through diet and exercise. Recommendations: Further research is needed to show longer-term outcomes.
(Study #6) Snorgaard, O., Poulsen, G. M., Andersen, H. K., & Astrup, A. (2017). Systematic review and meta-analysis of dietary carbohydrate restriction in patients with type 2 diabetes. <i>BMJ open diabetes research & care</i> , 5(1), e000354. https://doi-org.ezproxy.uttyler.edu/10.1136/bmjdr-2016-000354	To assess the effects of a low carb diet compared to a high carb diet in T2DM.	Nutrition is an important part in T2DM management and carbohydrates with a low-glucose are recommended, but its unsure what the ideal amount is.	SR & MA Databases searched: Cochrane library, EMBASE, and MEDLINE	10 RCTs with 1376 total participants	IV: Low carb diet group & high carb diet group DV: HbA1c	DV: change in HbA1c after 3, 6, 12 months.	Statistical analysis	0.34% lower HbA1c 95% CI 0.06 (0.7 mmol/mol), 0.63 (6.9 mmol/mol)	Level I Evidence Strengths: The study gave good evidence that supported that a low carbohydrate diet caused a lowering of HbA1c levels. Weaknesses: Study was not done for a long enough period of time to produce more reliable

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									<p>results. Also, sample size was small. Conclusion: Those with T2DM who follow a low carb diet can achieve a reduction in HbA1c levels. Recommendation: Further research is needed to see the effects of following a low carb diet for more than just one year.</p>
<p>(Study #7) Martin, C. G., Pomares, M. L., Muratore, C. M., Avila, P. J., Apoloni, S. B., Rodríguez, M., & Gonzalez, C. D. (2021). Level of physical activity and barriers to exercise in adults with type 2 diabetes. <i>AIMS public health</i>, 8(2), 229–239. https://doi-org.ezproxy.utt Tyler.edu/10.3934/publichealth.2021018</p>	<p>Assess T2DM who perform PA, the associate between metabolic control, and barriers to exercise.</p>	<p>None</p>	<p>Cross-sectional study</p>	<p>450 individuals with T2DM</p>	<p>IV: adults with T2DM DV1: Percentage who perform PA and barriers to PA. DV2: BMI DV3: HbA1c</p>	<p>DV1: PA Barrier questionnaire DV2: In kg/m2 DV3: last two values in % DV4: Measured in % and what</p>	<p>Statistical analysis. Chi-square test for categorial variables.</p>	<p>50% of T2DM were physically inactive. Barriers identified: lack of willpower, lack of energy, lack of time.</p>	<p>Level V Evidence Strengths: Good sample size. Gave good evidence on ways to improve the barriers to PA. Weaknesses: Only performed on those from Argentina. Study only carried out for a little over two months.</p>

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					DV4: chronic complications DV5: pharmacological treatment	complication. DV5: Measured in %. Insulin or oral medication.		Low level of PA associated with older age, higher HbA1c, diabetic foot history, and female sex.	Conclusion: Many with T2DM, have a lack of motivation when it comes to PA. Recommendation: further research to evaluate other means to improve diabetes management to compare with these findings. Further research in another location. The findings of this study could be used to find the best strategies to improve PA levels in those with T2DM and used to implement programs to promote PA.
(Study #8) Martenstyn, J., King, M., & Rutherford, C. (2020). Impact of weight loss interventions on patient-reported outcomes in	The effectiveness of weight loss interventions in overweight and	None	Systematic review	23 articles 19-RCTs	IV: Adults with T2DM DV: Weight loss interventions	DV: Measured in categories (Dietary, surgical,	Narrative Synthesis PRO assessment intervals.	Weight loss in overweight and obese T2DM has	Level I evidence Strengths: Gave good evidence on the benefits of various interventions in those who are

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overweight and obese adults with type 2 diabetes: a systematic review. Journal of Behavioral Medicine, 43(6), 873-891. https://doi-org.ezproxy.utt Tyler.edu/10.1007/s10865-020-00140-7	obese adults with T2DM.					pharmacological, multi-component lifestyle, physical activity)		many benefits. Multicomponent interventions improve physical function. Weight loss does not improve PROs.	obese and have T2DM. Weaknesses: Study only included those who are obese with T2DM. Study did not include non-electronic databases. Conclusion: The study gives good evidence found that all the interventions discussed are effective at the reduction in obese adults with T2DM. Recommendation: A study that includes those who aren't considered obese.
(Study #9) Tachanivate, P. & Phraewphiphat, Runya & Tanasanitkul, H. & Jinnawaso, R. & Areevut, C. & Rattanasila, R. & Pichitchaipitak, O. &	The purpose of the study was to evaluate a self-management education program in	None	Cohort Study	976 total participants	IV: Intervention & control group DV: Diabetes	DV: Lab tests, comorbidity diagnosis, medication	Independent t-tests or Chi square Mixed-effect	Diabetes self-management education program	Level IV evidence Strengths: Great sample size, transferrable into practice, and great results.

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Jantawee, K. & Saibuathong, N. & Chanchat, S. & Ha-Upala, A. & Ariyaprayoon, P. & Tanlakit, P. & Maitreejorn, P. & Pompantakron, C. & Boonpattaraksa, J. & Pabua, K. & Pattanaprathep, Oraluck & Reutrakul, Sirimon & Jerawatana, Ratanaporn. (2019). Effectiveness of diabetes self – Management education in thais with type 2 diabetes. Pacific Rim International Journal of Nursing Research. 23. 74-86.	individuals with type two diabetes.				knowledge scores, satisfaction scores, behavioral goals, demographic data, HbA1c, diabetes medication, and daily cost of medications.	prices, satisfaction scoring.	regression analyses Stata, version 14.2.	shows great benefit in lowering diabetes medication utilization and costs, increases patient knowledge and satisfaction.	Weaknesses: Some participant's disease was more severe than others in the intervention group therefore, both groups were not as similar at baseline. Conclusion: The program should be utilized as part of diabetes care in hospitals as it shows great benefits. Recommendation: Further research to explore the benefits with different group of participants in another part of the world.
(Study #10) Yu, X., Chau, J. P. C., Huo, L., Li, X., Wang, D., Wu, H., & Zhang, Y. (2022). The effects of	The purpose of the study was to implement a nurse-driven diabetes	Health Belief Model and Self-Efficacy Theory.	RCT	128 participants	IV: Intervention & control group	DV: Lab tests, surveys, and	IBM SPSS, version 22.	Participants in intervention group showed	Level II evidence Strengths: Effectiveness of interventions

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<p>a nurse-led integrative medicine-based structured education program on self-management behaviors among individuals with newly diagnosed type 2 diabetes: a randomized controlled trial. BMC Nursing, 21(1), 1–17. https://doi-org.ezproxy.utt Tyler.edu/10.1186/s12912-022-00970-7</p>	<p>education program and assess the benefits.</p>				<p>DV: HbA1c, self-efficacy, self-management behaviors, diet, physical activity, foot care, medication management, blood glucose monitoring, smoking status.</p>	<p>medications.</p>	<p>Independent-sample t-test, Mann-Whitney U test, Chi-square test, or Fisher's exact test</p>	<p>better self-management in diet, blood glucose monitoring, HbA1c levels, foot care, and medication management.</p>	<p>Weaknesses: Measure more statistical results rather than survey/objective data. Conclusion: The program showed great benefits on self-efficacy, glycemic control, and self-management behaviors. Recommendation: Further research for long-term effectiveness of program.</p>
<p>(Study #11)</p>	<p>The purpose of the study was to assess a nurse</p>	<p>Albert Bandura's self-efficacy</p>	<p>RCT</p>	<p>142 participants</p>	<p>IV: Intervention</p>	<p>DV: Lab tests, smoking</p>	<p>SPSS software.</p>	<p>Patients in intervention group</p>	<p>Level II evidence Strengths: Robust study design, well-</p>

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Azami, G., Soh, K. L., Sazlina, S. G., Salmiah, M. S., Aazami, S., Mozafari, M., & Taghinejad, H. (2018). Effect of a Nurse-Led Diabetes Self-Management Education Program on Glycosylated Hemoglobin among Adults with Type 2 Diabetes. <i>Journal of diabetes research</i> , 2018, 4930157. https://doi-org.ezproxy.uttyler.edu/10.1155/2018/4930157	led education program and its effects on HbA1c.	theory and Motivational Interviewing (MI) spirit			& control group DV: HbA1c, blood pressure, weight, lipid profiles, self-efficacy, self-management behaviors, quality of life, social support, and depression.	status, BMI, weight in kg.	Student's t-test or Mann-Whitney U test. Chi-square or Fisher exact test.	showed benefits in HbA1c levels, blood-pressure, body weight, efficacy expectation, outcome expectation, and self-management behaviors.	matched groups, minimalization of contamination between the groups. Weaknesses: Follow-up period was short. Conclusion: It is possible to achieve behavior changes by promoting these interventions and self-efficacy. Recommendation: Further research to determine long-term effects of intervention.

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<p>(Study #12)</p> <p>Hemmingsen B, Gimenez-Perez G, Mauricio D, Roqué i Figuls M, Metzendorf MI, Richter B. Diet, physical activity or both for prevention or delay of type 2 diabetes mellitus and its associated complications in people at increased risk of developing type 2 diabetes mellitus. Cochrane Database of Systematic Reviews 2017, Issue 12. Art. No.: CD003054. DOI: 10.1002/14651858.CD003054.pub4</p>	<p>The purpose of the study was to assess the effects of diet, physical activity or both on the prevention or delay of T2DM and its associated complications in people at an increased risk of developing T2DM.</p>	<p>None</p>	<p>SR</p>	<p>12 RCTs, randomizing 5,238 participants</p>	<p>IV: Diet + physical activity group, physical activity group, diet group, and standard treatment or no treatment DV: development of T2DM</p>	<p>DV: HbA1c, fasting glucose, quality of life</p>	<p>Cochrane methodology. GRADE.</p>	<p>Diet plus physical activity reduces or delays the incidence of T2DM.</p>	<p>Level I evidence Strengths: Sample size. Weaknesses: Not enough data on patient-important outcomes. Conclusion: It was found that through combining diet and physical activity, patients at risk for developing type two diabetes mellitus could decrease or delay their development of this disease. Recommendation: Further research for long term effectiveness.</p>

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Appendix B

Flowchart

Week 1	Gather info for packet and determine categories to be included
Week 2-3	Develop a rough draft of packet Set up meetings with Key Stakeholders
Week 4-5	Attend meetings & hand out flyers on packet
Week 6-7	Put together final packet with team Attend meetings/education sessions with specialists
Week 8-10	Implement the packet on key units
Week 11-12	Send out survey to patients that received packet on pilot unit(s)