



2017

## Effectiveness of Different Styles of Diabetic Education on Outcomes of the Type II Diabetic Patient

Emil Trutwin  
*University of North Dakota*

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: <https://commons.und.edu/pas-grad-posters>



Part of the [Endocrinology, Diabetes, and Metabolism Commons](#)

---

### Recommended Citation

Trutwin, Emil, "Effectiveness of Different Styles of Diabetic Education on Outcomes of the Type II Diabetic Patient" (2017). *Physician Assistant Scholarly Project Posters*. 58.  
<https://commons.und.edu/pas-grad-posters/58>

This Poster is brought to you for free and open access by the Department of Physician Studies at UND Scholarly Commons. It has been accepted for inclusion in Physician Assistant Scholarly Project Posters by an authorized administrator of UND Scholarly Commons. For more information, please contact [und.common@library.und.edu](mailto:und.common@library.und.edu).

# EFFECTIVENESS OF DIFFERENT STYLES OF DIABETIC EDUCATION ON OUTCOMES OF THE TYPE II DIABETIC PATIENT

Emil Trutwin, PA-S

Department of Physician Assistant Studies, University of North Dakota School of Medicine & Health Sciences

Grand Forks, ND 58202-9037



## Abstract

The purpose of this project is to determine if there is a significant advantage to certain diabetic education strategies that yield better outcomes in regards to control of diabetes.

## Introduction

Type II diabetes mellitus is a global problem that is seeing the average age of onset decrease and an increase in the annual financial burden. It is a disorder where the pancreas creates insulin but the body develops resistance to that insulin (Mattei et al., 2015). When this occurs, it manifests with elevated serum glucose readings, polydipsia, urinary frequency, and fatigue (Vermeire et al., 2009). Even though, no studies were considered break through, multiple offered valuable information.

### Group Based Education

Steinsbekk, Rygg, Lisulo, Rise and Fretheim (2012) assessed 21 studies that measured outcomes at 6 months, 12 months and 2 years.

### Individual Based Education

Duke, Colagiuri, and Calagiuri (2009) found 9 studies that measured metabolic outcomes at 6, 12, and 18 months. 3 of these studies specifically studied the effects of individual based education versus group based education.

### Computer Based Education

Pal et al., (2013) comprised a systematic review of 16 RCTs that studied the effects of metabolic control in type II diabetics.

### Group Versus Individual Based Education

Duke et al., (2009) had three studies within their review that focused on direct comparison between group and individual based education.

## Statement of the Problem

Even though it is well known that education leads to improvement in outcome measures like glycemic control, adherence to treatment, and reduction in complications, there is no “standard of care” currently in place for the amount or type of education a type II diabetic should receive (Bagnasco et al., 2014). It is accepted that education should be incorporated in the treatment of diabetes. It isn't fully known if there is a significant difference between the types of diabetes education and its effects on outcomes (Unick et al., 2011).

## Research Question

In adults with type II diabetes, are there any greater benefits of individual education versus group based or computer based education in control of their diabetes? Are there any additional gains other than control of diabetes (i.e. weight loss, reduction of cholesterol)?

In adults with type II diabetes, does group based education versus individual or computer-based education offer psychological advantages? Are there obvious pros and cons to each mode of education delivery?

## Literature Review

### Methods:

- DataBases:** CINAHL, PubMed, and Cochrane
- Key Words:** “Diabetes, Diabetic, Type II, Education, Diet, Computer-based, Individual-based, Group-based”
- Filters:** Articles published within the last 10 years
- Inclusion Criteria:** Type II diabetics, who were not taking insulin, with no major comorbid conditions, and had metabolic measures (HbA1c and FG values). Required to use some form of diabetic education (individual-based and/or group-based and/or computer-based) .
- Results:** Overall, 14 studies met the criteria (8 from PubMed, 3 from Cochrane, and 3 from CINAHL).

### Section 1. Group Based Education:

- Measurements in 13 studies found significant reduction in HbA1c at 6 months with a reduction of 0.44% points ( $p = 0.0006$ ), at 12 months with a reduction of 0.46% points ( $p = 0.001$ ) in 11 studies, and 2 years with a reduction of 0.87% points ( $p < 0.00001$ ) in three studies (Steinsbekk, Rygg, Lisulo, Rise, & Fretheim, 2012).

### Section 2. Individual Based Education

- Overall, 5 studies were reviewed.
- Duke, Colagiuri, & Colagiuri (2009) reviewed 9 studies.
  - Goudswaard (2004) study: Mean decrease of 1% HbA1c and 0.4% with intervention at 6-9 and 12-18 months follow up compared to 0.4% and 0.6% decrease respectively.
  - Hawthorne (1997) study: Mean decrease of 0.1% in the intervention versus a 0.04% gain in the control group at 6-9 month follow up.
  - Hiss (2001) study: Mean decrease of 0.3% at the 12-18 month follow up in the intervention versus a 0.2% decrease in the control group.
  - Ko (2004) study: Mean decrease of 0.5% decrease in HbA1c at the 12-18 month follow up for the intervention versus a 0.2% decrease in the control group.
  - Shibayama (2007) study: Mean decrease of 0.1% increase in their HbA1c at their 12-18 month follow up for the intervention versus no change in the control group.

### Section 3. Computer Based Education

- Pal et al., (2013) reviewed 10 studies : All studies combined to show a significant ( $p = 0.0018$ ) decrease in HbA1c in favor of the intervention group over the control at 6-12 months (Pal et al., 2013).

### Section 4. Group and Individual Based Education Studies

- Three studies specifically compared the effects of individual based education versus group based education.
- Campell (1996) saw a 3.9% decrease in HbA1c at 6-9 month follow up and a 3.3% decrease at 12-18 month follow up in the individual education group. In the group based education group at 6-9 month follow up there was a 5% decrease in HbA1c and 3% decrease at 12-18 months.
- Rickheim (2002) saw a 1.7% decrease in HbA1c at 6-9 month follow up for the individual education group versus a 2.5% decrease in HbA1c in the group based education group. There was no 12-18 month data for this study.
- Dalmau (2003) saw a 0.49% decrease in HbA1c at 12-18 month follow up in the individual education groups versus a 0.52% decrease in the group based education group. Overall, the results at 6-9 months were significant in favor of the group based education but the 12-18 month data was not significant (Duke, Colagiuri, & Colagiuri, 2009).

## Discussion

### Individual Therapy Versus Group Based Therapy

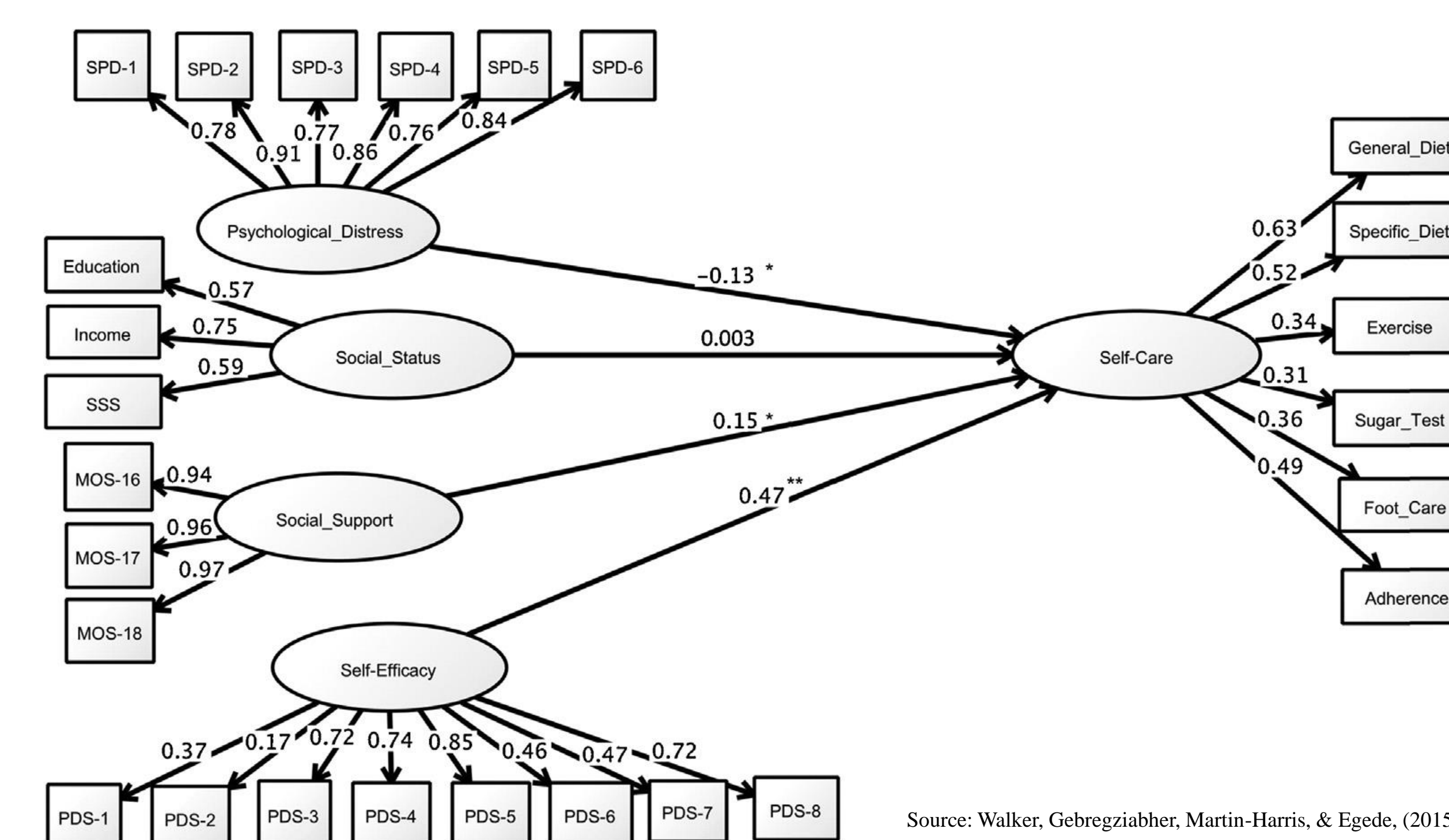
- The question that comes up is: how does diabetic education actually improve the HbA1c values? Are the patients eating better? Are they taking their medication more religiously? Are they just overall better educated and able to recognize when their diabetes is not controlled?
- Stiensbekk found statistically significant reduction in HbA1c but it doesn't appear to be clinically significant. Certainly education is great adjuvant treatment for the type II diabetic but education alone is not enough to control diabetes in all populations.
- Cinar & Shou (2014) saw only modest decrease in HbA1c and FPG at 6 months while Mukadder & Beyazit (2009) saw dramatic drops in HbA1c in only 2 months. This significant difference only highlights the challenge when comparing study to study. Mukadder's study had individuals from Turkey where routine diabetic education was not offered while Cinar's control group had routine education.

### Computer Based Education

- Pal et al., (2013) found varying results with the majority showing a significant improvement in HbA1c in 6 months. However, the studies spanned 4 countries. There are significant differences between the population, internet access, standards between each country that are not accounted for.
- Lee et al., (2007) did find a significant improvement in HbA1c but the results had some flaws. It showed subgroups were more likely to login and utilize the system over someone who was uneducated and were advanced in age.

### Underlying Issues

- Standard of care:** Each study made attempts to define this but left this area vague.
- Variability:** Education styles, sample size, routine care, inclusion/exclusion criteria, and duration were different in each study.
- Target Population:** In this review, multiple studies took place outside of the United States and ultimately will not implicate the population.



## Applicability to Clinical Practice

- Overall, it appears that education at any level should be incorporated in the usual care for type II diabetic patients. Studies show varied results but a direct relationship is seen between the amount of education received and the improvement on their metabolic and psychologic outcomes.
- Multiple effective strategies are available for the provider to consider.
- Side effects of diabetic education are very limited and only a few cases of anxiety have been documented.
- Incorporate the patient in the decision as to the type of education they receive.

Diabetes Self-management Education and Support Algorithm: Action Steps			
Four critical times to assess, provide, and adjust diabetes self-management education and support			
At diagnosis	Annual assessment of education, nutrition, and emotional needs	When new complicating factors influence self-management	When transitions in care occur
<b>Primary care provider/endocrinologist/clinical care team: areas of focus and action steps</b> <ul style="list-style-type: none"><li>Answer questions and provide emotional support regarding diagnosis</li><li>Provide overview of treatment and treatment goal</li><li>Teach survival skills to address immediate requirements (safe use of medication, hypoglycemia treatment if needed, introduction of eating guidelines)</li><li>Identify and discuss resources for education and ongoing support</li><li>Make referral for DSM/FS and MNT</li></ul>	<b>Assess all areas of self-management</b> <ul style="list-style-type: none"><li>Review problem-solving skills</li><li>Identify strengths and challenges of living with diabetes</li></ul>	<b>Identify presence of factors that affect diabetes self-management and attain treatment and behavioral goals</b> <ul style="list-style-type: none"><li>Discuss effect of complications and successes with treatment and self-management</li></ul>	<b>Develop diabetes transition plan</b> <ul style="list-style-type: none"><li>Communicate transition plan to new health care team members</li><li>Establish DSM/FS regular follow-up care</li></ul>
<b>Diabetes education: areas of focus and action steps</b> <ul style="list-style-type: none"><li>Assess cultural influences, health beliefs, current knowledge, physical limitations, family support, financial status, medical history, literacy, numeracy to determine context to provide and how:<ul style="list-style-type: none"><li>Medications—choice, action, titration, side effects</li><li>Monitoring blood glucose—when to test, interpreting and using glucose pattern management for feedback</li><li>Physical activity—safety, short-term vs. long-term goals/recommendations</li><li>Prevention, detecting, and treating acute and chronic complications</li><li>Nutrition—food plan, planning meals, portioning food, preparing meals, purchasing food</li><li>Risk reduction—smoking cessation, foot care</li><li>Developing personal strategies to address psychosocial issues and concerns</li><li>Developing personal strategies to promote health and behavior change</li></ul></li><li>Review and reinforce treatment goals and self-management needs</li><li>Emphasize preventing complications and promoting quality of life</li><li>Discuss how to select diabetes treatment and self-management to now life situations and competing demands</li><li>Support efforts to sustain initial behavior changes and cope with the ongoing burden of diabetes</li></ul>	<b>Review and reinforce treatment goals and self-management needs</b> <ul style="list-style-type: none"><li>Emphasize preventing complications and promoting quality of life</li><li>Discuss how to select diabetes treatment and self-management to now life situations and competing demands</li><li>Support efforts to sustain initial behavior changes and cope with the ongoing burden of diabetes</li></ul>	<b>Provide support for the provision of self-care skills as an effort to delay progression of the disease and prevent new complications</b> <ul style="list-style-type: none"><li>Provide/prioritize for emotional support for diabetes-related distress and depression</li><li>Develop and support personal strategies for behavior change and health coaching</li><li>Develop personal strategies to accommodate sensory or physical limitations, adapting to new self-management demands, and promote health and behavior change</li></ul>	<b>Identify needed adaptations in diabetes self-management</b> <ul style="list-style-type: none"><li>Provide support for independent self-management skills and self-efficacy</li><li>Identify level of significant other involvement and facilitate education and support</li><li>Assist with living challenges affecting usual level of activity, ability to function, health beliefs, and feelings of well-being</li><li>Maintain quality of life and emotional support for the patient (and family members)</li><li>Provide education for others now involved in care</li><li>Establish communication and follow-up plans with the provider, family, and others</li></ul>

Source: Powers et al., (2013)

## References

Adolfsson, E. T., Starrin, B., Smide, B., & Wikblad, K. (2008). Type 2 diabetic patients' experiences of two different educational approaches - A qualitative study. *International Journal of Nursing Studies*, 45(7), 986-994. <https://doi.org/10.1016/j.ijnurstu.2007.07.007>

Bagnasco, A., Di Giacomo, P., Da Rin Della Mora, R., Catania, G., Turci, C., Rocco, G., & Sasso, L. (2014). Factors influencing self-management in patients with type 2 diabetes: A quantitative systematic review protocol. *Journal of Advanced Nursing*, 70(1), 187-200. <https://doi.org/10.1111/jan.12178>

Cinar, A. B., & Schou, L. (2014). The role of self-efficacy in health coaching and health education for patients with type 2 diabetes. *International Dental Journal*, 64(3), 155-163. <https://doi.org/10.1111/idj.12093>

Duke, S., Colagiuri, S., & Colagiuri, R. (2009). Individual patient education for people with type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews*, (1). <https://doi.org/10.1002/14651858.CD005268.pub2>

Lee, T. I., Yeh, Y. T., Liu, C. T., & Chen, P. L. (2007). Development and evaluation of a patient-oriented education system for diabetes management. *International Journal of Medical Informatics*, 76(9), 655-663. <https://doi.org/10.1016/j.ijmedinf.2006.05.030>

Mattei, J., Malik, V., Wedick, N. M., Hu, F. B., Spiegelman, D., Willett, W. C., & Campos, H. (2015). Reducing the global burden of type 2 diabetes by improving the quality of staple foods: The global nutrition and epidemiologic transition initiative. *Globalization and Health*, 11, 23. <https://doi.org/10.1186/s12992-015-0109-9>

Mukadder, & Beyazit, E. (2009). Influence of diabetic education on patient metabolic control. *Applied Nursing Research*, 22(3), 183-190. <https://doi.org/10.1016/j.apnr.2007.12.003>

Pal, K., Eastwood, V. S., Michie, S., Farmer, A. J., Barnard, M. L., Peacock, R., ... Murray, E. (2013). Computer-based diabetes self-management interventions for adults with type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews*, (3). <https://doi.org/10.1002/14651858.CD008776.pub2>

Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Fischl, A. H., ... Vivian, E. (2015). Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *Diabetes Care*, 38(7), 1372-1382. <https://doi.org/10.2337/dc15-0730>

Steinsbekk, A., Rygg, L. Ø., Lisulo, M., Rise, M. B., & Fretheim, A. (2012). Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus: A systematic review with meta-analysis. *BMC Health Services Research*, 12(1), 213. <https://doi.org/10.1186/1472-6963-12-213>

Unick, J. L., Beavers, D., Jakicic, J. M., Kitabchi, A. E., Knowler, W. C., Wadden, T. A., & Wing, R. R. (2011). Effectiveness of lifestyle interventions for individuals with severe obesity and type 2 diabetes. *Diabetes Care*, 34(12), 2152-2157. <https://doi.org/10.2337/dc11-0874>

Vermeire, E., Wens, J., Van Royen, P., Biot, Y., Hearnshaw, H., Lindenmeyer, A., & Vermeire, C. (2009). Interventions for improving adherence to treatment recommendations in people with type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews*, (2). <https://doi.org/10.1002/14651858.CD003638.pub2>

Walker, R. J., Gebregziabher, M., Martin-Harris, B., & Egede, L. E. (2015). Understanding the influence of psychological and socioeconomic factors on diabetes self-care using Structured Equation Modeling. *Patient Education & Counseling*, 98(1), 34-40. <https://doi.org/10.1016/j.pec.2014.10.002>

## Acknowledgements

- I want to give a very special thanks to my family, especially my son, Nathan, and wife, Vanessa, for their understanding and support while I worked on this project.