Physician Barriers to Referring Patients to Diabetes Education and Suggestions for Evaluating a Solution: Visual Versus Textual Motivators as Health Care Nudges

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I. Acknowledgements

Arriving at Brown in the middle of my sophomore year was going to be a struggle. I had many adjustments to make, but within my first year at Brown University, I fell, by luck, into the hands of two of the most thoughtful and thought-provoking professors that I have encountered.

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II. Abstract

Diabetes education is a valuable tool which has been shown to dramatically improve the day to day living and long term outlook of individuals with both type 1 and type 2 diabetes. Despite its proven benefits, the overwhelming majority of individuals with diabetes do not receive diabetes education at the time of diagnosis, which is when it is most needed. The literature is abundant with articles illustrating patient barriers that explain why more patients might not attend diabetes education. There is a relative paucity of literature explaining the physician’s role in lack of attendance, and particularly why they frequently fail to refer to this essential element of diabetes care. This thesis reviews the physician’s role in referring to diabetes education, and explores the gaps in this referral decision-making process. In particular, this thesis analyzes whether there is a possibility that physicians are not referring patients to diabetes education when the physician predicts that the patient will refuse or object to attending. Since, to the best of my knowledge, this possibility as it relates to diabetes education is a new area of research, in analyzing this question I first discuss literature on the topic of whether this type of physician barrier has caused sub optimal care in treating other conditions and in recommending other treatments, including the timely initiation of insulin when needed. The analysis includes a discussion of underlying psychological and behavioral barriers, such as clinical inertia and lack of outcome expectancy. Additionally, studies are proposed for determining the existence and extent of the suggested barrier, and investigating the effectiveness of simple interventions to nudge the physician to overcome the barrier. A comparison of visual, textual, and mixes of visual and textual nudges are discussed.
III. INTRODUCTION: The Journey To My Thesis Topic

As the daughter of an endocrinologist who has shadowed and worked in diabetes offices for many years during school breaks, I have developed a keen interest in understanding why diabetes patients have such a difficult time adjusting their lifestyles in light of the devastating consequences of not changing their behaviors. As a member of a family with varying degrees of obesity, I have experienced first-hand, on a very personal level, how hard it is to make those changes, even for people who have suffered consequences of resulting diseases and are fully aware that obesity was a factor. As the sister of a behavioral economics aficionado, I have participated in long brain-storming sessions to come up with ideas about how to convince people to make those changes. So, throughout my college education I found myself drawn to researching how and why people make food choices, and how these choices can be improved, although I sometimes resisted my own impulses to revisit the topic.

Because of this interest, I have researched how food is an integral part of individual and cultural identity. Before I transferred to Brown University, in an anthropology course at Wellesley College, I investigated and reported about the effect of social media and modern technologies on how people view their relationship with food, both individually and in relating to others. At Brown, when taking a course focused on food and gender in the U.S., I focused my final project on how males and females differ when considering whether to eat junk versus healthy foods. I even put my interest in visual arts to use in a Brown course I took entitled Color by researching how color impacts food choices in different cultures and societies. I was amazed by all the evidence based studies on how the nature of color has such a huge impact on what we eat. To name just one of the many interesting facts I learned, apparently black buns and burgers are a big hit in Japan but a flop in the U.S., just because of how our different cultures view the
color black. Recently, in a course I took at Brown’s School of Public Health on Obesity in the 21st Century, I researched how mobile devices, new technologies, and social media could improve pre-diabetic adherence to lifestyle changes, giving special attention to how these advancements help people differently depending upon their age, ethnicity, gender, and other characteristics. Currently, in a course on Health Communication, I am working on implementing an intervention at a high school in an attempt to improve students’ food choices.

With thoughts about what I learned and discovered in all of these courses and projects, my initial inclination in choosing a thesis topic was to build upon what I learned about food choice by seeing how I could apply my artistic interests to encourage people to change those choices so that they could become healthier. After starting my research, it became clear that there is plentiful literature on interventions to improve lifestyle and health behaviors, although there is still much to be learned. What surprised me was the relatively small amount of attention given to how physician practices can influence patients to become better educated and make better choices. It is widely accepted that diabetes education effectively improves patient health, but diabetes education programs are closing because not enough patients attend (Powers et al., 2015, p. 9; Kalvaitis, 2008). Often, patients’ barriers are blamed for low attendance (Maine, 2006). Looking toward what I hope becomes my future career as a medical doctor, my attention shifted to how I could become the best possible physician, and how interventions might change physician behaviors and choices. With this in mind, I decided to base my thesis research on whether physicians who treat diabetics can do a better job of encouraging their patients to take the most important step for their health- namely, getting an education about their condition.
I have always believed that positive change begins with awareness and education. To explore how physicians can create this change, my thesis investigates three questions that, to the best of my knowledge, have not yet been answered.

1. Do physicians decide not to refer patients to diabetes education because they anticipate that the patient will resist or refuse their recommendation?

2. If so, what is an intervention that could be implemented to overcome this physician barrier, and thereby increase referrals to, and attendance at, diabetes education classes or consultations?

3. How would a visual intervention compare with a textual intervention to overcome the barrier?

IV. BACKGROUND AND LITERATURE

A. Terms and Definitions

Throughout this thesis, diabetes education in general (whether one-on-one or through group workshops or classes) will be referred to as DE, and when specifically discussing classes it will be referred to as DEC. One type of DE, Diabetes Self-Management Education, will be referred to as DSME. Descriptions of physicians as general practitioners, primary care providers, and internists will be used interchangeably, and sometimes referred to as GPs or PCPs. The terms diabetes educator, nutritionist, and dietician will be used interchangeably to describe non-physician diabetes educators, and when used to describe particular studies or articles these terms will be used consistently with how they are used in those particular studies or articles. These terms will describe a person certified to educate people with diabetes, or having substantial qualifications to do so through their experience and/or education. All references to diabetes in this paper refer to type 2 diabetes, and not to type 1 diabetes, unless otherwise stated. For the
purposes of this thesis, diabetes is defined as a condition where an individual has a blood glucose level of at least 120, normal blood glucose levels as 100 or less, and pre-diabetes as a condition where an individual has a blood glucose level in between those amounts. Hemoglobin A1c (HbA1c) is defined as the measure of an individual’s three month blood glucose average.

B. Diabetes- Description, Prevalence and Impact

Diabetes Mellitus is a chronic disorder characterized by high levels of blood glucose. Type 1 diabetes is an autoimmune disorder characterized by an immune attack on the pancreas, which ultimately leads to the inability of the pancreas to produce any insulin (Atkinson, M.A., 2012). Therefore, insulin therapy is needed. There is no known prevention. Type 2 diabetes is a chronic, progressive disorder (Fonseca, V.A., 2009, p. S131). Its classic core pathological defects are progressive, non-immune beta cell loss, and resistance to one’s own insulin (DeFronzo, 2009, p. 773). The severity of the condition is closely related to excess weight and inactivity. The chances of developing type 2 diabetes can be significantly reduced through physical activity, diet, and weight management (DPPRG, 2002; CDC Basics About Diabetes, 2015).

According to a 2015 International Diabetes Federation report, an estimated 415 million adults, or ~8.8% of the population worldwide, have diabetes (IDF, 2015, p. 6). Almost half of those (193 million) have not yet been diagnosed (p. 6). In its “Diabetes At A Glance 2016” factsheet, the Center for Disease Control (CDC) provides useful statistics about diabetes prevalence, complications, and related concerns in the U.S. According to that factsheet, in the U.S. in 2016 there were over 29 million adult diabetics (~9.3% of the U.S. population), and ~8.1 million (~27.8% of them) were undiagnosed (p. 1). An additional 1/3 of the U.S. population, or ~86 million adults, have prediabetes, although ~90% are unaware of it (p. 1). These numbers are
expected to climb, and it is estimated that globally, by 2040, 642 million will have diabetes (IDF, 2015, p. 6).

The health and cost impact of diabetes prevalence on individuals and the population is tremendous. The 2014 National Diabetes Statistics Report, written for a scientific audience, provides statistics on the extent of diabetes’s health complications and costs in the U.S. (CDC, 2014). In that report, diabetes is a named as the leading cause of complications such as kidney failure (44% of new cases in 2011), leg and foot amputations (73,000 cases in 2010), heart disease, and adult blindness (pp. 6-7). Further, people with diabetes have a 50% higher risk of premature death than those without diabetes- in 2013 it was the 7th leading cause of death, which may be an underestimate (CDC, 2014, pp. 6-7). The economic impact of diabetes in 2015 amounted to 12% of all annual global expenditures on health (IDF, 2015, p. 6), and over 20% of health care costs in the U.S. (CDC, 2016, p.1). In the U.S. during 2012, diabetes costs were $245 billion ($176 billion of direct costs and $69 billion of indirect costs) (CDC, 2014). Globally, in 2014 diabetes costs were $825 billion (Lancet, 2016, p. 1524).

C. Improving Diabetes Care- The Promise and Necessity of Diabetes Educators

1. Benefits- why diabetes education is imperative

The statistics are alarmingly dire, but by raising awareness and education, along with individual implementation of behavioral changes, progress can be made to reduce health and monetary costs and improve quality of life. With regard to diabetes prevention alone, lifestyle changes and the implementation of those changes can help up to 58% of pre-diabetics avoid developing diabetes (CDC, 2016, p. 1). Some studies have shown even better results, demonstrating that lifestyle behaviors including good diet and exercise and not smoking can prevent 9 of 10 diabetes diagnoses (The Nutrition Source, 2017).
There is a consensus that diabetes patients need education in order to achieve good glucose control (ADA et al., 2015, p. 1). For people who have already developed diabetes, two landmark studies demonstrated that intensive diabetes management can significantly reduce the incidence of complications. These studies, the Diabetes Complication Control Trial (“DCCT,” which studied type 1 diabetics) and the United Kingdom Prospective Diabetic Study (“UKPDS,” which studied type 2 diabetics), studied the effect of intensive glucose control versus usual control on diabetic outcomes, and emphasized the importance of bringing blood glucose levels as close to normal as safely possible, in-line with HbA1c goals, in order to reduce or delay diabetic complications and slow diabetes progression (DCCT et al., 1993; King et al., 1999). Yet, reports indicate that almost 50% of people with diabetes are not meeting glucose control goals (Strain, et al., 2014, p. 303.)

DE helps patients reach these glycemic goals, as well as providing other important diabetes care instructions and reducing complication risks (ADA et al., 2015, p. 2). As important examples of complication reductions when glucose levels are controlled, the incidence of kidney disease could be cut in half, nerve disease reduced by 60%, and eye disease reduced by 76% (DCCT et al., 1993). A DCCT follow up study (EDIC) additionally showed a reduction of 57% in heart attacks, strokes, and mortality from cardiovascular events (DCCT, 2005). Economically, DE reduces costs for individuals, hospitals, and society as a whole by reducing hospital admissions and risks of complications (ADA et al., 2015, p.1. See also Boren et al., 2009), a literature review concluding that DE economic benefits outweigh costs, but that more research is needed to validate their conclusion). For instance, for 18,404 patients between 1993 and 2001, each nutritionist visit reduced average hospital charges by $6,503 and for any educational visit hospitalizations were reduced by almost 10% (Robbins, J.M. et al., 2008, p. 655).
In a joint statement, the American Diabetes Association, American Academy of Nutrition and Dietetics, and American Association of Diabetes Educators named four critical points during the care of a diabetic patient when a referral to DE is recommended: when diabetes is newly diagnosed, at annual assessments, when there is a transition in care, and when complications or questions about self-management arise (ADA et al., 2015, pp. 4-7). The joint statement, along with other articles such as one by Burke et al. (2014), nicely describe why diabetes education is such an integral part of caring for people with diabetes (Burke et al., 2014, pp. 46-47; ADA et al., 2015, pp. 1-3). It is generally accepted that reaching glucose control goals should be individualized and comprehensive (Burke et al., 2014, p. 46). To improve glycemic controls, the DCCT implemented frequent blood sugar monitoring and frequent visits and phone calls with teams of physicians, nurses, and dieticians (DCCT et al., 1993). This team approach is necessary to provide diabetics with the knowledge they need to reach glycemic goals, but also to give them the motivation and skill to reach these goals, which is a very individualized process that has to take into account individual values, cognitive ability, personality, family, and environment (Burke et al., 2014, pp. 46-47; ADA et al., 2015, p. 2). To accomplish this, team members should include “experts in educational, clinical, psychosocial, and behavioral diabetes care,” which necessitates collaboration between doctors, educators, and patients (ADA et al., 2015, p. 2). When properly administered, in addition to helping patients improve glucose control (Manard et al., 2016, p. 377), DE improves quality of life and reduces costs to individuals and the economy by lowering hospital admissions and risks of diabetes-related complications (Li et al., 2015, p. 1; Kent et al. 2013; Menezes et al., 2016).

Another reason why patients need to acquire diabetes education from diabetes educators as sources other than their physicians is because there are not enough doctors who are qualified
and have the time to teach diabetes education. Reasons for this include the lack of nutrition training in medical schools and the shortage of endocrinologists. Therefore, the ADA and others recommend that diabetes patients attend diabetes classes and workshops, and/or one-on-one consultations with dieticians or nutritionists educated in diabetes and its treatment and prevention.

2. Not Enough Medical School Training in Nutrition

Despite the importance of understanding nutrition and diet in managing diabetics, medical school training for nutrition education is insufficient. This conclusion is evidenced by a 2008/9 survey of all U.S. medical schools to which 105 of 127 schools responding to questions regarding courses showed that only 27% of them satisfied the National Academy of Science’s 25 hour minimum in nutrition training to their students (Adams, 2010). This helps explains why one survey showed that even though 94% of internal medicine interns believed they were obligated to address nutrition with their patients of good nutrition, only 14% of them thought physicians were confident enough to provide such counseling (Vetter et al., 2008). As the authors of a recent report on the importance of nutrition education in academia and medical schools recently concluded, in general, medical schools are not adequately teaching students about nutrition, even as it relates to preventing and treating chronic disease (Donini et al., 2017, p.3). Studies have confirmed the need for more physician training and knowledge in order to fill gaps so that physicians can make optimal decisions in the treatment of their diabetes patients (e.g. Corriere et al., 2014; Sunaert et al., 2011, pp. 94-95, 101).

3. Shortage of Endocrinologists and Time Intensive Nature of Diabetes Control

Globally, only ~10% of diabetics are reported as treated by endocrinologists and diabetes specialists, so most diabetics are treated by internists and primary care providers (PCPs). This is
in part because of the shortage of endocrinologists caused by large number of diabetics and small number of specialists (Bin rsheed and Chenoweth, 2017, p. 29). According to statistics provided by the American Board of Internal Medicine, there were only 5,811 board certified endocrinologists in 2010 (Gharib, 2011). Of those, ~2,000 are academics who do not necessarily see many patients, and many work part time (Gharib, 2011).

4. Physician Perceptions on the Necessity for the Involvement of Diabetic Educators

For people with diabetes who are treated by general practitioners, an initial or annual visit with a physician is not sufficient to provide the necessary education to adequately treat diabetes and its complications (Powers et al., 2015, p. 1). One estimate is that due to time constraints, physicians typically spend under an hour each year with their diabetic patients, with patients managing more than 90% of their own diabetes care (Alzaid, 2014, p. 542). Therefore, it is imperative for physicians to refer diabetics to others for continuing DE so that patients properly understand how to manage their own care and deal with issues, questions, and complications that arise (Powers, 2015, p. 1). Physicians agree with the importance of having a team that includes non-physicians to treat people with diabetes. As an example of support for this view, researchers in one study of 19 doctors, consisting of endocrinologists and GPs, investigated physician perceptions about working in teams to care for diabetics, and found that the doctors highly valued this approach (Ritholz et al., 2011, p. 797). The doctors explained that they had limited time to spend with the patients, and that more time was needed to adequately treat this complex condition “with its many co-morbidities and challenging lifestyle recommendations” (p. 797). The doctors elaborated that diabetes educators and others are needed to help evaluate patients as individuals, to provide patients with the knowledge, motivation, and ability to self-manage their
condition, and to provide ongoing support (Ritholz et al., 2011, pp. 797, 799; Sunaert et al., 2011, pp. 94-95, 101).

D. Reasons For Low Enrollment in Diabetic Education

1. In General

Even though DE is important, patient enrollment is low, and there are multiple causes for low enrollment in DE (Maine, 2006). The direct source of these causes can be systemic, patient based, or physician based. In my thesis, I am primarily concerned with a physician based cause—doctors’ low referral rates of their diabetes patients to DE- and the reasons underlying this cause. In particular, I am interested in a largely unexplored, underlying reason that referral rates may be low despite the widespread recognition of DE’s importance: physician assumptions about how their patients will react when told to attend DE, and assumptions about whether they will attend.

Evidence of low referrals to structured diabetes education was reported in the U.K.’s National Diabetes Audit, which reported that only 4.5% of diabetics were offered this education (HSCIC, 2013, p.19). This percentage was especially low considering that referrals were incentivized, and that the structured education was considered essential to improving care and to giving diabetics the skills they needed to self-manage up to 95% of their own care (Millett, 2014). While my research did not reveal national statistics on physician referrals to DE in the U.S., the president of the American Association of Diabetes Educators commented in an interview that extremely low attendance rates of newly diagnosed diabetics provides evidence that patients are not being referred to DE, even though many of them are covered by insurance (Hope Warshaw, interviewed in Greenberg, 2017). Others also evidence that referral, as addressed below.
2. Patient Perspectives and Barriers

Despite strong evidence that diabetes education classes and consults with dieticians can have a significant impact on preventing diabetes in pre-diabetics and on improving glycemic control in diabetics, rates of diabetics who attend DE are low (Alameddine et al., 2013). In fact, only 6.8% of patients who have been newly diagnosed with diabetes and who have private health insurance attended DSME in the first year following their diagnosis (Li et al., 2014, 1046). Low utilization has made it difficult for DE programs and diabetes educators to remain profitable, which has led to the closing of many DE programs (Powers et al., 2015, p. 9; Kalvaitis, 2008).

One of the most significant reasons that patients do not attend DE is that their physicians do not direct and refer them to go. Physician referrals of patients to a dietician have been shown to increase the incidence of consultations by over 100% (Alameddine et al., 2013, p. 4). It is surprising that even when doctors have an understanding that diabetes education is essential for managing diabetes well and for preventing pre-diabetics from getting diabetes, physician referral rates to diabetes education remain low.

Failure of physicians to refer patients to DE has significant impact because physicians’ influence is a strong determining factor as to whether patients actually attend DE (Schafer et al., 2014, 5; Schafer et al., 2013). Evidence that supports this conclusion includes analysis of questionnaires where patients provided reasons for non-attendance by explaining that their doctors did not mention DE, or that their doctors did not think it was important (Schafer et al., 2014, p. 3). The extent to which physician referrals can influence attendance was demonstrated by results of one study where 332 diabetics completed a questionnaire. The answers revealed that of the 34% of participants who were referred by their physician to a dietician, a majority of 91%
consulted with dieticians, compared to a mere 11% of patients who consulted with dieticians even though they were not referred by their physicians (Alameddine et al., 2013, p. 4).

Another major patient-based barrier to DE attendance is that patients believe they know enough about diabetes, as expressed by over half of the 132 patients that did not attend DE in one German study (Schafer et al., 2013). Additionally, that study showed that significant numbers of patients reported that they did not attend because they thought their doctors were mainly responsible for managing their diabetes (29%) or because they did not understand how they would benefit from attending (21%) (Schafer et al., 2013). These stated reasons highlight the importance of physicians expressly telling their patients to participate in DE in order to encourage attendance (Schafer et al., 2014, p. 5). Other reasons that patients give for non-attendance are of less importance to the goals of this thesis, and include variables such as inconvenience, cost, and transportation (Maine, 2006). Overcoming these variables is being partially addressed through technological advances such as providing DE through telemedicine (e.g. Siminerio et al., 2014) or through email, web, and/or mobile applications (e.g. Block et al., 2015).

3. Physician Perceptions and Barriers

According to my research of the literature, it appears that a primary reason that physicians do not refer patients to diabetes education is that they believe the patients will resist or refuse their recommendations. Physicians consistently remark that patients are often reluctant to see diabetes educators and are unmotivated to attend, even though the patients need the education and support these educators provide (See e.g. Ritholz et al., 2015, p. 799; Sunaert et al., 2011, p. 101). Some doctors have expressed that they do not have enough training to motivate patients to attend (Sunaert et al., 2011, pp. 94-95, 101). When these beliefs are
combined with the patient barrier of believing that their physician provides them with all the knowledge they need to manage their diabetes, one can begin to understand why referral rates are low. The problem is compounded by population bias, which occurs when physicians look at low overall rates of patient diabetes education attendance and causes them to believe their individual patients will not go. This reasoning is faulty because an individual patient may wish to, or be willing to, attend diabetes education, despite what numbers concerning the entire diabetic population show. Therefore, I believe that physician failure to refer individual patients because of population rates may create a cycle that serves to reinforce low referral and attendance percentages. Further, since physician referral of a patient to diabetes education has a large impact on whether a patient attends (see discussion above), the physician referral of a patient can make a huge difference in that individual’s life, and when enough physicians make referrals, population-wide rates can increase. An increase of a seemingly low 1% of diabetics attending diabetes education would reflect large numbers of 4.15 million people worldwide and almost 300,000 people in the U.S., based upon statistics of the number of people who have diabetes.

Although my research indicated that there is a dearth of literature on the barriers that prevent physicians from referring patients to diabetes education, as discussed below several articles that do prefatorily address this issue listed physician belief that patients would resist or refuse to follow the doctor’s recommendation to attend as a primary reason that physicians do not refer. However, even when mentioned, physicians’ failure to refer because of concerns about patient reactions was given little attention, especially considering the significance of physician referrals in influencing patients to attend DE. For instance, analyzing 556 completed healthcare provider surveys, a Maine CDC-DPCP study researched the question of why more people do not participate in DSME, given the proven benefits of diabetes education on care and prevention of
complications (Maine, 2006, pp. 10, 15). The top reason given by providers who answered that they did not refer was that they decided not to refer because “patient refuses or declines” (Maine, 2006, p. 16). This seems to indicate that providers did not refer because they assumed their patients would not attend DE, although the report did not elaborate further on the reason, nor did the report suggest a solution that could specifically counter this belief. Similarly, a Canadian study reported questionnaire responses of 99 PCPs, which revealed that less than half of them followed clinical guidelines for referring patients to DE. The reasons provided by those doctors for not referring to DE were based upon their beliefs that patients would not attend because of patient unwillingness, language barriers, inability to get to appointments, and inconvenience (Gucciardi et al., 2011). These reasons can actually all be categorized as one physician barrier—namely that the physician does not refer because he does not think the patient will attend—although it lists several patient barriers to attending from the perspective of the physicians. Research articles investigating reasons why physicians fail to adhere to clinical guidelines in general refer to these types of physician assumptions as a “lack of outcome expectancy” (Lugtenberg et al., 2009; Rowe et al., 1999, p. 1461).

Since there is little to draw upon in the literature on lack of outcome expectancy in referring to DE, reports of this barrier as it relates to other medical conditions are of interest. Although not specifically on the topic of lack of outcome expectancy affecting referrals of diabetics to DE, lack of outcome expectancy’s effect on prescribing tests and procedures (not including DE) was demonstrated in the Rowe et al. (2009) report of results showing that 30% of PCPs agreed with the substance of guideline recommendations, yet did not think that making the recommendations would lead to better patient outcomes. Likewise, in Lugtenberg et al. (1999) the authors explained that physicians might not adhere to a variety of guidelines if they thought
the patients would not follow the advice, pointing to studies such as an example where 90% of physicians did not follow recommendations for treating alcohol abuse because they did not think the patients would comply (p. 1461). When lack of expectancy outcome causes a doctor to practice a certain way, it can be difficult for the doctor to deviate from his past practices, which could lead to clinical inertia.

4. Clinical Inertia

As with lack of outcome expectancy, my research did not uncover reports of clinical inertia with respect to failure to refer to DE. However, clinical inertia is a phenomena that is widely discussed with regard to other medical conditions. It has also been addressed in attempts to understand why physicians might sub optimally delay the initiation of insulin or fail to intensify pharmaceutical treatment.

Clinical inertia is a psychological occurrence that causes doctors to fail to treat patients optimally, either by delaying, not intensifying, or not implementing a treatment that is recognized as likely to improve patient health (Strain et al., 2014, p. 303; Aujoulat et al., 2014, p. 141). This factor may play a role in almost half of all medical decisions (Reach, 2015, p. 168), and may play a role in the majority of heart attacks and strokes (Aujoulat et al., 2014, p. 141). One author suggested that in caring for diabetics alone, in the U.S. clinical inertia might result in hundreds of thousands of serious adverse events and a consequent billions of dollars of costs and numerous patients dying prematurely (O’Connor et al., 2005, p. 296. Also discussed in Reach, 2015).

5. Reasons Leading to Clinical Inertia

A 2014 literature review on clinical inertia summarizes and discusses many themes explaining why clinical inertia occurs in general, including physician belief that they will not be
able to get patients to adhere to changing eating and smoking behaviors (Aujoulat et al., 2014, p. 144). The review does not discuss diabetes education, nor does it address assumptions about patient reactions to recommendations. However, O’Connor et al., (2015) touches upon what he calls “soft excuses” that physicians give for not intensifying diabetes care, including predictions that patients will resist their recommendations (p. 297). In his article “Patients’ Nonadherence and Doctors’ Clinical Inertia: Two Faces of Medical Irrationality,” Reach (2015) lends further insight into underlying reasons for clinical inertia. In fact, in U.K. study of over 80,000 people, clinical inertia was been found to contribute to delays in treatment intensification that resulted in many people with diabetes having poor glycemic control (Khunti et al., 2013).

Reach (2015) applies several possible psychological reasons for human irrationality from the field of behavioral economics to explain why physicians may make irrational medical decisions to depart from guidelines. These reasons involve heuristics, or shortcuts that doctors and others take when they make their decisions without fully considering all available information (Rice, 2013, p. 433). Some of the reasons mentioned by Reach include allowing emotions to impact medical decisions, loss aversion, and myopic short-sightedness due to hyperbolic discounting, preference reversal, and/or a short temporal horizon (Reach, 2015, pp. 171-175). One possible heuristic doctors might use is decision fatigue, which occurs when people start to make poor choices after becoming exhausted from decision making (Rice, 2013). Another possible heuristic is temporal horizon, which refers to a person’s tendency to have difficulty imagining future benefits of that person’s positive behavior, and the further off into the future that the benefits are, the less people can imagine that they will be effected by these benefits, even if they intellectually know that the benefits are likely to occur (p. 171). The oft cited Stanford marshmallow test is a frequently used example of these human tendencies, where,
as reported in an article in *The Atlantic*, a study showed that children who were offered one marshmallow today or two tomorrow often chose one today rather than delaying their gratification, even though the total benefit of opting for the current reward was much less (Urist, 2014). These myopic heuristics can explain why many diabetic patients are not willing to delay gratification by making lifestyle changes, but can also explain why physicians might not refer diabetics to education courses. To explain, physicians who believe that their patients will be reluctant to take doctor advice might put aside the future reward of having a patient with better diabetic control, in favor of avoiding the additional time and unpleasantness that would occur presently if the patient resists agreeing to get diabetic education (Reach, 2015, p. 173.)

Like these heuristics, emotions can lead to clinical inertia that prevents physicians from referring diabetics to diabetes education. The physician’s emotion of fear of having to deal with an unpleasant reluctance from patients who will resist treatment should optimally be left out of evidence based medical decisions, but as Reach points out, doctors are human, so the emotion of fear could lead to their clinical inertia (p. 176). However, emotions can also be beneficial, and one suggestion for counteracting fear and clinical inertia is to emphasize a positive emotion, such as pride in helping patients become healthy (pp. 176-177).

With regard to clinical decisions other than referring diabetics to DE, there is a body of literature evidencing that physicians deviate from recommended clinical guidelines and from the best standard of care due to their concerns and fears that patients will respond reluctantly to treatment recommendations. When deciding whether to refer cardiology patients to dieticians, an Australian study concluded that physicians are influenced by their perceptions of how the patients would react (Pomeroy and Cant, 2010, p. 150). Results of their survey of 248 GPs showed that 2/3 of the doctors expressed that one reason they did not refer patients to dieticians
was that patients were unwilling to go (p. 150). The authors noted that one interpretation of physician responses leads to the conclusion that by pre-judging “patients’ capacity to alter dietary behaviors, their sense of responsibility for their health and their ability to pay,” “GPs make unfounded assumptions” which create “artificial barriers” that stand in the way of doctors’ referral decisions (Pomeroy and Cant, 2010, pp. 151-152). In another study addressing whether pressure exerted by patients influences physicians in general decisions as to whether to order tests or procedures, survey results showed that 83% of 1,210 doctors self-reported that their decisions were influenced by patient pressures, with 28% agreeing that such pressure was a major influence and an additional 55% stating that it was a minor influence (HealthLeaders, 2010). In the field of diabetes, physician concern that patients will negatively react to being told that they should start insulin is another area where doctors make less than optimal decisions because of their assumptions as to patient reactions. Exemplifying how doctors perceive patient views on initiating insulin, in a 2013 American Association of Clinical Endocrinologist’s report 88% of responding, surveyed physicians agreed that insulin was effective at treating diabetes, but 69% thought their patients would view starting insulin as a failure (Diabetes in Control, 2013).

Reasons for patient resistance in starting insulin are widely reported, but my research revealed far fewer studies addressing reasons for physicians’ resistance or delay in prescribing insulin. Many PCPs who believe that insulin is essential to managing diabetes delay prescribing insulin except as a last resort (Bin rsheed and Chenoweth, 2017, 29. See also Peyrot et al. (2005) reporting the Diabetes Attitudes, Wishes, and Needs (DAWN) study, which demonstrated that about half delayed prescribing insulin). As Bin rsheed and Chenoweth (2017) reported, patient reasons include fear of injections, worries about weight gain, misunderstandings about insulin, and insufficient explanations from healthcare providers (p. 29). The Bin rsheed and Chenoweth
(2017) literature review also revealed that provider delays in prescribing insulin can be attributable to other factors having to do with physicians’ decision-making process, including lack of physician knowledge and training and concern that patients would gain weight (Bin rsheed and Chenoweth, 2017, p. 34). This review showed that doctors may be influenced by their assumptions predicting patient reactions and a resulting clinical inertia which prevents them from making decisions that are optimal for treating patients’ diseases. To analyze this possibility, the Bin rsheed and Chenoweth (2017) authors searched eight databases within the time period of 1/1/94 and 8/31/14 for all studies focusing on the perspectives of generalist health care providers as to what barriers prevent them from starting their patients on insulin, and how to overcome those barriers (Bin rsheed and Chenoweth, 2017, p. 30). The 19 relevant studies that they found demonstrated that one common reason for delaying insulin was the provider’s perception that patients would be reluctant to start insulin treatment (pp. 31-34). In the case of prescribing insulin, PCPs have acknowledged that their belief that patients will be reluctant is one reason that the PCPs delay in prescribing (Haque et al., 2005). However, interestingly, studies show that doctors tend to overestimate their patients’ level of concern and fear that injections will hurt, although they overestimate other patient concerns that prevent them from starting insulin, such as feelings of failure and worries that their disease will worsen (Yoshiok et al., 2014; Nakar et al., 2007).

Further demonstrating predictions of patient resistance as lending to clinical inertia, in one study exploring physician level barriers, of 83 PCPs, 64% of them expressed that patient resistance was their main reason for delaying insulin therapy, but the authors pointed out that physician beliefs predicting patient reactions may be inaccurate since they do not necessarily match patient preferences (Ratanawongsa et al., 2012, p. 5). In the Ratanawongsa et al. (2012)
study, the authors discussed statistics from the larger, TRIAD Insulin Starts Project that they were participating in, which produced findings that although 97% of physicians believed a fear of injections was a major reason that patients did not start insulin, a much lower 30% of patients named fear of injections as the reason that they did not start insulin. Adding to the evidence that physicians could be underestimating the number of patients who would be willing to start insulin if properly informed, 55% of the patients who did not follow directions to start insulin expressed that their failure to do so was due to patient impressions that their providers did not sufficiently explain insulin’s benefits and risks (p. 5). While the Ratanawongsa et al. authors acknowledged that physician decisions to delay initiating insulin could be the correct medical decision, they emphasized that the physician level barrier of failing to start insulin because of physician perceptions that patients would resist doctor recommendations supported findings in prior studies that clinical inertia was a major cause of poor diabetic control (pp. 4-5).

Another recent literature review shed some light on the extent of the problem of clinical inertia in managing diabetic control, and a possible reason that some physician barriers have not been adequately addressed by the literature or in practice. In the review, Blonde et al. (2017) explored in part how health care provider attitudes could be contributing to suboptimal glycemic control (Blonde et al., 2017). After stating that information on physician barriers is scarce, the authors identified 1. A lack of physician education about diabetes, and 2. Clinical inertia in initiating insulin as two factors which emerged from previous studies (pp. 5-6). Regarding clinical inertia, Blonde et al. (2017) estimated that based upon published studies, clinical inertia “is a common and widespread problem” that impacts 30% to 50% of diabetics (p. 6). The authors highlighted evidence that patient resistance or refusal are the most common reasons doctors give for not starting insulin, and that one study showed how 33% of physicians used a
higher glycemic target than recommended by guidelines because of their perception that patients are unwilling to manage their diabetes. This demonstrates that physicians are not always in tune with patient motivations for accepting and complying with treatments. It also shows that they may be willing to succumb to less that optimal practices because of their predictions about patients. Importantly, if the same is true with regard to diabetic education, informing physicians that their patients are motivated to consult with a dietician or attend diabetic education classes could increase referrals.

In the Blonde et al., (2017) review, the authors explained that despite the impact of clinical inertia on diabetes care, risks tend to be attributed to patients and system level barriers, not to physician attitudes and practices (p. 6). Perhaps to partially explain this lack of attention, Blonde et al. described a report of focus group discussions with one group of physicians that revealed how some of them were insulted by the idea of clinical inertia (p. 6, referring to Aujoulat et al., 2015). The authors then went on to underscore the importance of gaining a better understanding of how physician level and other barriers contribute to clinical inertia in order to combat it and thereby treat patients in ways that are the most likely to help them achieve the best possible glycemic control (p. 8).

Based on my search of the literature, I am unaware of interventions aimed at increasing physician referrals to DE by reducing or eliminating physician concerns about patient resistance or reluctance to their recommendations. However, I did find a study of 962 pre-diabetic and diabetic patients, where physician referrals to DE of patients who were members of a patient-centered medical home were more than double the referrals of patients who were not in a medical home (Manard et al., 2016, p. 381). A medical home uses a patient centered, team approach in treating patients (Adamson, M., 2011). The authors reporting their results were
unaware of any other studies comparing physician referral rates to DE for medical home patients versus non-medical home patients (Manard et al., 2016, p. 382), but they postulated that the cause of increased referrals could have been patient or physician based. A patient-based cause could have been that medical home patients might have a “personal orientation toward health,” and patients might therefore have asked their physicians for referrals to DE (p. 383). Alternatively, the cause could have been systemic, triggered by either the visual cue the physicians saw which alerted them to the fact that the patient was a medical home member, increased communication between the physician and diabetes educator, or incentives to improve diabetic control in medical home members (382-383). The Manard et al. (2016) study was intriguing because it demonstrated that it is possible to overcome barriers at the physician level, thereby significantly increasing referrals, but it is unclear how and why these results were achieved. While the difference in referrals to DE of 23.9% versus 13.5% was significant and impressive, even the higher referral rate had “substantial room for continued improvement” (p. 382).

None of the studies mentioned above specifically addresses whether physician DE referral decisions are influenced by assumptions that diabetic patients will not want to attend DE, and if so, how to solve this physician barrier. However, since physician expectancy of outcomes and clinical inertia affect treatment decisions in other medical treatment areas, including the management of diabetes through insulin use and referrals of cardiology patient to dieticians, my hypothesis is that it is likely that these factors are also playing a role in physician failures to refer diabetics to DE.
V. SUGGESTED STUDIES

A. Proposed Study 1- Evaluating Whether Assumptions About Patients Affect DE Referrals

To test this hypothesis, I suggest that a first step is to conduct a simple study to assess how physicians’ assumptions about 1. patient motivation to learn more about diabetes, and 2. patient reluctance to attend DE impact physician referrals to DE. Survey questions that would help evaluate physician preconceptions and their impact on referrals are attached as Appendix A. I propose that the survey questions should be separately divided into three groups of physicians: 1. Endocrinologists (who are specially trained and knowledgeable about diabetes), 2. GPs without a dietician or nutritionist trained or certified in diabetes education on staff or available at the physicians’ office, and 3. Physicians who are not endocrinologists, but who have a dietician or nutritionist trained or certified in diabetes education on staff or available at the physicians’ office (as in medical homes). Each survey will ask the physician which of the groups that physician falls within to enable survey division and to allow for comparison of the groups to each other. Survey answers will be rated on a scale of 1 to 5, to gauge the extent of individual physician beliefs and referral patterns. My expectation is that a percentage of both types of physicians will indicate that if they believe a patient will resist their recommendation to attend diabetes education, they will not refer the patient to DE. This view will be reflected in a response to the question, “Does your prediction of whether a particular patient will be reluctant to attend diabetes education affect your decision to refer them to diabetes education?” A response of 1 indicates “It does not affect my decision at all” and a response of 5 indicates “It affects my decision a lot.” Any rating of 3, 4, or 5 will also validate somewhat of a role that a physician’s pre-judgement of a patient plays in the physician’s decision making process of whether to refer a patient to DE.
In comparing responses of the three types of physicians, I hypothesize that fewer endocrinologists will take predicted patient responses into account than the other two groups. If this is verified, one reason could be that endocrinologists have more training in diabetes, so their deeper understanding, experience with, or confidence in how to persuade the reluctant patient enables them to overcome barriers such as outcome expectancy or clinical inertia. This reasoning would support solutions which could either require more diabetes training in medical school or for GPs to complete continuing medical education requirements, as is already being suggested as mentioned in the literature discussion above. A second reason that would explain why endocrinologists might be less affected by predictions of patient responses could be that patient populations who see diabetes specialists have more of an interest in improving and taking responsibility for their health. This explanation was proposed by Manard et al. (2016) as a possible reason for the significantly higher referrals of medical home patients to DE, and results confirming my hypothesis in this study would lend further support to that explanation. However, similar study results would be limited by the fact that they would be correlative, as the study I am proposing does not prove causation of the differences between the physicians. After obtaining results of this study, future studies would be recommended to gain a better understanding of causation for differences in physicians’ patient referral rates to DE.

In comparing responses of the third physician group who are not endocrinologists, but who have a dietician or nutritionist trained or certified in diabetes education on staff or available at their office, I hypothesize that fewer of this third group will take predicted patient responses into account than the GPs who do not have this easier access to diabetes educators. If this hypothesis is true, it would support the systemic-level possibility suggested in Manard et al., (2016) that the proximity of GPs to diabetes educators, and the potentially more open
communication between these professionals, plays a role in increased DE referrals (p. 382). By understanding the extent of the influence of this factor better, the potential impact of interventions to overcome physician level attitude barriers can be more accurately evaluated. The less of a role that proximity of diabetes educators plays in referral rate differences, the more of a role that interventions to overcome physician level attitudinal barriers plays. On the other hand, patients may be purposely opting to see GPs who have diabetes educators on staff, and this higher interest in their own diabetic health and the GP impressions of the patients who seek them out may positively impact physician referrals. Once again, this highlights the importance of future studies to determine causation for higher referral rates in order to best evaluate which interventions would be the most successful.

Two limitations to this first proposed study are of particular note. First, physicians are self-reporting on the surveys, which could create bias. I chose surveys because they are a relatively inexpensive, simple, and direct way to gather data from a large number of physician’s about how their perceptions and attitudes impact their referral rates. The next best way I could think of to determine why physicians decide not to send their patients to DE would be to gather and analyze data from notes of patient visits. In addition to the tremendous time and expense that this would involve, this method would have to overcome a substantial hurdle because of doctor patient confidentiality laws. Furthermore, it is likely that the notes would frequently omit the physicians’ reasons for the passive inaction of not taking the action of sending a patient to DE, as opposed to notes where physicians explain reasons why they are taking a particular treatment action.

However, even when surveys are anonymous, the nature of self-reporting raises questions as to whether the answers are completely accurate or whether they are affected by reporting or
attention bias (Cook, 2010, pp. 61-62). Reporting bias can cause respondents to give answers that they view as more socially correct (Cook, 2010, p. 62), and in the proposed survey it may be obvious that it is undesirable for physicians to allow assumptions about patient reactions to color their decisions to refer them to DE. Attention bias, sometimes described as a Hawthorn effect, causes respondents to give biased answers when they believe their behaviors are under observation or study (Cook, 2010, p. 61). The potential for these biases can be lessened by assuring the physicians that the surveys will remain anonymous, and by having them sent or given to them in writing by people that they do not know. Although the potential for these biases exists, bias would not lessen the significance of doctor’s answers showing that they are impacted by assumptions about patient reactions- if anything the biases would make such answers even more salient because the doctors would be admitting to conducting an undesirable practice.

A second limitation of the study is that payment structures incentivizing referrals to DE may differ from practice to practice, so monetary incentives may positively affect attitudes of physicians who are incentivized to refer. Additionally, physicians’ responses may differ depending upon demographics and characteristics of their patient bases, including factors related to geography, rural versus urban residents, race, socioeconomics, and extent of illness. As found in the Manard et al. (2016) study and their previous study mentioned in their report, greater physician referral rates to DE have been associated with patient characteristics of being African American, having diabetes as opposed to prediabetes, and have higher utilization of health care (more health care encounters made it more likely that the patient would be referred to DE) (p. 382).
B. Proposed Study 2- Comparing Interventions to Overcome Barriers in Referring to DE

After gathering survey data in my first study, I suggest conducting a study to evaluate and compare interventions that could overcome physician barriers caused by their predictions of negative patient responses. After completing a thorough search, I am unaware of any study using such interventions to overcome this physician barrier in referring patients to diabetes education. First, current and past physician referrals of patients to DE should be tallied. Sample bar graphs of these tallies are attached as Appendix B, showing a ten-person endocrinology group’s referrals to one-on-one DE consultations, referrals to DE workshops, and total combined referrals to consultations and workshops. These bar graphs are shown both as totals for all physicians, and as further breakdowns by individual physician. In future studies it will also be important to breakdown referrals by physician, so as to more accurately assess the effectiveness of an intervention on a given physician.

After gathering this baseline data, I suggest evaluating patient level of motivation to attend DE, so that physicians can be made aware of whether their patients are motivated to attend DE. One method of assessing a patient’s motivation would be to provide patients with surveys such as the fill-in-the-bubble survey in Appendix C, to be completed by patients while waiting to be seen by the physician. The survey would be easy to complete, to avoid patient frustration with additional paperwork. Then, the survey could be evaluated by a nurse or medical assistant to see if the patient expressed interest in learning more about diabetes in an education class or consultation, and to see if one of the reasons that the patient may not be interested is a self-reported belief that they already have a high level of knowledge. For those patients whose surveys demonstrate reluctance to attend DE and show a self-belief that their knowledge level is high, a short quiz such as that in Appendix D could be given to the patients to show them that
they could still learn more. As previously discussed herein, patients’ over-confidence in their own knowledge is a common and impactful barrier to their willingness to attend DE. After taking the quiz and revealing gaps in some patients’ knowledge, these patients would then be re-questioned as to whether they would be interested in attending DE. If a physician receives information showing that a patient will not be reluctant to attend DE, and rather would be interested in learning more about how to manage diabetes, this simple communication of patient information could be enough to overcome a physician’s assumption or perception that the patient will react negatively when given a recommendation or referral to DE, and could lead to greater referral rates.

It is beyond my intended scope of this thesis to suggest interventions that could overcome an accurate physician perception that a patient will be reluctant, but for situations where the physician receives information showing that the patient is not motivated to attend DE, one suggestion would be to provide the physician with enhanced education about the efficacy and importance of DE. Another suggestion is to provide the physician with training for how to effectively and efficiently persuade such patients to attend DE. Additional education and/or training could be provided in medical school, in continuing education courses, and/or by healthcare employers who wish to improve patient care. With the movement toward making physician remuneration more dependent upon patient health outcomes as opposed to fee for service (see e.g. Page, 2013), physicians and their employers could be more motivated to spend time and money on this kind of education and training.

C. Types of Interventions: Visual versus Textual Communication to Physicians

Just as different ways of communicating health information can affect the likelihood that a person will choose a healthy food instead of junk food, or will change another type of behavior
for the betterment of one’s health, communication methods of relaying patient motivation to attend DE could impact whether physicians refer these patients to DE. Therefore, I suggest that a study should be conducted comparing several ways of conveying to the physician that a patient is not reluctant to attend DE, and instead is interested in learning more. The physician would be given the information in one of three ways before meeting with the patient, along with the patient’s other medical information. One method would be to give the survey and quiz to the physician in a green, yellow, or red folder, depending upon whether the patient was highly motivated, neutral, or reluctant, respectively. A second method would be to give the survey and quiz to the physician in folders labeled with the words “highly motivated,” “neutral,” or “reluctant.” A third method would be to provide the physician with the survey and quiz along with a cartoon or imagery such as that in Appendix E and F in order to nudge the physician to overcome clinical inertia or lack of outcome expectancy that they may be experiencing. Only one method would be used per physician, and methods would be randomly assigned. If significant differences in increased referrals appear depending upon delivery methods, comparing which of these delivery methods resulted in the greatest rates of referral increases could provide insight into how to most effectively overcome referral barriers, as well as provide insight into how to encourage other recommended clinical practices.

As argued by Thaler and Sunstein (2009) in their book *Nudge: Improving Decisions About Health, Wealth, and Happiness*, nudges such as those I am suggesting for further study can help persuade people to make decisions in their best interests, which can be especially useful in cases where people have become susceptible to reaching less than optimal decisions. Nudges have been effective in changing various health care behaviors, such as reducing tobacco use, changing habits leading to obesity, and increasing organ donations (Rice, 2013, p. 440-444).
Nudges have also been useful in changing physician behaviors, without interfering with their ability to deviate when appropriate and to make good, individualized clinical decisions (Jackson, 2016). For instance, one study reported in *JAMA* that used an electronic medical records nudge reduced prescriptions of antibiotics simply by presenting physicians with suggested alternatives when electronic orders were placed, and another nudge in the same study reduced prescriptions by presenting physicians with comparisons of peers’ prescriptions (Meeker et al., 2016, pp. 562, 564-565). In another case, reminder nudges targeting physicians and a low-income population resulted in triple the number of cancer screenings (Fiscella et al., 2010, pp. 1, 4). In another example reported in Blumenthal-Barby and Burroughs (2012), nudges reminding physicians of proper steps to take in caring for ICU patients reduced infections from 11% to 0%, saving $2 million dollars, and preventing illnesses and deaths (p. 6).

My interest in comparing and evaluating visual interventions (such as the colored folders), textual interventions (such as the folders labeled with words describing extent of motivation), and interventions combining visuals and text (such as the cartoon images) stems from my research indicating that the visual nature of communications can more effectively increase desired behavioral changes in certain circumstances, but can be less effective in other cases. In communicating health care messages to patients, studies have shown that visual imagery can effectively improve attitudes, behaviors, and decision making (Garcia-Retamero and Cokely, 2013, pp. 392, 396). When pictures and text are linked, attention to and recall of health information can significantly increase compared to textual information alone (Houts, et al., 2004, pp. 173, 176). In communications specific to diabetes care, graphics and pictures have been shown to improve patient understanding and motivation (Alzaid, 2014, p. 543; Levetan et al. (2002). Although these studies and articles focus on communications to patients, their
conclusions could apply to health care providers as well. Furthermore, visual imagery can change people’s attitudes, as shown by a study revealing that pictures portraying overweight individuals in particular clothing could impact how favorably people view overweight individuals in general (Shute, 2012). Thus, pictures or visual cues could draw more of a physician’s attention to a patient’s motivation to attend DE, or could cause the physician to be more likely to perceive patient’s as taking responsibility for their health and diabetes management. Cues and images might therefore not only serve as a reminder, but could even improve perceptions about patients that would lead to increased referrals to DE.

In fact, although studies on the effectiveness of visual nudges on changing physician behavior are sparse, studies have shown that visual imagery or the method of delivering a message could change physician practices and improve medical behaviors. In one study, physician participants were confident in their analgesic practices, but the majority of them were actually deficient in their knowledge and were making prescription errors (Ryland, 2015). After receiving visual prompts, their prescription habits changed and their error rates fell to 0% (p. 2). In another study, researchers implemented an intervention that changed the wording of Brigham and Women’s hospital signs reminding doctors to wash their hands from focusing on protecting doctors’ health to focusing on protecting patient health (Grant and Hofmann, 2011). In an effort to increase physician handwashing, the hospital had previously moved sinks, purchased $5,000 carts to making handwashing convenient and easy, implemented movie ticket give-aways as incentives, and distributed hygiene evaluations (Herbert, 2011). Even though the importance of handwashing to prevent the spread of disease is widely accepted, none of these measures were effective until the signs’ wording was changed, possibly because of healthcare providers’ biases toward having a personal fable of invincibility (Herbert, 2011).
Some media campaigns have also attempted to change physician behaviors through targeted visual messaging. A case study reported on results of a campaign for New York’s Department of Health to increase PCP involvement and communications with their patients to help them quit smoking. Similarly to my hypothesis about reasons PCPs do not want to refer patients to DE, the case study report explained that too few physicians were talking to their patients about quitting because of their pre-judged perceptions that their patients would not want to hear their recommendations or would not take their advice (Better World, n.d.). Noting that research demonstrated that physicians have the ability to strongly influence their patients in helping them quit smoking, the report went on to discuss the visual images used in posters meant to encourage physicians to talk to their patients. Images of physicians with their mouths sealed shut with stitches or duct tape, combined with the words “don’t be silent about smoking,” proved effective. Thanks in part to the attention getting imagery, 78.9% of questioned health care providers reported that the posters got their attention, and 65% stated that the posters caused them to think more about helping patients quit (Better World, n.d.). In another case, a Rice University student discussed her view of the importance of using images in a poster campaign to encourage PCPs to increase HIV testing (Balotin, n.d.).

Research in the relatively new field of distance psychology is illuminating how the impact of visual versus verbal messages varies depending upon the type of message communicated. As Brown University professor Elinor Amit blogged about in a Huffington Post entry, along with others, her research has demonstrated that whereas some messages are better delivered visually, such as those related to hot trends, other messages are better delivered verbally, such as those related to achieving long term goals (Amit, 2015). In her post, she explains that distance psychology research reveals that messages about ideas, events, and objects
that are far-off in time are preferred in verbal form, whereas messages about ideas, events, and objects that are near in time and are preferred in visual form (Amit, 2015). Therefore, although pictures can evoke more emotion than words, words can produce more positive associations for distant rewards, such as health goals (Amit, 2015; Amit et al., 2012, p. 43-44; Carnevale et al., 2015). Importantly, not only are messages preferred in these ways, they are also more memorable, receive more attention, are more quickly identified, and are more likely to result in purchasing and other actions (Amit, 2015).

Amit’s post continues by explaining that one reason may be that it is easier for people to process visual images of information close by and verbal information of far-away ideas (Amit, 2015). This plays into the fact that people like to process information easily, with less effort, so they are more affected by easily processed information than ideas that are difficult to dissect (Amit, 2015). One interesting study by Amit is an example of research that supports this conclusion. In her study, some participants were showed visual images of a pasta recipe, and others only received the recipe verbally, without pictures. Unlike the participants who learned of the recipe verbally from a distant chef, the ones who received it visually tried the recipe more frequently when it was made by a local chef (Amit et al., 2012, pp. 50-52). Another study example Amit uses to support these associations involved people who identified foreign currency verbiage more quickly than their local currency verbiage, but identified pictures of local currency more quickly than foreign currency (Amit, 2015).

As in NY’s smoking campaign discussed previously, pictures may be more effective than words in getting the attention of physicians, thereby influencing them to overcome their assumptions and send their patients to DE. On the other hand, as Amit and others have shown, words may have more salience than visual cues in creating positive associations with the distant
goal of improving patient health. By comparing visual versus textual interventions that inform physicians about their patients’ motivation to attend DE and nudge physicians to increase referrals, insight can be gained into whether one form of communication to physicians is more effective than another.

VI. CONCLUSION

Patient attendance at diabetes education is lower than desirable. It is important to raise attendance rates so that patients can obtain valuable assistance in caring for their condition. With this education, individual and population health could improve and costs should be reduced. While various barriers stand in the way of patient attendance, more attention should be given to barriers that prevent physicians from referring their patients to diabetes education. This is especially true since physician referrals highly influence their patients to attend, and some patients may not even learn about diabetes education unless told about it from their physicians. Clinical inertia and lack of outcome expectancy may be playing a role in preventing physicians from referring patients to diabetes education, just as these factors affect physicians in suboptimal decisions in other clinical decisions. If there is a way to eliminate assumptions that patients will react poorly to physician referrals, perhaps more physicians will refer to diabetes education, and further study will demonstrate the efficacy of this goal. Once it is established that assumptions are playing a role, interventions that are visual, textual, or a combination of both could be simple, inexpensive, and efficient ways to positively influence physician decisions for the future health of individual patients and the global population as a whole.
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Appendix A - Survey to Assess Effect of Predicted Patient Motivation on Physician DE Referrals, developed and created by Alexandra Kaye and Dr. William Kaye

Physician Survey

Referrals of patients to diabetes education (including classes and/or consultations with dietitians and/or nutritionists)

1. How important do you believe it is for diabetics to receive diabetes education from diabetes education classes and/or a dietitian, in order for the patients to achieve good glycemic control?
   Mark only one oval.
   1 2 3 4 5
   Not important  ○ ○ ○ ○ ○ Very important

2. How important do you believe it is for pre-diabetics to receive diabetes education in order to avoid becoming diabetic?
   Mark only one oval.
   1 2 3 4 5
   Not important  ○ ○ ○ ○ ○ Very important

3. How likely is it that your average patient would attend diabetes education if you referred them?
   Mark only one oval.
   1 2 3 4 5
   Not likely  ○ ○ ○ ○ ○ Very Likely

4. Do you anticipate patient reluctance to attend diabetes education?
   Mark only one oval.
   1 2 3 4 5
   No I never know whether or not my patient will be reluctant or not before I ask them.
   ○ ○ ○ ○ ○ Yes! Based on my experience, I expect the patient to be reluctant.
5. What is the likelihood that your patients will attend diabetes education based on your referral?  
Mark only one oval.

1  2  3  4  5  
Not likely  ●  ●  ●  ●  ●  Likely

6. How frequently do you encounter resistance by a to patient to attend diabetes education classes or consultations with a nutritionist?  
Mark only one oval.

1  2  3  4  5  
Never  ●  ●  ●  ●  ●  Extremely frequent

7. Regardless of the level of your patient reluctance, do you anticipate they still will go to a nutritionist or attend classes?  
Mark only one oval.

1  2  3  4  5  
No, reluctance means they will not go  ●  ●  ●  ●  ●  Yes, even though reluctant they will follow advice and go.

8. Does your prediction of whether a particular patient will be reluctant to attend diabetes education affect your decision to refer them to diabetes education?  
Mark only one oval.

1  2  3  4  5  
It does not affect my decision at all  ●  ●  ●  ●  ●  It affects my decision a lot

9. Do you think a perception of patient reluctance affects other physicians (not yourself) when they decide whether to refer a patient to diabetes education?  
Mark only one oval.

1  2  3  4  5  
I do not think it affects their decisions at all  ●  ●  ●  ●  ●  I think it affects their decisions a lot
10. Are you an endocrinologist?
Mark only one oval.

☐ Yes
☐ No

11. Do you have access to a certified diabetes nutritionist or dietitian on staff or at your office?
Mark only one oval.

☐ Yes
☐ No

12. Please add additional comments, if any.
Appendix B: Historical Data of Patient Referrals to Diabetes Education from 10 person endocrine practice, graciously provided by Dr. William Kaye

Referral to Diabetes Education Statistics

1:1 Referrals

<table>
<thead>
<tr>
<th>Month</th>
<th>Mar 16</th>
<th>Apr 16</th>
<th>May 16</th>
<th>Jun 16</th>
<th>Jul 16</th>
<th>Aug 16</th>
<th>Sep 16</th>
<th>Oct 16</th>
<th>Nov 16</th>
<th>Dec 16</th>
<th>Jan 17</th>
<th>Feb 17</th>
<th>March 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referrals</td>
<td>194</td>
<td>197</td>
<td>127</td>
<td>152</td>
<td>159</td>
<td>166</td>
<td>168</td>
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Workshop Referrals

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Physician Referrals February 17 - March 17

1:1 Referrals & Workshop Total
Appendix C - survey to assess level of patient motivation to attend diabetes education, developed and created by Alexandra Kaye and Dr. William Kaye

Patient Survey
Attitudes and perceptions about diabetes classes and nutrition consults.

1. Do you consider yourself a motivated patient?
Mark only one oval.

1 2 3 4 5
No, I am not motivated ☐ ☐ ☐ ☐ ☐ Yes, I am very motivated

2. How knowledgeable do you believe you are about diabetes, its complications, and how to prevent them?
Mark only one oval.

1 2 3 4 5
I know very little about diabetes ☐ ☐ ☐ ☐ ☐ I'm extremely knowledgeable

3. Have you ever attended a certified diabetes education program?
Mark only one oval.

☐ Yes
☐ No

4. How do you view your current diabetic control?
Mark only one oval.

1 2 3 4 5
I am not controlled ☐ ☐ ☐ ☐ ☐ I am controlled
5. 5. Do you generally feel well?
   *Mark only one oval.*

   1 2 3 4 5

   No I do not feel well ☐ ☐ ☐ ☐ ☐ I feel very healthy

6. 6. Does diabetes affect your life?
   *Mark only one oval.*

   1 2 3 4 5

   No, I go about my life normally ☐ ☐ ☐ ☐ ☐ Yes, I find it burdensome

7. 7. Has diabetes in any way damaged any organ?
   *Mark only one oval.*

   1 2 3 4 5

   No everything is fine ☐ ☐ ☐ ☐ ☐ Yes, I have complications from diabetes

8. 8. Would you like to know more about diabetes, its complications, and management?
   *Mark only one oval.*

   1 2 3 4 5

   No I know enough. ☐ ☐ ☐ ☐ ☐ Yes I would like to know more.

9. 9. How would you rate your motivation to learn more by attending American Diabetes Association approved classes?
   *Mark only one oval.*

   1 2 3 4 5

   Not motivated at all ☐ ☐ ☐ ☐ ☐ Very motivated
10. If times of the classes were convenient for you and there were no insurance issues how likely would it be that you would attend diabetes classes?
   Mark only one oval.

   1  2  3  4  5
   If that was the case I would attend

   I would not go to these classes no matter how convenient

11. How would you rate your knowledge about nutrition?
    Mark only one oval.

   1  2  3  4  5
   I do not know very much
   Quite knowledgeable

12. How motivated are you to change the way you eat?
    Mark only one oval.

   1  2  3  4  5
   I do not feel I need to change
   I am motivated to change

13. How interested would you be in seeing a nutritionist to balance your meals?
    Mark only one oval.

   1  2  3  4  5
   Not interested
   Interested

14. How accurately does this describe your nutritional habits?
    Mark only one oval.

   1  2  3  4  5
   I don't know what to eat
   I know exactly how I should eat but I lack the will power
Appendix D - Quiz to Raise Patient Awareness About Gaps in Knowledge About Diabetes, developed and created by Alexandra Kaye and Dr. William Kaye

Test Your Diabetes Knowledge!

1. Which breakfast would be a better option for optimal blood sugar control?
   A. Scrambled Eggs with 1 Slice Toast
   ![Scrambled Eggs with Toast](image1)
   Or
   B. Cereal with Skim Milk & Banana
   ![Cereal with Milk and Banana](image2)

What is your answer for question 1?
   A. Scrambled eggs with toast
   B. Cereal with skim milk and banana
2. What is the optimal range for blood glucose level prior to breakfast (fasting)?
   A. 100-150
   B. 60-99
   C. 70-110
   D. 120-180

3. If you watch your diet, exercise and control your blood sugar, diabetes will eventually clear up and go away?
   A. True
   B. False

4. What is the number one chronic complication of diabetes?
   A. Heart disease
   B. Retinopathy
   C. Kidney disease
   D. None of the above

5. When determining how a particular food will affect your blood sugar, what is the most important aspect to consider?
   A. Sugar content
   B. Portion size
   C. Carbohydrate content
   D. Pre-meal blood sugar

6. Diabetes happens when your body...
   A. Is unable to use the food that you eat properly.
   B. Makes plenty of insulin, but your cells have problems at the receptor sites and insulin cannot do its job.
   C. Does not make enough insulin and your blood sugar level increases.
   D. All of the above.
7. The hemoglobin A1c (HbA1c) test reflects your blood sugar control over the past...
   A. Day
   B. 2 weeks
   C. 3 months
   D. 6 months
   E. 12 months

8. Illness tends to cause blood sugars to:
   A. Increase
   B. Decrease
   C. Stay the same

9. Exercise generally makes your blood sugar...
   A. Increase
   B. Decrease
   C. Stay the same

10. Which is the best source of protein?
    A. Cheese omelet
    B. Fruit salad
    C. BLT sandwich
    D. Bagel with cream cheese
Healthy Living with Diabetes 1,2,3 Program Survey

On a scale from 1 to 5, please rate your interest in these issues below:

1. Not interested
2. Slightly interested
3. Fairly interested
4. Interested
5. Very Interested!

Please circle one:

**Question 1:** Are you interested in learning how to reduce the amount of blood sugar testing done during the day, while still maintaining optimal blood sugar levels?

1  2  3  4  5

**Question 2:** Are you interested in learning the best foods to choose in order to achieve great blood sugar control?

1  2  3  4  5

**Question 3:** Would you like to learn how to effectively manage blood sugar control without increasing medication doses?

1  2  3  4  5

**Question 4:** Would you be willing to learn about scientifically proven ways to help reduce weight in order to help reduce blood sugar levels?

1  2  3  4  5

**Question 5:** Are you interested in understanding the most effective way to take your medications to minimize blood sugar spikes?

1  2  3  4  5
Appendix E

Mixed Visual and Textual Intervention Conveying Need For Doctor’s Referral

Why do you think none of our patients are going to diabetic education classes?

It’s simple—Try asking!

Why don’t you go to those diabetic education classes if you need the help?

Well they didn’t tell me to, so I figured it must not be important.

Graphics and text developed and created by Alexandra Kaye.
Appendix F

Mixed Visual and Textual Intervention Demonstrating Positive Patient Reaction to Referral

Graphics and text developed and created by Alexandra Kaye.