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Improving Diabetic Outcomes with Caring Communication: Identifying Communication Patterning for the Human Diabetic

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IMPROVING DIABETIC OUTCOMES WITH CARING COMMUNICATION: IDENTIFYING COMMUNICATION PATTERNING FOR THE HUMANDIABETIC

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Abstract

Introduction. The purpose of this study was to identify the influence of caring communication for people living with diabetes (PLD) and the relationship to diabetic outcomes. Caring communication has not been studied for improving diabetic outcomes. Randomized control trials (RCTs) direct care, however people do not do what they told, they need to be included in their care. PLD need a voice to establish what is important to them. Incorporating medical, communication, and nursing science as multidisciplinary approach within a theoretical framework can be predictive diabetic outcomes.

Methods. A correlational cross sectional survey design study was done. A sample of 107 patients with diabetes from two clinics in Southern California participated. The sample was recruited from naturally occurring appointments schedules and patients were asked to complete the survey. A clinical record review followed for benchmark data.

Results. Overall the PLD diabetes received care very close to benchmarks. The participant's scored 88% indicating a high level of caring communication. Men approached significance to have A1c within normal limits [$\chi^2(1) = 3.73, p < .053$] compared to females. Gender, age, length of time with diabetes and caring communication predicted 65.3% to have A1c within normal limits; length of time with diabetes, synergy, sharing, reciprocity, and gender predicted 64.3% for have A1c within normal limits; caring communication, gender, age, and marital status predicted 69.3% of cases for having a SBP within normal limits; and time with diabetes, gender, synergy, sharing, and reciprocity predicated 68.3% of the cases to have a SBP within normal limits.

Conclusions. Caring communication does influence diabetic outcomes. Females tend to have better A1c than men. As one increases time with diabetes, there outcomes tend to be better than newly diagnosed people with diabetes. Shared decision making, exploring possibilities, not feeling intimidated by the healthcare providers are important for better diabetic outcomes.

Keywords: caring communication, diabetes, diabetic outcomes, people living with diabetes

Dedication

Lora Constance Hinrichs

July 1, 1911 to September 23, 1987

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the science of nursing, the philosophy of science, and the foundation for thinking differently particularly about my own worldview and how Kennettian nursing is relevant, contextual, and ongoing.

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CHAPTER 1

Improving Diabetic Outcomes with Caring Communication: Identifying Communication Patterning for the HumanDiabetic

People living with diabetes (PLD) in the U.S. have reached epidemic proportions. The CDC (2011) reports there are 26 million people in the U.S., which is 8.3% of the population, who have diabetes. In 2008 there where 23.6 million with diabetes, or 7.6%, an increase of 2.4 million. It is also estimated that by the year 2050 1 in 3 people in the U.S. will be diagnosed with diabetes if trends continue (CDC, 2011). The numbers are likely to exceed to 333 million people worldwide with diabetes (Olshansky et al., 2008). The 2007 data estimated combined direct (providing healthcare) and indirect (disability, lost wages, premature death) costs at $174 billion (CDC, 2011a).

The American Diabetes Association (ADA), providing clinical practice recommendations for PLD, reports that outcomes are not what should be expected despite available research from random clinical trails (RCTs) and other multidisciplinary healthcare team researchers. Only 12.2% of PLD have achieved all of their diabetic outcomes: glycosylated hemoglobin (A1c) < 7%, low-density lipids (LDL-C), <100mg/dl and blood pressure (BP) <130/80 (ADA 2011).

Communication is critical for better outcomes for PLD. In contrast poorer outcomes lead to complications, hospitalizations; and PLDs are at twice the risk for death than people without diabetes (Centers for Disease Control and Prevention [CDC],

2011.) Communication is a two-way process; it transforms healthcare into a system where individuals are not treated in a vacuum; but rather demonstrates attentiveness, curiosity, flexibility, and presence (Epstein, 2005). With communication the person has a voice that can be heard and health is optimized (Jolly, Weiss, & Liehr, 2007).

Caring communication is patient-centered, and facilitates better health outcomes, improved emotional health, and fewer tests and referrals (Stewart et al., 2000). Conversely, if patient-centered communication is not used, the results can be devastating, including heart disease, hypertension and stroke; blindness and eye problems; kidney disease, nervous system disease, amputation, dental disease, other life threatening disease like pneumonia; and are twice as likely to have depression.

Communication patterning is the phenomenon of interest in this study is therefore the overall purpose of this study is to investigate caring communication as a patterning concept for PLD. What are the characteristics of how PLD? How caring communication affects diabetic's outcomes? Much work has been done using objective data (RCTs) however can subjective data influence diabetic outcomes, such as communication patterning? The final focus is to answer a question: If the patient experiences caring communication, can it predict diabetic outcomes? Using one of Walker and Avant's (2005) steps - determining the defining attributes "provides the broadest insight into the concept" (p. 68) providing the depth of work to be analyzed in this study.

Significance of the Research

The trend in diabetes research has been directed toward prevention, curing, and treating diabetes. According to the ADA their research milestones from 1990 to present lists biological, pharmacological, transplant, and prevention advances in diabetes care.

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), part of the National Institutes of Health (NIH) and the U.S. Department of Health and Human Services, share a similar research agenda as the ADA. The Diabetes Research Working Group (DRWG), from the NIDDK, has two broad aims: understanding the cause and prevention of type 1 and type 2 diabetes; and developing optimal management, treatment, and cure of diabetes (NIDDK, 2007).

Although the efforts from the NIDDK and ADA have done a great deal to advance the science of diabetes in its prevention, curing, and treating people with diabetes, there continues to be people diagnosed with diabetes with dismal outcomes. The research agendas from the ADA and NIDDK exemplifies that experts know where worthwhile diabetes research should be focused. However, if PLD were asked about their research priorities, the emphasis was completely different, supporting quality, and consistency of information on diabetes, raising awareness in the general public, improving information about food and exercise, one-on-one support, delivery of healthcare services, prevention and screening, problems with co-morbidities, and self-management (Brown, Dyas, Chahal, Khalil, Riaz, & Cummings-Jones, 2006). Oddly only one area, prevention, was reported as important in both groups from experts and people with diabetes.

Investigating caring communication for PLD is important in three ways. First communication can motivate behavioral changes that can potentially result in better outcomes (Haynes, McChon, Panahi, Hamre, & Pohiman, 2008). Secondly, caring communication gives a voice that reflects more supportive, anticipatory, and responsive communication allowing needs, feelings, concerns, and concerns to be verbalized

(Branstetter, Domian, Williams, Graff, & Piamjariyakul, 2008). Finally, caring communication can relieve suffering if concerns are heard and not dismissed by provider's lack of attention of other issues (Vandermause & Wood, 2009).

Multidisciplinary Perspective

The patient perspective is important in studying PLD. Experts, but not people with diabetes, typically guide research agendas. Brown and colleagues (2006) report that in the United Kingdom patients are not included in research agendas and therefore provide little input in factors that are important for people with diabetes. In another study, Wilhide, Hayes, & Farah (2008) suggests that if the patient selects behaviors, they are more likely to adhere and participate in the recommendations for diabetes management.

Nursing and other disciplines, including dietitians and pharmacists, are members of the American Association of Diabetic Educators (AADE). Founded in 1973, their mission is promoting healthy living with diabetes and related conditions. The AADE uses a framework of seven self-care behaviors to educate people with diabetes. The self-care behaviors, known as AADE7, include: 1) healthy eating, 2) being active, 3) daily monitoring, 4) taking medication, 5) problem solving, 6) reducing risks, and 7) healthy coping (AADE, 2008). Effective communication may be supportive and a conduit by which all of the AADE7 can be realized.

A multidisciplinary research agenda has been established with AADE. There are six agendas: 1) build evidence-based foundation for self-management behavior, 2) provide tools to strengthen the evidence-base and articulate how diabetes educators inform the AADE7 to the healthcare community, 3) minimize the gap between research and practice, 4) commit to research-related session at the Annual Meeting, 5) collaborate

with other organizations to keep the evidence-base, and 6) expand the Reviewer Registry for research-related projects (AADE, 2008). Surely, there would be no disagreement that communication is a subcomponent of the AADE's research agenda. Illustrating how communication can be aligned with item #1, using communication is a way to build evidence for enhancing self-management behavior.

Healthy People 2010, lead by the CDC and NIH recognizes that although much is known about diabetes, more effective interventions need to be established to improve the care of people with diabetes (U.S. Department of Health and Human Services, 2001). Healthy People 2010 also points out that nurses, as well as other health professionals, should be involved in critical decisions affecting chronic disease such as diabetes.

Significance for Nursing Science

PLD contend with multiple complex issues involving practically all aspects of life. Living with diabetes is much more than a medical issue (Moser, van der Bruggen, & Widdershoven, 2005). People with diabetes work, have families, deal with emotions, other healthcare issues, and interact with their environment constantly. When nursing has participated in the very mist of a complex life of living with diabetes the outcomes are much more positive. An example of this is when nurses as life coaches are utilized in the care of people with diabetes, their A1c improves by a factor of 50% (Bray, Turpin, Jungkind, & Heuser, 2008).

Nursing science will also advance by knowledge and theory development. First, it is quite challenging for society, even nursing professionals, to articulate what nursing does, what nursing is, and how and when nursing care is given. The knowledge development from the study will provide an understandable domain unique within the

science of nursing. The core of nursing science is the recipient of nursing care, and the phenomena that is being experienced by the recipient. In this unique science, truth is not universal, but local, has multiple variants, contextual and consists of many variables (Reed, 2006). This study will support the uniqueness of nursing within the context of the recipient care, the person with diabetes, and how the individual cannot be viewed solely as a diabetic, but a person living with diabetes, a holistic view, of a person with patterns that require open assess to nursing and its unique approach to care of the individual with diabetes.

Theory is the foundation of nursing science and professional practice (Frisch, 2006). This purpose of this study is to explore one component of a theoretical basis for PLD. There are few existing theories in diabetes that take into consideration the voice of the patient. Theory development in this project has as its theory boundaries the following focuses: prevention for people at risk, people who have type 1or type 2 diabetes, and gestational diabetes. Furthermore, the idea of communication patterning maybe used beyond the boundaries for any individual that desires healthcare, especially those with other chronic illnesses. For the above-mentioned issues for PLD and nursing science the aims of this study are:

Aim #1: Describe caring communication, A1c, LDL-C, and BP in people living with diabetes.

Aim #2: Examine the relationship among demographic factors, caring communication, A1c, LDL-C, and BP in people living with diabetes.

Aim #3: To explore factors that increase the odds for improved A1c, LDL-C, and BP in people living with diabetes.

Conceptual Framework

HumanDiabetic

The main focus of the HumanDiabetic framework is to develop a nursing framework for working with diabetic patients. In an explanatory process, the person with diabetes (human) and patient-nurse (caring communication) provides and supports diabetic well- being. The phenomenon of interest in diabetic patients became apparent from the researcher's clinical experiences and philosophical views. Current research findings shows self-management education strategies only reduces A1c by .76% (Norris, Lau, Smith, Schmid, & Engelgau, 2002), patients are not happy with healthcare providers and patients are not being given opportunities to share their individual experiences to living with diabetes, nor given a voice in the their health care.

The boundary of the HumanDiabetic model is the various complexities of PLD. The variations of diabetes include: type 2 diabetes; type 1 diabetes; gestational diabetes; or even diabetes prevention for those at risk.

Main Concepts

There are three main concepts of HumanDiabetic 1) HumanDiabetic, 2) communication patterning, and 3) behavior patterning. Each has three sub-elements that help describe the three main concepts of the HumanDiabetic.

HumanDiabetic. The concept of HumanDiabetic is the human pathophysiology of the destruction of beta cells leading to lack of insulin secretion, progressive insulin secretory defect with insulin resistance for the person living with type 1, type 2 diabetes; gestational diabetes; or in the case of prevention, those individuals taking steps to prevent diabetes. HumanDiabetic is a term developed to holistically represent the individual with

diabetes. The concept has three sub-dimensions that continually interact with each other and the environment representing the whole person with diabetes. One sub-dimension is the implementalities that describe medications, diet, exercise, testing, and follow-up with other healthcare providers in the care of diabetes (ADA, 2009). The second sub-dimension is physicalities that include the physical symptoms that the patient experiences when blood sugars are high or low. Also included are complications from integument, cardiovascular, renal, or neurological alterations (Porth, 2005). The third sub-dimension describes emotionalities that are the psychosocial dynamics of diabetes. The emotionalities are feelings the patient with diabetes experiences including depression, anxiety, fear, or other feelings associated with living life (Whittemore, Chase, Mandle, & Roy, 2002).

Communication patterning. Conceptually, patient-nurse communication is the interaction between the dyad of the patient and the nurse during an encounter. The patient is positioned first, because it signifies that the patient directs the encounter in so much as, what they feel is important to them in living with diabetes. The nurse utilizes the process of three important stages in the communication (Lewis, 2007). Attentive listening is the first stage. In this stage the nurse listens for clues in the patient's narrative about what are problematic/beneficial issues from the patient's perspective. The second stage is accessing technology to explore ways in which the problematic area can be addressed. Accessing technologies challenges the nurse's expertise and knowledge base to introduce equipment, supplies, education, and support that are available or create individual technologies that the patient helps to develop. The third stage is integrated understanding. For the patient, what knowledge or behaviors were discussed and what specific plans are

set into motion (Mika, Wood, Weiss, & Treviño, 2007). For the nurse, it is a time to assess and confirm patient understanding and knowledge and set up plans for the next encounter.

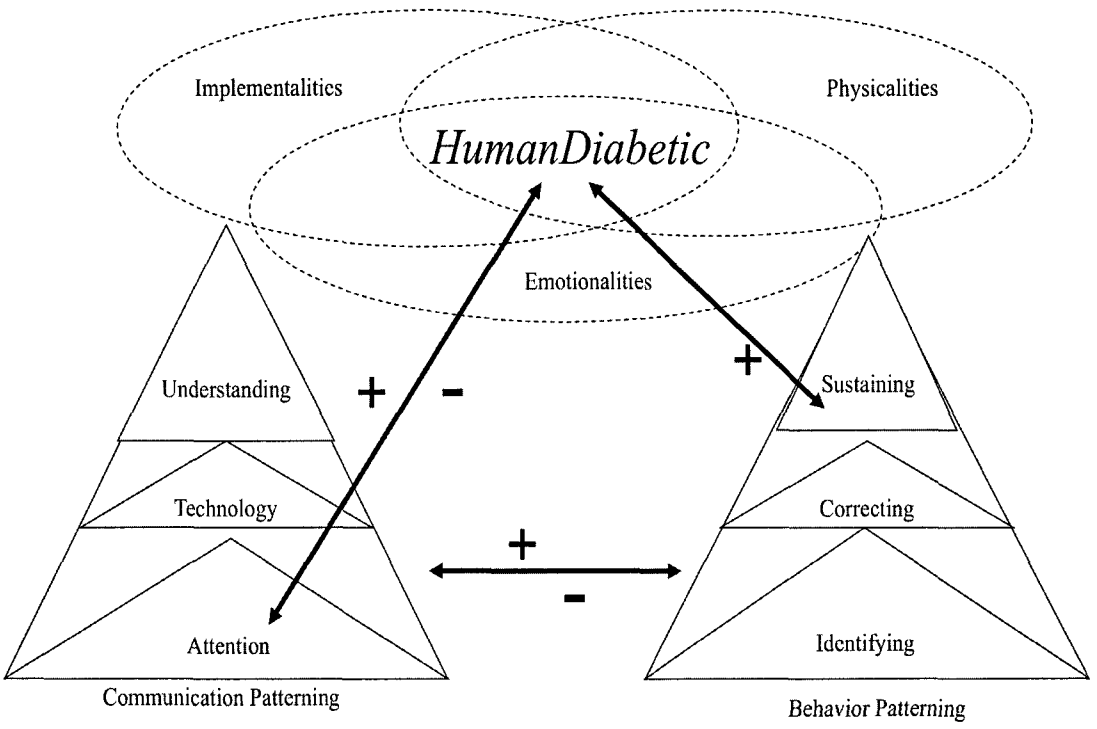
Behavior patterning. Living with diabetes is a dynamic process that involves multiple behavior changes at once and developing positive behavior patterns that prove successful for the patient with diabetes (Hall, Joseph, and Schwartz-Barcott, 2002). Effective behavior patterns are essentially labels given to a problematic/beneficial area that the patient and nurse communicate with each. This involves isolating problematic/beneficial areas, progression toward resolving the problem, and setbacks that are experienced during the resolution of the problem, leading to maintaining a behavior that is beneficial. In the beginning the patient, (and the nurse may be involved) explores the many aspects of living with diabetes, which allows for identifying and labeling areas that are important to the patient. Once problems are identified, the patient engages in correcting behaviors of their choice. Finally, after the problematic area has been identified, behaviors have gone beyond correcting, and are incorporated into the patient's life, the patient moves into a sustaining pattern. Not all problematic areas are known. Some are obvious to the patient, some to the nurse, and are discovered in and out of encounters. The expertise of the nurse provides guidance and helping the patient set priorities for problematic areas. See Figure 1

Relationships between Concepts

The HumanDiabetic is revealed to the nurse through communication patterning. Positive and negative factors are uncovered with selective attention. HumanDiabetic is the reference point (focus) for the encounters, not using treatment algorithms, flow

sheets, or other technology to guide care. With communication patterning, the algorithms, flow sheet and other technology are accessed based on the patient's direction, rather on the providers need to "treat." The concepts of communication patterning and behavior patterning co-exist (Meleis, 2007) for the HumandDiabetic and nurse to function as a framework in addressing problematic/beneficial areas of living with or preventing diabetes. After the encounter, the patient takes their new understanding, knowledge and behaviors to a newly emerged-self to face new and different challenges in their world until the next encounter. The process then repeats itself, as the patient desires. See Figure 1.1.

Figure 1.1 Conceptual Framework



Statement of the Problem

Despite much research being done to improve diabetes, evidence supports that diabetic outcomes are suboptimal. What is needed is to give patients a voice. Researchers' resources are scarce and expert-led research agendas do not have the evidence to move from the current manner of research since most, if not all research, is based on experts (Brown, et al., 2006) and patients are not seen as individuals with investigational topics. It is time to permit patients to guide their own care, and it will start with understanding communication patterning.

When patients are heard and communication occurs patient outcomes are improved. This translates into less discomfort, less worrying, better mental health, increased efficiency of care delivery, and decreased emergency room visits (Stewart et al., 2000; Thiedke, 2007). In a study done about communication for patients who need total knee replacement surgery (n=74), 20% of the time patients and providers disagreed about whether the provider recommended surgery; a modest to poor agreement about how severe the patient's condition was (patients tended to think their condition was more severe than provider) and what was the risk-to-benefit profile of a total knee replacement (Street, Richardson, Cox, & Suarez-Almazor, 2008). This makes obvious that patient and provider are not communicating well.

Communication influences many other outcome areas of patient care. Justifying patient-focused care for asthma patients. Irwin and Richardson (2006) found that patient satisfaction improved, adherence improved, providers were less likely to have malpractice cases brought against them, there was more patient retention, and communication played a role in working with patients that were difficult-to-treat. They

concluded that communication, continuity, and concordance were highly effective, and key to the treatment of patients with asthma.

Improving communication requires three things to happen: 1) identification that communication needs to occur; 2) inspiring the healthcare team, to initiate conversation with confidence and professional integrity: and 3) creating an environment where communication is valued and encouraged (Ulrich, 2007). Many healthcare providers may see that asking more questions might lead to more time in a very fast-paced setting such as in a healthcare delivery setting. However, the encounter time may increase for the short term, but there is improvement in patient satisfaction, health outcomes, and reduces resource utilization in occurs over the long term (Irwin & Richardson, 2006).

Finally it is critical to place nursing at forefront of diabetes care. There are studies that support how nurses contribute greatly to diabetic outcomes. Historically, nursing used physiological or medical science aspects of diabetes care (Walton & Brand, 1994). But as nursing science evolved, so has the unique approach of nursing science to diabetes care. Open access to nursing should be available to patients, not just as an in-patient in the hospital, or ordered by a provider, for diabetic education, but when even they feel they need nursing care. A study done in Sweden (n=20) found that people with diabetes were able to incorporate the complex life of diabetes into the management of daily life. Patients were seen as being confirmed, guided in the disease process, then becoming confident and independent, as well as relieved about living with diabetes (Edwall, Hellström, Öhrn, & Danielson, 2007). Another study done in South Korea supported that if nurses used cellular phones and Internet, A1c can be reduced by 1.5%.

Purpose of the study

The purpose of this study is to determine the relationship between communication patterning and diabetic outcomes. The questions that follow are planned:

Question #1: *What is the level of caring communication, A1c, LDL-C, and BP in people living with diabetes?*

Question #2: *What is the relationship of caring communication, demographic variables, and diabetic outcomes (A1c, LDL-C, BP)?*

Question #3: What independent variable(s) increase the odds for having diabetic outcomes within normal limits?

Question 3a. *Can A1c status (within normal limit or not) be correctly predicted from length of time with DM, caring communication, and age?*

Question 3b. *Can A1c status (within normal limit or not) be correctly predicted from length of time with DM, caring communication subscales of synergy, sharing, reciprocity) and gender?*

Question 3c. *Can SBP status (within normal limit or not) be correctly predicted from BHPS, gender, age, and marital status?*

Question 3d. *Can SBP status (within normal limit or not) be correctly predicted from synergy, sharing, reciprocity length of time with DM, and gender,?*

Limitations and Assumptions

Limitations

The study does not explore the patient's alliance with exercise, diet, and medication. The scope of this study is limited to communication.

Assumptions

Communication can be scrutinized as a common denominator for exercise, diet, and medication. Because if the patient is not provided the respect to select what they would like to do to control their diabetes, outcomes of exercise, diet and medication alliance are not likely to improve. Furthermore if only A1c, LDL- C, and BP can be evaluated by objective data, who needs the patient? Why not just do phlebotomy and take a blood pressure for treatment decision-making?

Cultural aspects of care, particularly when applying the definition of health, are culturally based. When working with people with diabetes, which has such a broad base of different ethnic representation, how can culture not be addressed? No healthcare provider can be culturally competent, only culturally aware. Culture training is part of all healthcare providers training. It does not make providers competent, only aware and how to individualize treatment based on culture. That will take communication. For instance, a patient with diabetes could be in the U. S. for several years, or generations. The patient now has a mixture of cultures, their home culture and the culture of U. S. There is not a consistent way of providing culturally competent care because of levels of assimilation; therefore, realistically, care cannot be provided from a competent perspective but a culturally aware perspective.

Definition of Key Terms

Key terms used in the study are *caring communication* and *diabetic outcomes.* Caring communication is defined by a healthcare partnership. Diabetic outcomes are defined by the three standard measures established by the ADA.

Caring Communication

The term "caring communication" is defined by a healthcare partnership between the patient and healthcare professional. The partnership requires sharing, reciprocity, and synergy. Sharing is the give and take in a mutual set of values in communication with regard to respect and openness without feeling intimidated or inferior. Reciprocity is an exchange of ideas that informs both parties and is supportive of each other's unique position in the context of the dialogue. Synergy understands that together, the patient and the healthcare professional can realize that the possibilities are unlimited, succinct, and decision-making is a shared venture.

Diabetic Outcomes

There are three types of diabetic outcomes Glysocatd Hemoglobin, Low Density Lipids and Blood Pressure. See Table 1.

Table 1
Diabetic Biomarkers

Measure	Abb.	Value
Glysocated Hemoglobin	A1c	<7.0%
Lipids	LDL-C	<100mg/dl
Blood Pressure	BP	<130/80mmHg

Summary

People with diabetes have reached epidemic portions not only in the U. S. but around the world. Even though the ADA is a leading organization recommending treatment guidelines, outcomes are very poor. Multidisciplinary efforts have been more helpful through the introduction of the AADE. Noted is the underlining benefit of effective communication. Nursing is a unique discipline where they can take the pathophysiology of persons, and use communication to improve their healthcare,

however they describe their health. When is the healthcare profession going to believe that people with diabetes need a voice? There is evidence that suggests that when experts lead research, the outcomes are sup-optimal. There needs to be evidence that supports when patients have a partnership with their healthcare provider, it works, and outcomes improve.

Nursing science is uniquely qualified and educated to provide such a challenge to improve diabetic outcomes. When using a theoretical basis, and listening to patients, research and theory has narrowed the gap in the benefit of using nursing to improve diabetic outcomes.

Therefore the problem exists. Communication and nursing can improve diabetic outcomes when the patient's voice is being heard. That means that patients have the agency to lead their care (after all *they* have diabetes), and they are the only ones that report how diabetes is affecting their lives, and leading to better outcomes ultimately decreasing complications of diabetes and death.

CHAPTER 2

Literature Review

People with diabetes have reached epidemic proportions in the U.S. Addressing this issue of epidemic proportions for people with diabetes; contributions come from medical science, multidisciplinary healthcare teams, and nursing science, have not yet unlocked the key to consistent better diabetic outcomes. It appears that if nursing is evolved, diabetic outcomes improve. From a conceptual framework, effective communication patterning is actively engaging the patient in their care and permits the patient to guide care, not the expert. The communication patterning is important because it leads to understanding, trust, and alliance with patients to achieve better diabetic outcomes.

A comprehensive search was done from seven databases: Academic Search Elite; Cumulative Index to Nursing and Allied Health Literature (CINAHL); PsycINFO; Sociological Collection; Science Direct; Sage; and Communication and Mass Media Complete. The search perimeters were research based studies conducted from 2006 to 2009, peer-reviewed, scholarly journals, with search terms: nursing, diabetes and communication. A total of 715 articles were identified. Articles were excluded if not relevant, if authorship was from medical science, because of the landmark studies that have already contributed significantly to the literature, and theoretical articles, although important, the scope of the literature review was done within the confines of data driven

research. One article was excluded because the data was reported from two points; one at 12 weeks and one at 6 months. The one study done at 6 months was retained because it demonstrated repeated measures. The final number of research articles used was ten. Three qualitative studies, two meta analysis studies, four quantitative studies and one communication study that reported on two studies comprised the finally selection of articles used in the presentation of related literature.

Four themes emerged from the studies and will guide the presentation of related literature from nursing and communication science. First will be the characteristics of people with diabetes; second will be the influence of nursing specialist caring for people with diabetes; third, the use of technology to enhance communication; and finally, the formulation of health messages. In conclusion the two meta-analysis studies will be used to illuminate missing components in the literature.

Nursing and Communication Science Studies

Characteristics of People with Diabetes

People with diabetes are unique. Their health influences many aspects of their lives. Understanding who people with diabetes are is a starting point to understanding how communication can be used in speaking with people with diabetes. In a grounded theory study (n=39), done by Olshansky and colleagues (2008), found that a central theme emerged from the data, that people with diabetes look toward normalizing an identity as a person with diabetes. The author further describes that living with diabetes reflects taking on an identity of having diabetes, feeling fearful about the diabetes, feeling different from others, eventually normalizing their lifestyle changes related to managing the disease.

In a communication study (n=39), Burke, Earley, Dixon, Wilke, & Puczynski (2006) evaluated how a physician could improve communication during an encounter to improve diabetic outcomes. Furthermore, improved communication is grounded from the patient's perspective. From a grounded theory methodology, the research demonstrated that people with diabetes are concerned about the complications and comorbidities of diabetes. That diabetes is very time consuming, considering self-care management, meals, exercise, and appointments. People with diabetes are worried about glycemic control and self-control and they affect one another. In other words, eating properly and exercise is self-control that affects glycemic control. Reliable information is very important to help manage their disease. Information available should include how to manage blood sugar levels near normal and other relevant information about resources for people with diabetes. Finally, the family is also part of the mix. The family can either be supportive or hindering in diet or medication management.

Nursing Specialist Care

When patients are cared for by nurses, they have improved autonomy and diabetic outcomes. One qualitative study done, again using the grounded theory method, studied what is the concept of autonomy for people with diabetes in a nurse-led clinic (Moser et al., 2006). The care provided by Doctorate of Science in Nursing (DSNs) and the sample came from the Netherlands (n=15). The findings concluded that autonomy had seven dimensions: 1) identification, 2) self-management, 3) welcomed paternalism, 4) self-determination, 5) shared decision-making, 6) planned surveillance, and 7) responsive relationship. These dimensions form actions that develop a pattern. This means that an autonomous person develops from an integrating process of not just thinking, but doing,

accommodating themselves to new circumstances and adapting is a unique structure of meaning about their world. In conclusion, the DSNs that care for people with diabetes, can foster autonomy by individualizing their approach to each person individually, taking into account that autonomy is a skill with a context.

A quasi-experimental design study was conducted by Bray and colleagues (2008) to evaluate patients engaged with a life coach and showed that there were significant influences on diabetes outcomes. Participates (n=1117) were from six clinics in southwestern Virginia. Life coaches were experienced registered nurses and certified diabetic educators. The sample was stratified by those patients with HgA1c < 7.0% (low risk group) and A1c between 7.0% and 7.0% (moderate risk group) and A1c > 8.0% (high risk group). Engaged participates met face-to-face with the life coach at least twice during the intervention year, and monthly telephone follow-ups. Of the sample, 67% met the engaged criteria.

Significant difference existed between the groups. First, African Americans were significantly more likely to engage in the life coach program than European Americans. Although statistically significant improvement was seen from baseline in all 7 measures (p=0.05). The high risk group was more likely to be engaged in the life coach program, they were less likely to have to experienced poor glycemic control. Also, engaged persons were likely to have met the target A1c (<7.0%) by a factor of 50%. Whereas two other measures, BP and lipid outcomes, did not reveal statistical significance when working with a life coach. Older participants were more likely to experience poor control (>9.0%). African Americans and European Americans were more likely to reach a A1c

<7.0%, Hispanics, Asian American and other groups were more likely to achieve all three outcomes with target ranges for A1c, BP, and lipids.

Technology and Communication

Technology has advanced and continues to advance. Not only does technology make information more available, it provides tools to improve communication. Two studies cited earlier demonstrate how technology is used. Olshansky and colleagues (2008) used a computer portal system for access to information about diabetes to enhance communication. The sample was drawn from participants that used the portal system. Bray and colleagues (2008) used telephone follow-up in addition to face-to-face encounters to achieve their results.

By using the telephone, older African American women with diabetes were able to improve their psychosocial adjustment with diabetes (Amoako, Skelly, & Rossen, 2008). The experiential design was used to determine the benefits of psychoeducational telephone intervention to manage diabetes self-care uncertainty for people with diabetes in North Carolina (n=63). Experimental group received a call every week for four weeks by an African American geriatric nurse practitioner experienced in diabetes and cardiovascular disease management. The control group received usual care. Data was collected at two time points. The findings revealed that psychosocial adjustment and exercise improved for the experimental group (p<0.001).

A study in South Korea addressed using short message service (SMS) by a cellular phone for people with diabetes (Kim, & Jeong, 2006). The experimental design was used to investigate the effectiveness of nurse SMS and electronic reporting (internet). The total of participants were 51 and randomized into two groups (n=25 and n=26). The

experimental group was required to send a SMS or electronically send blood glucose levels, diet and exercise diary daily. The nurse would respond with recommendations weekly. The results demonstrated the HgA1c decrease by 1.5% at month 3 and 1.0% at month 6 for the experimental group ($p<0.05$). Although there were sustained no statistical differences between groups, there was a difference over time ($p=0.011$) with the interventional group.

Message Framing

Message framing is the distinction between a message that has an advantage or disadvantage. Furthermore, messaging hinges on the degree to which a message is used for argument and language to emphasis the benefits versus the results of following or not following a recommended course of action (Shen & Dillard, 2007). Key concepts in communication come from a behavior approach system (BAS) or a behavior inhibition system (BIS). With the BAS there is sensitivity about reward, nonpunishment and escape from punishment. Whereas the BIS is the source of aversive motivation in response to cues associated with punishment, non-reward, and novelty. Ultimately the BIS are the negative effects where the BAS are positive effects.

The first study was done using college students ($n=286$) from Wisconsin (Shen, & Dillard, 2007). They reviewed a PowerPoint presentation about health topics relevant to college students. The results supported when framing was manipulated there was significance difference ($p=0.001$).

A second study was done using a public service announcement (PSA). The three topics included: smoking, glaucoma, and pedestrian safety. The participants again were recruited from a college in Wisconsin using undergraduate journalism and

communication students (n=251). When advantageous vs. disadvantageous messages were reveled there was also a significance difference (p<0.001). However, despite the statistically significant results, conclusion of the study supported that BIS correlated with positive cognition when participants were exposed to a disadvantage frame, whereas BAS showed a direct relationship with the advantageous frame.

Another study was done with message framing by nursing science. The study was done by examining the impact of an educational program on diabetes (Grady, Entin, Entin, & Brunyé, (in press). The participants came from an outpatient clinic of an acute hospital in Pennsylvania (n=155). The participants viewed two versions of a video, one that was a gain-frame (positive) and the other from loss-frame (negative). Overall the results showed that after six months there was a significant behavior change from the gain-frame vs. the loss-rame groups (p<0.01). This was confirmed by a Bonferroni correction with a significance of p <0.1 for three months follow-up and a higher score in six months out (p=0.04).

Direction of Research for People with Diabetes

A synthesis of the literature is a valuable tool in helping develop knowledge and guide research. In two meta-analysis studies people with diabetes were evaluated as to the current literature available. A gleaming result from the studies show that research does not sufficiently provide knowledge development that contributes to the care for people with diabetes.

First, a study was conducted to explore strategies for improving diabetic outcomes. The outcomes of the study suggest that nurse practitioners (NPs) are under-utilized and NPs need more formal education about coaching (Hayes, McCahon, Panahi,

Hamre, & Pohlman, 2008). Specifically, the author posited that providers need more adherence to evidence-based management guidelines. Practice settings need to be streamlined, promoting lifestyle changes through intensive education. Although studies are conflicting regarding evidence-based management and streamlining care, there are many complexities for people with diabetes and motivating change behaviors is most challenging. Using NPs can help address this issue.

Another study was done looking at Roger's theory of diffusion of innovations (Leeman, Jackson, & Sandelowski, 2006). In their review, authors of studies provided limited information for people with diabetes related to implementing interventions in the practice setting. What seems to lack is the limited applicability of the innovation as described in the articles. In other words, how can the practitioner implement such findings from a study? To this end, there ultimately needs to be closure in the gap between research and practice.

Landmark Diabetes Studies

Reviewing the literature, six landmark clinical trials cannot be ignored and are presented. The clinical trials were done by medical science, to support different treatment approaches to improve the health of people with diabetes.

DCCT, EDIC and UKPDS

The Diabetes Control and Complications Trial (DCCT), the follow-up study called Epidemiology of Diabetes Interventions and Complications (EDIC), and the United Kingdom Prospective Diabetes Study (UKPDS). The DCCT, EDIC, and UKPDS are prominent diabetes studies in medicine, yet offers nursing valuable information about understanding the benefits of diabetic management. DCCT was a major clinical trial

lasting ten years (1983 to 1993) for people with type 1 diabetes (n=1441) ages 13 – 39 in 29 medical centers from the U.S. and Canada (DCCT Research Group, 1993). The conclusions support that if aggressive management of an insulin pump or three or more insulin injections per day decreased the risk of retinopathy by 76%, nephropathy by 50%, and neuropathy by 60%. The EDIC study, lasting 17 years (1993 to 2005), followed-up the DCCT with 93% of the original sample (n = 1397) which concluded that with continued aggressive management of diabetes leads to an overall decrease in cardiovascular events by 42% (DCCT/EDIC Research Group, 2005).

The UKPDS study was conducted in the U.K. between 1977 and 1991, the largest and longest study for people with type 2 diabetes (n = 5102) in 23 centers in the U.K. (ADA, 2002). The participants were followed for an average of ten years and concluded that intensive pharmacological therapy to lower blood glucose levels had positive effects on reducing microvascular and cardiovascular events by improved diabetic outcomes. Furthermore, if blood pressure was tightly controlled it reduced the risk of cerebrovascular events, heart failure, vision loss, and death related to diabetes.

ADVANCE, ACCORD, and VADT

In the new millennium, clinical trials for people with diabetes continued and were focused on intensive blood glucose control and vascular problems. The three studies conducted were: 1) the Action in Diabetes and Vascular Disease: Pretereax and Diamicron Modified Release Controlled Evaluation (ADVANCE); 2) Action to Control Cardiovascular Risk in Diabetes (ACCORD); and 3) Veterans Affairs Diabetes Trial (VADT). The ADVANCE study (2008) was conducted between 2001 and 2008. The purpose of the study was to evaluate tight glycemic control taking gliclazide (modified

release) and other medications to achieve an A1c $\leq$ 6.6% and no macrovascular or microvascular events. The sample came from 20 counties, in 215 centers (n=11,140). The results supported that the intensive therapy group compared to the standard group had a reduction of both microvascular and macrovascular events by 18.1% and 20% respectfully (p=0.01). For both the intensive and standard group with regard to major macrovascular event supported a reduction of 9.4% and 10.9% respectively (p=0.01).

In the ACCORD study (2008) the investigators ended the study early by 17 months due to the high rate of mortality. The ACCORD study had a similar purpose as the ADVANCE study, yet the outcome variables were increased to lower HgA1c, systolic blood pressure (SBP), and lipids. The sample was from 77 clinical sites in the U.S. and Canada (n=10,251). The number of first myocardial infarctions, cerebral infarctions, or death for the intensive vs. control group was 352 and 371 respectfully (p=0.16). Death rates between the intensive vs. control group were 257 and 203 respectfully (p=0.04). What was also noted was assistance with hypoglycemia management and weight gain > 10 kg were indentified in the intensive group (p=0.001).

The Veterans Affairs (VA) recently reported on the VADT study (2009). This study addressed the effect of intensive vs. standard glycemic control on cardiovascular events. Groups were randomized by BMI, and given metformin plus reosiglitozone (Body mass index [BMI] >27). The second group had a BMI of <27. The study was done in 9 VA sites in the U.S. (n=1791). Results showed a median A1c for the intensive group at 6.9% and for the standard group at 8.4%. Cardiovascular events were not significant between intensive vs. standard group (p=0.14). See Appendix A for a detailed description of the studies.

Summary

In summary, nursing and communication studies show that when communication is involved, outcomes improve yet will have a positive or negative effective depending on the presentation. Nursing has unique ways at looking at the individual holistically. This is not only demonstrated by literature, but also by Glascow (2003) when he reports that in translating research into practice, nurse care managers have shown the best results.

The review of the six medical studies demonstrated that experts guiding RCT are not meeting diabetic outcomes. They are conflicting as to the benefits of intensive gylcemic control. The ACCORD showed a benefit, where the ADVANCE study showed significant risk, and the VADT study showed no difference.

From a researcher's perspective, treatment protocols in the medical science studies could be made at the discretion of the investor, which lead to questions regarding the validity of the results in any of the studies. As a clinician, the need to tailor treatments for patients is important, and no treatment protocol can really be followed exactly from an ethical perspective.

CHAPTER 3

Methodology

Caring communication is similar to transpersonal caring, which according to Watson's Theory of Human Caring is a moral ideal in nursing. Communication involves the self (the oneness of mind, body, and spirit), the phenomenal field (the totality of one's being-in-the-world), and intersubjectivity (human-to-human relationship), which have been well studied (Fawcett, 2005). Although, individual communication has been incorporated to inform clinical decisions, caring communication has not been studied with diabetic patients. The purpose of this study was to examine caring communication for people with diabetes and diabetic outcomes (A1c, LDL-C, and BP). A conceptual framework of the HumanDiabetic with a subcomponent of communication patterning guided the investigation. In this chapter, the research design, sample and sampling, procedures for data collection, measurement, as well as data analysis techniques are described. The protection of human subjects is also discussed.

Specific Aims

Aim # 1: To describe caring communication, A1c, LDL-C, and BP levels in people living with diabetes mellitus.

Aim #2: To examine the relationship among demographic factors, caring communication, A1c, LDL-C, and BP levels in people living with diabetes mellitus.

Aim # 3: To explore factors that increase the odds for improved A1c, LDL-C, and BP levels in people living with diabetes mellitus.

Research Design

A correlational cross sectional survey design was used for this study. Survey research designs are best for describing attitudes and opinions such as perceptions communication patterning (Creswell, 2009; Norwood, 2000). According to Burns and Grove (2001) survey designs are seen as both a design and a data collection method. They further cite surveys, as a research design, are controversial because the limited data obtained is shallow and therefore does not add significantly to scientific knowledge. On the other hand, a carefully thought out survey design supports very useful and representative information (Meadows, 2003).

Proposing quantitative research, there are often questions that arise about why a non-experimental design is used over the gold standard of a traditional or true experimental design. This study used a non-experimental design because the research questions were more descriptive in nature, and less predictive. True experimental designs, provide better-recognized evidence, and in turn able to be more predictive. Experimental designs are also more costly in time, money and effort (Norwood, 2000). In this study, the researcher ethically could not create a control group of "with-holding communication," because harm may come to patients with diabetes from limiting a patient's history that might alert clinicians to problems the patient had not noticed.

Design Controls

Many possible issues for implementing this study care considered *a priori* to allow for scientific control. The setting is identified, and has been supported by the study.

Master's prepared nurses provide the leadership at the setting, which will provide a basic understanding of the research process. Standard posters for recruitment will be used, as well as an "interaction guide" to help all people responsible for data collection to administer the tool consistently. Finally, other doctoral prepared nurse researchers will be available for consultation.

Sample and Sampling

The target population in the study was people living with diabetes. It would be difficult to identify the entire population because there are 57 million undiagnosed people with diabetes (CDC 2008). There are also more than 45 million Americans in the U.S. without health insurance further mystifying the total population of people with diabetes (Reinberg, 2008). Consequently, a nonprobability-sampling plan was appropriate.

The population sample in this study represented a clinic with two sites in the San Diego area. Inclusion criteria for the sample were males and females, over 18 years of age; with diverse ethnicity; a diagnosis of type 1 or type 2 diabetes of one year or more; and able to read and write English or Spanish. Women with gestational diabetes were excluded, because their diabetic status changes after pregnancy.

Two advantages of using nonprobability sampling were convenience and network sampling. Convenience sampling identified potential participants from one clinic. Network sampling is used when sufficient sample size cannot be met from one location and another location is referred by the previous location (Norwood, 2000). In this case, networking from colleagues assisted in site identification. Network sampling has an added advantage in gaining access to a potential new site.

A disadvantage to nonprobablity sampling is that it is prone to error and affects the representativeness of the sample. Sampling bias may arise if the sample is over or under representative of the population. Sampling errors also occur when characteristics of the sample are different from the entire population (Norwood, 2000).

Power analysis

There is no consensus on the approach to compute power and sample size with logistic regression; although as pointed out by Katz (1999), 10 outcomes for each independent variable is appropriate. In logistic regression an estimate of the probability of a certain event occurring is made, rather than detecting the difference or relationship that may be present, such as in linear regression. No assumptions are made about the dependent variable (DV) and independent variable (IV), the relationship is non-linear, and is not normally distributed (Munro, 2005). Some authors use the likelihood ratio test; some use the test on proportions; some suggest various approximations to handle the multivariate case. Some advocate the use of the Wald test since the *Z*-score is routinely used for statistical significance testing of regression coefficients (Demidenko, 2007). Since this a descriptive study and not focused on hypothesis testing, the Final Logistic Regression Model, which includes statistical significance defined by $p < 0.05$, where p is from the Wald test for Confidence Interval for the Odds ration and overall statistical significance is tested by the likelihood ration test, $p < 0.1$, was used to demonstrate logistic regression model fit.

Instrumentation and Data Collection

Measurement

An evaluation of three measures was used to find an appropriate measure for patient communication. Based upon this review Boren Health Partnership Scale (BHPS) was selected (See Appendix B.) The BHPS was developed to examine health partnerships in women with chronic heart failure. Psychometric testing was conducted using convergent and divergent validity (Boren, 2003). The scoring on the BHPS was calculated from the responses. For example: Items were scored as never=1; rarely=2; sometimes=3; always =4. The pattern for the coding had the same values from left to right for all of the items. If items are left unanswered, that number answered will reduce the total items. From psychometric testing it was determined that the BHPS must be scored as one scale, but there are three subscales that can also be investigated. Synergy items: 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, and 30; sharing/communication items: 1, 3, 6, 7, 8, 9, 11, 12, 13, 27, and 28; and reciprocity items: 2, 4, 5, 14, 15, and 16.

The Agnew Relationship Measure (ARM), a 28-item Likert-type scale that measures the quality of alliance between therapist and client determined convergent validity. Comparing ARM to BHPS demonstrated highly correlated items for bonding, partnership, confidence, and openness. For divergent validity, the Multidimensional Health Locus of Control (MHLC) Scales were utilized which consist of two 18-item scales. In the MHLC there were three subscales: Internal Health Locus of Control (IHLC); Powerful Others Health Locus of Control (PHLC); and Chance Health Locus of Control (CHLC). Scoring was based on a six-point Likert scale. Comparing the MHLC three subscales to BHPS, indicated that health status was positively correlated with IHCL

(r=0.40, p<0.05), CHLC was negatively correlated with health (r=-0.28, p<0.01); and PHLC did not correlate (r=-0.006) (Boren, 2003).

The BHPS was used with two other items, Heart Failure Clinic Satisfaction Survey and the Becks Depression Inventory to evaluate if a shared medical appointment (SMA) approach for heart failure was useful by reduction of hospitalizations, and increased the quality of life for the heart failure patients. The results of the pilot study suggested that SMA did increase patient satisfaction, improve quality of life, and reduce hospitalizations (Lin, Cavendish, Boren, Ofstad, & Seidensticker, 2008).

Another measure evaluated was Patient Perception Patient-Centeredness (PPPC) (Stewart et al., 2000). This instrument was developed in Canada and has 14-items scored on a 4-point Likert scale. It is based on the model of patient-centered medicine that explores the patient's perception of the provider's ability to explore the patient's disease, illness experience, and finding common ground (Stewart et al., 2000). Based on a comparative study from the Kalamazoo Consensus Statement, the PPPC had a Cronbach Alpha of 0.86 (Schrirmer et al., 2005).

Reliability for the PPPC was established by interrater reliability. Scores were reported from 0.73 to 0.91, which demonstrated that researchers agreed the tool measured what it was intended to measure (Norwood, 2000; Stewart et al., 2000). Validity was shown through convergence and construct validity in the Kalamazoo study (cited in Stewart et al., 2000).

The PPPC has been used for physicians, patients with nonspecific reoccurring health problems and respiratory patients (Irwin & Richardson, 2006; Stewart et al., 2000). It has not been used for people with diabetes. Similar to patients with respiratory

problems, people living with diabetes also have reoccurring health problems. The PPPC was not selected because it focused on the patient's evaluation of the provider's directed understanding; not emphasizing the patients expected understanding of communication.

A final measure evaluated was developed by the AADE, the Diabetes Self-Management Assessment Report (D-SMART®). The D-SMART evaluates current behavior, intent to change, skill and skill confidence, and barriers (Mulcahy, 2000), and was tested over 1400 times in 29 different diabetes education centers in the U.S. Content validity was >90% and reliability was established by test-retest method which showed there were no significant differences in 97% of the responses.

The measure is easily completed at home over the internet or via a voice-activated phone system in less than 30 minutes (Charron-Prochownik, 2007). When a satisfaction study was done on D-SMART; 76% of the participants believed that it helped them think more about their diabetes, improved communication with healthcare provider (in this case diabetic educators). Overall 94% of the participants liked using the tool, but satisfaction was based on the type of system (internet vs. phone) used.

The D-SMART was not selected either based on the constructs, which were based on stages of change, intention, barriers, self-efficacy, social support, and distress, not specifically on patient communication.

Variables

Independent Variables. The independent variables for this study included communication in caring, gender, age, length of time post diagnosis of living with diabetes, ethnicity, marital status, and education.

Caring Communication defined as a metanarrative in when a message is framed, feedback is given within an environment that is safe, comfortable, and free from a power struggle inherent between two humans and was measured by the Boren Health Partnership Scale (BHPS) (Boren, 2003).

Gender is defined as either male or female and was measured by self-report on the patient demographic profile survey.

Age is defined as how old the person is in years and was measured by self-report on the patient demographic profile survey.

Length of time post diagnosis of living with diabetes is defined as the amount of time in years since the diagnosis of diabetic mellitus and was measured by self-report on the patient demographic profile survey or obtained from the clinical record review.

Ethnicity is defined in the following categories: European American, Hispanic, African American, Asian, Pacific Islander, and other. It was measured by self-report on the patient demographic profile survey.

Marital Status is defined by the following categories: Single, Not Married/Partnered, Married, Separated, Divorced, or Widowed. It was measured by self-report on the patient demographic profile survey.

Education is defined as the highest level achieved with the following categories: No High School, Some High School, High School Graduate, Some College, College Graduate, Some Graduate School, Earned Masters, Some Doctoral School, Earned Doctorate. It was measured by self-report on the patient demographic profile survey.

Dependent Variables. The dependent variables for diabetic outcomes (A1c, LDL-C, and BP) came from the clinical record.

Glycosylated hemoglobin (A1c) is defined as a percentage of glucose saturation evaluating glucose control over the last 12 weeks (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2008). This was obtained from the clinical record.

Low-density lipoprotein (LDL-C) is defined as a lipid that in the plasma carries approximately 70% of the cholesterol in the body (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2008). The value was obtained from the clinical record.

Blood Pressure (BP) is defined as a force created from arterial structures involving flow, volume, and constriction (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2008). Measurement was taken at the time of the encounter and retrieved from the clinical record.

Data Collection

After initial arrangements and IRB approval was obtained, dates and times were set to collect administer the survey. A flyer was posted next to the reception window that a study was being conducted and the receptionist referred and directed interested potential participants to the researcher. Providers were also asked by the researcher to encourage participation in the study. Once the patient agreed, the informed consent was discussed in detail and questions were answered. After the survey had been completed the researcher reviewed the clinical record for the needed information listed above. The information was coded and placed in a locked box to be entered in the computer for analysis.

Preliminary Efforts

Three Southern California clinic sites were used to collect the data. Originally a site in San Diego had agreed to support the study, however despite multiple attempts to

finalize a letter of support for data collection, the site eventually declined. Another site in Los Angeles, which is a free clinic, granted access with a letter of support and an application for the IRB was submitted and approved. Due to budgetary cuts, a number of patients were diverted to other locations, which were not affiliated with the clinic. Little data was collected from that site from June 2010 to July 2010. A final search went underway with letters of support from two different locations. An IRB modification was approved. However one site was not able to grant the researcher orientation to be in the clinic. The final clinic with two sites in San Diego then became the sites that participated in the study. The site was introduced to the researcher prior to starting data collect and how would the best way to logistically be placed and when to offer the survey as not to disrupt the clinic follow and maintain confidentiality. A key stakeholder was the receptionist who presented flyers to the PLD as they naturally came for appointments. Participants who desired to be involved were consented and if agreed to participate received $10.00 cash for appreciation and time to complete the survey.

Data Analytic Techniques

The Statistical Package for Social Sciences (SPSS) for Windows version 17.0 was used to perform the various statistical procedures for analyzing the data. Analytic procedures included a descriptive analysis of the variables and inferential statistics for testing the research questions.

Initially tables showing the variables frequency distribution, mean, range, percentage, and standard deviations described the sample and provided an overview of the data. Issues related to missing data were dropped from the analysis (Mertler & Vannatta, 2005). Correlations were computed to evaluate the relationships between the

IV and each DV (Mertler & Vannatta, 2005). A final preliminary look at the data by multicollinearity examined the variance inflation factor evaluated if one or more variables were measuring the same thing (Merlter & Vannatta, 2005).

Aim #1: Describe caring communication, A1c, LDL-C, and BP in people living with diabetes.

Question #1: *What is the level of caring communication, A1c, LDL-C, and BP in people living with diabetes?*

Descriptive statistics (e.g., frequency, means and standard deviations) were calculated in order to describe the levels of caring communication, A1c, LDL-C, and blood pressure in people living with diabetes.

Aim #2: Examine the relationship among demographic factors, caring communication, A1c, LDL-C, and BP in people living with diabetes.

Question #2: *What is the relationship of caring communication, demographic variables, and diabetic outcomes (A1c, LDL-C, BP)?*

Correlational and Chi-square analyses were used to evaluate the communication in caring, patient characteristics, and diabetic outcomes. Prior to the analysis the variable for each diabetic outcome was dichotomized (0 = not within normal limits; 1 = within normal limits). First, correlational analysis was used to exam the relationships among the variables of communication in caring (BHPS total score, and subscales of synergy, sharing, reciprocity), continuous demographic variables of gender, age, length of time

living with Diabetes, and the diabetic outcomes (A1c, LDL-C, BP). Pearson's *r* was used to examine the bivariate relationships between these quantitatively measured (continuous) variables.

Chi-square was used to examine whether there is a statistically significant difference between A1c, LDL-C, BP groups by gender, ethnicity, education, and marital status.

Aim #3: To explore factors that increase the odds for improved A1c, LDL-C, and BP in people living with diabetes.

Question #3: *What independent variable(s) increase the odds for having diabetic outcomes within normal limits?*

Logistic regression was conducted to examine which predictors increased the odds for having diabetic outcomes within normal limits. According to Field (2005) logistic regression is used to predict which of two groups a person is likely to belong to given certain other information. Logistic regression is used when the dependent variable is neither continuous nor quantitative (Mertler and Vannatta, 2005). This statistical method was chosen as the point of this research as not to imply causes; the interest of this study was investigate the relationship between the variables, i.e. the variables which increase the odds for having diabetic outcomes within normal limits.

Human Subjects Protection

Protecting subjects in research is an ethical consideration that should be important to the researcher. Analyzing the risks to benefits is an important step in minimizing risks

and maximizing benefits (Moore & Miller, 1999). Other researchers were used to assist in the analysis of risks (Owen, 2001). Potential risks involved subjects who wanted to participant in a study because they saw the value in participating in research and wanted to be heard, but time sacrificed from or work or family was not feasible. Another risk might be that during the questionnaire participants may conclude that in fact acceptable levels of communication does not exist with their healthcare provider, and elicit feelings of confusion, despair or even anger. Possibly their negatives responses may cause them to feel that their care may be jeopardized in some way.

Maximizing benefits for the subjects takes into consideration the possible risks. The Institutional Review Board (IRB) was used to review and approve this study to decrease risks and improve benefits (See Appendix C.) Three areas the researcher addressed to decrease potential risks were recruitment, informed consent, and confidentiality (Oaks, 2002). Recruitment strategies included minorities and an examination of the incentives to participate in the study. This study was conducted in Southern California where there is a large population of minorities. Incentives were minimal - $10.00 cash. The informed consent was a process so that study participates were a clear about of the purpose of the study and potential risks. Finally, confidentiality was explained and maintained. Since participates names were linked to their clinical records, the participant was assured during the consent that only the research had access to their responses to the survey.

Summary

The methodology presented in this chapter covered the key elements in implementing this study. Sampling and power analysis discussed provided a description

of the target population. The selection of the BHPS demonstrated good validity through convergent and divergent validity. IV and DV were presented and defined along with how the final setting was procured.

Three specific aims and questions were developed with analytical rationale for each. Finally human subject protection was discussed.

CHAPTER 4

Results

The purpose of this study was to examine whether or not communication patterning influenced three biomarkers for diabetic outcomes: A1c, LDL-C, and BP. The significance would support that PLD will feel cared for by communication with their healthcare providers managing their diabetics and in turn improve diabetic outcomes. The study design was grounded in a theoretical framework of HumanDiabetic Patterning using a non-experimental survey research design. This chapter presents the study findings. First a descriptive profile of the sample, followed by specific findings for each aim.

Characteristics of the Sample

Data was obtained from 107 participants who attended clinic appointments at two health care facilities located in Southern California between January and February 2011.

Ages ranged from 20 years to 87 years (M= 56.79; SD = 16.16). The sample had 46 males (43%) and 61 females (57%). There were 17 (15.9%) Singles; 3 (2.8%) Not married but partnered; 66 (61.7%) Married; 4 (3.7%) Separated; 10 (9.3%) Divorced; and 7 (6.5%) Widowed. European American numbered 72 (67.3%); Hispanic 17 (16.8%); Asian 5 (4.7%); Pacific Islander 1 (0.9%); Other 11 (10.3%). Education levels achieved 5 (4.7%) with no High School; 6 (5.6%) with some High School; 15 (14.0%) were High School graduates; 38 (35%) had some college; 26 (24.3%) were college graduates; 4

(3.7%) had some graduate school; 10 (9.3%) had earned a Master's degree; and 3(2.8%) had earned a doctorate degree. See Table 4.1.

Table 4.1
Sample demographics

	M(SD)	Range
Age	56.79(16.16)	20-87
	N = 107	(%)
Gender		
Male	46	(43)
Female	61	(57)
Marital Status		
Single	17	(15.9)
Not Married/Partnered	3	(2.8)
Married	66	(61.7)
Separated	4	(3.7)
Divorced	10	(9.3)
Widowed	7	(6.5)
Ethnicity		
European American	72	(67.3)
Hispanic	18	(16.8)
Asian	5	(4.7)
Pacific Islander	1	(0.8)
Other	11	(10.3)
Education		
No High School	5	(4.7)
Some High School	6	(5.6)
High School Graduate	15	(14)
Some College	38	(35.5)
College Graduate	26	(24.3)
Some Graduate School	4	(3.7)
Earned Masters	10	(9.3)
Earned Doctorate	3	(2.8)

Aims and Questions

Aim #1: Describe caring communication, length of time living with Diabetes, A1c, LDL-C, and BP levels for PLD.

Question #1: What is the level of caring communication, length of time living with DM, A1c, LDL-C, and BP in PLD?

The clinical record review included the most recent A1c, LDL-C, BP, and length of time with diabetes. Some participants were asked when length of time was not documented in the clinical record. The A1c had a mean of 7.50% (SD = 1.63) with a range of 5.1% to 15.3% (n = 105). The LDL-C had a mean of 82.57mg/dl (SD (27.09) with a range of 24mg/dl to 152mg/dl (n = 92). Systolic BP mean was 132.50mmHg (SD 17.64) with a range of 97mmHg to 203mmHg (n = 105). Diastolic BP mean was 74.58mmHg (SD 8.96) with a range of 51mmHg to 94mmHg (n=105). The mean length of time with diabetes was 16.36 years (SD 13.20) and with a range of 2 years to 59 years (n=105). See Table 4.2.

Table 4.2
Study variables

	N	M (SD)	Range
A1c	105	7.5% (1.63)	5.1% to 15.3%
LDL-C	92	82.57mg/dl (27.09)	24mg/dl to 152mg/dl
Systolic BP	105	132.50mmHg(17.64)	97mmHg to 203mmHg
Diastolic BP	105	74.58mmHg (8.96)	51mmHg to 94mmHg
Length of time with diabetes	105*	16.36 yrs (13.20)	2 years to 59 years

N* Reflects a combination of clinical record data and self reporting.

Caring Communication

The Boren Healthcare Partnership Scale (BHPS) included one overall score and three subscales (synergy, sharing, and reciprocity). The overall scale score ranged from 30 to 120 (M= 109.61, SD = 13.93); (n = 100). The subscales ranged from 13 to 52 (M = 48.60, SD = 5.64); synergy (n=105); 11 to 44 (M = 40.95, SD = 5.20) sharing (n=104); and for reciprocity 6 to 24 (M =20.10, SD =3.60); (n=105). See Table 4.3.

Table 4.3
Tool results

	M (SD)	Range	Chronbach's α
Total (n=100)	109.61 (13.93)	30 to 120	.97
Synergy (n=105)	48.60 (5.64)	13 to 52	.93
Sharing (n=104)	40.95 (5.20)	11 to 44	.94
Reciprocity (n=105)	20.10 (3.60)	6 to 24	.86

To put the HCPS responses into perspective, 88.8% demonstrated a high level of communication with their healthcare provider. Participants had a high level of *synergy* (94.4%), which showed that both the patient and the healthcare provider share decision-making, they are succinctly connected, and realize that the possibilities are unlimited. *Sharing* indicated a high level (91.6%) representing a give and take with an openness of communicating without fear of intimidation or inferiority. Finally, *reciprocity* also showed a high level (84.1%) of the participants exchanging ideas, supportive of each other's unique position in the context of the dialogue.

Aim #2: Examine the relationship among patient characteristics, caring communication A1c, LDL-C, and BP levels for PLD.

Question #2: What is the relationship of caring communication, demographic variables (age, marital status, ethnicity, and education level), and diabetic outcomes (A1c, LDL-C, BP levels)?

Correlational and Chi-square analyses were used to examine the relationship among caring communication, patient characteristics, and diabetic outcomes. Prior to the analysis the variable for each diabetic outcome was dichotomized (0 = not normal, 1 = within normal limits).

Correlational analysis was used to exam the relationships among the variables of communication in caring (total score, and subscales of synergy, sharing, reciprocity), continuous demographic variables of age, length of time living with DM, and the diabetic outcomes (A1C, LDL-C, BP levels). Pearson's *r* was used to examine the bivariate relationships between these quantitatively measured (continuous) variables. See Table 4.4.

Table 4.4
Correlation Matrix of Predictor Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Age	--									
2. Time with DM	.191*	--								
3. BHPS Total	.226*	.252*	--							
4. Synergy	.149	.198*	.966**	--						
5. Reciprocity	.203*	.258**	.922**	.833**	--					
6. Sharing	.273**	.199*	.962**	.893**	.835**	--				
7. A1c	-.215*	-.119	-.205*	-.153	-.211*	-.182	--			
8. LDL-C	-.115	-.012	-.093	-.021	-.065	-.109	.057	--		
9. SBP	.115	-.095	.076	.072	.059	.084	-.041	-.132	--	
10. DBP	-.238*	-.303**	-.159	-.083	-.192	-.108	.193*	.002	.019	--

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Cross-tabulations were computed to examine whether there is a statistically significant difference between A1c, LDL-C, BP groups by age, ethnicity, education, and marital status. A difference approaching significance was detected in A1C group by gender $\chi^2(1) = 3.73, p < .053$. Men were found to be trending to be less likely to be within normal limits than females.

Aim #3: To explore factors that increase the odds for improved A1c, LDL-C, and BP levels for PLD.

Question #3: What independent variable(s) increase the odds for having diabetic outcomes within normal limits?

Question 3a. Can A1c status (within normal limit or not) be correctly predicted from length of time with DM, caring communication, and age?

A preliminary multiple regression was conducted to identify outliers and examine multicollinearity among the four predictor variables. Tolerance for all variables is greater than .1 indicating multicollinearity is not a problem. Binary logistic regression was then performed.

Regression results indicated the overall model fit of 4 predictors (gender, age, length of time with DM, and BHPS total score) was statistically reliable in distinguishing between patients with A1c within normal limits and those with A1c outside normal limits (-2 log likelihood = 122.819; goodness of fit = 4.77; $\chi^2(4) = 12.87, p < .01$). The model correctly classified 65.3% of the cases. Regression coefficients are presented in Table

4.5. Wald statistics indicate caring communication total score and gender significantly predict A1c group. Odds ratios for these variables indicate little change in A1c group based upon caring communication; females have 2 times (the probability of having A1c levels in the normal range than males.

Table 4.5 Regression Coefficients

Predictor	B	S.E.	Wald*	Sig.	Exp(B)
Gender	.889	.443	4.029	.045	2.433
Age	.002	.015	.012	.911	1.001
Time with DM	.008	.017	.218	.640	1.008
BHPS Total	.055	.024	5.245	.022	1.056
Constant	-6.863	2.604	6.948	.008	.001

*$df = 1$

Question 3b. Can A1c status (within normal limit or not) be correctly predicted from length of time with DM, caring communication subscales of synergy, sharing, reciprocity) and gender?

Regression results indicated the overall model fit of 5 predictors (length of time with DM, BHPS- *synergy, sharing, reciprocity*, gender) was statistically reliable in distinguishing between patients with A1c within normal limits and those with A1c outside normal limits (-2 log likelihood = 117.26; goodness of fit = 10.63; $\chi^2(5) = 18.42, p < .01$). The model correctly classified 64.3% of the cases. Regression coefficients are presented in Table 4.6. Wald statistics indicate caring communication reciprocity approaches significance in predicting A1c group. Odds ratios for this variable indicate little change in A1c group based upon caring communication reciprocity.

Table 4.6 Regression Coefficients

Predictor	B	S.E.	Wald*	Sig.	Exp(B)
Gender	.775	.462	2.81	.093	2.171
Time with DM	.001	.017	.001	.971	1.001
Synergy	.191	.127	2.257	.133	1.210
Sharing	-.206	.123	2.84	.094	.814
Reciprocity	.267	.138	3.776	.052	1.306
Contstant	-6.848	3.195	4.593	.032	.001

*$df = 1$

Question 3c. Can SBP status (within normal limit or not) be correctly predicted from BHPS, gender, age, and marital status?

Regression results indicated the overall model fit of 4 predictors (BHPS total score, gender, age, and marital status) was statistically reliable in distinguishing between patients with SPB within normal limits and those with SPB outside normal limits (-2 log likelihood = 124.398; goodness of fit = 18.066; $\chi^2(4) = 11.42$, $p < .01$). The model correctly classified 69.4% of the cases. Regression coefficients are presented in Table 4.7. Wald statistics indicate SPB was significance in predicting SPB group. Odds ratios for this variable indicate a small negative change in SPB group based upon age.

Table 4.7 Regression Coefficients

Predictor	B	S.E.	Wald*	Sig.	Exp(B)
Time with DM	.014	.018	.648	.421	1.014
Gender	.165	.451	.134	.715	1.179
Age	-.046	.017	7.876	.005	.955
Marital Status	.020	.193	.010	.919	1.020
Constant	.892	1.912	.218	.641	2.441

*$df = 1$

Question 3d. Can SBP status (within normal limit or not) be correctly predicted from synergy, sharing, reciprocity length of time with DM, and gender,?

Regression results indicated the overall model fit of 5 predictors (synergy, sharing, reciprocity length of time with DM, and gender) was statistically reliable in distinguishing between patients with SPB within normal limits and those with SPB outside normal limits (-2 log likelihood = 123.46; goodness of fit = 7.56; $\chi^2(5) = 12.34$, $p < .03$). The model correctly classified 68.4% of the cases. Regression coefficients are presented in Table 4.8. Wald statistics indicate Synergy and Sharing were significance in predicting SPB group. Odds ratios for this variable indicate a small negative change in SPB group based upon age.

Table 4.8 Regression Coefficients

Predictor	B	S.E.	Wald*	Sig.	Exp(B)
Time with DM	-. 014	.017	.691	.406	.98
Gender	.144	.438	.109	.742	1.115
Synergy	.26	.121	4.46	.03	1.29
Sharing	-.38	.136	7.96	.005	.68
Reciprocity	.175	.125	1.96	.16	1.19
Constant	-.504	2.51	.04	.841	.604

*$df = 1$

Summary

Results presented in this chapter were an analysis of correlation and logistic regression. Statistical significance approached that men were less likely have Alc levels within normal limits ($p > .53$). Regression results supported that gender ($p > .45$) and BHPS total score ($p > .022$) accounted for A1c levels within normal limits, which

classified 65.3% of the cases. A1c levels within normal limits were also approached significance for the BHPS subscale of reciprocity ($p > .52$), which accounted for 64.3% of the cases. Most interesting was that age was statistically significant for have a small negative in their SPB ($p > .005$) which accounted for 69.4% of the cases. Discussions of results and interpretations will be presented in Chapter Five.

CHAPTER 5

Findings, Discussion, and Implications

The purpose of this study was to examine PLD and the relationship between caring communication and the biomarkers of diabetes: A1c, LDL-C and BP. A clinic in Southern California was the setting where the participants completed the surveys with a subsequent clinical record review. A total of 107 surveys were completed between January 2011 and February 2011.

The theoretical framework for this study was based on the HumanDiabetic. A conceptual model developed by the researcher. The concept of communication patterning was the focus because when more information is communicated involving the complexity of living with diabetes there is has more of an opportunity to improve diabetic outcomes. In another words, you can't tell people what to do, but it is much better to negotiate to motive behaviors to improve diabetic outcomes and prevent complications.

Three specific aims were used in this study to find if caring communication is supported in improving diabetic outcomes. The first describe caring communication in relationship to A1c, LDL-C, and BP. The second aim was to examine the relationship between caring communication, A1c, LDL-C, and BP among different demographics factors such as gender, age, marital status, education levels, and length of time with DM. The last aim was to explore factors that increase the odds for improved A1c, LDL-C, and

BP in PLD. The following will describes the findings, makes conclusions, and offers implications of the findings.

Describing People Living with Diabetes

Aim #1 was to describe the characteristics of caring communication, A1c, LDL-C and BP. The sample of PLD in this study represented a large age range between 20 and 87 years of age (M56.79, SD 16.16), nearly evenly distributed by gender - 43% males to 57% females. Approximately two thirds were married (61.7%) and of European American background (67.3%). Thirty-five percent of the sample had some college. The mean time of living with diabetes was 16.36 years (SD 13.20).

The mean A1c was a 7.5% (SD 1.63%). As a group this is considered a well cared for group, particularly with a standard deviation of 1.63%. The LDL-C was 82.57mg/dl (SD 27.09). This is impressive because it not only did the sample achieve optimal levels even with a standard deviation of 27.09 mg/dl they demonstrated near benchmarks. The mean BP of 132.50mmHg/74.58mmHg achieved benchmarks as well, showing a standard deviation of 17.64 and 8.69 respectively. The most variability comes from the time living diabetes. Does caring communication work more effectively for type 1 or type 2 diabetics would require more investigation.

The sample reveals a group of individuals well cared for with regard to their diabetes based on the gold standards established by the ADA (2011). The means of diabetics' outcomes come close to the gold standards of diabetic care with little variations. This is likely due to the clinic's specialty of managing metabolic disorders. Also half the healthcare providers were not physicians, but nurse practitioners and physician's assistants.

Among the sample was a wide distribution of ages and nearly even distribution of gender. This shows generalizability of the findings. The sample also describes a group of primarily married, European Americans with some college that conversely narrows the results gleaned from the sample.

Examining the Relationships

Aim #2 was to examine the relationship among demographic factors, caring communication, A1c, LDL-C, and BP. From the correlation matrix the variables that were statistically significant for PLD were A1c with age (r = -.215, p <.05), total health partnership scale (r = -.203, p <.05), and the subscale measure of reciprocity (r = -.211, p <.05). DBP was also significant with age (r = -.238, p <.05), and with the subscale sharing (r = -.193, p <.05). Time living with diabetes correlated with age (r = .191, p <.05). DBP correlated with time living with diabetes (r = -.303, p < .01).

All but " living with diabetes" supported a decrease in biomarkers, with a weak relationship. The results indicate that the role of a caring relationship is beneficial in caring for some aspects of diabetes care. The data also could account for the fact that the patients were being well cared because the focused of the clinic is on diabetes and other metabolic disorders. Research is also part of the settings activities, which could account for the overall well-cared sample.

Interestingly as well was that the healthcare providers were physicians, physician assistants, and nurse practitioners. Therefore one could speculate that nursing science has contributed to influencing better diabetic outcomes through caring communication rather than RCTs and medications.

Exploring the Odds

Aim # 3 explored factors that increase the odds for improved A1c, LDL-C, and BP for PLD. Three models emerged from the data. There were two models involving A1c status and one for SBP. Each model will be discussed.

Predicating A1c (within normal limits), length of time with diabetes, caring communication, and age

This model correctly classified 65.3% of the cases. With age, one becomes experienced. So, if individuals, who have diabetes for longer period of time and are older, could explain why A1c would be within normal limits (WNL) more than others with lesser time with diabetes. Life experience when supported by caring communication allows growth, personal responsibility, and acceptance. The data supports that if caring communication is emphasized as one grows with diabetes, supports an expectation that the A1c can be found WNL and prevent complications.

Predicating A1c WNL for length of time with diabetes, synergy, sharing, reciprocity and gender

This model correctly classified 64.3% of the cases. Caring communication from the BHPS scale subscale shows reciprocity approaching significance levels. Reciprocity as defined earlier is an exchange of ideas that informs both parties and is supportive of each other's unique position in the context of the dialogue. Hiding behind white coat/uniform stating, "how are you doing?" is obviously a mantra for healthcare providers. Exploring beyond the "how are you doing?" to specific questions about what have you learned about living with diabetes? What is it you (the patient) would like to work on? How can the knowledge of the provider and the PLD share opinions about

diabetes care? There needs to be a bonding between healthcare provider and patient and how does that occur? A brief analogy is found with infants. There is a rapid change in growth and development. Physical changes need to be addressed, cognitive changes relate to behavior changes, psychosocial changes occurs where diabetic differentiate themselves from others, the health risks and concerns that become now paramount (Potter & Perry, 2009). It might seem disrespectful to refer grown people with infancy development theory, however, concerning a new life with diabetes, might shed insight into a critical periods of adjustment needing basic growth and development concepts leading to a productive healthy life.

Predicating SBP WNL for BHPS, gender, age, and marital status

The model with SBP accounted for 69.4% of the sample. Age was statistically significant predicting SBP WNL opposed to those outside normal limits. Typically age causes BP to increase due to and people over 50 are more at risk for developing heart disease (Tabloski, 2006), however the sample supported lower SBP ($p > .005$). Again age and experience is likely to explain this finding. However according to the landmark studies of EDIC, UKPDS, ADVANCE, and ACCORD cardiovascular complications are tempered by tighter A1c and BP care. There is a balance in tight control of A1c and BP because the ACCORD study ended because of very tight control ended fatalities.

Discussion

The gap in the literature was identified that there were no studies examining caring communication for PLD. As healthcare providers, it is likely patients are receiving caring communication, however this study supports and predicts improved outcomes when caring communication is utilized. Consequently a paradigm shift of using caring

communication for PLD is needed as part of the guiding recommendations of diabetics. Healthcare providers can use algorithms that include the latest RCTs, but using caring communication is an important intervention that can improve diabetic outcomes along with the most evidenced-based guides for diabetic care.

Social policy changes should include open access to nursing. Nursing science includes caring communication as part of their education and it is an imperative to professional practice. Therefore, in addition to the ADA outlines of referrals for PLD: 1) annual eye exam; 2) family planning; 3) nutritionist; 4) CDE; 5) dental examination; 6) mental health professional, if needed; nursing should be included because of the unique contribution in improving diabetic outcomes.

As a result, reimbursement should be made for professional nursing services rendered and not part of the "the encounter" or "daily rate." Nursing services that provide caring communication are improving outcomes, which in turn can decrease complications and costs.

People do not do what they what to do, however, using a model of communication patterning, the nurse is able to use science to give attention to the patient, inquiring what issue(s) the person has living with diabetes. The nurse becomes the resource, which has the technology to interact with the patient using caring communication. Finally, obtaining mutual understanding is paramount. Sometimes discussions are misunderstood, therefore the final step of ensuring understanding reinforces a plan that the patient wants to do, not what they are told to do.

Using caring communication is a different way of caring for PLD. The focus begins with a "bottom up" approach. Subjective data, rather than objective data of the

biomarkers become the guides in caring for PLD. There is a common statement for healthcare providers: "80% of the diagnosis comes from the subjective data." There needs to be a revitalization of that concept post diagnosis of diabetes for ongoing treatment for PDL. Manipulating treatment plans based on biomarkers and maybe a brief explanation of treatment plan is not working. The extra time in giving the patient a voice by using caring communication creates a narrative where barriers to life style changes for PLD can be addressed, not just adding or changing medications or reinforcing diet and exercise. Today's life is challenging, complex, and fast paced. As healthcare providers we need hone in on patients issues living with diabetes, not just using medication to achieve benchmarks.

Implications for Nursing Science

Nursing Research

Further research needs to be done to investigate communication patterns that are helpful for diabetics. PLD are constantly reminded during the day they have diabetes. Medications, injections, checking blood sugars, eating, and exercising are common activities needed for PLD to maintain or improve their care with diabetes. Healthcare providers can no longer prescribe and encourage, but listen to the person. Continued research that investigates what PLD are faced with on daily bases requires attentive listening. Once listening is used with caring communication, patterns will reveal themselves more clearly.

Investigating technologies as an extension of caring communication that work is also important. Current technologies involve such things as education, glucometers, and weight scales; certainly cannot be the only ways to care for PLD. What other

technologies can be found to improve diabetic outcomes that are time-sensitive, less painful, and less costly? Again, this will require the patient's voice; after all they are the ones living with diabetes. Some are successful at maintaining benchmarks that decrease complications and costs. Why not listen to them? Should they not be considered experts and leading research to better diabetic outcomes?

Communication is triumphant if understanding between individuals has been achieved. As healthcare providers suggest new treatment(s) like a new medication, requires an understanding. If a new treatment is suggested, there could be a misunderstanding that the patient is not doing what they are supposed to be doing which can lead to poor self-esteem, powerlessness, even depression that can increase blood sugars and contribute to poorer outcomes causing complications. Maybe the patient did not know how to take the medication such as before meals instead of after meals. In the end, the new treatment becomes counter-productive for the patient, even leading to healthcare providers labeling the patient as noncompliant. Further research can be done to provide healthcare providers with ways to establish understanding, not just giving a new treatment(s) and expecting the PLD to follow the new treatment blindly.

Middle Range Theory Development for PLD

Theory development is not meant to promote a "cookie-cutter" approach to patients, but offers guidelines to be flexible for PLD. Even if there is a box of cookie-cutters, there are many variables (shapes) that need to be considered. When theory is used empirical knowledge can be combined with patient's life experience to assist the nurse in narrowing the gap between research and practice. Not only for improving outcomes for

PLD, but possibly for other chronic conditions as well, such as asthma or high blood pressure.

21st Century nursing is a basic science that requires a common language represented by middle range theory. A language and science that is unique to nursing that sets nursing apart from other disciplines offering society a much-needed service. Over the years nursing has advanced its position from historical times as "hand-maidens" to scientist. Meaning nurses no longer think an activity will help, but has evidence and theories to support their actions that have empirical evidence. Much work still needs to be done, however more work needs to be done in educating society about nursing science.

Summary

Presented in this chapter was a discussion of the findings in this study. Although the sample was well cared for evidenced by near benchmarks demonstrating control, most were educated with at least by graduating from high school. The four models predictive of diabetic outcomes were discussed with possible explanations. Future nursing research and implications for nursing science were also addressed.

Caring communication can influence diabetic outcomes, and nurses are best to implement this activity. Layers of healthcare health policy might benefit from having healthier diabetics, less complications, better satisfaction with healthcare, and cost savings, if 21st Century nursing using a theoretical framework can be placed in the mainstream of diabetes care, not just part of medical care, but part of a healthcare team dedicated to improving lives of people living with diabetes.

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Appendix A

Landmark Diabetes Studies: DCCT, EDIC, and UKPDS

Title	Purpose/Design	Time/Sample	Results/Remarks
DCCT The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus *NEJM* 1993, 329 977-986	Randomized control trial (RCT) to compare intensive conventional diabetes therapy and the effects on the development and progression of early vascular and neurological complications for type 1 diabetes Conventional group one or two daily insulin injections self-blood glucose monitoring (SBGM), education regarding diet and exercise Intensive group three or more injection of insulin (or pump) adjustments made from SBGM at least 4 times per day, dietary intake and anticipated exercise	1983-1993 *n*=1441 Ages 13-39 20 medical centers in the U S and Canada	Aggressive management of an insulin pump or ≥3 insulin injections/day ↓ the risk of retinopathy by76% (p=0 001), nephropathy by 56% (p=0 001), and neuropathy by 69% (p=0 001)
EDIC Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes *NEJM* 2005, 353 2643-2653	Continuation of the RCT of DCCT, examining long term effects of DCCT interventions on cardiovascular disease	1993-2005 (follow-up to DCCT) Mean 17 years of follow up *n*=1397 (93% retention) 20 medical centers in the U S and Canada	Continued aggressive management supported a risk reduction of any cardiovascular event by 42% (p=0 02), nonfatal heat attack, stroke, or death from cardiovascular by 57% (p=0 02)
UKPDS Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes *Lancet* 1998, 352 837-853 Effect of intensive blood-glucose control with metformin on complications in over-weight patients with type 2 diabetes *Lancet* 1998, 352 854-865 Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes *BMJ* 1998, 317 703-713 Efficacy of atenolol and captopril in reducing risk of both macrovascular and microvascular complications in type 2 diabetes *BMJ* 1998, 317 713-720	RCT to determine 1) whether intensive use of pharmacological therapy to lower blood glucose levels results in clinical benefits (reduction in cardiovascular and microvascular complications, 2) whether the use of various sulfonylurea drugs, biguanide, or insulin has therapeutic advantages or disadvantages Also a randomization of patients were done to evaluate tight or less tight blood pressure control to find out the benefits of captopril (ACE inhibitor) or atenolol (β-blocker) Intensive group all patient taking oral and Injectable medications Conventional group diet treat only (note if the diet group need therapy, they were placed on medication that added another dimension to the study)	1977-1991 *n*=5102 23 medical centers in the U K Participant followed for 10 years on average *Largest study to date for people with DMT2	Lower blood glucose levels reduces the incidence of microvascular complication in type 2 as well as type 1 diabetes Pharmacological therapy lower blood pressure significantly ↓ microvascular and cardiovascular events ranging from 24 to 26% and a ↓ of 21% for myocardial infarction was not significant (p=0 013) (ADA 2002)

Landmark Diabetes Studies: ADVANCE and ACCORD

Title	Purpose/Design	Time/Sample	Results/Remarks
ADVANCE Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes *NEJM* 2008, 358 2560-2572	RCT of people with type 2 diabetes and the effects of tight control and taking gliclazide (modified release) plus other medication(s) to achieve HgA1c ≤ 6 5%, macrovascular and microvascular events All participants were given 6-week lead time for adherence and tolerance with a fixed combination of perindopril and indapamide and their usual medication for glucose control Factorial design of randomization received either perindopril and indapamide or placebo and separated by an intensive or standard treatment group for glucose control Intensive group received gliclazide modified release and require to stop any other sulfonylurea (physicians could use protocol for medication adjustment, or use their preferred method Standard group were required to discontinue gliclazide and take another sulfonylurea Follow up Intensive group at 2weeks, months 1, 2, 3, 4, and 6, then every 6 months for 5 years Standard group months 3, 4, 6 and then every months for 5 years	2001-2008 *n*=11,140 Age 66 (SD± 6) Median follow-up was 5 years 215 centers 20 countries participated	Overall intensive treatment with gliclazide (modified release) and other medication had a reduction of 10% of microvascular and macrovascular, primarily related to a 21% reduction in nephropathy Intensive group mean HgA1c was 6 5%, Standard group mean HgA1c was 7 3% Reduced macrovascular and microvascular events by 18 1% (intensive) and 20 0% (standard) groups (p=0 01) Major microvascular events by 9 4% (intensive and 10 9% for standard) group (p=0 01) No significant result for major macrovascular event in both groups Conflicted with ACCORD study, which did not show an increased risk for cardiovascular events
ACCORD Effects of intensive glucose lowering in type 2 diabetes *NEJM* 2008, 358 2545-2559	RCT addressing the challenge of testing three complementary treatments to ↓ HgA1c, ↓ lipidsand ↓ systolic blood pressure for patients with cardiovascular disease or risk factors for cardiovascular disease Intensive group HgA1c target < 6 0%, Standard group HgA1c 7 0% to 7 9% The participants were randomized again to intensive/standard systolic control (SPB <120mmHg and <140mmHg , respectfully) and intensive/standard lipid control – while maintaining good LDL-C with simvastatin, patients were randomized for fenofibrate or placebo (Note antihyperglycemic medication had a formulary, who for any participant, the physician could customize individual medical treatments, no listed blood pressure medications were listed in the design) Follow up Intensive group every month for the 1st four months, then every 2 months, at least one interim call Standard group every four months	2005-2010 (2008) *n*=10,251 patients for HgA1c, *n*=5518 for the lipids, and *n*=4733 for the BP issue Mean age 62 2 years 77 clinical setting in the U S and Canada	After one year HgA1c levels were achieved between 6 4% (intensive) and 7 5% (standard) First occurrence of nonfatal myocardial infraction, cerebral infarction, or death from cardiovascular causes intensive group had 352 events compared to 371 events for the standard group (p=0 16) 257 participants died in the intensive group vs 203 patients in the standard group (p=0 04) Hypoglycemia management assistance and weight gain >10 kg was identified in the intensive group (p=0 001) *Study ended 17 months before scheduled (2/2008) because of higher mortality rate in the intensive therapy group* Builds from the UKPDS & VADT

Landmark Diabetes Studies: VADT

Title	Purpose/Design	Time/Sample	Results/Remarks
VADT Glucose control and vascular complications in Veterans with type 2 diabetes *NEJM* 2009, 360 129-139	RCT to compare the effects of intensive and standard glucose control on cardiovascular events Permuted-block design with a block size of six Both groups BMI >27 received two oral agents (metformin + rosiglitazone, BMI<27 received glimepiride + rosiglitazone Intensive group started on maximal dosing Standard group stared on half maximal dosing Before changes were made with medications, insulin was added for intensive group when HgA1c was not at <6 0% and <9 0% for the standard group (medication could be changed per physician discretion) Intensive group had a goal of reduction of HgA1c by 1 5% All participants followed ADA guidlelines for BP and lipid control, dietary, exercise diabetic education All participants were prescribed aspirin and hydroxymethylglutaryl coenzyme (statin) unless contraindicated Follow up Median was 5 6 years (no description of intervals by group)	2001-2008 *n*=1791 Mean age 60 4 years HgA1c >7 5% 9 VA sites in the U S	Median HgA1c for intensive group 6 9% and for standard group 8 4% First cardiovascular events was not significant 264 patients (standard group) and 235 patients (intensive group) (p=0 14) and no differences between groups in the first cardiovascular event or death (p=0 62) No differences occurred between the two groups for microvascualr complications Adverse event of hypoglycemia were 24 1% in the intensive group and 17 6% for the standard group Overall intensive glucose control for patient with poor glucose had not significant effect on rates of cardiovascular events, microvascular complications or death

Appendix B

HEALTH PARTNERSHIP SCALE

Directions: The statements below describe a person's partnership with their health care provider. Beside each statement is a scale that ranges from a frequency of never to always. For each item, please circle the number that represents the frequency of the behavior described in the item statement. Please make sure you answer each item and that you circle only one response per item. There are no right or wrong answers. You should respond according to your actual perceptions about the partnership and not according to how you feel you should respond or how you think your health care provider would want you to respond.

When making your response choice, please consider the spaces between each choice as being equal. This means that the difference between strongly disagree and disagree is the same as between disagree and agree or between any other two adjacent choices.

Never = 1 Rarely = 2 Sometimes = 3 Always = 4

	Never	Rarely	Sometimes	Always	Please do not write in this space
1. My provider clearly explains all treatments and medications.	1	2	3	4	1.
2. My provider and I seem to teach each other.	1	2	3	4	2.
3. I am comfortable saying anything to my provider.	1	2	3	4	3.
4. Working together with my provider gives me energy to keep up my health care plan.	1	2	3	4	4.
5. My provider frequently asks for my opinion.	1	2	3	4	5.
6. I connect with my provider.	1	2	3	4	6.
7. My provider encourages my questions.	1	2	3	4	7.
8. I can talk freely with my provider.	1	2	3	4	8.
9. I work in alliance with my provider.	1	2	3	4	9.

	Never	Rarely	Sometimes	Always	Please do not write in this space
10. My provider and I plan health care goals together so we will know what to expect for my care.	1	2	3	4	10.
11. I can discuss health issues with my provider without feelings of inferiority.	1	2	3	4	11.
12. My provider understands me.	1	2	3	4	12.
13. I have open communication with my provider.	1	2	3	4	13.
14. There is give and take in my relationship with my provider.	1	2	3	4	14.
15. I have a bond with my provider.	1	2	3	4	15.
16. My provider and I negotiate our differences of opinion regarding health care decisions.	1	2	3	4	16.
17. My provider and I are in unison regarding my health.	1	2	3	4	17.
18. My provider encourages me to take part in my health care plan.	1	2	3	4	18.
19. My provider facilitates my efforts in staying as healthy as I can.	1	2	3	4	19.
20. I approach my provider without fear of a negative reaction.	1	2	3	4	20.
21. My provider and I are on the same wavelength regarding my health.	1	2	3	4	21.
22. My provider shares everything about my health, good or bad.	1	2	3	4	22.
23. I have a good relationship with my provider.	1	2	3	4	23.

	Never	Rarely	Sometimes	Always	Please do not write in this space
24. My provider and I work as a team to make my health better.	1	2	3	4	24.
25. My provider and I share common goals regarding my health.	1	2	3	4	25.
26. I have equal status in making decisions with my provider.	1	2	3	4	26.
27. I can easily talk with my provider and feel heard by him/her.	1	2	3	4	27.
28. My provider respects my opinions on health.	1	2	3	4	28.
29. My provider and I discuss strategies for improving my health.	1	2	3	4	29.
30. Working with my provider, I have healthier outcomes.	1	2	3	4	30.

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Demographics

Please CIRCLE the responses to the items and indicate your age in the box.

					Please do not write in this space
31	What is your sex?	Male	Female		31.
32	What was your age as of your last birthday?				32.
33.	What is your marital status?	Single	Not married, partnered.	Married	33.
		Separated	Divorced	Widowed	
34.	What is your ethnicity?	Hispanic	African American	European American	34
		Asian	Pacific Islander	Other	
35.	What is your highest education achieved	No High School	Some High School	High School Graduate	35.
		Some College	College graduate	Some Graduate School	
		Earned Masters	Some Doctoral School	Earned Doctorate	

Thank you very much for completing the questionnaire!

Please do not write in this space		
36.	A1C	
37.	LDL-C	
38.	Sys	
39.	Dia	
40.	DMT	

The information from this box will come from the clinical record.