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Understanding How Patients Perceive Their Medical Providers' Communication in a Hospital Based Emergency Department Setting

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DEDICATION

This dissertation is dedicated to my father, Pritam Singh Grewal, who always supported me in my educational endeavors and continues to encourage my dreams. I would not be here without him.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

UNDERSTANDING HOW PATIENTS PERCEIVE THEIR MEDICAL PROVIDERS' COMMUNICATION IN A HOSPITAL BASED EMERGENCY DEPARTMENT SETTING

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Seton Hall University, 2015

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Background: In recent years, a chief patient complaint has been that there is a breakdown in communication with their healthcare provider. This is concerning because poor provider-patient communication can lead to reduced medication adherence, misdiagnosis, increased healthcare costs, and even death. Furthermore, the implementation of the Affordable Care Act has availed healthcare insurance to more individuals, which will increase the insured patient population. This will lead to a rise in patient visits, but also means that there are not enough physicians to support this new volume of patients. Other healthcare providers, like nurse practitioners and physicians assistants are more likely to be engaged with patients, because of these increased demands. Therefore, understanding how patients perceive communication in all of these groups is essential because, as aforementioned, a lack of good communication can have grave consequences. The purpose of this study was to understand the patient's perception of the medical doctor-patient communication encounter, the patient's

perceptions of the midlevel-patient communication encounter, and to identify the patient's perceptions of difference between the two groups.

Methods: The research design for this study was descriptive, correlational and cross-sectional. The study engaged a convenience sample of 137 treat and release patients at the emergency department (ED) of Hackensack University Medical Center (HUMC).

Results: The survey utilized in this study consisted of two parts: the Communication Assessment Tool (CAT) (Makoul, 2007, Appendix A) and the Demographic Questionnaire. The CAT consisted of fourteen items where each item addressed a different aspect of the patient-provider communication encounter. Each item employed the following five-point Likert type scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent. The Demographic Questionnaire (Appendix B) was developed by the researcher and asked the patient to self-identify in the following five areas: age, gender, ethnicity, educational level, and employment status. The following shows the results of each research question.

Findings 1: The fact that both the mean and median CAT Composite scores for this segment of the sample were very high (*M* = 65.13 and *Mdn* = 67 on a 14-70 scale) showed that patients were extremely satisfied with their doctors' communication skills.

Findings 2: While both the mean and median scores for this segment (*M* = 54.34 and *Mdn* = 56) suggested that patients were quite satisfied with their midlevel

providers' communication skills, their degree of satisfaction was not quite as high as those who dealt with physicians.

Findings 3: The perception of the physicians is better than their midlevel counterparts; reject null hypothesis.

Findings 4: The perception of the physicians is better in each of the fourteen areas versus their midlevel counterparts; reject null hypothesis.

Demographic Questionnaire Findings: While not considered as a formal research question, the final component of this study focused on whether demographics have an influence on patients' overall perceptions of their healthcare providers' communication skills as measured by the CAT composite score; none of the five demographics examined – age, gender, ethnicity, education, and employment status – had any significant influence.

Conclusion: Although past research shows that midlevel providers perform better than their physician counterparts, this study indicates differently. This is explained by the uniqueness of the hospital setting, where this study was conducted. In addition, further evidence-based research and longitudinal studies are recommended to compare with the results of this study. Future research may include hospitals in different geographic areas, further variation in practitioner groups, and a comparison of teaching versus non-teaching hospitals.

Keywords: physician communication, midlevel communication, physician-patient communication, midlevel-patient communication, prompt care communication, ED communication.

Chapter I

INTRODUCTION

Area of Interest and Significance

The Joint Commission on Accreditation of Healthcare Organizations describes communication error as the cause of 60% to 70% of avoidable hospital deaths (Murphy, 2010). Clear and effective communication is necessary for quality patient outcomes. Physician-patient communication is considered an important marker of health-care quality, and the social-psychological aspects of the patient-physician interaction are increasingly recognized as complementary to the more technical aspects of medical care (Schenker, 2009).

Communication is defined as the act of imparting or transmitting information, both verbally and nonverbally (Charlton, 2008.) In addition, physician-patient communication is the interaction between the physician and a patient. This interaction involves an exchange of words, gestures, feelings, thoughts, and attitudes (Charlton, 2008). When enhanced communication takes place, there is higher satisfaction and better outcomes. For example, when provided with patient-centered communication, patients report higher satisfaction and improved outcomes without significant increases in time and money for the provider (Anderson, 2002). In addition, Hilton (2006) reports that physician-patient communication impacts compliance, treatment outcomes, medical errors, frequency of malpractice litigation and much more. According to a statement on

physician-patient communication, “effective communication between doctor and patient is a central clinical function that cannot be delegated (Stewart, 1995).”

For years it was commonly thought that physician-patient communication was generally adequate and was not a cause for concern (Stewart, 1995). More recently, however, evidence has mounted to the contrary. According to Stewart, numerous complaints stemming from breakdowns in physician-patient communication have been made to licensing bodies, and headlines declaring an “urgent need for MDs to relate better to patients” and criticizing the “cold, hard” manner of physicians have appeared in the medical and popular press. Stewart found that these problems begin as early as history taking and continue during discussion of how the patient’s problem should be managed. He points out that the problem may be related to a lack of communication skills on the part of either the physician or the patient.

In general terms, communication difficulties can be described with reference to problems of diagnosis, a lack of patient’s involvement in the discussion or the inadequate provision of information to the patient. Furthermore, “studies have shown that 50% of psychosocial and psychiatric problems are missed and that physicians interrupt patients on an average of 18 seconds into the patient’s description of the presenting problem. Additionally, 54% of patient problems and 45% of patient concerns are neither elicited by the physician nor disclosed by the patient and that patients and physicians do not agree on the main presenting problem in 50% of visits and that patients are dissatisfied with the information provided to them by physicians” (Stewart, 1995, p.1424).

High quality physician-patient communication involves multiple domains, including building an effective relationship, gathering information, understanding the patient's perspective, giving information, and decision making (Schenker, 2009). Patients rate communication with their physicians as a valuable part of the medical encounter, and improved doctor-patient communication has been associated with higher patient satisfaction, self-management of chronic diseases, more appropriate prescribing of medications and improved health outcomes (Schenker, 2009). Further, doctor-patient communication is particularly important in the management of chronic diseases, which may require frequent encounters with the medical system and complex treatment decisions.

The communication that takes place between the physician and patient also impacts the patient once they leave the hospital setting and impacts post-operative care. According to Bell (2008), patients admitted to general medical wards are increasingly cared for by hospital-based physicians. These clinicians specialize in general medical care of hospitalized patients and seldom see outpatients as primary care providers (PCPs) (Bell, 2008). Upon discharge of their patients, hospital-based physicians usually transfer care to the patient's usual PCP. This separation of hospital care may result in important care discontinuities after discharge, so the communication that occurs within the hospital may impact post-discharge or post-operative care as well (Bell, 2008.) In addition to these aforementioned matters, it is important to note that communication patterns are highly variable and are influenced by multiple

factors. Factors include individual style differences, gender, perspectives, culture, stress, established hierarchies, and social structures (Manning, 2006). Therefore it is important to understand physician-patient communication, how to better its quality, and eventually improve patient outcomes.

Purpose of the Study

The purpose of the study was threefold:

1. To understand the patient's perception of the medical doctor-patient communication encounter
2. To understand the patient's perception of the mid-level provider-patient communication encounter
3. To identify the patient's perceptions of differences between communications that occur by medical doctors and mid-levels when encountering patients

Research Questions and Hypotheses

RQ1: Using the Communication Assessment Tool (CAT), what are the patients' perceptions of physician-patient communication, both on an overall basis and by specific areas (as defined by the CAT)?

RQ2: Using the Communication Assessment Tool (CAT), what are the patients' perceptions of mid-level provider-patient communication, both on an overall basis and by specific areas (as defined by the CAT)?

RQ3: Is there a difference in patients' overall perceptions of the provider-patient communication encounter (as measured by the composite score on the

Communication Assessment Tool (CAT)) between physicians and mid-level providers?

HQ3: There will be a positive difference in patients' overall perceptions of the mid-level provider-patient communication encounter as measured by the composite CAT score as compared to patients' overall perceptions of the MD provider-patient communication encounter.

RQ4: In each of the specific areas, is there a difference in patients' perceptions of the provider-patient communication encounter (as measured by the ratings for the particular item on the Communication Assessment Tool (CAT)) between physicians and mid-level providers?

HQ4. Overall, there will be a positive difference between patients' perceptions of the provider-patient communication encounter for each individual rating assessment made, such that the midlevel providers will rate higher consistently in the communication encounter with patients than will their MD counterpart.

Theoretical Consideration

Social Cognitive Theory. The social cognitive theory explains how people acquire and maintain certain behavioral patterns, while also providing the basis for intervention strategies (Bandura, 1997). Evaluating behavioral change depends on three factors: environment, people and behavior. It can be speculated that a physician can pick up or learn behaviors from other physician's, according to this theory. A recent study was published in 2012, which exemplified how observing role models and having mastery experiences foster medical

student's self-efficacy with family-centered care (FCC) during rounds (Young et al, 2012). "Researchers surveyed 184 students during pediatric clerkship rotations during the 2008-2011 academic years. Surveys assessed supportive experiences and students' self-efficacy with FCC during rounds and with key FCC tasks. Measurement models were constructed via exploratory and confirmatory factor analyses" (Young et al, 2012, p.767).

The purpose of Young et al's study was to understand factors that support self-efficacy and FCC. Based on social cognitive theory, it examined how three supportive experiences (observing role models, having mastery experiences, and receiving feedback) influence self-efficacy with FCC during rounds. It also looked at whether the influence of these supportive experiences was mediated by self-efficacy with 3 key FCC tasks (relationship building, exchanging information, and decision making) (Young et al, 2012).

After surveying 184 students, from 2008-2011, the researchers found that observing role models and having mastery experiences foster students' self-efficacy with FCC during rounds. These results suggest the importance of helping students gain these skills before the rounds experience and helping educators implement supportive experiences during rounds. Furthermore, this suggests that according to social cognitive theory, effective physician-patient communication can be learned before or during a medical encounter.

Transtheoretical Model. Another theoretical model that is relevant for this study is the Transtheoretical Model (Prochaska et al, 2008). In order for a physician to change his or her behavior, a level of willingness to change must

exist. Plus, the transtheoretical model (TTM) explains the different levels of change one incurs. TTM uses stages of change as an organizing framework: Precomtemplation, contemplation, preparation, action, and maintenance (Prochaska et al, 2008). According to Armitage (2009), the first stage, precontemplation, designates individuals who are not thinking about performing the behavior in question and are not sufficiently aware of the health implications of their actions. The second stage is labeled contemplation, the stage at which persons begin to think seriously about changing their behavior, but have not acted on it. The third stage is called preparation and is characterized by people preparing themselves for a change in their behavior. When individuals effectively and steadily perform the behavior in question, they are regarded as being in the action stage. Advancement from the action stage to the maintenance stage occurs when the behavior in question has been performed for more than six months. (Armitage, 2009).

Prochaska et al (2008) explains that TTM has high generalizability, which is defined as the number of problems and populations to which a model can be validly applied. For instance, patterns of relationships that were first established for smoking cessation were quickly generalized to a broad range of behaviors including, diet, exercise, weight management, sun exposure, delinquency, alcohol abuse, cocaine abuse, and even mammography screening (Prochaska et al, 2008). Other target areas include stress, depression, organ donation, organizational change, partner abuse, medication adherence, blood glucose self-monitoring, pregnancy prevention, and prevention of drug use. “The replicability

of the patterns of relationships like those between the stages of change and the pros and cons of changing has allowed TTM to have growing influence across many areas of health promotion and disease management" (Prochaska et al, 2008, p. 576). It would be reasonable to state that understanding the "readiness" of physicians and patients to change their behaviors regarding physician-patient communication could be better understood through TTM.

The Four-Habits Model. After realizing that patients are less concerned with how much their physicians know and more about how much they care, Richard M. Frankel, PhD and Terry Stein, MD, developed "The Four Habits Model." Physicians conduct a mean of 120,000 to 160,000 interviews in a practice lifetime (Frankel, 1999). Even a small amount of improvement in the ways they conduct themselves can greatly affect patient outcomes. Therefore, having a standard set of approaches to implement during the physician-patient communication may prove elementary to improving this interaction and eventually outcomes. This model is reassuring because growing evidence indicates that clinical communication skills can be taught, learned, and practiced (Frankel, 1999). The Four Habits are: Invest in the Beginning, Elicit the Patient's Perspective, Demonstrate Empathy, and Invest in the End. All of these habits are interrelated at some level.

The first habit, invest in the beginning, has three components. They are the following: creating rapport quickly, eliciting the patient's concerns, and planning the visit. Creating a rapport concerns making the patient feel comfortable. Shaking the patient's hand, finding out the names of each person in the room

and their relationship to the patient, can do this. Eliciting the patient's concerns simply refers to accurately determining the reason for the patients visit. Asking open-ended questions, like "I understand you've been having pain in your leg (Frankel, 1999, p.82). Can you tell me about that," can help with this (Frankel, 1999, p.82). The physician should encourage the patient to elaborate more, so staying engaged and interested in what the patient is saying is imperative. Finally, planning the visit, involves prioritizing and time framing. In other words, the physician must state the amount of time allocated for the visit and ask the patient to state the issues of highest concern. This aids in making the office visit more efficient and effective.

The second habit, elicit the patient's perspective, is used to assess the patient's point of view concerning the meaning of symptoms and the request for care. This consists of three skills: assessing patient attribution, identifying patient requests for care, and exploring the impact of symptoms on the patient's physical, psychological, and social well-being. Assessing patient attribution involves determining the patient's perspective about what caused the difficulty. Knowing specifically what meaning the patient is giving to the symptoms allows the physician to frame the rest of the conversation accordingly and thus reducing the potential for miscommunication. The next skill is identifying patient requests, which means treating patients like "customers." If a physician has an understanding of the patient's expectations and desires then the clinician can try to meet them. This skill also increases patient satisfaction, which is linked to increased adherence to medical recommendations. The third and final skill is

exploring the impact of symptoms on the patient's physical, psychological, and social well-being. This skill is used to determine the impact of the patient's symptoms or illness on daily activities, work, and family. Many physicians disregard this portion of the interaction because it may take additional time, but it often provides important information about the patient's functionality and mental health.

The third habit, demonstrate empathy, in the clinician-patient relationship requires identifying a patient's emotional state accurately, naming it, and responding to it. The model identified five types of empathetic responses and suggests a generic format for each. They are:

- Reflect- "I can see that you are…"
- Legitimation- "I can understand why you feel…"
- Support- "I want to help."
- Partnership- "Let's work together…"
- Respect-"You're doing great."

Taking all of these responses into consideration when communicating with the patient shows empathy and builds a better relationship between the physician and patient. Furthermore, empathy is something that can be learned, taught, and practiced.

The fourth and final habit is, invest in the end. The first three habits focused on information gathering, however the fourth habit requires information sharing. This may include giving the patient news regarding his or her health and also encompasses encouraging patients to participate in decision making; negotiating

treatment plans and probing for adherence. According to the model, “a number of research studies have confirmed that increasing patient participation in decision-making leads to positive functional and biomedical outcomes. Patient participation is particularly important at the conclusion of the visit when clear understanding and agreement on courses of action to be pursued become operative (Frankel, 1999, p.87).” The physician should also provide a clear rationale for the patient’s treatment plan and discuss what barriers to implementation exist. Lastly, providing the patient support during and after the medical makes the patients feel more comfortable, almost to the extent in which the patient views the physician as a “coach.”

The Four Habit Model is a response to the challenges that physicians and patients face during medical communication. “Investing in the Four Habits provides a stepwise approach to enhancing patient relationships, optimizing the amount and quality of information available for making clinical decisions, and making the practice of medicine more mutually satisfying for doctor and patient” (Frankel, 1999, p.79). Levels of inter-rater reliability were acceptable for this model, since multiple raters gave similar scores. Correlations between ratings, back channel responses, and non-verbal measures provided evidence of the instrument's construct validity. There is evidence to support that this approach helps better equip physicians with the skills they need in order to effectively communicate with their patients.

Measurement Tools and Instruments. Over the past 3-4 decades, hundreds of studies have been published that are designed to identify tactics that

may be utilized to improve patient health outcomes (Auerbach, 2009). Physician-patient communication, a key aspect of healthcare delivery, has been assessed through multiple methods for purposes of research, education, and quality control. For example, Chou (2011) utilized both qualitative and quantitative approaches to analyze ten videotaped simulated encounters between medical students and patients. The study utilized coding to understand associations among different behaviors as well as with participant characteristics. Analysts from linguistics and anthropology have scrutinized clinical encounters through ethnography and summative assessments of video/audiotapes to describe the process of communication. This type of analysis has helped identify key linguistic features of the physician-patient encounters and their functions in the clinical context (Chou, 2011). Additionally, Chou states, “grounded in theories of social interactions, such analysis offers an in-depth understanding of the form and function of language, interpersonal dynamics, the healthcare context, and institutional discourse in general.” This particular study used cross-method comparisons, which included patient/ standardized patients (SP) satisfaction ratings, coding studies, and qualitative discourse analysis.

In a different study, the importance of patients’ trust in physicians is addressed, since it heavily impacts service delivery and patient outcomes. One of the most frequently described dimensions of physician behavior in which patients are believed to base their trust are competence, compassion, privacy, reliability, and communication (Pearson, 2009). There are multiple instruments that measure trust. Pearson mentions that the first trust measurement instrument

specific to the physician-patient relationship was developed in 1990. This instrument was eventually called the Trust in Physician Scale, an 11-item, interviewer administered measure that assesses patient trust in physician in the domains of dependability, confidence, and confidentiality of information. All items are fashioned in a 5-point Likert format, with a combination of positively and negatively worded questions.

The physician-patient relationship has also been measured by studying multiple components of the patient-physician relationship simultaneously (Pearson, 2009). These components include, accessibility, continuity, comprehensiveness, integration, clinical interaction, interpersonal treatment, and trust. Pearson explains that the most used instrument is the Primary Care Assessment Survey (PCAS), a self-administered written questionnaire that was developed for a study of primary care performance across different types of delivery systems. The 11 summary scales of the PCAS were evaluated in pilot studies for data completeness, score distribution characteristics, and interscale correlations. Detailed psychometric evaluations showed outstanding performance of all subscales, including trust. Cronbach's alpha coefficient for each subscale exceeded statistical criterion for internal consistency and ranged from .81 to .95 (Pearson, 2009).

The PCAS consists of 11 unique summary scales, 51 questions, and 7 distinct elements of primary care. According to Pearson, "some of the best data on correlates of patient trust that relate to physician behavior are found in the published evaluation of the PCAS instrument. The patient trust subscale

correlated most highly with patient assessment of the physician's communication" (Pearson, 2009, p.511). As a result, he argues that the importance of trust in the physician-patient relationship is not questioned since it deeply affects other areas like communication, reliability, and competence.

Summary

Chapter 1 provides the area of interest and its significance, definition of communication, the purpose of the study, the research questions and hypotheses, the theoretical consideration, and the measurement tools considered,. Chapter 2 contains the literature review that explains the elements that impact provider-patient communication, and the gaps in the literature. Chapter 3 presents the methodology, which includes the design, instrumentation, sample size determination, sampling procedure, inclusion-exclusion criteria, setting, and data analysis. Chapter 4 presents the outcomes of the research questions; Chapter 5 includes the interpretations of the outcomes and their implications and recommendations based on the outcomes as well as limitations and future research areas.

CHAPTER II

REVIEW OF THE LITERATURE

Physician-Patient Communication – What factors impact it?

Patient-Centered Communication (PCC). Physician-patient communication has drastically changed over the years. In past years, patients lacked medical knowledge and did not participate in much verbal communication during an office visit (Johnson, 2000). For the most part, a patient would explain his or her ailment, wait for a diagnosis, and finally a prescription. Johnson (2000) describes the increased level of health care knowledge in the United States and its impact on the patient-physician relationship. He explains that in the past physicians had an authoritarian attitude dominating the relationship, almost placing the patient in a vulnerable position. Physicians were looked at as divine figures because patients lacked familiarity with the health care system and medicine. The interaction used to be one-way because the doctor did the checking, most of the talking, and eventually prescribing. The patient's deficiency in information was taken for granted.

Today, "large portions of patients have expressed the desire for a different relationship than the one described in previous years" (Johnson, 2000, p.21). Patients want a higher degree of involvement and the information age has influenced this immensely. The information age has helped some patients make better decisions because they know more about different prescriptions, medical procedures, and are more knowledgeable about their physicians. Patients have

access to the Internet, multiple publications, and are readily discussing their medical problems with physicians. In the present day, patient-centered communication (PCC) is the trend in primary care. This means that in today's healthcare model, the communication is focused on the information that the patient provides to the physician (Bertakis, 2009). This is a turnaround from the past where the physician was in charge of the complete visit and determined everything. This bilateral method of communication is beneficial in many ways; such as providing a two-way line of communication. Today, there is more dialogue because both the provider and the patient are contributing to the conversation. Also, it is important to note that patient-centered communication is a component of physician-patient communication and that these two terms cannot be used interchangeably.

"Although more research is needed on patient participation, the literature to date suggests that active patients are more satisfied, feel more in control of their health care, and have better health outcomes" (Cegala, 2009, p. 203). Patients are able to better explain the problems that they are having and doctors have the ability to respond to them in a better way because PCC increases understanding. Also, there is higher physician satisfaction, greater patient trust in their physician, and ultimately there will be fewer medical malpractice lawsuits (Bertakis, 2009). Bertakis found that this is because the level of information exchange between the doctor and patient will be greater and therefore both parties will have a better grasp of the situation. The doctor will be able to evaluate the symptoms better

and the patient will be able to take care of his or her ailment in a more adequate manner.

While PCC has received considerable attention as the best approach for patient care, there is conflicting evidence regarding its results. Michie, Miles, and Weinman (2003) stated that there is inconsistent evidence that patient-centered communication is associated with beneficial physical and psychological outcomes. Also, Mead, Bower, and Hann (2002) concluded that there is a lack of supportive evidence regarding patient-centered communication, identifying that there is no clarity over the definition of PCC, the optimal methods of measurement, and the relationship between PCC and patient outcomes.

Communication and Gender. The importance of PCC remains a fast growing topic in healthcare, however it is not the single contributing factor in patient-provider communication. PCC is the umbrella under which many sub-categories exist. These parts are essential to consider, when discussing provider-patient communication. Bertakis (2009) maintains that there are many dimensions of PCC such as understanding the patient's illness within a broader context, appreciating the patient's experience of illness, advocating an open doctor-patient relationship, and creating a therapeutic alliance. In a study he found that physician and patient gender affect PCC as well. In his study, Bertakis observed 100 family physicians and internists in the Rochester, New York area. He found that females were more engaging and were better at partnership building with their patients. They shared more information, discussed psychosocial topics, and encouraged patients to participate in the conversation.

On the other hand, male physicians tended to devote more time to technical practice behavior, such as writing down the history of the patients. Overall, patients were more comfortable with female physicians because they were more nurturing, less mechanical in their interactions, and instilled a higher degree of comfort within their patients, resulting in less inhibited conversation. All patients had a higher degree of comfort with female physicians and therefore communicated more freely.

Bertakis' findings indicated that the physician's gender could affect the interactions between physician and patient. The results of her study also provided evidence that PCC is on the rise. However, a limitation to the study was that it focused more on the survey measurement and too little on the meaning of the findings. Also, another limitation of the study was that the sample examined was only in a specific geographic area and therefore not generalizable beyond the student perspective.

High and Low Patient Participation. To explore provider-patient communication further, Cegala (2009) primarily focused on high and low patient participation and its impact on PCC, unlike Bertakis (2009) who concentrated on the impact of physician gender. The idea that asking questions and providing information on the patient's behalf empowers both the patient and the physician are considered in Cegala's study. Cegala (2009) observed 25 physicians interacting with high and low participation patients. High participation was defined as "the frequency of information seeking/verifying, information provision, assertive utterances, and expressing concerns." A low participation patient was

someone who was more passive and less interactive during the visit. He found that that when interacting with high participation patients, physicians experienced more communication versus those who spoke less to the physician. In other words, patients that spoke more and those who gave in-depth details to the physician had increased communication with them, versus those who conversed less.

Overall, patients who frequently communicate during office visits influence physicians to adopt a PCC style of communication because these doctors have a tendency to exchange comments back and forth with the patient. Hence, the communication pattern changes as a result of the patient's initiative and as a result there is more physician-patient interaction with the patient as the center of attention. Cegala points out that asking questions and providing information on the patient's behalf empowers both the patient and the physician. Cegala (2009) focused on PCC because he found that it helped improve care quality, patient engagement, and may help avoid medical errors. However, Cegala did not provide a detailed definition of PCC and this represents a limitation to the article, compared to Bertakis (2009), who introduced PCC with a thorough explanation.

Trust Between the Physician and Patient. Communication between the doctor and patients also involves a certain degree of trust. According to Ommen (2010), who looked at the relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients in Germany, found that a trusting physician-patient interaction promotes adherence to treatment, improved health outcomes, and patient satisfaction.

Therefore it is important for physicians to know how to establish trust with their patients. Trust in the physician-patient relationship is defined as “the expression of individuals that certain other individuals or institutions will meet their responsibility to them” (Ommen, 2012, p. 319).

Ommen found that social support and shared decision-making are essential factors for a trustful physician-patient relationship. Specifically, the provision of information and adequate time for discussion as well as the involvement of the patient in treatment decisions form the basis for a trusting relationship between the physician and the patient. Ommen’s findings concerning the importance of trust and good communication skills should be proficiencies that physicians acquire in medical school; they go hand-in-hand.

Cultural Competence. An additional consideration in physician-patient communication is the concept of cultural competence. Shannon (2010) examined cultural competency in health care and its effects on patient-provider communication. He found that not understanding the varying cultural distinctions of the patient could hinder physician-patient communication by heightening resistance to open conversation and eventually leading to adverse consequences. Shannon proposes that physicians need to understand the relevance of cultural competence and its impact on PCC. This is especially important due to the influx of immigrant’s entering the United States, resulting in varying socio-economic and cultural backgrounds. Shannon (2010) proposes that recognizing differences and similarities in varying cultures will also reduce medical malpractice errors because there will be an open flow of communication.

Cultural competence is an increasingly important concept in healthcare as it is predicted, by the US Census Bureau, that by 2050 more than half of our population would consist of racial or ethnic groups other than white, non-Hispanic. This notion supports Bertakis' (2009) argument that getting a better understanding of who a person really is matters in PCC.

In a study by Paez et al (2009), physicians completed a survey assessing their cultural competence (CC) in three domains: motivation to learn about other cultures (motivation attitudes), awareness of white privilege and acceptance of racial group's choice to retain distinct customs and values (power assimilation attitudes), and clinical behaviors reflective CC. Their African-American and white patients completed interviews assessing satisfaction with the medical visit, trust in their physician, perceptions of their physician's respect for them and their participation in care. The results suggest that attitudinal and behavioral components of CC are important to developing higher quality, participative relationships between patients and their physicians. In this case, patients of physicians with more culturally competent attitudes and greater incidence of self-reported culturally competent behaviors were more satisfied, perceived their physicians were more facilitative, and sought and shared more information with their physicians (Paez et al., 2009). Paez et al. findings suggest that a strong physician-patient relationship and CC is integral to the delivery of high-quality health care.

Another recent study looked at whether cultural competence training of health professionals improved patient outcomes. The objective of the study was to

conduct a systematic review addressing the effects of cultural competency training on patient centered outcomes; assess the quality of the studies and strength of effect; and propose a framework for future research (Lie, 2010.) "Studies that reported cultural competence educational interventions for health professionals and measured impact on patients and/or health care utilization as primary or secondary outcomes were included." (Lie, 2010, p.317). The study reported positive (beneficial) effects; none demonstrated negative (harmful) effects of cultural competency. However, the results did mention that there is limited research showing a positive relationship between cultural competency training and improved patient outcomes.

Psychosocial Communication. The literature concerning physician-patient communication also identifies that psychosocial communication is underestimated. "Psychosocial communication elicits information about the social and psychological issues that patients face and provides the physician with an opportunity to offer information and counsel about these issues" (Golin, 2007, p. 192). According to Golin (2007) several studies have demonstrated that a balance between psychosocial and biomedical communication in office visits impacts patients' satisfaction with medical care. Patients do not feel as comfortable when discussing biomedical issues alone because they do not feel any empathy from the physician (Smith, 2006). Medical visits are more productive if physicians use an interviewing technique that employs open-ended questions to encourage patients to explain why they came to the office, which makes them feel more comfortable (Smith, 2006). Furthermore, Golin explains

that psychosocial communication enhances physician understanding of barriers and facilitators to illness management, helps in shared decision making, and improves perceptions of physician support, trust, and rapport.

Nonverbal Communication. Communication goes beyond the verbal exchange between the physician and patient to nonverbal communication. According to Roter (2006), nonverbal behavior involves a range of communication activities that do not have linguistic content, including eye contact, facial expressions, head movement (such as nodding), hand gestures, and postural positions. He found that “greater patient satisfaction is associated with nonverbal indicators of physician interest including less time reading the patient’s chart (probably associated with more eye contact), more physician immediacy (e.g., forward lean), more head nods and gestures, and closer interpersonal distance” (Roter, 2006, p. 30).

Physicians with greater nonverbal skill (i.e., those who were better able to decode body movements and more skilled at emotional encoding) received higher patient satisfaction rating than those without these abilities (DiMatteo, 1986). In one study, nonverbal behaviors explained more variance in patient satisfaction than did verbal content, regardless of the type or severity of medical condition being discussed (Griffith, 2003). In summary, these findings emphasize the potentially significant impact that nonverbal communication can have on outcomes, like patient satisfaction.

Gaps in the Literature

The literature review supports that effective communication positively influences the physician—patient relationship and the patient experience. Although many areas have been covered in this area the research remains incomplete. However, there are a number of gaps in the literature. First, many of the studies in this review were cross-sectional and most physician-patient communication encounters are long-term, involving more than one visit. Therefore the generalizability of studies that focus on one specific point and time are limited. Next, many of the studies are limited to one type of doctor, a small population that underrepresents the masses, or a single practice. Again, this makes the generalizability of the study limited. Third, most patients' perceptions are measured via surveys, which are subjective views and these views may be influenced by other factors, like state of mind, type of illness, and mood that particular day. Therefore, the answers to a survey may not be a true reflection of what the patient is actually experiencing. Furthermore, there are many different tools (surveys) that are used to measure patient satisfaction and experience, so it is difficult to compare the finding of studies. There is a need for a "gold standard" in measuring physician-patient communication so that broader comparisons can be made. Finally, there may be a Hawthorne effect, which means that patients may answer surveys in a particular way because they know they are being evaluated.

Given all of these gaps in the literature or shortcomings of other studies, the study focused on a tightly defined homogenous population, which was surveyed

in the most neutral environment as possible, in which the primary focus was to answer whether effective physician-patient communication, during a medical encounter, improved the patients' experience with care. After learning about the areas that need further consideration, it is imperative to understand what types of research methods were applied to conduct the study. The next portion of the writing will explain this in great detail.

Summary

A reoccurring theme, exemplifying the power of effective physician-patient communication emerged while reviewing the literature regarding this relationship. According to Shipman (2010), communication is often the most important feature of a successful relationship between and physician and patient. The literature has shown that high-quality communication, with keeping the aforementioned elements in mind, between physicians and their patients is essential to the delivery of effective medical care and patient satisfaction. Physician-patient communication requires that physicians communicate clearly and effectively with their patients and strive to understand how to enhance this relationship with getting a better understanding of what makes a patient more comfortable in a clinical setting, since most patients are dealing with undesirable emotional and physical symptoms.

Understanding elements like, patient-centered communication, physician gender, patient participation level, building trust, cultural competence, psychosocial communication, and finally nonverbal communication contribute to improved medical delivery and medical outcomes. Bandura's (1997) social

cognitive theory explains how these skills can be learned through observations and practice.

Patients are typically in a vulnerable position when they are in a clinical setting and therefore it is the physician's duty to make them feel at ease and hopefully satisfied. "Communication is a two-way street, but physicians and health care providers are responsible for opening the lines of communication and encouraging patients to ask questions" (Shipman, 2010, p.434). Therefore, it can be stated, based on the literature, that effective physician-patient communication, during a medical encounter, improves the patients' experience with care.

CHAPTER III

METHODOLOGY

Research Design

The research design for this study was descriptive, correlational and cross-sectional. According to Polit and Hungler (1995) and Portney and Watkins (2000) descriptive studies are used to describe phenomena occurring within individuals or among groups of individuals, while correlational designs examine relationships between variables without controlling or manipulating them. Both the Communication Assessment Tool (CAT) responses and the demographic characteristics of the study participants were captured, organized, and summarized using a descriptive design. In fact, the first two research questions of this study dealt exclusively with the descriptive characteristics of the provider-patient communication encounter using information from the completed CAT surveys. Since the third and fourth research questions focused on whether differences exist in patients' perceptions of the communication skills between physicians and midlevel providers, these two questions dealt with the relationships between the type of provider and his or her ability to communicate with patients which is one aspect of a correlational study.

The study also did not involve any control or manipulation of variables – which is the other requirement of a correlational study – since the researcher did not explicitly assign participants to a one of the two provider type groups, but rather utilized the reported survey results for any eligible patient who chose to

participate. Cross-sectional studies capture data at one point in time to avoid history or testing effects. In this study, data were collected over a relatively short period of time, roughly seven weeks, and each participant reported information about his or her patient-provider encounter at only one point in time -- i.e., immediately following treatment.

Instrumentation

The survey utilized in this study consisted of two parts: the Communication Assessment Tool (CAT) (Makoul, 2007, Appendix A) and the Demographic Questionnaire. Dr. Gregory Makoul, provided written consent to use the CAT (Appendix A-1). The CAT consisted of fourteen items where each item addressed a different aspect of the patient-provider communication encounter. Each item employed the following five-point Likert type scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent. For each survey, the CAT Composite score was calculated by summing of the scores on the fourteen component items. (Please note that none of the CAT survey questions are reversed scored.) Hence, the CAT Composite score could range from a low of 14 to a high of 70. The CAT Composite score gave a general sense of how a patient viewed his or her healthcare provider's interpersonal and communication skills with a higher score indicating a greater degree of satisfaction.

The Demographic Questionnaire (Appendix B) was developed by the researcher and asked the patient to self-identify in the following five areas: age, gender, ethnicity, educational level, and employment status. For each of these demographic characteristics, the questionnaire provided a list of categories from

which the participant selected the category which best described him or herself in that particular area. Even for age, the subject selected the appropriate age range band as opposed to reporting his or her specific age in years. The only exception to this was the ethnicity demographic. For ethnicity, in addition to providing six specific ethnic categories from which to choose the survey also listed an “Other” category in which the patient could write in his or her ethnicity classification.

The five-point Likert scale utilized on each CAT survey item was by definition an ordinal scale. Since the CAT Composite score was a sum of these ordinal variables on the fourteen questions comprising the survey, one can conclude that the CAT Composite score was also an ordinal variable. In practice, however, many researchers who obtain composite scores by adding together scores on Likert type items treat these composite scores as interval or ratio variables for the purposes of performing statistical tests. Based on this latter interpretation, the CAT Composite score could be considered to be an interval or ratio level variable. With respect to the Demographic Questionnaire, each of the five demographic characteristics appearing on this survey were by definition nominal level variables.

Determination of Target Sample Size

Prior to embarking on the data collection phase of the study, the researcher attempted to determine a target sample size, which would produce a sufficient degree of statistical power for the analysis of the Research Question #3 of the dissertation. This research question asked whether there is a significant

difference in patients' overall assessments of communication abilities (as measured by the CAT Composite score) for physicians versus midlevel providers. The one-tailed alternative hypothesis of this research question was that midlevel providers had better communication skills than their physician counterparts.

To determine a target sample size, the researcher ran an analysis using G*Power software on an a priori basis. For purposes of this exercise, the researcher treated the dependent variable – the CAT Composite score – as an interval/ ratio variable; hence the researcher selected the parametric independent samples t-test from the menu of statistical tests available in G*Power due to the fact that the research question dealt with two provider groups (physicians versus midlevels). Further, the researcher utilized the following in the G*Power analysis: a significance level of $\alpha = .05$, a target power of $1 - \beta = .80$, an effect size of Cohen's d = .50, and equal sized samples in each of the two provider groups. The $\alpha = .05$ significance level (which measures the probability of a Type I error) is the standard for statistical studies in the healthcare sciences as is the target power level of $1 - \beta = .80$. (The power level is the complement of the probability of a Type II error.) The Cohen's d of .50 was selected, since it is considered a medium effect size for purposes of the independent samples t-test. Despite the directional nature of the main research question's alternative hypothesis, the researcher also opted to run the G*Power analysis on a two-tailed basis, since an a priori G*Power analysis performed on a two-tailed basis produces more

conservative results (i.e., a higher recommended sample size) than an analysis run on a one-tailed basis.

The G*Power analysis performed in the fashion described above produced a target sample size of n = 128 participants. Since one can also view the CAT Composite score as an ordinal variable, the researcher also ran an a priori G*Power analysis for the Mann-Whitney U test (which is the non-parametric counterpart to the independent samples t-test). This second G*Power analysis utilized the same assumptions as the initial analysis and produced a slightly higher recommended sample size of n = 134. In light of these results, the researcher attempted to collect at least 134 completed surveys for use in the study.

Sampling Procedure

The study engaged a convenience sample of 137 treat and release patients at the emergency department (ED) of Hackensack University Medical Center (HUMC). What follows is an account of the steps and procedures utilized by the researcher to obtain this sample.

Prior to embarking on this study, the researcher obtained permission from Hackensack University Medical Center (Appendix C) and also received approval of her study research proposal from the Institutional Review Board of Seton Hall University, (Appendix D-1, D-2, D-3, D-4). As a part of the pending research, the researcher completed the National Institutes of Health Protection of Human Subjects Training Module for both Seton Hall University (Appendix G1d) and Hackensack University Medical Center (Appendix G2a). The researcher had a

script (Appendix D-4), a checklist of actions/steps to prepare the envelopes and materials necessary for the data collection process (Appendix D-1) and the steps to complete (Appendix D-3) the entire recruitment and data collection processes, in order to ensure consistency and completeness in performing the process and procedure from participant to participant. Once all of these items were in place, participant recruitment began.

Prior to the first day of the study, the researcher prepared each survey package and envelope. Each package had a matching numerical code written on the outside of the envelope and on each document within the envelope to ensure consistency. Each survey envelope contained one (1) each of the following documents: a letter of solicitation/implied informed consent (Appendix F), a demographic survey (Appendix B-2), and the Communication Assessment Tool (CAT) (Appendix B). The envelopes were assembled in ascending numerical order in a box, which were taken to the ED of HUMC daily. The researcher also carried additional stationary items: pencils, pencil sharpeners, checklists, scripts, withdraw/incomplete stickers, tape and other materials as needed.

Prior to arriving at the hospital, the researcher ensured that the survey envelopes were coded and that each envelope contained a letter of solicitation/implied informed consent, a demographic survey, and a CAT, and that all items were coded with the same identifying code. This was done for quality control and to ensure that the participants will experience no unnecessary delays once they are seated, qualified and ready to complete the survey. Additionally, the researcher checked that a sufficient supply of pencils, pencil sharpeners,

checklists, scripts, withdraw/incomplete stickers, tape and other stationary items were included with the materials for convenience. This was verified on the checklist the researcher kept on hand. (Appendix D-1)

Next, the researcher gave each eligible participant one of the pre-coded envelopes labeled with an ID number. All materials included in the packet had the same ID number as the coded envelope. The researcher reviewed the materials with the participant prior to the participant actually completing the survey. This served the dual purpose of not only familiarizing the participant with the materials and what needed to be completed, but also as a secondary check for completeness of each package of information.

If during the check of materials with the participant a packet was found to be incomplete, an incomplete label was placed on the envelope and the participant was given another packet. The researcher began the review process for a second time, with the participant. When the package had been reviewed satisfactorily, the participant was told that he/she may begin completing the survey documents, and may take as much time as needed. Participants were also told that they were free to withdraw from the study at any point in time during the process without penalty. If a participant informed the researcher that he/she would like to withdraw from the study, all materials were collected and returned to the original coded envelope. A withdraw label was attached to that envelope and the envelope was sealed. The sealed envelope was returned to the box so that all materials were kept together safely under the control of the researcher. The participant was thanked for his or her time.

Separate from the actual package that the participant was given to complete was a picture card of six providers of care that worked regularly in the ED area of care. (Appendix E) This card was used when the participant began the questions about the actual ED encounter that he/she had that day. It was used to facilitate the participant's recall of what provider(s) he or she may have encountered that day in the ED during the time of their visit. This same card was used for all participants and it was available for them to use to try to recall who they may have seen or spoken to that day. There was a number from 1 to 6 next to the face of each provider, on the card. The participant was asked to tell the researcher the number corresponding to the provider he or she may have spoken with during their ED encounter that day. The researcher recorded this number on the participant's survey sheet in front of the participant.

If at any time the patient was called back by the physician or mid-level while completing the survey, the participant was instructed to attend to that medical provider. The participant was told that if he or she wished to finish the survey afterwards, he or she was welcome to return and that the survey materials would be kept. The materials were gathered into the corresponding coded envelope by the researcher and set aside in a secured location until the participant returned. The researcher notified the medical provider that the participant needed to complete the survey upon the end of his or her visit, so that the participant may be gently reminded to return to complete the survey. Of course, this was contingent upon the participant's willingness to finish the survey. If the participant

did not return by the end of that business day, the researcher sealed the envelope and marked it with a withdrawn sticker.

Materials completed by a participant were returned to its corresponding coded envelope. The researcher verified each package for completeness and utilized the checklist to ensure that all documentation was completed and returned. (Appendix D-1) Additionally, the researcher perused each document to ensure that the CAT survey and demographic questionnaire were completely filled in. None of the 137 completed surveys had any incomplete or incorrectly completed CAT's or demographic questionnaires. At the end of each survey collection day, the researcher ensured that all envelopes and materials brought to the data collection site were returned to the box, and that the location used was left neat and clean.

The actual data collection took place during a seven-week period, which began on February 4th, 2015. Although convenience sampling was used in this study, the researcher's data collection times included days, evenings, and nights both on weekdays and during the weekend. Hence, an attempt was made to gather a representative sample of treat and release patients utilizing the HUMC emergency department.

Inclusion and Exclusion Criteria:

To ensure that the study focused on its targeted group of participants and to minimize the chances of anomalies in the information collected, the researcher screened each potential study participant based on the following inclusion and exclusion criteria. Only those patients who met all the inclusion criteria items and

did not have any of the exclusion characteristics were allowed to participate in the study.

Inclusion Criteria:

- All adult ED patients, 18 years of age and older, both male and female
    - The age criterion was determined so that the surveyor can speak with the patients and not guardians of children, guardians or legal representatives of adults or children directly. Only direct patient communication shall be used for this study.
- Speaks and understands the English language sufficiently to answer questions by themselves.
- Patient has had ED encounter before they leave HUMC, in the treat and release area.

Exclusion Criteria:

- Any patient under the age of 18 or any adult requiring a guardian to answer for them, regardless of age.
- Does not speak or understand the English language sufficiently to answer questions by themselves.
- Direct admits, which are individuals who are not treated and released on the same day.
- Avoid survey on admission, admitting, or one who has not completed the ED visit.
- Avoid any patient with trauma, extreme pain, or special circumstance.

Research Site

Research was conducted in the treat and release area of the emergency department of Hackensack University Medical Center. The emergency department is triaged into three areas. The treat and release patients arrive with ailments that are considered as minimally acute in comparison to patients in the other two areas of the emergency department. This determination is made at check-in by medical staff and the assessment is made independent from this study. The researcher approached these patients at the end of their visit to the emergency department, as according to the HUMC procedures (Appendix C). This was to make sure they have completed their experience in the emergency department.

Subjects were recruited from the “treat and release” population, in the emergency department. ”Treat and release” is common terminology referring to patients who are not being further admitted to an inpatient bed. Prior to recruitment, the ED management was made aware of the study and prepared for the recruitment as part of the organization’s procedure when permission was granted for research to be conducted on site (Appendix C). As per the HUMC procedure, the researcher spoke with the office staff at Hackensack University Medical Center prior to the start of recruitment to determine the best days and hours for recruitment. (See HUMC Site Approval Letter, Appendix C, attached)

The researcher identified potential participants according to the procedure that was outlined (Appendix D-2). The researcher quietly mentioned to each patient, once each patient completed his/her treat and release visit, the

opportunity to participate, if interested, in a survey regarding provider communication. If the patient indicated interest in participating, then he/she was given instruction by the researcher on how to participate. Each interested participant was briefed on what his or her participation entailed. Participants were informed of the purpose of the study, that their participation is completely voluntary, and if they were still interested, would be asked to review the letter of solicitation. (Appendix F) Consent was implied by their voluntary participation and voluntary completion of the survey documents. They were also told that the entire survey process would take about 10 minutes to complete. Eligibility was determined based on inclusion/exclusion criteria.

Data Compilation and Analysis

Through the researcher's data collection efforts, the researcher obtained a total of n = 137 completed surveys for use in the study. None of these completed surveys contained any missing items on either the CAT survey or the Demographic Questionnaire. All of these surveys also had a valid provider identifier code from which the researcher could determine whether the healthcare provider was a physician, physician's assistant, or nurse practitioner. This total of n = 137 completed surveys exceeded the researcher's target sample size of 134.

In preparation for using the survey data for statistical analyses, the researcher manually input the survey data into a Microsoft® Excel® spreadsheet. In the Excel spreadsheet, the data from each survey was entered on a separate row. In addition, separate spreadsheet columns were used to record each relevant data item from the survey. The items recorded included the participant ID, the

provider type, the responses to each of the fourteen items on the CAT survey, and the responses to each of the five questions on the Demographic Questionnaire. For each of the CAT survey questions, the actual score (i.e., 1, 2, 3, 4, or 5) was entered into the spreadsheet. For each of the categorical items appearing on the survey, numerical codes were used to identify the responses. Codes of 1, 2, and 3 were used to identify the physician, physician's assistant, and nurse practitioner provider types, respectively, although the latter two provider types were later combined into the midlevel category for use in the statistical analyses. Numerical codes were also assigned to the various categories listed for each of the five demographics addressed on the Demographic Questionnaire, and these codes were entered into the appropriate columns on the Excel spreadsheet for each participant. There was also a column in the Excel spreadsheet on which the scores for the fourteen CAT survey items were added together to produce the CAT Composite score for each participant.

Once the data compilation in Excel was complete, the spreadsheet was uploaded into an IBM® SPSS® Version 22 data file, so that the data could be used in statistical analyses. Before running any statistical analyses, however, the Transform Compute Variable tool in SPSS was utilized to create a new provider type variable (called Provider1) which combined the physician's assistants and the nurse practitioners into a single midlevel provider category. The Provider1 variable was assigned a value of 1 for a physician provider and a 2 for a midlevel provider. The Transform Compute Variable command was also invoked at various other times when performing the statistical analyses in SPSS

in order to create auxiliary variables from the existing variables in the database which were useful in running these statistical tests.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to investigate patients' assessments of their healthcare providers' communication abilities as measured by the Communication Assessment Tool (CAT) survey. The analysis consisted of four major components. The first component involved compiling and summarizing the survey responses. This was done separately for patients with physician providers and for patients with midlevel providers (either physician's assistants or nurse practitioners). For each of the two provider groups, relevant sample statistics, as well as meaningful graphical exhibits were calculated to evaluate the central tendency, dispersion, and shape of the distribution of the composite survey scores. Descriptive statistics were also compiled on the individual question level in order to get an idea of these three items on a question-by-question basis. This portion of the analysis focused on answering Research Questions #1 and #2.

The second component of the study concentrated on whether there was a significant difference between patients' overall assessment of physician's communication skills versus midlevel provider's communication skills. The CAT Composite scores of the participants in this study were utilized as the basis for this comparison. The researcher viewed the CAT Composite score as an ordinal variable, since it was the sum of the scores on the fourteen five-point

Likert scale items comprising the CAT survey. In light of this, a non-parametric inferential statistical test was utilized in this phase of the study. The result of this statistical test was used to answer Research Question #3.

The third component of the analysis focused on whether there were significant differences between the patients' overall assessments of physicians versus midlevel providers in each of the fourteen areas addressed in the CAT survey. Since each item on the CAT survey was an ordinal variable (due to the fact that each item was measured using a five-point Likert scale), non-parametric statistical tests were employed. The researcher used the results of these tests to answer Research Question #4.

Comparison of CAT Composite Scores for Various Demographics

The final component of the study examined whether there were differences in patients' views of their medical providers' communication abilities based on the patients' demographic characteristics. This demographic information was obtained from the Demographic Questionnaires, which were filled out by each CAT survey participant. The demographic characteristics included patient age group, gender, ethnicity, education level, and employment status. Each of these five characteristics was considered separately in order to determine whether patients in the different subgroups of the particular demographic had different perceptions of their providers' communication skills. In making this query for each demographic, the researcher utilized non-parametric inferential statistical methods, because the dependent variable – the CAT Composite score – was

considered to be an ordinal variable. For purposes of this final component of the study, no distinction was made between physicians and midlevel providers.

IBM® SPSS® Version 22 software was utilized in this study. Both the CAT survey data and the Demographic Questionnaire data obtained from the study participants were first entered into a Microsoft® Excel® spreadsheet. This spreadsheet was then uploaded into an SPSS data file. Using this data file, all of the statistical analyses as well as most of the descriptive statistics tables and graphs were generated in SPSS. A few of the descriptive statistics tables used to answer Research Questions #1 and #2 were created directly in Excel. All of the statistical power analyses appearing in this study were performed using G*Power software.

Descriptive Statistics

As mentioned above, the purpose of this phase of the study was to compile various summary statistics and other information on the CAT surveys collected, separately for the physicians versus midlevel provider groups. The goal of this component was to answer Research Question #1 and Research Question #2, respectively.

For each of the two provider groups, summary statistics – including mean, median, standard deviation, minimum, maximum, and range – were computed for the CAT Composite score. Recall that the CAT Composite score for each participant was obtained by adding together the individual Likert scale scores for the fourteen questions appearing on the CAT survey. Since a five-point Likert scale is used for each question (ranging from a rating of 1 for poor to a rating of 5

for excellent), the CAT Composite score on an individual survey can range from 14 to 70, inclusive. Skewness and kurtosis statistics were also calculated for each provider group in order to obtain some additional information about the distribution of scores for each group. A histogram of the CAT Composite scores was also generated in order to give a visual picture of the distribution of CAT Composite scores within each provider group.

In addition to the statistics shown for the CAT Composite score, descriptive statistics were also compiled for each of the fourteen CAT survey questions, again separately for physicians versus midlevel providers. These descriptive statistics include the minimum score, maximum score, mean score, median score, and the standard deviation of the scores by question, along with the relative frequencies of 1, 2, 3, 4, and 5 responses, respectively, by question. These relative frequencies provide information about the shape of the distribution of scores by question.

Table 1

Descriptives					
	Provider1			Statistic	Std. Error
CATComp	Physician	Mean		65.13	.65
		95% Confidence Interval for Mean	Lower Bound	63.84	
			Upper Bound	66.42	
		5% Trimmed Mean		65.70	
		Median		67	
		Variance		29.13	
		Std. Deviation		5.40	
		Minimum		44	
		Maximum		70	
		Range		26	
		Interquartile Range		7	
		Skewness		-1.58	.29
		Kurtosis		2.77	.57

Table 1 shows descriptive statistics for the CAT Composite scores for the physician provider group. For the n = 70 surveys included in this group, the mean CAT Composite score was 65.13, while the median score was 67. Since the CAT Composite score can range from 14 to 70 with 70 being the highest

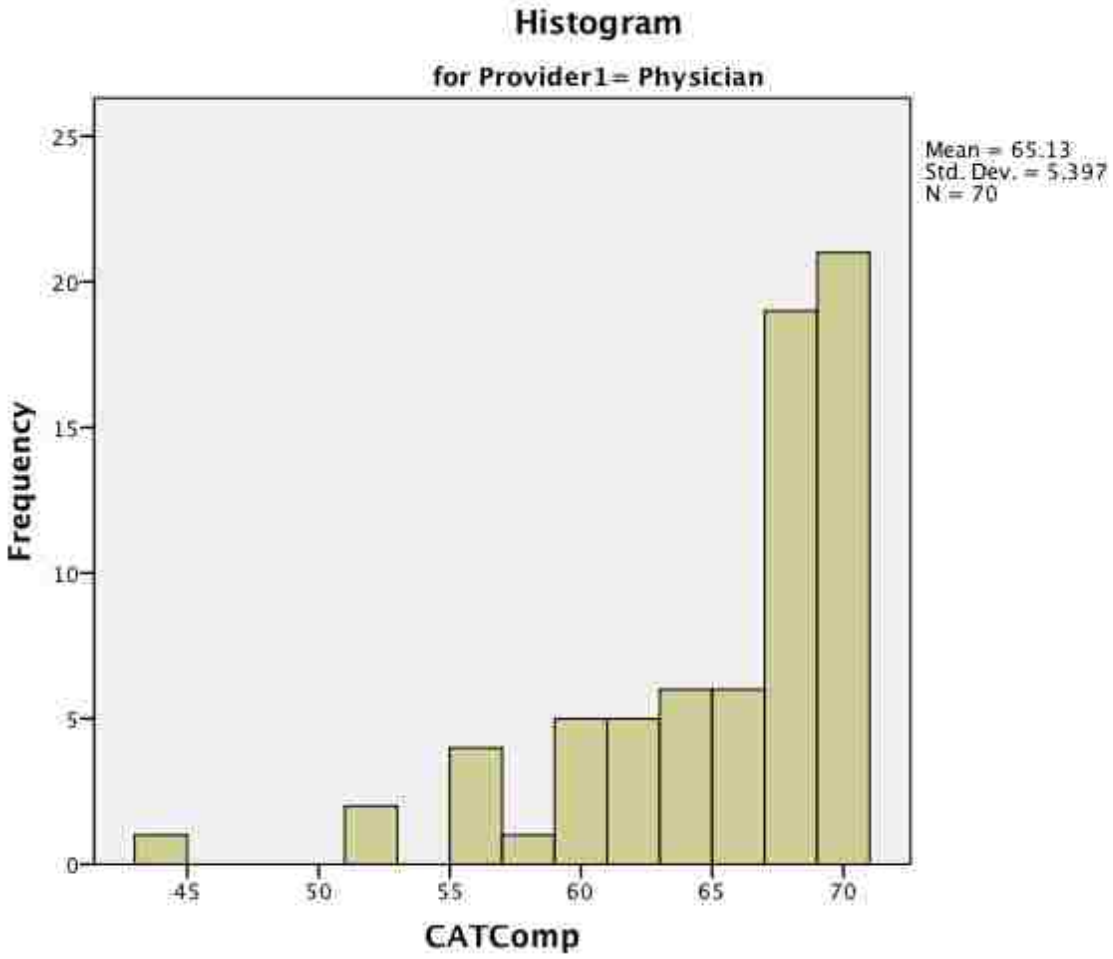
score, these mean and median statistics reveal that the survey participants had a very high regard for their physician providers' communication skills. The small standard deviation of the scores (5.40) relative to the mean suggests that there was little variation of the scores from the mean score. This gives further evidence that the majority of the patients had a high assessment of the communication ability of their physician providers. The fact that the minimum CAT Composite score for this group was 44 -- which lies slightly above the midpoint between the 14 and 70 lowest and highest possible scores – supports the notion that no survey participant gave their physician provider less than a good overall patient communication rating.

The skewness and kurtosis statistics shown in the above table provide information about the shape of the CAT Composite scores for the physician provider segment. One can obtain a skewness z-score by dividing the skewness statistic by the corresponding skewness standard error – i.e., z = -1.58/.29 = -5.45. The skewness z-score can be used to make inferences about the skewness of the population distribution of scores from the sample. Since the skewness z-statistic of -5.45 is more extreme (i.e., further away from zero) than the critical values of -1.96 and 1.96 corresponding to a two-tailed z-test at the 5% level of significance, one can conclude that the distribution of CAT Composite scores for physicians was significantly skewed. Since the calculated z-score is a large negative value, one can further conclude that the distribution was significantly left skewed.

One can use a similar approach to evaluate the kurtosis (i.e., peakedness) of the population distribution of CAT Composite scores for the physician segment. By dividing the kurtosis statistic by the corresponding kurtosis standard error, one obtains a kurtosis z-score. In this case, the kurtosis z-score is z = 2.77/.57 = 4.86. Since the kurtosis z-statistic of 4.86 is more extreme (i.e., further away from zero) than the critical values of -1.96 and 1.96 corresponding to a two-tailed z-test at the 5% level of significance, one can conclude that the distribution of CAT Composite scores for physicians was significantly kurtotic. Since the calculated z-score is a large positive value, one can further conclude that the distribution had significant positive kurtosis – i.e., was leptokurtic.

Figure 1

Histogram of CAT Composite Scores for Physician Providers



The histogram above shows the distribution of CAT Composite scores for the physician provider segment. The left skew of this distribution is clearly evident. The positive kurtosis – or peakedness -- of the distribution is also apparent, since the frequencies of the two highest score intervals are much greater than the frequencies of the other intervals.

Table 2

Descriptive Statistics for Physicians (n = 70)

Question	Minimum	Maximum	Mean	Median	Standard Deviation
CAT1	3	5	4.60	5	.57
CAT2	2	5	4.66	5	.56
CAT3	3	5	4.70	5	.49
CAT4	3	5	4.73	5	.51
CAT5	1	5	4.49	5	.78
CAT6	2	5	4.51	5	.65
CAT7	2	5	4.59	5	.63
CAT8	3	5	4.60	5	.60
CAT9	2	5	4.69	5	.58
CAT10	2	5	4.69	5	.60
CAT11	3	5	4.69	5	.55
CAT12	1	5	4.74	5	.65
CAT13	2	5	4.74	5	.56
CAT14	1	5	4.71	5	.68
CAT Composite	44	70	65.13	67	5.40

Table 2 shows descriptive statistics for the physician provider segment, separately by CAT survey question. Since the individual question scores utilized a five-point Likert scale (with 5 indicating a rating of excellent), the fact that the mean scores for the fourteen questions ranged from 4.49 to 4.74, while the median score for each of the fourteen questions was 5, suggests that the participants' ratings of their physician providers' communication skills were consistently high across all areas. Moreover, the fact that the standard deviations of the scores (which ranged from .49 to .78) were relatively small in relation to the corresponding mean scores suggests that there was little variation about the favorable mean score for each question. Lastly, an examination of the minimum scores by question reveals that five of the fourteen questions had a minimum score of 3 (good), while six questions had a minimum rating of 2 (fair) and only three questions had a minimum rating of 1 (poor). It should be noted that the questions whose minimum rating was a 2 or a 1 had no more than one or two responses in both these categories combined.

Table 3

Relative Frequencies of Scores for Physicians (n = 70)

	Relative Frequencies of Scores					
Question	1	2	3	4	5	Total
CAT1	.00%	.00%	4.29%	31.43%	64.29%	100.00%
CAT2	.00%	1.43%	.00%	30.00%	68.57%	100.00%
CAT3	.00%	.00%	1.43%	27.14%	71.43%	100.00%
CAT4	.00%	.00%	2.86%	21.43%	75.71%	100.00%
CAT5	1.43%	1.43%	4.29%	32.86%	60.00%	100.00%
CAT6	.00%	1.43%	4.29%	35.71%	58.57%	100.00%
CAT7	.00%	1.43%	2.86%	31.43%	64.29%	100.00%
CAT8	.00%	.00%	5.71%	28.57%	65.71%	100.00%
CAT9	.00%	1.43%	1.43%	24.29%	72.86%	100.00%
CAT10	.00%	1.43%	2.86%	21.43%	74.29%	100.00%
CAT11	.00%	.00%	4.29%	22.86%	72.86%	100.00%
CAT12	1.43%	.00%	2.86%	14.29%	81.43%	100.00%
CAT13	.00%	1.43%	1.43%	18.57%	78.57%	100.00%
CAT14	1.43%	1.43%	0.00%	18.57%	78.57%	100.00%
	14-20	21-34	35-48	49-62	63-70	Total
CAT Composite	.00%	.00%	1.43%	24.29%	74.29%	100.00%

The above table shows the relative frequencies of 1, 2, 3, 4, and 5 scores, respectively, separately by question for the physician providers group. For each of the fourteen questions, the majority of the responses (between 59% and 81%) were 5's, followed by 4's (which comprised between 14% and 36% of the responses). There were relatively few 3 responses (between 0% and 6% depending on the question) and even fewer responses of 1 or 2. These relative frequencies suggest that the distributions of scores for all fourteen questions all had a distinctive left skew. The last line of the table shows the relative frequencies for the CAT Composite scores for the score ranges 14-20, 21-34, 35-48, 49-62, and 63-70, respectively.

These five composite score ranges were selected since they correspond to average scores per question of 1, 2, 3, 4, and 5, respectively, when the average score (i.e., the composite score divided by 14) is rounded to the nearest whole number. An examination of this line shows that 74% of the CAT Composite scores fell into the 63-70 range (which is equivalent to a 5 or excellent), while 24% of the CAT Composite scores were in the 49-62 range (which is equivalent to a 4 or very good). Only one CAT Composite score was in the 35-48 range, and no composite scores fell into either of the two lowest ranges. This distribution of the CAT Composite scores provides additional support for the notion that a large majority of patients who dealt with physician providers had a high regard of their communication skills. Having discussed the descriptive statistics for the physician provider group, the statistics for the midlevel provider group will now be presented.

Table 4

Descriptives					
	Provider1			Statistic	Std. Error
CATComp	Midlevel Provider	Mean		54.34	1.77
		95% Confidence Interval for Mean	Lower Bound	50.82	
			Upper Bound	57.87	
		5% Trimmed Mean		55.52	
		Median		56	
		Variance		209.17	
		Std. Deviation		14.46	
		Minimum		14	
		Maximum		70	
		Range		56	
		Interquartile Range		22	
		Skewness		-.89	.29
		Kurtosis		.37	.58

Table 4 shows descriptive statistics for the CAT Composite scores for the midlevel provider group. For the n = 67 surveys included in this group, the mean CAT Composite score was 54.34, while the median score was 56. Since the CAT Composite score can range from 14 to 70 with 70 being the highest score, these mean and median statistics reveal that the survey participants had a reasonably high regard for their midlevel providers' communication skills but not as extremely favorable as that for their physician provider counterparts. The fact that the standard deviation of the midlevel provider scores (14.46) was noticeably higher than the standard deviation of the physicians' scores (5.40) suggests that there was significantly more variation about the mean among the midlevel provider scores. The fact that the minimum CAT Composite score for this midlevel provider group was 14 (which is the minimum possible composite score) as opposed to 44 for the physician provider group lends further support to the notion that there was a wider variation among the midlevel provider composite scores as compared to those of the physician group.

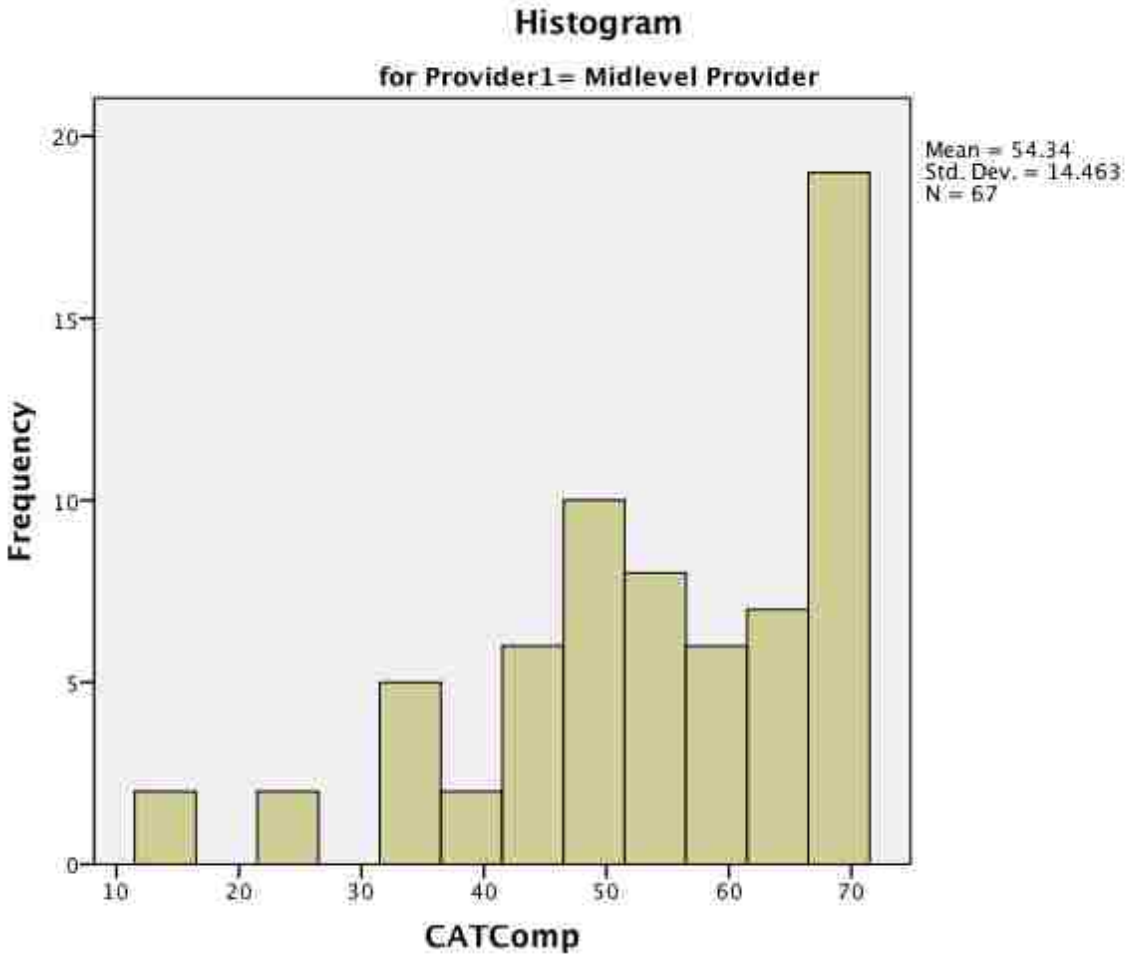
The skewness and kurtosis statistics shown in the above table provide information about the shape of the CAT Composite scores for the midlevel provider segment. One can obtain a skewness z-score by dividing the skewness statistic by the corresponding skewness standard error – i.e., z = -.89/.29 = -3.07. Since the skewness z-statistic of -3.07 is negative and is also more extreme (i.e., further away from zero) than the critical values of -1.96 and 1.96 corresponding to a two-tailed z-test at the 5% level of significance, one can conclude that the population distribution of CAT Composite scores for midlevel providers was

significantly left skewed. While still significant, the left skew of the midlevel providers' CAT Composite score distribution was not as extreme as the left skew for the physicians' distribution, since that magnitude midlevel group's skewness z-score (3.07) is less than that for the physicians' group (5.45).

One can use a similar approach to evaluate the kurtosis (i.e., peakedness) of the population distribution of CAT Composite scores for the midlevel provider segment. By dividing the kurtosis statistic by the corresponding kurtosis standard error, one obtains a kurtosis z-score. In this case, the kurtosis z-score is z = .37/.58 = .64. Since the kurtosis z-statistic of .64 lies in between the critical values of -1.96 and 1.96 corresponding to a two-tailed z-test at the 5% level of significance, one can conclude that the distribution of CAT Composite scores for midlevel providers was not significantly kurtotic – i.e., the distribution was mesokurtic.

Figure 2

Histogram of CAT Composite Scores for Midlevel Providers



The histogram above shows the distribution of CAT Composite scores for the midlevel provider segment. The left skew of this distribution is clearly evident. While the distribution exhibits some positive kurtosis (i.e., peakedness) in the right tail, the degree of this kurtosis was not enough to be considered statistically significant. The greater spread of the midlevel provider CAT Composite scores as compared to those for their physician counterparts is also evident in this histogram.

Table 5

Descriptive Statistics for Midlevel Providers (n = 7)

Question	Minimum	Maximum	Mean	Median	Standard Deviation
CAT1	1	5	3.99	4	1.11
CAT2	1	5	4.04	4	1.19
CAT3	1	5	3.84	4	1.16
CAT4	1	5	3.94	4	1.15
CAT5	1	5	3.81	4	1.17
CAT6	1	5	3.99	4	1.13
CAT7	1	5	3.88	4	1.20
CAT8	1	5	3.96	4	1.12
CAT9	1	5	3.75	4	1.17
CAT10	1	5	3.58	4	1.27
CAT11	1	5	3.64	4	1.28
CAT12	1	5	4.07	4	1.05
CAT13	1	5	3.94	4	1.15
CAT14	1	5	3.93	4	1.13
CAT Composite	14	70	54.34	56	14.46

Table 5 shows descriptive statistics for the midlevel provider segment, separately by CAT survey question. Since the individual question scores utilized a five-point Likert scale (with 5 indicating a rating of excellent), the fact that the mean scores for the fourteen questions range from 3.58 to 4.07, while the median score for each of the fourteen questions is 4, suggests that the participants' ratings of their midlevel providers' communication skills were, on average, good to very good across all areas. Moreover, the fact that the standard deviations of the scores (which ranged from 1.05 to 1.28) on each of the questions were noticeably higher than those for their physician provider counterparts (which ranged from .49 to .78) supports the notion that there was more variation among the midlevel provider scores on each question as compared to those for the physician group. Lastly, an examination of the minimum scores by question for the midlevel provider group reveals that all fourteen questions had a minimum score of 1 (poor), as compared to only three questions with a minimum rating of 1 for the physicians' group.

Table 6

Relative Frequencies of Scores for Midlevel Providers (n = 7)

	Relative Frequencies of Scores					
Question	1	2	3	4	5	Total
CAT1	4.48%	7.46%	11.94%	37.31%	38.81%	100.00%
CAT2	4.48%	10.45%	8.96%	28.36%	47.76%	100.00%
CAT3	4.48%	8.96%	22.39%	26.87%	37.31%	100.00%
CAT4	5.97%	5.97%	14.93%	34.33%	38.81%	100.00%
CAT5	5.97%	8.96%	16.42%	35.82%	32.84%	100.00%
CAT6	5.97%	2.99%	19.40%	29.85%	41.79%	100.00%
CAT7	4.48%	11.94%	14.93%	28.36%	40.30%	100.00%
CAT8	2.99%	7.46%	23.88%	22.39%	43.28%	100.00%
CAT9	4.48%	10.45%	25.37%	25.37%	34.33%	100.00%
CAT10	7.46%	13.43%	23.88%	23.88%	31.34%	100.00%
CAT11	7.46%	11.94%	23.88%	22.39%	34.33%	100.00%
CAT12	2.99%	4.48%	19.40%	28.36%	44.78%	100.00%
CAT13	4.48%	8.96%	14.93%	31.34%	40.30%	100.00%
CAT14	4.48%	7.46%	17.91%	31.34%	38.81%	100.00%
	14-20	21-34	35-48	49-62	63-70	Total
CAT Composite	2.99%	5.97%	23.88%	28.36%	38.81%	100.00%

The above table shows the relative frequencies of 1, 2, 3, 4, and 5 scores, respectively, separately by question for the midlevel providers group. For thirteen out of the fourteen questions (the only exception being CAT5), the largest proportions of the responses (between 31% and 48%) were 5's. Eleven of the questions (the only exceptions being CAT5, CAT8, and CAT11) had 4 as the second most popular response (with relative frequencies ranging from 24% to 37%). The third most popular response on most questions was a 3 (with relative frequencies ranging from 12% to 25%). There were also a fair percentage of 2 responses on most questions as well as few responses of 1 on each of the questions. These relative frequencies suggest that although the distributions of the midlevel provider scores for all fourteen questions all exhibited a left skew, these skews were not as severe as those for their physician counterparts. Moreover, for each of the questions, the midlevel provider scores were more spread out over the 1-5 range than the physician provider scores were.

The last line of the table shows the relative frequencies for the CAT Composite scores for the score ranges 14-20, 21-34, 35-48, 49-62, and 63-70, respectively. These five composite score ranges were selected since they correspond to average scores per question of 1, 2, 3, 4, and 5, respectively, when the average score (i.e., the composite score divided by 14) is rounded to the nearest whole number. An examination of this line shows that 39% of the CAT Composite scores fell into the 63-70 range (which is equivalent to a 5 or excellent), while 28% of the CAT Composite scores were in the 49-62 range (which is equivalent to a 4 or very good), and 24% of the scores were in the 35-

48 range (which is equivalent to a 3 or good). Of the remaining 9% of scores, 6% of them were in the 21-34 range (which is equivalent to a 2 or fair) and 3% of them fell in the 14-20 range (which is equivalent to a 1 or poor). This distribution of the midlevel provider CAT Composite scores reveals that while the majority of survey participants (67%) gave composite ratings falling into the top two ranges to their midlevel providers, the remaining one-third of participants felt that their midlevel providers' overall communication skills fell into one of the bottom three score ranges.

The remainder of this section of Chapter IV provides additional insight into the differences between the physicians versus the midlevel providers CAT survey scores.

Table 7

Differences in Mean and Median Scores Between Physicians and Midlevel Providers

Question	Mean[a]	Median[b]
CAT1	.61	1
CAT2	.61	1
CAT3	.86	1
CAT4	.79	1
CAT5	.68	1
CAT6	.53	1
CAT7	.71	1
CAT8	.64	1
CAT9	.94	1
CAT10	1.10	1
CAT11	1.04	1
CAT12	.67	1
CAT13	.80	1
CAT14	.79	1
CAT Composite	10.79	11

[a] Physician Mean Score less Midlevel Provider Mean Score

[b] Physician Median Score less Midlevel Provider Median Score

The above table shows the differences the mean and median CAT survey scores between physicians and midlevel providers, respectively. These differences are shown for each question as well as for the CAT Composite. On the individual questions, the mean physician's score was between .53 and 1.10 points higher than the corresponding midlevel provider's mean score. A comparison of the median scores on the individual questions reveals that the physician's median score was consistently one point higher than the midlevel provider's median score. (Recall that the median score for physicians on each of the questions was a 5, while the midlevel providers' median score was a 4.) For the CAT Composite, both the mean and median scores for physicians were approximately 11 points higher than the corresponding statistics for midlevel providers.

Table 8

Differences in Relative Frequencies of Scores Between Physicians and Midlevel Providers

	Differences in Relative Frequencies of Scores[a]					
Question	1	2	3	4	5	Total
CAT1	-4.48%	-7.46%	-7.65%	-5.88%	25.48%	.00%
CAT2	-4.48%	-9.02%	-8.96%	1.64%	20.81%	.00%
CAT3	-4.48%	-8.96%	-20.96%	.28%	34.12%	.00%
CAT4	-5.97%	-5.97%	-12.07%	-12.90%	36.91%	.00%
CAT5	-4.54%	-7.53%	-12.13%	-2.96%	27.16%	.00%

CAT6	-5.97%	-1.56%	-15.12%	5.86%	16.78%	.00%
CAT7	-4.48%	-10.51%	-12.07%	3.07%	23.99%	.00%
CAT8	-2.99%	-7.46%	-18.17%	6.18%	22.43%	.00%
CAT9	-4.48%	-9.02%	-23.94%	-1.09%	38.53%	.00%
CAT10	-7.46%	-12.00%	-21.02%	-2.45%	42.94%	.00%
CAT11	-7.46%	-11.94%	-19.59%	.47%	38.53%	.00%
CAT12	-1.56%	-4.48%	-16.55%	-14.07%	36.65%	.00%
CAT13	-4.48%	-7.53%	-13.50%	-12.77%	38.27%	.00%
CAT14	-3.05%	-6.03%	-17.91%	-12.77%	39.77%	.00%
	14-20	21-34	35-48	49-62	63-70	Total
CAT Composite	-2.99%	-5.97%	-22.45%	-4.07%	35.48%	.00%

[a] Calculated by subtracting the midlevel provider relative frequency of the score for a given question from the physician relative frequency of that score for the same question.

Table 8 shows the differences in the relative frequencies of scores between physicians and midlevel providers. These differences were obtained by subtracting the midlevel provider relative frequency of the score for a given question (as given in Table 6) from the physician relative frequency of that score for the same question (as given in Table 3). For example, for CAT1 the relative frequency difference of 25.48% for a score of 5 was obtained by subtracting the midlevel provider relative frequency of a 5 for CAT1 (38.81%) from the physician

provider relative frequency of a 5 for CAT1 (64.29%) – i.e., 64.29% - 38.81% = 25.48%. Likewise, for CAT1 the relative frequency difference of -5.88% for a score of 4 was obtained by subtracting the midlevel provider relative frequency of a 4 for CAT1 (37.31%) from the physician provider relative frequency of a 4 for CAT1 (31.43%) – i.e., 31.43% - 37.31% = -5.88%. Please note that a positive difference means that the physician relative frequency for the given question/ score combination exceeded the midlevel provider relative frequency for that particular question/ score, while a negative difference indicates that the opposite is true.

An examination of the above table reveals that for each question, physician providers consistently had higher relative frequencies of 5 scores than their midlevel counterparts. The differences for the 4 scores were mixed with midlevel providers having higher relative frequencies on some questions and physicians having higher relative frequencies on others. For scores of 3, 2, and 1, midlevel providers consistently had higher relative frequencies than their physician counterparts on all the questions.

In order to address Research Questions #1 and #2, this section has done in-depth analyses of the relevant descriptive statistics – including measures of central tendency, variation, and distribution shape – for the scores on the completed CAT surveys, both in the composite and by individual question. These analyses were done separately for surveys that involved an encounter with a physician versus those which involved an encounter with a midlevel

provider. The latter part of this section focuses on comparing the results of the physician provider analysis to those of midlevel provider analysis.

Comparison of CAT Composite Scores Between Physicians and Midlevel Providers

Having completed thorough descriptive analyses of both the physician and midlevel provider CAT survey scores, the next step examines whether there is a statistically significant difference between the CAT Composite scores for physicians versus midlevel providers. In particular, the study tried to answer Research Question #3, which hypothesizes that midlevel providers have better overall communication skills with their patients than physicians do.

In order to assess this claim, the non-parametric Mann-Whitney U test was run. For this statistical test as well as for the other statistical tests performed in this dissertation, a significance level of $\alpha = .05$ was utilized. A 5% significance level is the standard for most statistical tests conducted in the health sciences, and for this reason it was used in this study. Since the research hypothesis associated with Research Question #3 is directional, the Mann-Whitney U test was performed on a one-tailed basis.

The assumptions for the Mann-Whitney U test are as follows.

- The samples drawn from the two groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the two groups are random samples. As explained in the Data Collection section of Chapter III, the researcher utilized convenience sampling techniques in order to obtain the sets of participants

for the two groups. Nevertheless the researcher did make an effort to visit the emergency department at her hospital on various days of the week (including both weekdays and weekends) as well as at various times of the day (including days, evenings, and nights) in order to collect survey data. The purpose of doing this was to obtain a cross-sectional sample of the people who utilize the emergency department. In light of this, one may argue that while the participant samples were technically not random samples, they were indeed representative of the types of people who use outpatient emergency department services.

- The dependent variable is measured on an ordinal, interval, or ratio level. As previously explained, the CAT Composite score was considered to be an ordinal level variable. Hence this assumption was met.
- If the population distributions of the dependent variable for both groups had the same shape, then the Mann-Whitney test could be used to test for the equality of medians between the two groups; if the distributions had different shapes then Mann-Whitney could only test whether the mean ranks for the two groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the physician and midlevel provider groups had the same shape before making a definitive statement about what Mann-Whitney can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for the

physicians' and midlevel providers' groups were the same. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each provider group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test.)

Table 9

Kolmogorov-Smirnov Two Sample Test			
	Provider1	N	
RescaledCATComp	Physician		70
	Midlevel Provider		67
	Total		137
Test Statistics[a]			
		RescaledCATComp	
Most Extreme Differences	Absolute		.40
	Positive		.40
	Negative		-.21
Kolmogorov-Smirnov Z			2.36
Asymp. Sig. (2-tailed)			.000
[a] Grouping Variable: Provider1			

Table 9 displays the results of the KS two sample test. The results were statistically significant ($z = 2.36$, $p = .0001 < .05$) indicating that the two distributions had different shapes. In light of this, the researcher used the Mann-Whitney U test

to determine whether the mean ranks of the dependent variable were the same for the two provider groups.

Table 10

Mann-Whitney U Test

Ranks

	Provider1	N	Mean Rank	Sum of Ranks
CATComp	Physician	70	83.50	5845
	Midlevel Provider	67	53.85	3608
	Total	137		

Test Statistics[a]

	CATComp
Mann-Whitney U	1330
Wilcoxon W	3608
Z	-4.40
Asymp. Sig. (2-tailed)	.000

[a] Grouping Variable: Provider1

The results of the Mann-Whitney U test are given in the above table. There was a significant difference in the mean ranks for the CAT Composite dependent

variable between the physicians and the midlevel providers: $z = -4.40$, $p = .0001/2 = .0001 < .05$. (As a technical note, the two-tailed p-value obtained from SPSS was divided by a factor of 2 before being compared to the $\alpha = .05$ significance level, since the researcher was performing a one-tailed test.) Despite this significance, one cannot use this result to support the one-tailed Research Question #3 alternative hypothesis which states that midlevel providers have better overall patient communication skills than there physician counterparts do. This is due to the fact that for the sample used in this study the physicians had a higher mean rank (83.50) than the midlevel providers did (53.85).

Figure 3

*Post Hoc G*Power Analysis for Provider Type Mann-Whitney U Test on CAT Composite Score*

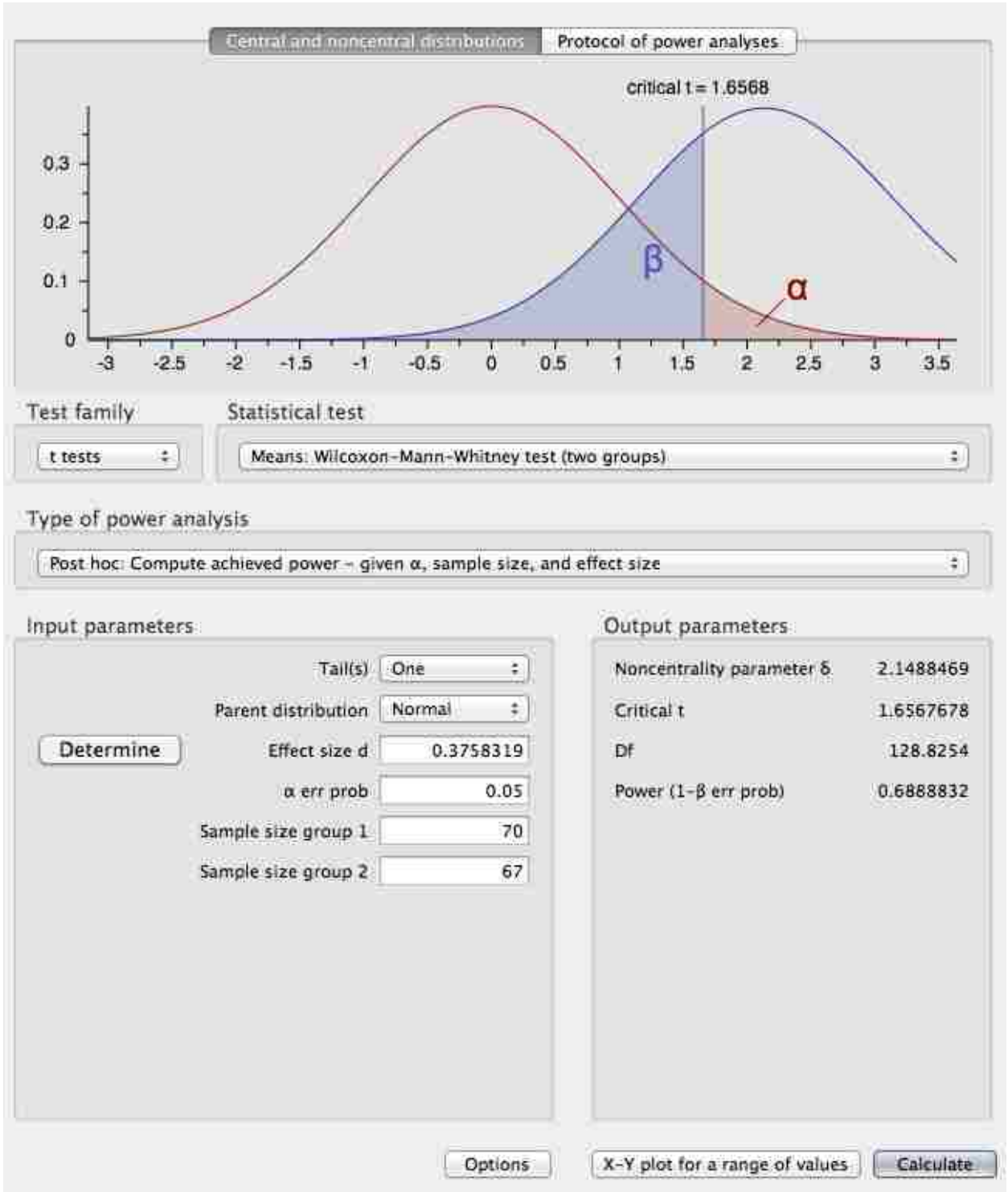


Figure 3 displays the post hoc G*Power results for this run of the Mann-Whitney U test. The achieved power of this test was 1 – β = .69, which fell short of the recommended power level of .80 for statistical, analyses in the health sciences. The G*Power output also shows that the Cohen's effect size for the Mann-Whitney test was d = .38 which is considered a medium effect. As a point of information, this effect size was obtained by dividing the absolute value of the z statistic by the square root of total sample size – i.e., d = $\left|-4.40\right| / \sqrt{137}$ = .38.

Chapter III discussed how the researcher ran G*Power for the Mann-Whitney U test on an a priori basis to obtain a target sample size of 134 needed produce a statistical power of .80 for this particular research question. Since the actual sample size of n = 137 exceeded the target sample size, one might ask why the achieved power of .69 was less than the .80 targeted power level. This was due to the fact that the actual effect size of d = .38 was less than the effect size of d = .50 assumed in the initial a priori G*Power analysis.

Recall that the statistical power level is the probability of correctly rejecting the null hypothesis when it is indeed false. The danger of a low statistical power level is that there is chance of not rejecting the null hypothesis when it is false. In other words, the probability of a Type II error is increased. In this particular instance, the low p-value caused the researcher to reject the null hypothesis stating that there was no significant difference between the mean ranks between the physician and midlevel provider groups. Since the null hypothesis was rejected, the fact that achieved power fell short of the recommended power level had no bearing on the accuracy of the statistical test.

In conclusion, the statistically significant results of the Mann Whitney U test show that there was a meaningful difference in the patient communication abilities between physicians and midlevel providers. In this case, the physicians outperformed the midlevel providers, as evidenced by the physicians' higher mean rank on their CAT Composite scores for the Mann-Whitney U test. Hence, the test did not support the Research Question #3 alternative hypothesis, which promulgates that those midlevel providers have better patient communication skills than their physician counterparts do.

Comparison of Individual CAT Item Scores Between Physicians and Midlevel Providers

The third step of the study was to examine whether there is a statistically significant difference between the CAT scores for physicians versus midlevel providers on each of the fourteen individual items comprising the CAT survey. In particular, the study tried to answer Research Question #4 which hypothesizes that midlevel providers outperform physicians in each of the fourteen communication areas addressed in the CAT survey.

In order to assess this claim, a separate non-parametric Mann-Whitney U test was run for each of the fourteen items appearing in the CAT survey. Since the research hypothesis associated with Research Question #4 is directional, these Mann-Whitney U tests were performed on a one-tailed basis.

The assumptions for the Mann-Whitney U test are as follows.

- The samples drawn from the two groups are independent of each other. As explained above, this assumption was met by the design of this study.

- The samples drawn from the two provider groups (physicians versus midlevels) are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given previously to conclude that the resulting samples for the two provider groups were representative of the types of people who use outpatient emergency department services at HUMC and hence are comparable to random samples.
- The dependent variable is measured on an ordinal, interval, or ratio level. As previously explained, each item appearing in the CAT survey was measured on a five-point Likert scale and hence should be considered to be an ordinal level variable. Hence this assumption was met.
- If the population distributions of the scores on a particular CAT survey item for both groups had the same shape, then the Mann-Whitney test could be used to test for the equality of median scores on that item between the two groups; if the distributions had different shapes then Mann-Whitney could only test whether the mean ranks on that item for the two groups were the same. In light of this, for each of the fourteen CAT survey items the researcher first had to determine whether the population distributions of the scores for the physician and midlevel provider groups had the same shape before making a definitive statement about what Mann-Whitney can be used to test for that particular item.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of a particular CAT survey item's scores

were the same for the physicians' and midlevel providers' groups. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each provider group by item were calculated by subtracting the respective group's mean score for the particular item from each participant's actual score on that item. For each of the CAT survey items, the rescaled data set for each provider group had a mean of zero but the same shape as the original distribution of scores. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test.)

Table 11

Kolmogorov-Smirnov Two Sample Test					
	Most Extreme Differences				
Question	Absolute	Positive	Negative	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
CAT1	.39	.39	-.26	2.27	.000
CAT2	.48	.48	-.23	2.79	.000
CAT3	.37	.37	-.34	2.18	.000
CAT4	.39	.39	-.37	2.27	.000
CAT5	.33	.33	-.27	1.92	.001
CAT6	.42	.42	-.23	2.45	.000
CAT7	.40	.40	-.27	2.36	.000
CAT8	.43	.43	-.29	2.53	.000
CAT9	.39	.34	-.39	2.25	.000
CAT10	.55	.55	-.19	3.23	.000
CAT11	.57	.57	-.16	3.32	.000
CAT12	.45	.45	-.37	2.62	.000
CAT13	.40	.40	-.38	2.36	.000
CAT14	.40	.39	-.40	2.33	.000
Grouping Variable: Provider1					

The above table shows the results of the KS two sample test for each of the fourteen CAT survey items. The results for all of the items were statistically significant as evidenced by their p-values all being less than $\alpha = .05$. In light of this, the researcher concluded that for each of the items the shape of the distribution of scores for physician providers was different from the distribution of scores for midlevel providers. This meant that for each of the survey questions the Mann-Whitney U test could only be used to test for the equality of the mean ranks of the scores between the two provider groups rather than for the equality of the median scores between the groups.

Table 12

Mann-Whitney U Test

	Mean Ranks		Test Statistics[a]			
Question	Physician	Midlevel Provider	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
CAT1	79.69	57.84	1597.00	3875.00	-3.56	.000
CAT2	78.21	59.37	1700.00	3978.00	-3.15	.002
CAT3	83.62	53.72	1321.50	3599.50	-4.88	.000
CAT4	83.08	54.29	1359.50	3637.50	-4.79	.000
CAT5	80.74	56.74	1523.50	3801.50	-3.82	.000
CAT6	77.51	60.11	1749.50	4027.50	-2.81	.005
CAT7	80.04	57.47	1572.50	3850.50	-3.66	.000
CAT8	79.57	57.96	1605.00	3883.00	-3.53	.000
CAT9	84.91	52.37	1231.00	3509.00	-5.28	.000
CAT10	86.38	50.84	1128.50	3406.50	-5.73	.000
CAT11	85.18	52.10	1212.50	3490.50	-5.36	.000
CAT12	82.11	55.30	1427.00	3705.00	-4.62	.000
CAT13	83.30	54.06	1344.00	3622.00	-4.91	.000
CAT14	83.69	53.65	1316.50	3594.50	-5.02	.000

[a] Grouping Variable: Provider1

The results of the Mann-Whitney U test for each of the survey questions is shown in Table 12. The result for each question was statistically significant since each of the p-values was less than $\alpha = .05$. (As a technical note, the p-values generated by SPSS which are shown in the above table should be divided by a factor of 2 before being compared to the $\alpha = .05$ significance level since Research Question #4 involves a one-tailed hypothesis test.) Despite these significant results, one cannot use these outcomes to support the one-tailed Research Question #4 alternative hypothesis which states that midlevel providers have better patient communication skills in each of the fourteen areas included on the CAT survey than their physician counterparts do. This is due to the fact that for each of the fourteen questions the physicians had a higher mean rank than the midlevel providers did.

Table 13

*Post Hoc G*Power Analyses for Provider Type Mann-Whitney U Tests by CAT Survey Item*

Question	Cohen's d Effect Size	Statistical Power 1 - β
CAT1	.30	.53
CAT2	.27	.46
CAT3	.42	.77
CAT4	.41	.75
CAT5	.33	.58
CAT6	.24	.39
CAT7	.31	.55
CAT8	.30	.53
CAT9	.45	.82
CAT10	.49	.87
CAT11	.46	.83
CAT12	.39	.73
CAT13	.42	.77
CAT14	.43	.79

Post hoc G*Power analyses were run on a one-tailed basis assuming an α = .05 significance level. For each CAT questions the Cohen's d effect size was calculated using the following formula:

$d = |Z| / \sqrt{n}$

where Z is the Mann-Whitney U test Z statistic (see Table 12) and n = 137 is the sample size.

For each of the fourteen items, a post hoc G*Power analysis was performed to determine the statistical power of the corresponding Mann-Whitney U test. The results of these G*Power analyses are summarized in the above table. The achieved power levels 1 - β ranged from .39 to .87 with three of the questions – CAT9, CAT10, and CAT11 – producing power levels exceeding the recommended power level of 1 – β = .80 for statistical studies in the health sciences. A key input into each of these G*Power analyses was the Cohen's d effect size. These effect sizes ranged from d = .24 to d = .49 with the majority of them falling in the .30-.50 range which is considered medium to large. The effect sizes for only two of the questions (CAT2 and CAT6) were below d = .30.

In conclusion, the statistically significant Mann-Whitney U test results for each item on the CAT survey reveal that there were meaningful differences in the patient communication abilities between physicians and midlevel providers in each of the fourteen areas addressed on this survey. In all fourteen areas, the physicians outperformed the midlevel providers, as evidenced by the physicians having a higher mean rank than the midlevel providers had on each of the items. Hence, the Mann-Whitney test did not support the Research Question #4 alternative hypothesis which promulgates that that midlevel providers have better

patient communication skills in each of the fourteen areas assessed on the CAT survey than their physician counterparts do.

Demographic Questionnaire

Table 14

Frequency Distributions by Demographic

		Frequency	Percent
Age	18-25	13	9.5
	26-44	70	51.1
	45-64	39	28.5
	65-84	14	10.2
	85 or older	1	.7
	Total	137	100.0
Gender	Male	61	44.5
	Female	76	55.5
	Total	137	100.0
Ethnicity	American Indian or Alaska Native	1	.7
	Asian or Asian-American	10	7.3
	Black or African-American	21	15.3
	Hispanic or Latino	36	26.3

	White or Caucasian	63	46.0
	Other	6	4.4
	Total	137	100.0
Education	Nursery School to 8th grade	2	1.5
	Some high school, no diploma	11	8.0
	High school graduate	13	9.5
	Some college credit, no degree	25	18.2
	Trade/tech/vocational training	9	6.6
	Associates degree	25	18.2
	Bachelor's degree	35	25.5
	Master's degree	13	9.5
	Doctorate degree	2	1.5
	Professional degree	2	1.5
	Total	137	100.0
Employment Status	Employed	94	68.6
	Full-time homemaker	12	8.8
	Full-time student	1	.7

Retired or not actively seeking work	19	13.9
Unemployed	11	8.0
Total	137	100.0

Table 14 shows frequency distributions for each of the demographic items included in the Demographic Questionnaire. An examination of the age group distribution shows that just over half of the study participants were in the 26-44 age range, while almost 30% of the participants were between 45 and 64 years old. The 18-25 and 65-84 age groups each had approximately 10% of the subjects. There was only one person in the age 85 or older category. The gender distribution reveals that there were slightly more female participants than male participants in the study – approximately a 55%/ 45% split, respectively.

As for ethnicity, slightly fewer than half of the participants (46%) were White or Caucasian, followed by 29% who were Hispanic or Latino, 15% who were Black or African-American, and 7% who were Asian or Asian-American. There was only one subject who classified himself or herself as American Indian or Alaska Native. The Other category consisted of one person who identified himself or herself as Persian, another who self-identified as Arabic, and four who provided no additional information.

In relation to highest educational level achieved, about 25% of the participants had bachelor's degrees, 18% had associates degrees, and 18% had some college credit but no degree. About 10% of the sample had a master's

degree; 10% were high school graduates; 8% had some high school but no diploma; and 7% had trade, technical, or vocational training. The remaining categories – doctorate degree, professional degree (including MD, DDS, and JD), and nursery school to eighth grade only – had two participants each.

For employment status, 69% of the participants reported themselves as employed full-time, 14% were retired or not actively seeking work, 9% were full-time homemakers, and 8% classified themselves as unemployed. There was only one full-time student included in the sample.

Having reviewed the demographic composition of the sample used in the study, the next step involved looking at each demographic characteristic individually to see whether there were significant differences in the participants' overall assessments of their healthcare providers' communication skills – as measured by the CAT Composite score -- between the various categories within that demographic.

Age Group. In order to assess whether there were differences in the mean CAT Composite scores across the various age groups, a Kruskal-Wallis test was run. The Kruskal-Wallis test is the non-parametric alternative to the one-way between-subjects analysis of variance (ANOVA) when there are three or more independent groups to be compared. For purposes of this analysis, the 85 or older age group (which had only one participant) was combined with the 65-84 group to obtain a single 65 or older group. Hence, four age groups – 18-25, 26-44, 45-64, and 65 or older – were used in the Kruskal-Wallis test. Before running the Kruskal-Wallis, the following assumptions of this test were examined.

- The samples drawn from the four age groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the four age groups are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given previously to conclude that the resulting samples for each of the age groups were representative of the types of people who use outpatient emergency department services at HUMC and hence are comparable to random samples.
- The dependent variable is measured on an ordinal, interval, or ratio level. As previously explained, each item appearing in the CAT survey was measured on a five-point Likert scale and hence should be considered to be an ordinal level variable. Hence this assumption was met.
- If the population distributions of the dependent variable for the four age groups had the same shape, then the Kruskal-Wallis test could be used to test for the equality of medians between the groups; if the distributions had different shapes then Kruskal-Wallis could only test whether the mean ranks for the four groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the four age groups had the same shape before making a definitive statement about what Kruskal-Wallis can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for four age

groups were the same. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each age group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any purpose other than running the K-S two sample test.)

Table 15

Kolmogorov-Smirnov Two Sample Test

RescaledAgeCATComp	Comparison Groups[a]		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	18-25	26-44	1.53	.019
	18-25	45-64	1.44	.031
	18-25	65 or older	1.22	.103
	26-44	45-64	.68	.744
	26-44	65 or older	.70	.706
	45-64	65 or older	.68	.752

[a] Grouping Variable: DQAge1

Table 15 shows the KS two sample test results for the age groups. Since this is a pairwise test, the results for each of the possible pairings of the four age groups – six in all – are displayed in the table. The fact that the p-values both for the 18-25/ 26-44 age group pairing and for the 18-25/ 45-64 age group pairing were less than $\alpha = .05$ supports the notion that the shapes of the dependent variable distributions for these pairs of age groups are significantly different. On the other

hand, the fact that the p-values for the remaining pairs of age groups were greater than $\alpha = .05$ suggests that these pairs of age groups had similarly shaped distributions of the dependent variable. Since there was at least one pair of age groups that had significantly different shaped distributions, one cannot conclude that all four age groups had similarly shaped distributions. In light of this, the Kruskal-Wallis test could be used only to test the equality of mean ranks among the age groups.

Table 16

Kruskal-Wallis Test

Ranks

	DQAge1	N	Mean Rank
CATComp	18-25	13	64.38
	26-44	70	70.84
	45-64	39	68.10
	65 or older	15	66.73
	Total	137	

Test Statistics[a,b]

	CATComp
Chi-Square	.40
Df	3
Asymp. Sig.	.940

[a] Kruskal Wallis Test

[b] Grouping Variable: DQAge1

The above table displays the output of the Kruskal-Wallis test performed on the age groups. The top portion of the table shows the mean ranks for the four age

groups, which ranged from a low of 64.38 for the 18-25 group to a high of 70.84 for the 26-44 group. Despite these differences, the result of the Kruskal-Wallis test was not significant: $\chi^2(3, N= 137) = .40$, $p = .940 > .05$. Hence, one concludes that there were no meaningful differences in the mean ranks of the CAT Composite variable among the four age groups. This finding supports the notion that the participant's age had no appreciable impact on the subject's perception of his or her healthcare provider's communication abilities.

Since the Kruskal-Wallis test yielded a non-significant result, there was no need to run post-hoc tests (i.e., Mann-Whitney tests for each possible pair of age groups) in order to find where the differences among the age groups lie.

Figure 4

*Post Hoc G*Power Analysis for Age Group Kruskal-Wallis Test*

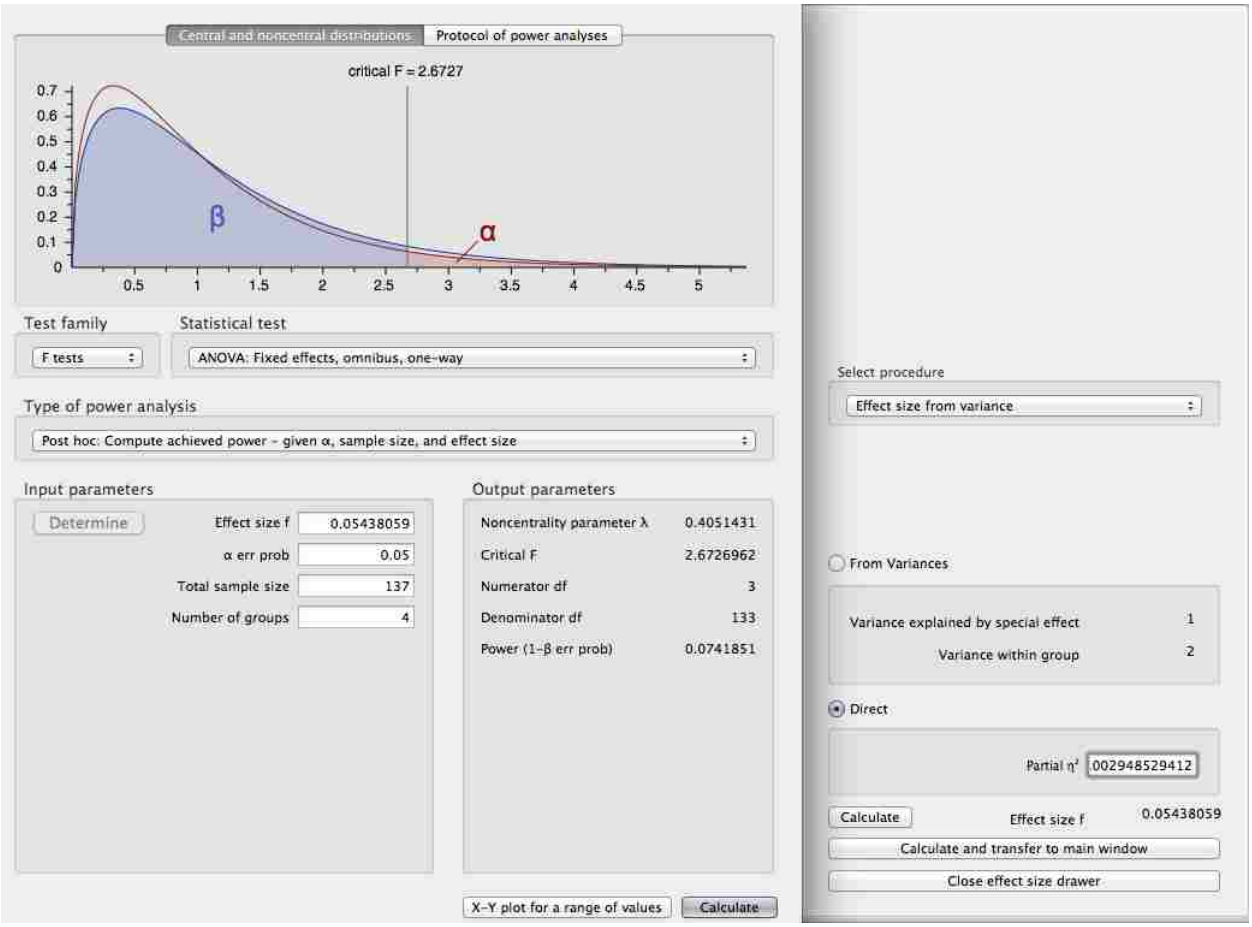


Figure 4 displays the post hoc G*Power results for this run of the Kruskal-Wallis test. The achieved power of this test was 1 – β = .07 which is far below the recommended power level of .80 for statistical analyses in the health sciences. The G*Power output also shows that the effect size for the Kruskal-Wallis test was $\eta^2 = .003$ which is considered an extremely small effect. As a point of information, this effect size was obtained by dividing the Kruskal-Wallis χ^2 statistic by the total sample size less one – i.e., $\eta^2 = .40/ (137 – 1) = .003$.

Gender. In order to assess whether there were differences in the mean CAT Composite scores between male and female participants, a Mann-Whitney U test was run since there were only two groups to compare.

The assumptions for the Mann-Whitney U test are as follows.

- The samples drawn from the two groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the two groups are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given above to conclude that the resulting samples for both gender groups were representative of the types of people who use outpatient emergency department services at HUMC and hence are comparable to random samples.
- Each item appearing in the CAT survey was measured on a five-point Likert scale and hence should be considered to be an ordinal level variable. Hence this assumption was met.
- If the population distributions of the dependent variable for both gender groups had the same shape, then the Mann-Whitney test could be used to test for the equality of medians between men and women; if the distributions had different shapes then Mann-Whitney could only test whether the mean ranks for the two groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the male and female groups had the same shape before making a definitive statement about what Mann-Whitney can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for the male and female groups were the same. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each gender group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test.)

Table 17

Kolmogorov-Smirnov Two Sample Test		
Frequencies		
	DQGender	N
RescaledGenderCATComp	Male	61
	Female	76
	Total	137
Test Statistics[a]		
		RescaledGenderCATComp
Most Extreme Differences	Absolute	.19
	Positive	.12
	Negative	-.19
Kolmogorov-Smirnov Z		1.09
Asymp. Sig. (2-tailed)		.183
[a] Grouping Variable: DQGender		

Table 17 displays the results of the KS two sample test. The results were not statistically significant ($z = 1.09$, $p = .183 > .05$) indicating that the two distributions had similar shapes. In light of this, the researcher was able to use the Mann-Whitney U test to determine whether the median CAT Composite scores were the same for the men versus the women.

Table 18

Mann-Whitney U Test

Ranks

	DQGender	N	Mean Rank	Sum of Ranks
CATComp	Male	61	62.98	3842
	Female	76	73.83	5611
	Total	137		

Test Statistics[a]

	CATComp
Mann-Whitney U	1951
Wilcoxon W	3842
Z	-1.60
Asymp. Sig. (2-tailed)	.110

[a] Grouping Variable: DQGender

The results of the Mann-Whitney U test are given in the above table. As shown on the top portion of the table, for the sample examined females had a higher mean rank (73.83) than the males did (62.98). Despite this difference in the sample, the Mann-Whitney test revealed that there was no statistically significant difference in the median scores for the CAT Composite dependent variable between the males

and females: $z = -1.60$, $p = .110 > .05$. The results of this non-parametric test support the premise that the participant's gender had no meaningful impact on the subject's perception of his or her healthcare provider's communication skills.

Figure 5

*Post Hoc G*Power Analysis for Gender Mann-Whitney U Test*

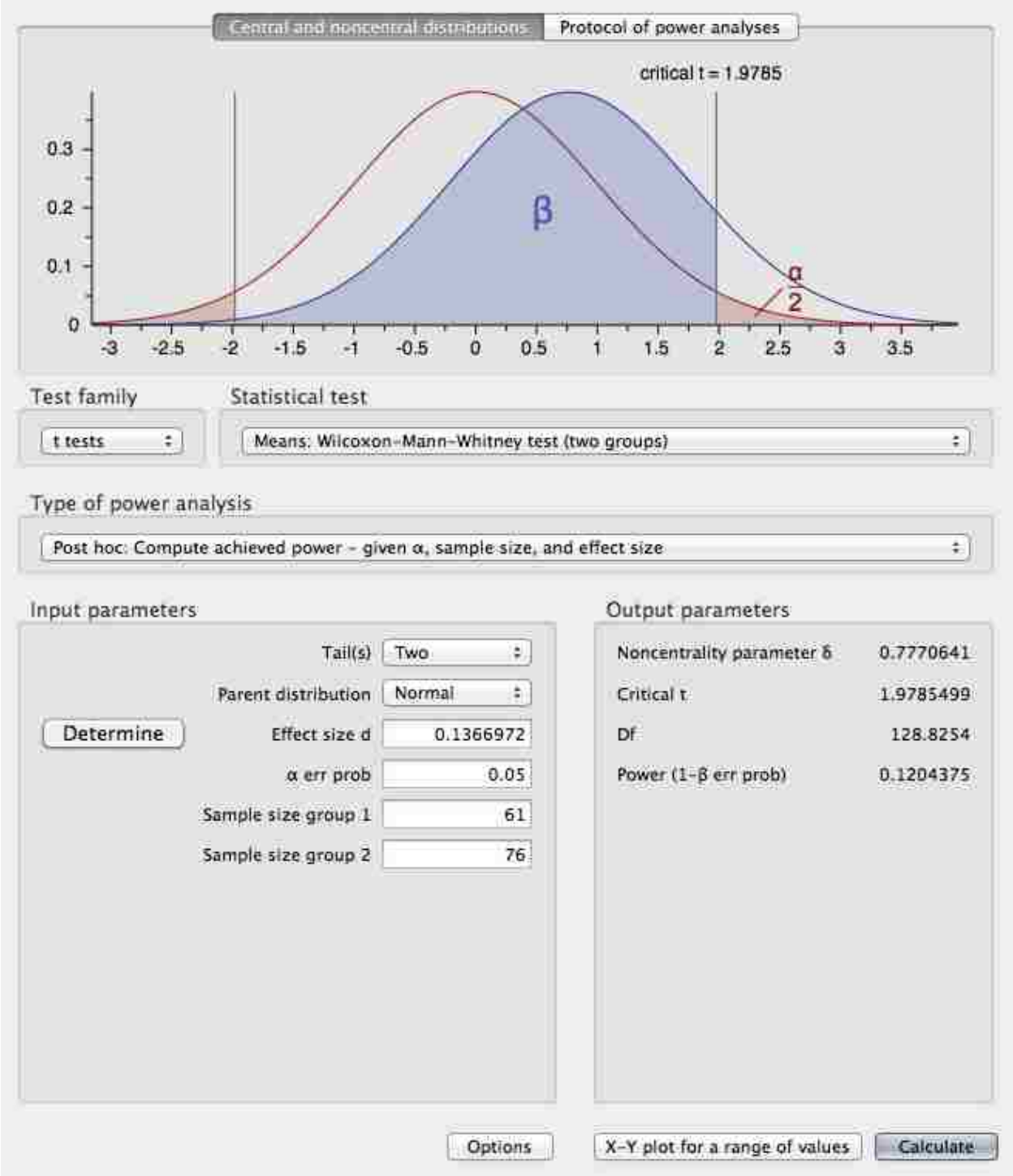


Figure 5 displays the post hoc G*Power results for this run of the Mann-Whitney U test. The achieved power of this test was 1 – β = .12 which fell short of the recommended power level of .80 for statistical analyses in the health sciences. The G*Power output also shows that the Cohen's effect size for the Mann-Whitney test was d = .14 which is considered a small effect. As a point of information, this effect size was obtained by dividing the absolute value of the z statistic by the square root of total sample size – i.e., d = $\left|-1.60\right| / \sqrt{137}$ = .14.

Ethnicity. In order to assess whether there were differences in the mean CAT Composite scores across the various ethnicity categories, a Kruskal-Wallis test was run. To increase the credibility of this analysis, both the American Indian or Alaska Native category (which had only one participant) and the Other category (which had six subjects) were combined with the Asian or Asian-American category to obtain a single group entitled "Asian, American Native, Other". The researcher's decision to combine the Other category with the Asian group (as opposed to one of the other ethnicities) was based on the fact that the two persons in the Other group who provided information on their ethnicities identified themselves as either Persian or Arabic which are types of Asians. Hence, four ethnicity groups – Asian, American Native, Other; Black or African-American; Hispanic or Latino; and White or Caucasian – were used in the Kruskal-Wallis analysis.

Before running the Kruskal-Wallis, the following assumptions of this test were examined.

- The samples drawn from the four ethnicity groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the four ethnicity groups are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given previously to conclude that the resulting samples for each of the ethnicity groups were representative of the types of people who use outpatient emergency department services at HUMC and hence are comparable to random samples.
- The CAT Composite score was considered to be an ordinal level variable. Therefore this assumption was met.
- If the population distributions of the dependent variable for the four ethnicity groups had the same shape, then the Kruskal-Wallis test could be used to test for the equality of medians between the groups; if the distributions had different shapes then Kruskal-Wallis could only test whether the mean ranks for the four groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the four ethnicity groups had the same shape before making a definitive statement about what Kruskal-Wallis can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for four ethnicity groups were the same. Since the KS two sample test is designed to assess

whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each ethnicity group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test).

Table 19

Kolmogorov-Smirnov Two Sample Test

RescaledEthnicityCATComp	Comparison Groups[a]		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	Asian, Amer Native, Other	Black or African-American	1.46	.028
	Asian, Amer Native, Other	Hispanic or Latino	1.06	.216
	Asian, Amer Native, Other	White or Caucasian	1.05	.224
	Black or African-American	Hispanic or Latino	1.91	.001
	Black or African-American	White or Caucasian	1.32	.060
	Hispanic or Latino	White or Caucasian	1.98	.001

[a] Grouping Variable: DQEthnicity1

Table 19 shows the KS two sample test results for the ethnicity groups. Since this is a pairwise test, the results for each of the possible pairings of the four

ethnicity groups – six in all – are displayed in the table. The fact that the p-values for the Asian, American Native, Other/ Black or African-American group pairing; the Black or African-American/ Hispanic or Latino group pairing; and the Hispanic or Latino/ White or Caucasian group pairing were all less than $\alpha = .05$ supports the notion that the shapes of the dependent variable distributions for these pairs of ethnicity groups were significantly different. On the other hand, the fact that the p-values for the remaining pairs of ethnic groups were greater than $\alpha = .05$ suggests that these pairs of groups had similarly shaped distributions of the dependent variable. Since there was at least one pair of ethnicity groups that had significantly different shaped distributions, one cannot conclude that all four ethnicity groups had similarly shaped distributions. In light of this, the Kruskal-Wallis test could be used only to test the equality of mean ranks among the ethnic groups.

Table 20

Kruskal-Wallis Test

Ranks

	DQEthnicity1	N	Mean Rank
CATComp	Asian, Amer Native, Other	17	78.74
	Black or African-American	21	68.62
	Hispanic or Latino	36	74.33
	White or Caucasian	63	63.45
	Total	137	

Test Statistics[a,b]

	CATComp
Chi-Square	2.94
df	3
Asymp. Sig.	.400

[a] Kruskal Wallis Test

[b] Grouping Variable: DQEthnicity1

The above table displays the output of the Kruskal-Wallis test performed on the ethnicity groups. The top portion of the table shows the mean ranks for the four ethnicity groups which ranged from a low of 63.45 for the White or Caucasian group

to a high of 78.74 for the Asian, American Native, Other group. Even though the differences in the mean ranks for the four groups may seem large, the Kruskal-Wallis test result was not statistically significant: $\chi^2(3, N = 137) = 2.94$, $p = .400 > .05$. Hence, one concludes that there were no meaningful differences in the mean ranks of the CAT Composite variable among the four ethnic groups. This finding provides support to the notion that the participant's ethnic background had no appreciable impact on the subject's perception of his or her healthcare provider's communication abilities.

Since the Kruskal-Wallis test yielded a non-significant result, there was no need to run post-hoc tests (i.e., Mann-Whitney tests for each possible pair of ethnicity groups) in order to find where the differences among the ethnic groups lie.

Figure 6

*Post Hoc G*Power Analysis for Ethnicity Group Kruskal-Wallis Test*

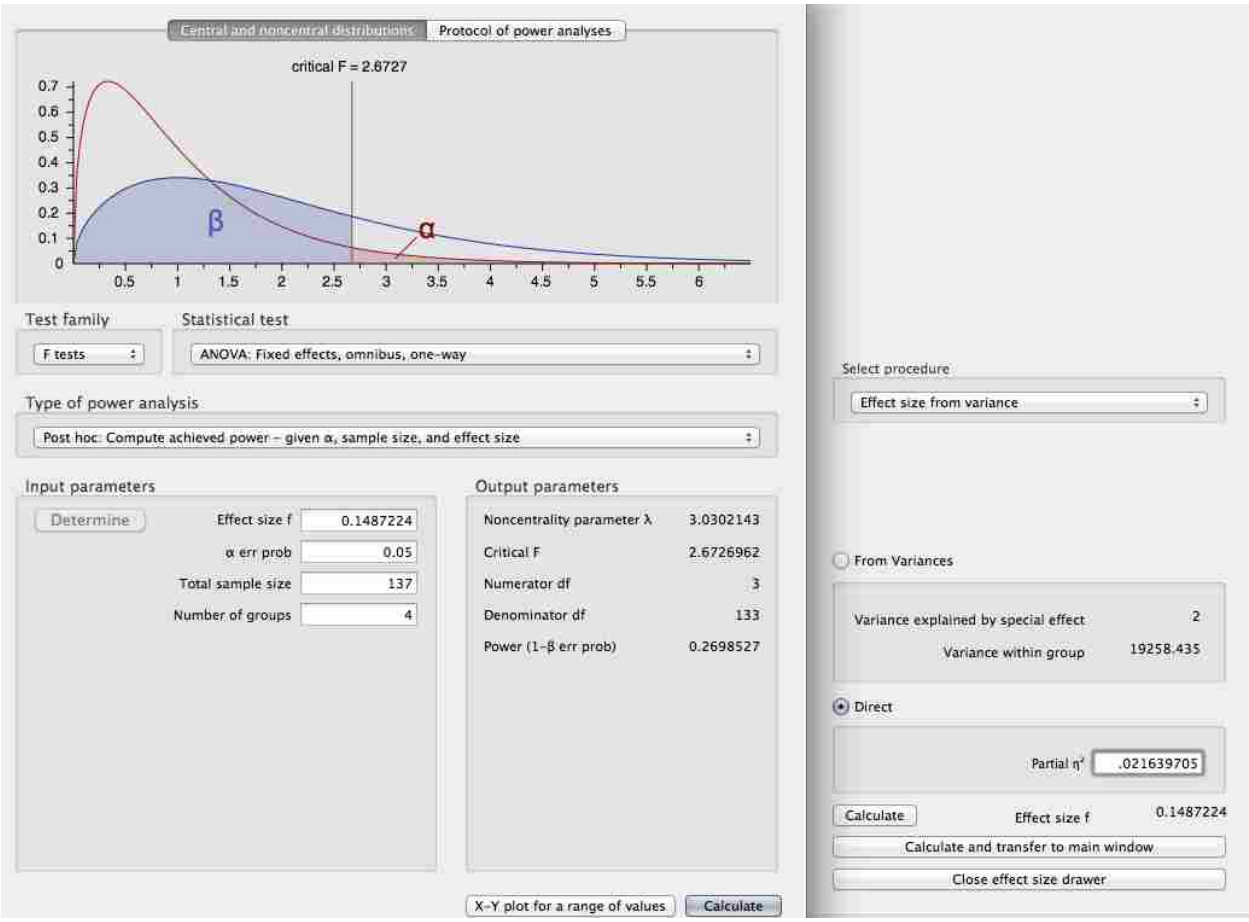


Figure 6 displays the post hoc G*Power results for this run of the Kruskal-Wallis test. The achieved power of this test was 1 – β = .27 which is far below the recommended power level of .80 for statistical analyses in the health sciences. The G*Power output also shows that the effect size for the Kruskal-Wallis test was η^2 = .02 which is considered a small effect. As a point of information, this effect size was obtained by dividing the Kruskal-Wallis χ^2 statistic by the total sample size less one – i.e., η^2 = 2.94/ (137 – 1) = .02.

Education. In order to assess whether there were differences in the mean CAT Composite scores among participants with different levels of education, a Kruskal-

Wallis test utilizing education as the grouping variable was run. Recall that Table 14 showed that the following three educational level groups each contained two or fewer participants: nursery school to 8th grade, doctorate degree, and professional degree. To increase the credibility of this analysis, each of these groups was combined with an appropriate more populous group. The nursery school to 8th grade group was combined with the some high school, no diploma group to create a new group entitled no high school diploma. On the other end of the spectrum, both the doctorate degree and professional degree groups were combined with the master's degree group to create a new group known as advanced degree. Hence, the ten original educational level groups appearing in the Demographic Survey were reduced to seven more credibly sized groups for purposes of running statistical analyses.

Before running the Kruskal-Wallis on the education grouping variable, the following assumptions of this test were examined.

- The samples drawn from the seven education groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the seven educational level groups are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given previously to conclude that the resulting samples for each of the educational levels were representative of the types of people who use outpatient

emergency department services at HUMC and hence are comparable to random samples.

- The dependent variable is measured on an ordinal, interval, or ratio level. As previously explained, the CAT Composite score was considered to be an ordinal level variable. Hence this assumption was met.
- If the population distributions of the dependent variable for the seven educational level groups had the same shape, then the Kruskal-Wallis test could be used to test for the equality of medians between the groups; if the distributions had different shapes then Kruskal-Wallis could only test whether the mean ranks for the seven groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the seven education groups had the same shape before making a definitive statement about what Kruskal-Wallis can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for the seven educational level groups were the same. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each education group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each

group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test.)

Table 21

Kolmogorov-Smirnov Two Sample Test

RescaledEducCATComp			
Comparison Groups[a]		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
No high school diploma	High school graduate	.78	.570
No high school diploma	Some college credit	1.45	.030
No high school diploma	Trade/tech/voc training	1.42	.036
No high school diploma	Associates degree	.75	.632
No high school diploma	Bachelor's degree	1.66	.008
No high school diploma	Advanced degree	1.46	.028
High school graduate	Some college credit	.90	.393

	Trade/tech/voc		
High school graduate	training	.89	.411
High school graduate	Associates degree	.62	.835
High school graduate	Bachelor's degree	1.18	.121
High school graduate	Advanced degree	1.04	.226
	Trade/tech/voc		
Some college credit	training	.87	.437
Some college credit	Associates degree	.85	.468
Some college credit	Bachelor's degree	.55	.927
Some college credit	Advanced degree	.74	.642
Trade/tech/voc			
training	Associates degree	.93	.358
Trade/tech/voc			
training	Bachelor's degree	.69	.731
Trade/tech/voc			
training	Advanced degree	.86	.456
Associates degree	Bachelor's degree	1.22	.101
Associates degree	Advanced degree	1.02	.251
Bachelor's degree	Advanced degree	1.00	.276

[a] Grouping Variable: DQEduc1

Table 21 shows the KS two sample test results for the education groups. Since this is a pairwise test, the results for each of the possible pairings of the seven

educational level groups – 21 in all – are displayed in the table. The fact that the p-values for the pairings of the no high school diploma group with the some college credit, trade/tech/vocational training, bachelor's degree, and advanced degree groups, respectively, were all less than $\alpha = .05$ supports the notion that the shapes of the dependent variable distributions for these pairs of educational level groups are significantly different. On the other hand, the fact that the p-values for the remaining pairs of education groups were greater than $\alpha = .05$ suggests that these pairs of groups had similarly shaped distributions of the dependent variable. Since there was at least one pair of education groups that had significantly different shaped distributions, one cannot conclude that all seven educational level groups had similarly shaped distributions. In light of this, the Kruskal-Wallis test could be used only to test the equality of mean ranks among the schooling groups.

Table 22

Kruskal-Wallis Test

Ranks

	DQEduc1	N	Mean Rank
CATComp	No high school diploma	13	74.77
	High school graduate	13	67.81
	Some college credit, no degree	25	64.46
	Trade/tech/vocational training	9	88.11
	Associates degree	25	58.86
	Bachelor's degree	35	70.56
	Advanced degree	17	73.76
	Total	137	

Test Statistics[a,b]

	CATComp
Chi-Square	4.69
Df	6
Asymp. Sig.	.584

[a] Kruskal Wallis Test

[b] Grouping Variable: DQEduc1

The above table displays the output of the Kruskal-Wallis test performed on the educational level groups. The top portion of the table shows the mean ranks for the four education groups which ranged from a low of 58.86 for the associates degree group to a high of 88.11 for trade/tech/vocational training group. Despite these differences based on the sample data, the Kruskal-Wallis test result was not statistically significant: $\chi^2(6, N = 137) = 4.69$, $p = .584 > .05$. Hence, one concludes that there were no meaningful differences in the mean ranks of the CAT Composite variable among the seven education groups. This finding supports the belief that the participant's level of schooling had no appreciable impact on the subject's perception of his or her healthcare provider's communication abilities.

Since the Kruskal-Wallis test yielded a non-significant result, there was no need to run post-hoc tests (i.e., Mann-Whitney tests for each possible pair of education groups) in order to find where the differences among the education groups lie.

Figure 7

*Post Hoc G*Power Analysis for Educational Level Group Kruskal-Wallis Test*

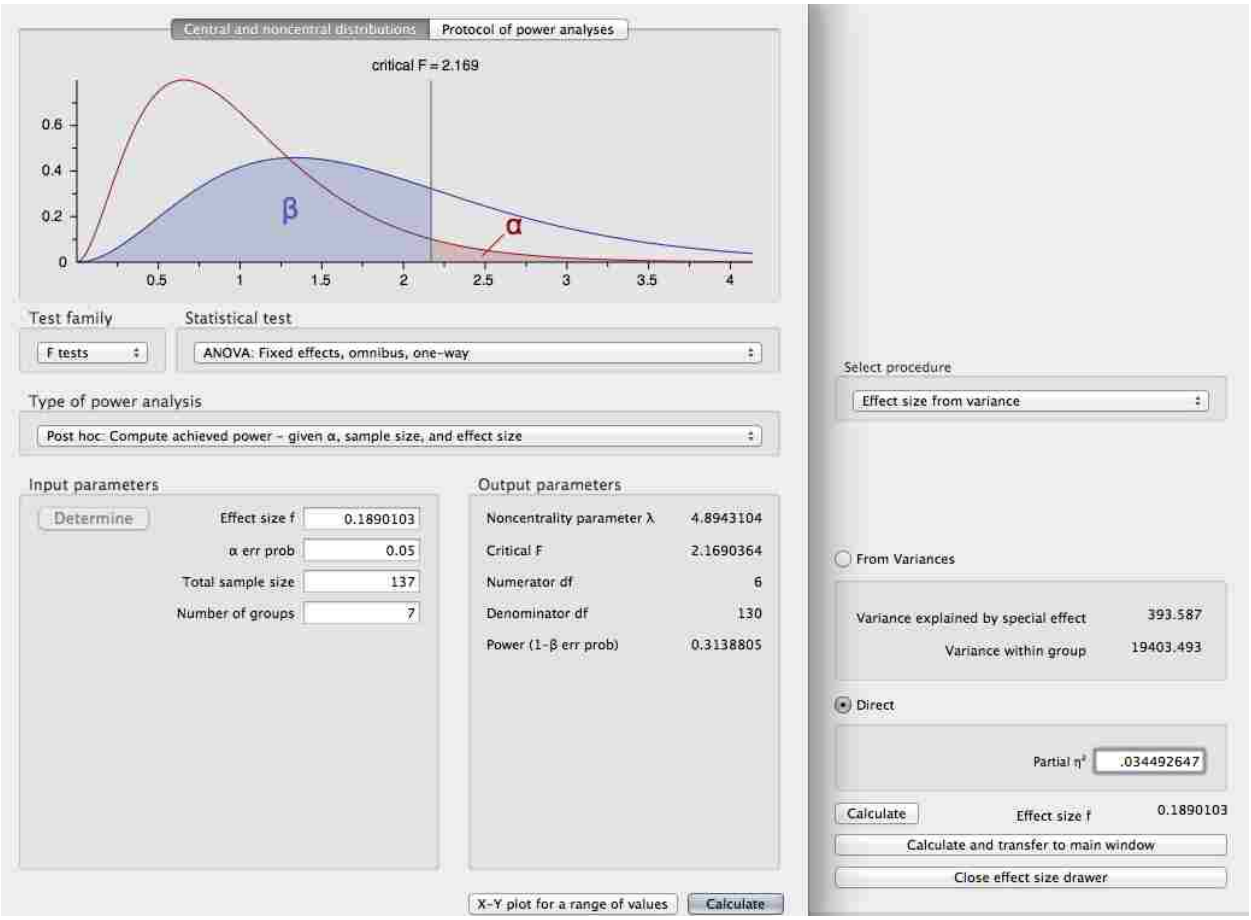


Figure 7 displays the post hoc G*Power results for this run of the Kruskal-Wallis test. The achieved power of this test was 1 – β = .31 which is far below the recommended power level of .80 for statistical analyses in the health sciences. The G*Power output also shows that the effect size for the Kruskal-Wallis test was $\eta^2 = .03$ which is considered a small effect. As a point of information, this effect size was obtained by dividing the Kruskal-Wallis χ^2 statistic by the total sample size less one – i.e., $\eta^2 = 4.69/ (137 – 1) = .03$.

Employment. In order to assess whether there were differences in the mean CAT Composite scores among participants with different employment statuses, a Kruskal-Wallis test utilizing employment status as the grouping variable was run. Since the full-time student employment category contained only one participant and hence was not credible on its own, the category was combined with the unemployed group. Hence, the five original employment status groups appearing in the Demographic Survey were reduced to four groups for purposes of running statistical analyses.

Before running the Kruskal-Wallis, the following assumptions of this test were reviewed.

- The samples drawn from the four employment groups are independent of each other. As explained above, this assumption was met by the design of this study.
- The samples drawn from the four employment status groups are random samples. Even though convenience sampling techniques were used to collect the data for this study, one can use the same argument as given previously to conclude that the resulting samples for each of the employment categories were representative of the types of people who use outpatient emergency department services at HUMC and hence are comparable to random samples.
- The CAT Composite score was considered to be an ordinal level variable. Hence, this assumption was met.

- If the population distributions of the dependent variable for the four employment status groups had the same shape, then the Kruskal-Wallis test could be used to test for the equality of medians between the groups; if the distributions had different shapes then Kruskal-Wallis could only test whether the mean ranks for the four groups were the same. In light of this, the researcher first had to determine whether the population distributions of the CAT Composite scores for the four employment groups had the same shape before making a definitive statement about what Kruskal-Wallis can be used to test.

The Kolgomorov-Smirnov (KS) two sample test was utilized to determine whether the shapes of the distributions of the dependent variable for the four employment status categories were the same. Since the KS two sample test is designed to assess whether two distributions are identical to each other, in order to use this test to determine whether only the shapes of the distributions are the same one must first rescale the data for the two groups being compared so that they have the same mean. To accomplish this, rescaled data sets for each employment group were calculated by subtracting the respective group's CAT Composite mean score from each participant's CAT Composite score. The rescaled data set for each group had a mean of zero but the same shape as the original dependent variable distribution. These rescaled data sets were used in the running of the KS two sample test. (Please note that the rescaled data sets were not used for any other purpose other than running the K-S two sample test.)

Table 23

Kolmogorov-Smirnov Two Sample Test

RescaledEmployCATComp	Comparison Groups[a]		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	Employed	Full-time homemaker	.90	.390
	Employed	Retired	.89	.409
	Employed	Unemployed	.82	.519
	Full-time homemaker	Retired	.95	.326
	Full-time homemaker	Unemployed	.82	.518
	Retired	Unemployed	.70	.708

[a] Grouping Variable: DQEmploy1

Table 23 shows the KS two sample test results for the employment status groups. Since this is a pairwise test, the results for each of the possible pairings of the four employment groups – six in all – are displayed in the table. The fact that the p-values for all six possible pairings were greater than $\alpha = .05$ supports the notion that the shapes of the dependent variable distributions for each of the four employment categories were not significantly different from each other. In

light of this result, the Kruskal-Wallis test was used to test the equality of median CAT Composite scores among the employment groups.

Table 24

Kruskal-Wallis Test

Ranks

	DQEmploy1	N	Mean Rank
CATComp	Employed	94	68.27
	Full-time homemaker	12	81.25
	Retired	19	66.63
	Unemployed	12	66.25
	Total	137	

Test Statisticsa,[b]

	CATComp
Chi-Square	1.32
df	3
Asymp. Sig.	.725

[a] Kruskal Wallis Test

[b] Grouping Variable: DQEmploy1

The above table displays the output of the Kruskal-Wallis test performed on the employment status groups. The top portion of the table shows the mean ranks for the four employment groups. With the exception of the full-time homemaker group

(whose mean rank was several points higher than those of the other groups), the mean ranks for the remaining groups were fairly close to each other. Even with this apparently large difference, the result of the Kruskal-Wallis test was not significant: $\chi^2(3, N = 137) = 1.32$, $p = .725 > .05$. Hence, one concludes that there were no meaningful differences in the median CAT Composite scores among the four employment groups. Based on this finding, one can conclude that the participant's employment situation had no appreciable impact on the subject's perception of his or her healthcare provider's communication abilities.

Since the Kruskal-Wallis test yielded a non-significant result, there was no need to run post-hoc tests (i.e., Mann-Whitney tests for each possible pair of employment groups) in order to find where the differences among the employment groups lie.

Figure 8

*Post Hoc G*Power Analysis for Employment Status Group Kruskal-Wallis Test*

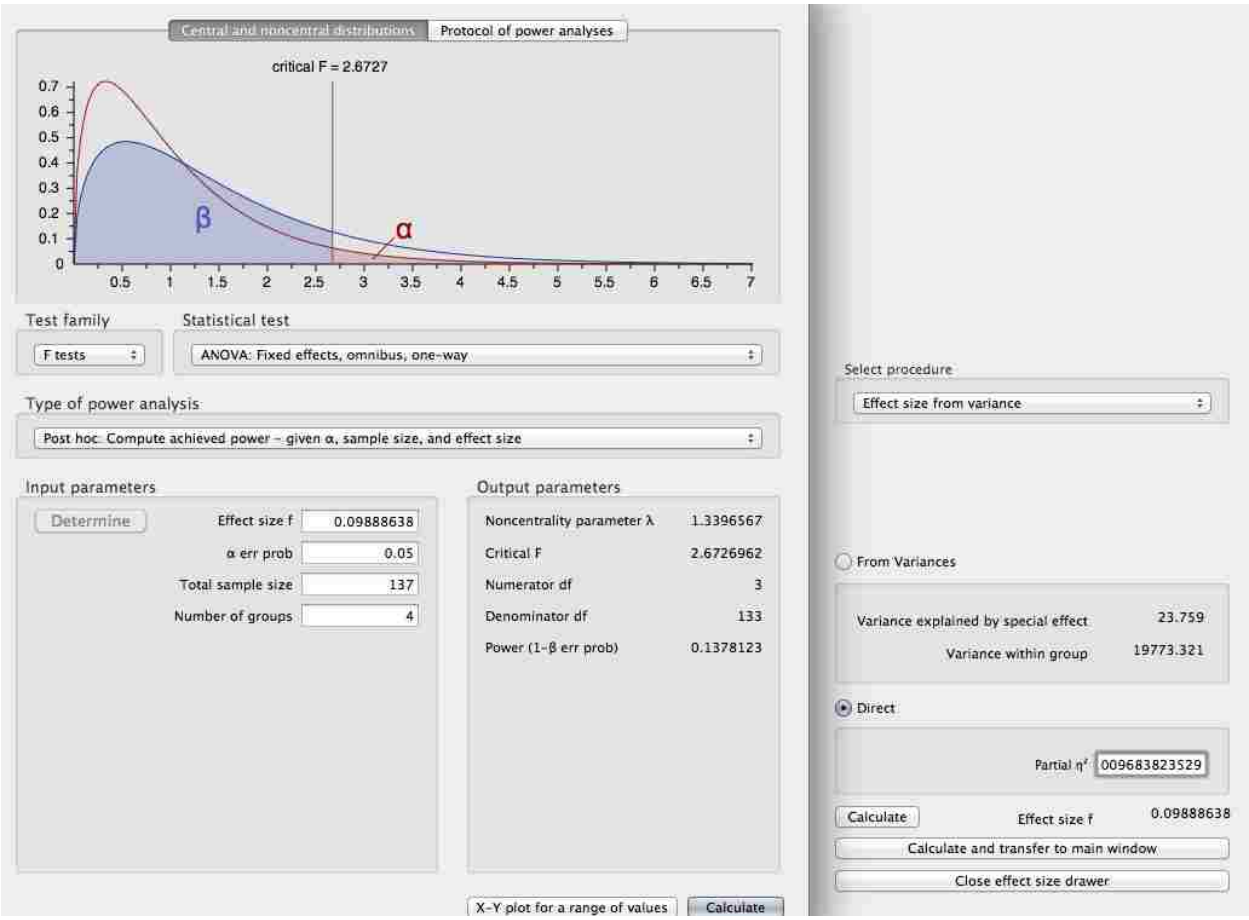


Figure 8 displays the post hoc G*Power results for this run of the Kruskal-Wallis test. The achieved power of this test was 1 – β = .14 which is far below the recommended power level of .80 for statistical analyses in the health sciences. The G*Power output also shows that the effect size for the Kruskal-Wallis test was η^2 = .01 which is considered a small effect. As a point of information, this effect size was obtained by dividing the Kruskal-Wallis χ^2 statistic by the total sample size less one – i.e., η^2 = 1.32/ (137 – 1) = .01.

Summary of Findings

The goal of this chapter was to discuss the various descriptive and inferential statistical tests, which were conducted in order to answer the four research questions posed earlier in this dissertation. In addition, the chapter examined the impacts that patients' demographic characteristics have on their perceptions of their healthcare providers' communication skills.

Research Question #1 dealt with describing the distribution of CAT Composite scores for physician healthcare providers. The fact that both the mean and median CAT Composite scores for this segment of the sample were very high (*M* = 65.13 and *Mdn* = 67 on a 14-70 scale) showed that patients were extremely satisfied with their doctors' communication skills. The distribution of CAT Composite scores was also highly left skewed with a majority of patients (74%) rating their physician providers in the excellent range (63-70), followed by 24% in the very good range (49-62), and very few in the three lower ranges. This skewed distribution of scores, with the large majority of patients being extremely satisfied, was consistent among the fourteen questions comprising the CAT survey.

To answer Research Question #2, a similar analysis was done to describe the distribution of CAT Composite scores for midlevel providers. While both the mean and median scores for this segment (*M* = 54.34 and *Mdn* = 56) suggested that patients were quite satisfied with their midlevel providers' communication skills, their degree of satisfaction was not quite as high as those who dealt with physicians. While the distribution of CAT Composite scores for the midlevel

providers also had a notable left skew, the distribution of scores was more dispersed than that for physicians with 39% of patients giving their midlevel providers an excellent rating (63-70), 28% giving a very good rating (49-62), 24% assigning a good rating (35-48), and the remaining 9% giving a fair or poor rating to their midlevel providers. This distribution of results for the midlevel providers segment was reasonably consistent among the fourteen questions comprising the CAT survey.

Research Question #3 asked whether patients who dealt with midlevels had a better perception of their providers' overall communication skills than those who dealt with physicians. Given that the researcher viewed the dependent variable – the CAT Composite score – as an ordinal level variable, a non-parametric Mann-Whitney U test was conducted to answer this one-tailed research question. The results of this test revealed that the premise of Research Question #3 does not hold as evidenced by the fact that the mean rank of the physicians' CAT Composite scores were actually higher than the mean rank of the midlevel providers' scores. The differences between the physicians' and the midlevel providers' scores were large enough to show that patients who were treated by physicians had a significantly better perception of their providers' communication abilities than those who worked with midlevels.

Research Question #4 found that midlevel providers have better patient communication skills in each of the fourteen areas addressed on the CAT survey than their physician counterparts do. Since each item on the CAT survey involved a Likert-type scale and hence was considered to be an ordinal variable,

the researcher utilized non-parametric Mann-Whitney U tests to answer this question for each of the items appearing on the CAT survey. These outcomes of these tests did not support the premise of the research question and in fact showed that physicians significantly outperformed their midlevel provider counterparts in each of the fourteen communication areas included on the CAT survey.

While not considered as a formal research question, the final component of this study focused on whether demographics have an influence on patients' overall perceptions of their healthcare providers' communication skills as measured by the CAT composite score. In analyzing this issue, no distinction was made between the provider types. The specific demographics examined included the age, gender, ethnicity, educational level, and employment status of the patient. For each demographic, a non-parametric test (either a Mann-Whitney U test or a Kruskal-Wallis test) was run in order to see whether there were significant differences in the patients' views of the providers' communication skills between the various categories comprising that particular demographic. None of the statistical tests conducted produced significant results, indicating that all five demographics examined had no meaningful influence on the patient's assessment of his or her healthcare provider's communication abilities.

In the final chapter, the study findings will be considered in respect to their meaning, relation to theory, practical implications, limitations, and future research directions.

CHAPTER V

DISCUSSION AND CONCLUSION

General Discussion of Study Findings

The purpose of this dissertation was threefold. First, it was to understand the patient's perceptions of the medical doctor-patient communication encounter. Second, it was to understand the patient's perceptions of the mid-level provider-patient communication encounter. Third, it was to identify the patients' perceptions of differences between communications that occur by medical doctors and midlevels when encountering patients.

This study addressed several gaps in the literature by exploring a tightly defined homogenous population, which was surveyed in the most neutral environment as possible, in which the primary focus was determine how the patient assessed his or her medical provider's communication abilities, in the "treat and release" area of the emergency department. Understanding how a patient feels about provider communication is essential in today's fast paced healthcare environment, mainly because there are multiple elements that impact this interaction. The encounter between a patient and physician involves multiple features that make the communication complex. These include: patient centered care, physician gender, level of patient participation, amount of trust between the physician and patient, the physicians cultural competence, amount of psychosocial communication, and understanding nonverbal communication. Therefore patient provider communication has many different intricacies that must be taken in to consideration.

The survey package utilized in this study was designed to minimize certain anomalies that create limitations with other survey-based studies. Questions on the Communication Assessment Tool (CAT) were clearly and concisely worded, and each of the items on the CAT was scored using the same five-point Likert scale. The CAT was also fairly short in length (14 items), which lessen the fatigue factor in completing the survey. Likewise, the length of the Demographic Questionnaire was kept to a reasonable length of five questions. On this questionnaire, an effort was made to have enough categories for the each demographic to distinguish between the participants but not too many categories which could result in potential ambiguities. By designing the survey package in this fashion, there were no incomplete or incorrectly completed surveys that had to be discarded from the study. The absence of these issues tends to increase the credibility of the study, since removing participant data due to survey incompleteness or response errors could introduce a hidden bias in the results.

Discussion of the Study Results

The results of this study were interesting because many of the outcomes were contrary to what the researcher was initially expecting. Based on the literature, the researcher hypothesized that the midlevel group, which included nurse practitioners and physician's assistants, would have superior communication abilities in comparison to the physician group. However, in this study the opposite occurred. The patients' perceived the physicians to have better communication, as measured by the Communication Assessment Tool, than the midlevel group. The researcher believes there are five reasons as to

why this result was attained. They include: the difference in prompt care patients and inpatients, years and type of training of the practitioner, type of hospital, the triage environment, and patient factors.

The National Perspective

Prior to explaining the five reasons the results are unique, it is important to understand the national overview of hospitals. That way, it will be easier to understand why Hackensack University Medical Center (HUMC) is distinctive, which is where this study took place. There are 5,725 hospitals in the United States and only 266 of these have over 500 beds. Just under one fifth of the 5,725 hospitals, 1,100 to be exact, are teaching hospitals.

When looking at healthcare practitioners nationally, there is an uneven balance between physicians and midlevels, since there are many more physicians. According to Larkin (2010), there are 110,000 nurse practitioners and physicians assistants in the US workforce and 970,000 medical doctors. The age of the practitioners also vary greatly. Physicians tend to be older than the midlevel counterparts. Hawkins (2012) explains that 47% of all medical doctors are 50 and older and of those 22% are 60 and older. The average age of nurse practitioners is 48 and the average age of physician's assistants is 30 (USDHHS, 2012). Finally, only 7% of US hospitals have received Magnet recognition status.

Now, it is important to see how HUMC compares. HUMC has 900 beds and is among the 50 highest grossing hospitals in the country, HUMC places #12 ($5.1 billion). It is the fourth largest hospital in the US, based on admissions. The physician presence in the emergency department is greater at HUMC and the

hospital has had Magnet recognition since 1995. The major similarity HUMC has with most of the other institutions in the country is the age of the practitioners. A majority of the physicians are older than their midlevel counterparts, nationwide.

The triage environment of the hospital separates patients according to the severity of their medical problem. According to Morgan et al (2012) patients of PA's and NP's are typically less complex than those of physicians. That may indicate that patient severity may change the amount of communication being done. If someone has multiple issues or comorbidities the physician, for instance, may spend more time with them, which typically means more communication to figure out the problem. That may make the patient think that the physician is a better communicator. If a patient has a minor laceration and the issue is evident then a midlevel may not need to ask too many questions. Therefore, a patient may think the midlevel is a poor communicator. The time spent with the patient impacts his or her perception of provider communication.

HUMC Uniqueness

Besides HUMC being different from the vast majority of hospitals in the nation, it is important to understand the hospitals internal functions and complexities, to really understand the results of this study. The study was conducted in the prompt care or "treat and release" area of the emergency department. The patients here are different from inpatients because they have a very short stay in the hospital, mostly lasting only a few hours. During an inpatient stay, the patient is likely to spend more time with NP's and PA's versus a physician because they are rounding on patient floors more often than medical

doctors. Physicians typically round once, during the morning. Throughout the rest of the day, the midlevels are more available to provide care. The prompt care area of the emergency department is very busy. The providers see 130-150 patients daily. The patients that are seen in this area are not typically admitted to the hospital and therefore are released within a few hours. Therefore, the level of interaction that a patient has with physicians and midlevels differs according to the area of the hospital.

Furthermore, ED doctors primarily only deal with the emergency department, especially at HUMC. They are practicing there and they are also teaching residents there. Therefore their level of familiarity and presence is higher in the ED versus the midlevel team. Midlevels move around to other areas of the hospital, unless they are hired by an ED doctor to work with them. Therefore some of the midlevels may not deal with the daily complexities of the ED, like the physicians.

Another contributing factor that differentiates the physicians from the midlevels is the residency program at HUMC.

Each block or rotation consists of four weeks. Vacation time is four weeks per year.

Sample schedule:

Year - 1												
1	2	3	4	5	6	7	8	9	10	11	12	13
Orientation	Anesthesia (50%) Ortho (50%)	US (50%) ED (50%)	ED	ED (75%) Vacation (25%)	MICU	Peds ED	ED (50%) Vacation (50%)	Trauma	ED	OB	ED (75%) Vacation (25%)	ED

Year - 2												
1	2	3	4	5	6	7	8	9	10	11	12	13
ED	ED (50%) Vacation (50%)	Peds ED	Tox @ NYC Poison Control	EMS (50%) ED (50%)	PICU	Vacation (25%) ED (75%)	ED	Trauma	ED (75%) Vacation (25%)	ED	SICU	ED

Year - 3												
1	2	3	4	5	6	7	8	9	10	11	12	13
Peds ED	ED	ED	Community ED @ PVH	Trauma	MICU	Vacation (25%) ED (75%)	US (50%) ED (50%)	ED	Vacation (25%) ED (75%)	Elective	ED (50%) Research & Admin (50%)	Vacation (50%) ED (50%)

As one can see in the above schedule, the HUMC residency curriculum emphasizes direct emergency department time. Residents spend seventy-five percent of their time in the emergency department, which is a high number. HUMC doctors have extensive bedside training in the emergency department versus physicians in the other areas of the hospital because they have a larger number of residents to train. That means that ED physicians, who are the faculty, are spending a lot more time training these particular individuals, spending even more time communicating with them and patients in the ED. That effect is likely to carry over into the prompt care area of the ED as well.

Impact of Patient Preconceptions

Finally, patients may have certain opinions about one provider versus another. Although it is uncommon for a patient to know whether the practitioner treating them in the prompt care area is a physician, physicians assistant, or

nurse practitioner, in some circumstances they may have taken notice of this. Patients that assume that a physician is better qualified than a midlevel may rate them better. They may not know how qualified a NP or PA actually is. According to Shum et al (2000) despite allegations of equal or better satisfaction with PAs and/or NPs than with physicians, patient studies comparing NPs and physicians reveal higher preferences for physicians than for nurses/NPs. According to Larkin (2010) 79.5% of patients fully expect to see a physician regardless of acuity or potential for cost savings by seeing another provider. Furthermore, patients are more willing to see residents than non-physicians. Also, patient willingness to use NPs and PAs for minor injuries or illness was more than 50%, but this changed with the moderate and major injury scenarios, with willingness ranging from 15% to 35%.

Theoretical Considerations, Bandura's Theory

It is important to also look back at Bandura's theory, since it is a significant underpinning that explains the findings. Bandura supports the notion that learning can occur through observation. He argues that human behavior is impacted by personal, environmental, and behavioral influences. This theory explains how effective communication can influence the midlevel providers via three different areas: the hospital environment, personal reasons to adapt certain skills, and the environment the practitioner is in.

The first is the environment: HUMC has a teaching orientation, where healthcare providers can acquire effective communication skills. An example would be a nurse practitioner spending more time at the bedside with an ED

doctor, observing the doctors interactions with the patients. As the nurse practitioner (NP) observes the ED doctor effectively communicating with patients, the NP learns to communicate more effectively.

The second is personal: Further educating oneself about communication by seeking a mentor or more training. At HUMC the faculty is on-site daily, so coaching concerning communication practices is readily accessible. For instance, if a nurse practitioner wanted to improve his/her communication skills then he/she may find a mentor within HUMC to help in learning those specific skills.

The third is behavioral: In this situation the practitioners can mimic, by learning from the best communicators, the ED doctors. They can change their behavior by acquiring communication skills from others. A 2012 longitudinal study looking at “Medical student self efficacy with family centered care during bedside rounds” concluded that observing role models and having mastery experiences foster students’ self- efficacy with Family Centered Care (FCC) during rounds (Young et al, 2012).

Practice Implications

There are several recommendations that can be made to improve provider communication. The first would be to create an organizational culture where communication is a top priority. It is important to emphasize the importance of effective communication at all levels of organizations. The second would be to provide a benchmark or standard. An example is having something similar to HCAHPS, which is a standardized survey instrument and data collection methodology for measuring patients’ perspective on hospital care (NQF, 1995). It

is important to know how well each department is performing. Next, the key communication issues should be highlighted and brought to everyone's attention, so that they can be improved upon. The providers can also learn communication through training and mentoring. This is something that can easily be done since HUMC is a teaching hospital. There are many ways to connect tenured physicians and midlevels for the purpose of mentoring or training. Finally, it is vital to drive accountability and reward performance. If a healthcare provider is doing well then he or she should be recognized. On the other hand, if a provider is not doing concerning effective communication in the area of communication and does not make an effort to change, then he/she needs to be made of aware of their deficiencies. Taking all of these recommendations into consideration would help address communication areas that are lacking.

One additional consideration needs to be taken into account regarding the communication skills of midlevel providers. While this study revealed that as a whole midlevel providers' communication skills were adequate, they significantly lagged behind those of physicians. One could argue that this result was due to the unique characteristics of the treat and release area of the ED at HUMC and hence may not apply to other departments within HUMC or to other hospitals. Regardless of whether or not this outcome is applicable to a particular department and/or hospital, it is important that all hospitals conduct more training programs to improve the patient communication skills of physician's assistants and nurse practitioners.

Study Limitations

The study had several limitations. First the study included only one hospital and within that hospital only the treat and release patients from the ED. Future studies should include more hospitals, more departments, and both inpatient and outpatient clients. The treat and release area only allows an encounter with one provider and not multiple providers. The results may be different if the patient saw multiple practitioners. Second, this study did not include other healthcare practitioners like nurses and hospitalists. Additionally, only 17 of 137 study participants had an encounter with a physician's assistant; this was an insufficient volume of data for the researcher to analyze the physician's assistant segment separately from the nurse practitioner group. Third, there was no follow-up with the study patients. Any subsequent changes in the patients' perceptions of their healthcare providers communication skills----perhaps seeing how they felt after following their providers' advice, a few days out from leaving the hospital was unavailable in this study. Moreover, the sample of participants used in this study was a convenience sample, so the results are not generalizable. However, the researcher did make an effort to collect data at different days and times during the week in order to obtain a representative sample of treat and release patients in the ED of HUMC. Finally, the years that the practitioners were in practice were not collected. For example, it would have been interesting to compare someone who had thirty years of practice with someone who only had three years of practice.

Future Research

This study was undertaken because there was limited literature that compared how patients perceived their physician providers and midlevel providers, in the emergency room. A major finding in this study was that the physician group performed very well in the patient communication area, even higher than the midlevel group, which is counterintuitive to studies in the past. Further research may expand the study to include more hospitals—This would in turn increase the sample size and make the study results even more credible. Also, one could look at hospitals in different geographic areas (e.g. a rural area versus a major city) to see if there is a difference.

The group of providers can be expanded to include other practitioners, such as hospitalists or nurses. Furthermore, one could conduct a longitudinal study, instead of a cross-sectional study, so that a longer period of time could be analyzed in different departments. Additional research might include an intervention study or even a mixed methods study to find out what the patients were thinking during their health care experience. Other research can explore teaching versus non-teaching hospitals to see if there is a difference in patients' perceptions of effective communication with providers. Finally, spending more time in the emergency department, collecting more data could be helpful.

Any data collection possible expansions of this study to include more provider types, more departments, and/or more hospitals could produce results, which are different from those obtained from this analysis. One might find that physicians' overall communication skills do not surpass those of other provider types.

Perhaps physicians will score better than other healthcare providers in certain aspects of communication but not in others. An expanded study might also reveal that certain demographic groups have different perceptions of their healthcare providers' communication skills than other demographic groups do. In particular, the larger sample size utilized in an expanded study may result in enough observations in certain demographic categories to detect statistically significant differences. Even though an effort was made in this study to combine demographic categories with small numbers of participants with other more credible categories, there were still several categories used in the various demographic statistical analyses that had fewer than 20 observations. Due to these small volumes of data, true differences may exist for these groups, which were not detected by the statistical tests.

A study that included more participants would also allow one to consider more complex research questions. As an example, a researcher may want to run a two-way analysis of variance (ANOVA) for a given demographic (such as gender) using both the categories for that particular demographic and the provider type as grouping variables. This type of analysis would allow the researcher to determine whether there is a significant interaction between the demographic and the provider type on the CAT composite score. For the gender example, an interaction would occur if males felt that physicians were better communicators than the midlevel providers were (or vice versa), while females felt that the opposite was true. Running two-way ANOVA analyses requires a sufficiently large sample size, since for a two-way ANOVA to be meaningful each cell (i.e.,

each demographic category/ provider type combination) must have a credible number of observations.

Dissertation Significance and Conclusion

Communication is still something that healthcare providers struggle with. As mentioned earlier, The Joint Commission on Accreditation of Healthcare Organizations describes communication error as the cause of 60% to 70% of avoidable hospital deaths (Murphy, 2010). Many different factors can help or hinder this very important interaction. It is important to recognize when there is a communication issue between a patient and a physician, and the problem should be remedied immediately.

Beyond saving lives, cutting healthcare costs has become a very important subject matter in the US. That is because the cost of healthcare is at an all-time high. Today there are also items like “pay for performance” which makes having highly trained healthcare providers, who can communicate thoroughly with their patients, that much more important. In fact, if a patient returns to the hospital, with the same issue, within a certain number of days, the institution may even get penalized. Readmissions cost Medicare millions of dollars every year, further burdening our system, since most of these are avoidable. Readmissions within the 30-day period cost Medicare $26 million annually and $17 million of that amount comes from potentially avoidable readmissions.

Furthermore, the overall healthcare environment is changing– there is a shortage in primary care physicians today. According to the US Department of Health and Human Services (2015)—if nothing changes, the Primary Care

Physician shortage by 2020 will exceed 20,000 practitioners. The hiring of more midlevel providers is inevitable in the years to come.

The patient population is only increasing because of population growth, aging baby boomers, and increased healthcare accessibility due to the Affordable Care Act. The reason this is of importance is because patient-provider communication is becoming that much more essential today. Healthcare providers have a very important duty, a duty that begins and ends with good communication.

References

Anderson, E.B. (2002). Patient-centeredness: A new approach. *Nephrology News and Issues*, 16 (12), 80-82.

Armitage, C. J. (2009). Is there utility in the transtheoretical model?. British Journal Of Health Psychology, 14(2), 195-210.

Auerbach, S. M. (2009). The Impact on patient health outcomes of interventions targeting the patient-physician relationship. *The Patient*, *2*(2), 77-84.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bell, C. M., Auerbach, A. D., & Gonzales, D. V. (2008). Association of Communication Between Hospital-based Physicians and Primary Care Providers with Patient Outcomes. *Journal of General Internal Medicine*, *23*(3), 381-6.

Bertakis, K., Franks, P., & Epstein, R. (2009). Patient centered communication in primary care: physician and patient gender and gender concordance. *Journal of Women's Health*, 18 (4), 539-545.

Blackstone, S. W., David R. B., and Kathryn M. Y. (2015) *Patient-Provider Communication*. San Diego, CA: Plural Publishing, Inc.

Budzi, D., Laurie, S., Singh, K., Hooker, R. (2010). Veterans' perceptions of care by nurse practitioners, physicians assistants, and physicians: A comparison from satisfaction surveys. *Journal of the American Academy of Nurse Practitioners, 170-176.*

Cegala, D., & Post, D. (2009). The impact of patients' participation on physicians' patient centered communication. *Patient Education & Counseling*, 77(2), 202-208.

Centers for Medicare & Medicaid Services, Baltimore, MD. *6/10/15.*

Charlton, C. R. (2008). Nurse practitioners' communication styles and their impact on patient outcomes: An integrated literature review. *Journal of the American Academy of Nurse Practitioners*, *20*(7), 382-388.

Chou, W. S. (2011). Interdisciplinary research on patient-provider communication: A cross-method comparison. *Communication & Medicine*, *8*(1), 29-40.

Chronic Heart Failure; Study Reveals Barriers to Effective Doctor-Patient Communication. (2000). *Biotech Week*, *3*(3), 1-3.

Creswick, N., Westbrook, J.I., Braithwaite, J. *Understanding Communication Networks in the Emergency Department*. BioMed Central.

DiMatteo, R. M. (1980). Predicting Patient Satisfaction from Physicians' Nonverbal Communication Skills. *Medical Care*, *18*(4), 376-387.

Feldman-Stewart, D., & Brundage, M. (2009). A conceptual framework for patient provider communication: a tool in the PRO research toolbox. *Quality of Life Research*, 18(1), 109-114.

Frankel, R. M. (1999). Getting the Most out of the Clinical Encounter: The Four Habits Model. *The Permanente Journal*, *3*(3), 79-88.

Golin CE, Thorpe C, DiMatteo MR. (1997). Accessing the Patient's World:

Patient Physician Communication about Psychosocial Issues, in Patient Advocacy for Health Care Quality: Strategies for Achieving Patient-Centered Care. ed. Earp JE, French E, Gilkey, M. 185-213, Jones & Bartlett, Inc. Pub.

Griffith, C. H., Wilson, J. F., Langer, S. and Haist, S. A. (2003), House Staff NonverbalCommunication Skills and Standardized Patient Satisfaction. Journal of General Internal Medicine, 18:170–174.

Hawkins, M. (2012). A survey of America's physicians: practice patterns and perspectives. Retrieved from http://www.physiciansfoundation.org/uploads/default/Physicians_Foundation_2012_Binnial_Survey.pdf

Hilton, L. (2006). Communication is the cornerstone of compliance, outcomes, no lawsuits. *Dermatology Times*, *27*(11), 28-23,42.

Johnson, G. L., & Arkalgud, R. (2000). Patient-physician relationships in the Information age. *Marketing Health Services*, 20, 20-27.

Larkin, G. L., & Hooker, R. S. (2010). Patient Willingness to Be Seen by Physician Assistants, Nurse Practitioners, and Residents in the Emergency Department: Does the Presumption of Assent Have an Empirical Basis? *American Journal of Bioethics*.

Lie, D. A. (2010). Does cultural competency training of health professionals improve patient outcomes? A systematic review and proposed algorithm for future research. *Journal of General Internal Medicine*, *26*(3), 317-25.

Manning, M. L. (2006). Improving clinical outcomes through structured conversation. *Nursing Economics*, *25*(5), 268-271.

Mead, N., Bower, P., & Hann, M. (2002). The impact of general practioners' patient centeredness on patients' post consultation satisfaction and enablement. *Social Science and Medicine*, 5, 283-299.

Michie, S., Miles, J., & Weinman, J., (2003). Patient-centeredness in chronic illness: what is it and does it matter? *Patient Education and Counseling*, 51, 197-206.

Morgan, A.P, Abbott, D.H., McNeil, R., Fisher, D. (2012) Characteristics of primary care office visits to nurse practitioners, physician assistants and physicians in United States Veterans Health Administration facilities, 2005 to 2010: a retrospective study*. Human Resources for Health*, 10:42

Murphy, J. G., & Dunn, W. F. (2010). Medical errors and poor communication. *Journal of the American College of Chest Physicians*, *138*, 1292-1293.

Ommen, O., Thuem, S., Pfaff, H., & Janssen, C. (2012). The relationship between social support, shared decision-making, and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire. *International Journal of Public Health*, *56*, 319-327.

Paez, K. A., Allen, J. K., Beach, M. C., Carson, K. A., & Cooper, L. A. (2009). Physician cultural competence and patient ratings of the patient-physician relationship. *Journal of General Internal Medicine*, *24*(4), 495-8.

Pearson, S. D., & Raeke, L. H. (2009). Patients' trust in physicians: many theories, few measures, and little data. *Journal of General Internal Medicine*, *15*, 509-513.

Prochaska, J. O., Wright, J. A., & Velicer, W. F. (2008). Evaluating Theories of Health Behavior Change: A Hierarchy of Criteria Applied to the Transtheoretical Model. *Applied Psychology*, *57*(4), 561-588.

Roter, D.L., Frankel, R.M., Hall, J.A., & Sluyter D. (2006). The expression of emotions through nonverbal behavior in medical visits: Mechanisms and outcomes. *Journal of Internal Medicine,* 21:S28-34.

Manning, M. L. (2006). Improving clinical outcomes through structured conversation. *Nursing Economics*, *25*(5), 268-271.

Mead, N., Bower, P., & Hann, M. (2002). The impact of general practioners' patient centeredness on patients' post consultation satisfaction and enablement. *Social Science and Medicine*, 5, 283-299.

Michie, S., Miles, J., & Weinman, J., (2003). Patient-centeredness in chronic illness: what is it and does it matter? *Patient Education and Counseling*, 51, 197-206.

Morgan, A.P, Abbott, D.H., McNeil, R., Fisher, D. (2012) Characteristics of primary care office visits to nurse practitioners, physician assistants and physician's in United States Veterans Health Administration facilities, 2005 to 2010: a retrospective study*. Human Resources for Health*, 10:42

Murphy, J. G., & Dunn, W. F. (2010). Medical errors and poor communication. *Journal of the American College of Chest Physicians*, *138*, 1292-1293.

Ommen, O., Thuem, S., Pfaff, H., & Janssen, C. (2012). The relationship between social support, shared decision-making, and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire. *International Journal of Public Health*, *56*, 319-327.

Paez, K. A., Allen, J. K., Beach, M. C., Carson, K. A., & Cooper, L. A. (2009). Physician cultural competence and patient ratings of the patient-physician relationship. *Journal of General Internal Medicine*, *24*(4), 495-8.

Pearson, S. D., & Raeke, L. H. (2009). Patients' trust in physicians: many theories, few measures, and little data. *Journal of General Internal Medicine*, *15*, 509-513.

Prochaska, J. O., Wright, J. A., & Velicer, W. F. (2008). Evaluating Theories of Health Behavior Change: A Hierarchy of Criteria Applied to the Transtheoretical Model. *Applied Psychology*, *57*(4), 561-588.

Roter, D.L., Frankel, R.M., Hall, J.A., & Sluyter D. (2006). The expression of emotions through nonverbal behavior in medical visits: Mechanisms and outcomes. *Journal of Internal Medicine,* 21:S28-34.

US Department of Health and Human Services. (2015). Shortage Designation: Health Professional Shortage Areas & Medically Underserved Areas/Populations. Retrieved from http://www.hrsa.gov/shortage/.

Appendices

A. Communication Assessment Tool (CAT)

A-1. Consent to Use Communication Assessment Tool (CAT)

B. Demographic Questionnaire

C. Hackensack University Permission Letter

D-1. Researcher Checklist

D-2. Inclusion, Exclusion Criteria

D-3. Data Collection Steps

D-4. Researcher Script

E. Healthcare Provider Picture Card

F. Letter of Solicitation

G-1d. Researcher NIH Training Certificate

G-2a. Researcher HUMC Training Certificate

Appendix A

Communication Assessment Tool (CAT)

Form R

Communication Assessment Tool

Communication with patients is a very important part of quality medical care. We would like to know how you feel about the way your resident physician communicated with you. Your answers are completely confidential, so please be as open and honest as you can. Thank you very much.

1	2	3	4	5
poor	fair	good	very good	excellent

Please use this scale to rate the resident physician's communication with you. Circle your answer for each item below.

The doctor	*poor*				*excellent*
1. Greeted me in a way that made me feel comfortable	1	2	3	4	5
2. Treated me with respect	1	2	3	4	5
3. Showed interest in my ideas about my health	1	2	3	4	5
4. Understood my main health concerns	1	2	3	4	5
5. Paid attention to me (looked at me, listened carefully)	1	2	3	4	5
6. Let me talk without interruptions	1	2	3	4	5
7. Gave me as much information as I wanted	1	2	3	4	5
8. Talked in terms I could understand	1	2	3	4	5
9. Checked to be sure I understood everything	1	2	3	4	5
10. Encouraged me to ask questions	1	2	3	4	5
11. Involved me in decisions as much as I wanted	1	2	3	4	5
12. Discussed next steps, including any follow-up plans	1	2	3	4	5
13. Showed care and concern	1	2	3	4	5
14. Spent the right amount of time with me	1	2	3	4	5

|__|__|__|__|MM/YY MD/MS|__|__|__|__|__|__|

Seton Hall University
9/2014

Appendix A-1

Consent to Use Communication Assessment Tool (CAT)

Makoul, Gregory <GMakoul@stfranciscare.org> 6/24/14

to Jonathan, me

Hello Balpreet, and thanks for your message. You are welcome to use the CAT for research purposes. As mentioned on the phone, I ask only that you keep me posted on your progress and send a de-identified dataset for our growing international CAT database. The scale development article and the healthcare provider version of the CAT are attached. Please let me know if you need the Spanish version as well. And feel free to contact me if you have any questions along the way.
Best,
-gm

Gregory Makoul, PhD, MS
Chief Innovation Officer and Chief Academic Officer | Saint Francis Care
Professor of Medicine | University of Connecticut School of Medicine
Founding Director | Connecticut Institute for Primary Care Innovation (CIPCI)
Senior Fellow | Health Research and Educational Trust

Appendix B

Demographic Questionnaire

Demographic Questions

This set of questions about the patient is for statistical purposes. Your own responses are completely confidential. Please choose only one answer for each question.

1. How old are you?
   - ☐ 18-25
   - ☐ 26-44
   - ☐ 45-64
   - ☐ 65-84
   - ☐ 85 or older
2. Are you male or female?
   - ☐ Male
   - ☐ Female
3. How would you describe your race or ethnicity?
   - ☐ American Indian or Alaska Native
   - ☐ Asian or Asian-American
   - ☐ Black or African-American
   - ☐ Hispanic or Latino
   - ☐ Native Hawaiian or Pacific Islander
   - ☐ White or Caucasian (but not Hispanic or Latino)
   - ☐ Other _____
4. What best describes your educational level?
   - ☐ Nursery school to 8th grade
   - ☐ Some high school, no diploma
   - ☐ High school graduate, diploma or the equivalent (for example: GED)
   - ☐ Some college credit, no degree
   - ☐ Trade/technical/vocational training
   - ☐ Associate degree
   - ☐ Bachelor's degree
   - ☐ Master's degree
   - ☐ Doctorate degree (Psy.D., Ed.D., Ph.D. or equivalent)
   - ☐ Professional degree (MD, JD, DMD, or equivalent)
5. What is your employment status?
   - ☐ Employed
   - ☐ Full-time homemaker
   - ☐ Full-time student
   - ☐ Active Military
   - ☐ Retired or not actively seeking work
   - ☐ Unemployed, but actively seeking employment

Seton Hall University
9/2014

Appendix C

Hackensack University Permission Letter

HackensackUMC
Where medicine meets innovation

To: Balpreet Grewal-Virk, MS, MBA
12 Bates Drive
Fairfield, NJ 07004
908.642.7010

Site Approval Letter

To Whom it May Concern: August 28, 2014

It is acceptable for Balpreet Grewal-Virk, MS, MBA to conduct her research study entitled, " Understanding how patients perceive their medical providers communication in a hospital based emergency department setting," which is being used toward fulfillment of her dissertation requirements for her completion of her doctoral degree at Seton Hall University's School of Health and Medical Sciences, here at Hackensack University Medical Center (HUMC) through the hospital's Treat and Release Emergency Department.

This aforementioned research study will be completed under the supervision of Balpreet's Research Advisor at the University, Dr. Deborah A. DeLuca, Chair, Dr. Terrence F. Cahill, and Hackensack University Medical Center's Principal Investigator Overseer, Dr. Saraswati Dayal. Balpreet will be able to engage in her research study once she receives approval from the HUMC Institutional Review Board and from Seton Hall University's Institutional Review Board. This approval will remain active from the date of Seton Hall University's Institutional Review Board's Letter of Approval through December 31, 2015, inclusive.

For our purposes, Balpreet Grewal-Virk, MS, MBA will be listed as Principal Investigator/Student on the study documents filed with HUMC for the duration of her research project.

Hackensack University Medical Center recognizes Balpreet Grewal-Virk's Educational Affiliation as with Seton Hall University School of Health and Medical Sciences in South Orange, New Jersey.

Balpreet Grewal-Virk's research will be conducted entirely at Hackensack University Medical Center's main campus facility, located at: 30 Prospect Avenue, Hackensack, New Jersey, 07601. The site of the actual research will be in the area designated as the HUMC Treat and Release Emergency Department, which is located at the same address.

If you have any questions or need anything further from HUMC, please do not hesitate to contact me. I can be reached during normal business hours at: 551.996.3831 or msparta@hackensackumc.org

Mark Sparta
VP, Sr. Operations Officer

9/4/14
Date

Appendix D-1

Researcher Checklist

- Review and understand proposed study
- Review and understand the participant letter of solicitation
- Review and understand the inclusion/exclusion criteria
- Review and understand the CAT survey tool
- Review and understand data collection and subject confidentiality
- Review and understand the transfer of data to PI
- Review and understand how to administer the paper-based survey packet
- Review and understand the collection of items on the checklist
    - ____ Subject ID #: _____ (write in from envelope and verify number is same against the numbered contents)
    - ____ Envelope is: complete incomplete withdrawn (Circle one)
    - ____ Pencil
    - ____ Participant Letter of Solicitation
    - ____ Communication Assessment Tool (CAT)
    - ____ Demographic Questionnaire
    - ____ Sticker Applied
- Review and understand how to properly label study packets as complete, incomplete, and withdrawn
    - Complete- all items of the paper-based survey packet have been returned filled out in entirety
    - Incomplete- one or more of the items in the paper-based packet have not been filled out or are missing
    - Withdrawn-the participant decides not to finish the survey

Appendix D-2

Inclusion, Exclusion Criteria

Inclusion Criteria:

- All adult ED patients, 18 years of age and over, both male and female
    - This criterion was determined so that the surveyor can directly speak with the patients and not guardians of children or children directly. Only direct patient communication shall be used for this study.
- English if first or second language
- Patient has had one ED (treat and release) encounter before they leave HUMC

Exclusion Criteria:

- Any patient under the age of 18 or any non-competent adult, regardless of age.
    - Seeking patients who can answer survey firsthand without assistance
- Direct admits
    - Study focusing on ED experiences only
- Avoid survey on admission, admitting, or one who has not completed the ED visit.
    - Seeking encounter of completed ED visit
- Avoid any patient who is not treat and release
    - Do not want to distress or inconvenience patient

Appendix D-3

Data Collection Steps

Data Collection Steps Checklist

1. Introduce yourself to the medical staff when you arrive in the emergency department
2. Make sure all materials are in the correct order and labeled properly
3. Greet and thank the participants for availing themselves
4. Read the RA script to the study participants
5. Review the eligibility criteria with the study participants
6. Begin the surveying process
7. Make sure all survey materials are retuned by each study participant in the correct envelope
8. Make sure all participant materials match the subject ID number on the envelope once the survey is returned
9. Review everything to make sure the packets are complete
10. Apply stickers accordingly (complete, incomplete, withdrawn)
11. Thank the participants again for their partaking

Appendix D-4

Researcher Script

Researcher Script

My name is _____(*state name clearly*). The purpose of this **anonymous** study is to understand how patients perceive their medical providers communication in a hospital based emergency department setting. The letter of solicitation included in your study package must be reviewed before you can participate in this study. Please open your package if you have not done so already and look for the Participant Letter of Solicitation, which looks like this (*hold up the copy of the letter*) Make sure number on the Letter of Solicitation matches the number on the envelope. If they do not match, please let me know, and I will give you a new packet.

Let's review the Letter of Solicitation (review with patient). You are able to keep this copy and may refer back to it at any time.

Participating in this study will entail completing one survey questionnaire entitled Communication Assessment Tool, which includes two parts:

1. Communication Assessment Tool (CAT): the purpose of this section is to understand your perception of the medical providers communication.
2. Demographic Survey: the purpose of this section is to collect demographic information including, but not limited to gender, age, and years of education.

Please verify that you have these two surveys in your packet. They look like this (*hold up a copy of each questionnaire*).

Next please take a look at this card with pictures (*show card*) of healthcare providers. Please indicate which provider you will be thinking of when filling out this survey. I will mark your envelope for my purposed only (*mark corner of survey with corresponding number*).

I ask that you approach the survey and your answers from your individual point of view. Again, your answer will be kept completely anonymous. It is important that you complete each question. This entire process should only take 15 minutes, at most. If you prefer <u>not</u> to take part in this process, you may return your materials to me at this point.

Thank you for your time and consideration.

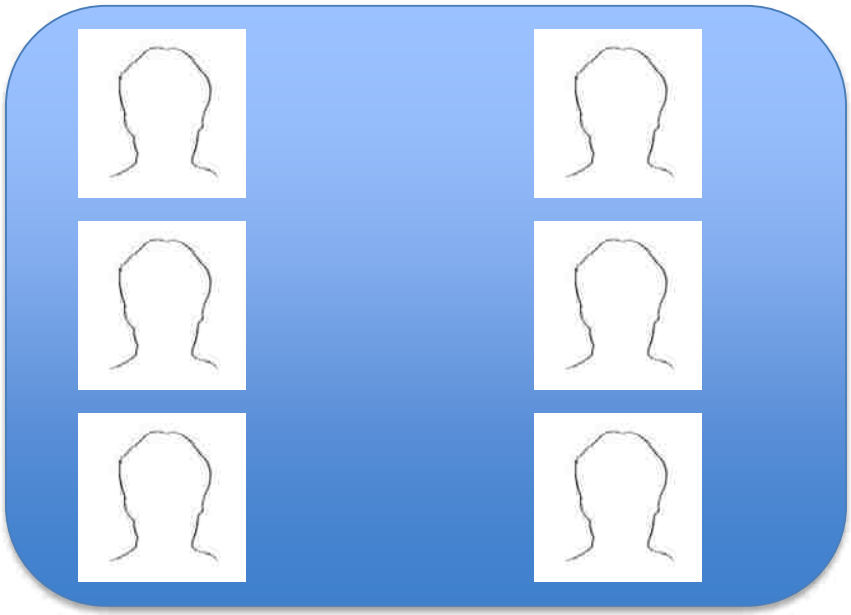
Appendix E

Healthcare Provider Picture Card

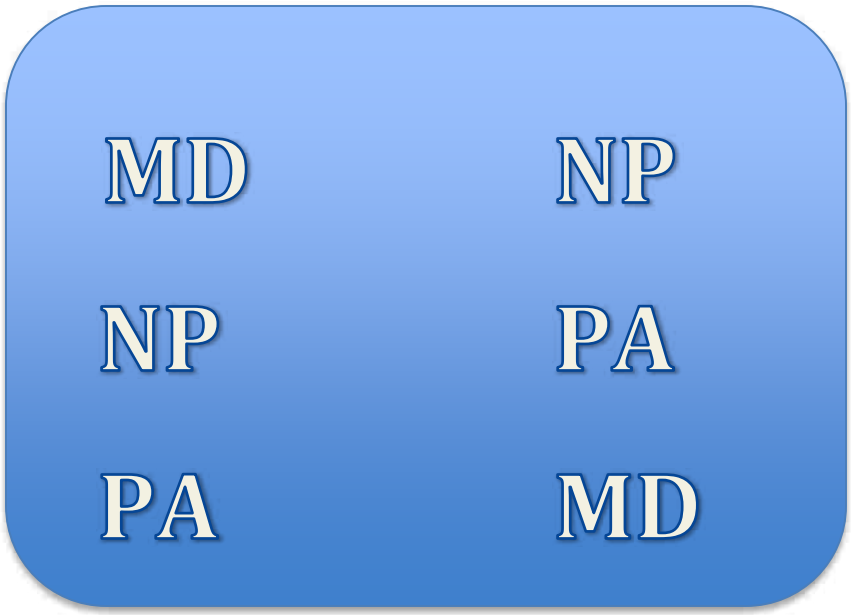
Card of Images of MD Provider and
Mid-level Providers for ER Patients

Note: Security will provide actual photos to principal investigator the day of the study's beginning to use onsite at the institution. The below John Doe images will appear as actual physician and mid-level images for the patients viewing them. The front will have the actual image and the back of the card will identify their position as MD, PA, or NP. Only the PI and RA will see the backside of the card.

FRONT



BACK



Appendix F

Letter of Solicitation

Letter of Solicitation

Study Title: Understanding how patients perceive their medical provider's communication in a hospital based emergency department setting.

Dear Participant,

You are reading the participant solicitation letter for the above-mentioned study.

Affiliation

My name is Balpreet Grewal-Virk and I am a doctoral student at Seton Hall University in the Department of Interprofessional Health Sciences and Health Administration. I am conducting this research study in partial fulfillment of my dissertation requirement for a PhD in Health Sciences.

Purpose

You are being invited to participate in this research study as an opportunity to share your thoughts regarding medical provider communication.

Procedure

You will be asked to complete two questionnaires with the following sections:

3. Communication Assessment Tool (CAT): the purpose of this survey is to understand your perception of your medical provider's communication.
4. Demographic Survey: the purpose of this survey is to collect demographic information including, but not limited to your gender, age, and years of education.

Approach the survey and your answers from your individual point of view to candidly express your thoughts regarding medical provider communication. Please respond honestly to all the questions. It is important that you complete the surveys in their entirety. It will take you approximately 15 minutes to complete both surveys.

Voluntary participation

Your participation in this research study is voluntary. You may decide at any time not to participate in this study. If you decide not to participate or you withdraw from taking the survey, there will be no penalty.

Anonymity

You will not be asked to provide your name if you agree to participate in this study. You will not be identified by name or description in any reports or publications about this study. A coding provided by numbers found on the top right corner of each survey document will be used to maintain complete anonymity at all times.

Privacy and Confidentiality

Protection and confidentiality will be maintained throughout the duration of the research project. No personal identifying information will be collected from participants. Upon completion of the study, the paper data will be kept in a locked filing cabinet in the principal investigator's home for three years after which time all data will be destroyed. Similarly, all electronic data will be stored on a USB memory key with access to the file protected by use of a password only known to the principal investigator. The memory key will also remain in a secured filing cabinet for three years, upon which the data will be destroyed.

Risk

There is no foreseeable risk or discomfort from participating.

Benefit of Participation

There are no proposed or direct benefits to you by participating in this study. However, the results of this study will help clinicians, researchers, and other medical professionals understand what factor(s) related to medical provider-patient communication is important.

Compensation

There will be no monetary or any kind of compensation for your participation.

Ways to participate

The survey is only available in a paper-based format and is only going to be administered at Hackensack University Medical Center, for the purposes of this particular research study.

Contact Information

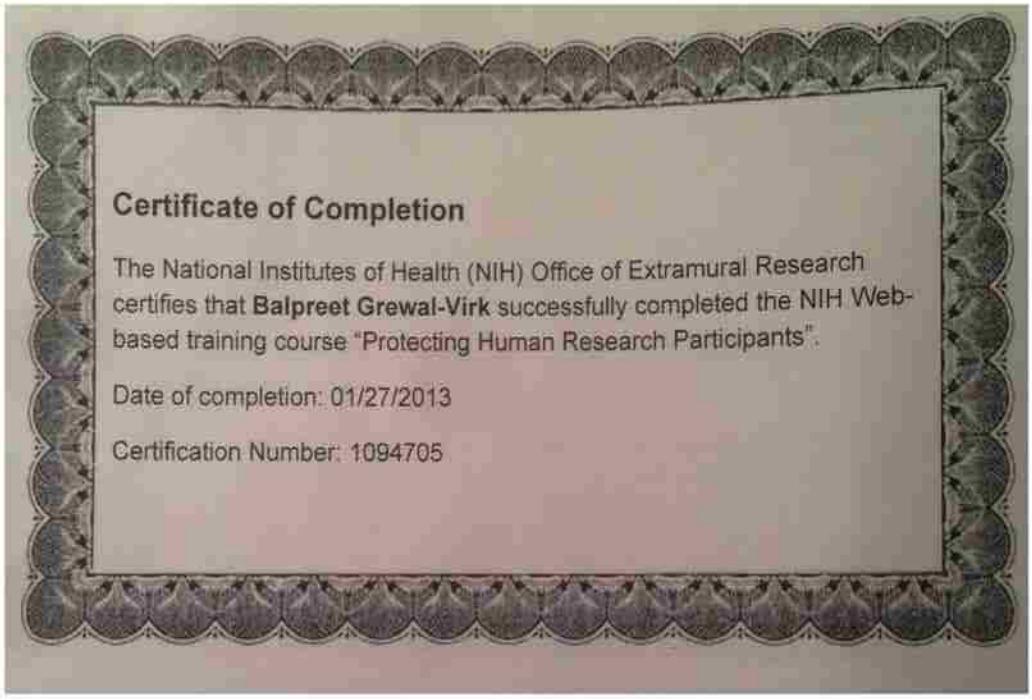
You have the right to ask questions concerning this study at any time. If you have any questions concerning this study or your rights as a study participant, please contact the primary investigator, Balpreet Grewal-Virk, through the office of Dr. Terrence F. Cahill, Dissertation Chair in the Department of Interprofessional Health Sciences & Health Administration in the Seton Hall University School of Health and Medical Sciences at 973.275.2440. Additionally, Dr. Mary Ruzicka, Chair of the Institutional Review Board, in the office of IRB at Seton Hall University may be reached at 973.313.6314.

Thank you for taking the time to participate in my dissertation research. Your time is considered very precious and I greatly appreciate it.

Balpreet Grewal-Virk

Appendix G-1d

Researcher NIH Training Certificate



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Balpreet Grewal-Virk** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 01/27/2013

Certification Number: 1094705

Appendix G-2a

Researcher HUMC Training Certificate

REQUIRED MODULES	DATE COMPLETED
CITI Conflict of Interest Course - Introduction	09/03/14
Financial Conflicts of Interest: Overview, Investigator Responsibilities, and COI Rules	09/03/14
Institutional Responsibilities as They Affect Investigators	09/03/14
Conflicts of Interest Institution-Specific Policies	09/03/14

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

REQUIRED MODULES	DATE COMPLETED
Belmont Report and CITI Course Introduction	09/03/14
Students in Research	09/03/14
History and Ethical Principles - SBE	09/03/14
Defining Research with Human Subjects - SBE	09/03/14
The Regulations - SBE	09/03/14
Basic Institutional Review Board (IRB) Regulations and Review Process	09/03/14
Assessing Risk - SBE	09/03/14
Informed Consent - SBE	09/03/14
Privacy and Confidentiality - SBE	09/03/14
Research with Prisoners - SBE	09/03/14
Research with Children - SBE	09/03/14
Research in Public Elementary and Secondary Schools - SBE	09/03/14
International Research - SBE	09/03/14
Internet Research - SBE	09/03/14
Research and HIPAA Privacy Protections	09/03/14
Vulnerable Subjects - Research Involving Workers/Employees	09/03/14
Conflicts of Interest in Research Involving Human Subjects	09/03/14
Hackensack University Medical Center	09/03/14

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator