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Disparity Between The Real And The Ideal: How Do Different Health Profession Students View Effective Clinical Preceptors?

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DISPARITY BETWEEN THE REAL AND THE IDEAL: HOW DO DIFFERENT HEALTH PROFESSION STUDENTS VIEW EFFECTIVE CLINICAL PRECEPTORS?

by

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This dissertation, submitted by Steven B. Westereng in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Steven B. Westereng
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ABSTRACT

Preceptors overseeing health care students during clinical education are critical to the overall learning experience of the student. Although research has been conducted surrounding the characteristics of effective clinical preceptors from the students' perspective within specific professions, little research has been done across health care disciplines. Research across health care professions is important because of the increased attention by academic programs on interprofessional education. The purpose of this quantitative study was to determine if there is a difference amongst health care education students' perceptions as to the characteristics of effective clinical preceptors. This study included participants from six different health care programs at one research-intensive university in the Midwest. Findings included students from all disciplines ranked teaching ability lowest of four subcategories when surveyed on characteristics of their past preceptors. Teaching ability was also the subcategory showing the largest difference between actual student-preceptor experiences and the students' ideal preceptor. Differences among professions were seen within this study such as students' opinion of actual preceptor professional competence between occupational therapy and physician assistant students. However, students overall perceive their actual preceptor experiences and their ideal preceptors similarly. The findings in this study assist educational programs utilizing interprofessional education to better understand their students' perspective of past preceptors and their ideal preceptors.

CHAPTER I

INTRODUCTION

The American Medical Association (AMA) recognizes in excess of 80 health care careers that involve direct patient care (American Medical Association [AMA], 2018). There are over 8,600 educational programs in the United States leading to these health professions (AMA, 2018). Many professions within the health care field have a similar educational process based on the traditional medical school model (Gillespie & McLaren, 2010). In this model, health care education is typically broken down into two distinct parts: didactic and clinical. Didactic instruction serves to cover basic knowledge in specific areas of the curriculum and is traditionally taught in the classroom or laboratory setting. Clinical education offers the experiential opportunity for students to practice what they have learned in the didactic setting. Accreditation bodies mandate the clinical education component within the health care education process (Commission on Accreditation of Athletic Training Education [CAATE], 2018; Liaison Committee on Medical Education [LCME], 2018; Accreditation Council for Occupational Therapy Education [ACOTE], 2018). Clinical education takes place in a real life setting with actual patients while under the supervision of practicing clinicians. This experience allows students to gradually apply skills learned in the didactic setting.

While participating in clinical education, students are overseen by a clinical instructor, or *preceptor*, who may or may not be a full-time faculty member of academic program. Preceptors are health care professionals providing service to their patients.

Students will typically encounter various preceptors throughout their educational experiences based on their clinical rotations. The clinical preceptors play an important role in the education and professional socialization of a health care student because they serve as a bridge in the transition from the classroom to actual patient care within their profession.

Statement of the Problem

There is an opinion that American healthcare professionals are insufficiently prepared (Institute of Medicine, 2003; ASPH, 2008). Additionally, there is a concern from the U.S. Health and Human Services that students are not equipped for entry-level practice through the formal education process and that they rely too much on experience trial and error as they enter healthcare fields (Gebbie & Turnock, 2006). This is specifically interesting considering the initiative to train more healthcare students collaboratively in an interprofessional manner (World Health Organization, 2015). Because of this concern about the preparedness of the student and the importance of interprofessional clinical education to the student, this study aims to better understand the relationship between the student and preceptor among various professions. Understanding the perceptions of the students may assist in making changes in their educational process to better prepare future practitioners in the health professions.

Purpose of the Study

The purpose of this study was to determine if there is a difference in identified characteristics of effective clinical education preceptors from the perspective of health care profession students. The healthcare professions included are athletic training, physical therapy, occupational therapy, medical laboratory science, physician assistant studies and medicine. As health care educational programs implement and emphasize

interprofessional education, it is important to look at students' experience and perceptions to gain better understanding of how they will learn together. This includes the students' interactions with their respective preceptors. The information gathered in this study can be used to establish a baseline of students' perceptions to better understand the preceptor-student relationship among the various professions.

Research Questions

There were two primary research questions that guided this study:

1) Is there a difference among various health profession students in identified characteristics of recent clinical education preceptors?
2) Is there a difference in identified characteristics of recent clinical education preceptors and characteristics of "ideal" preceptors for various health professional students?

Precepting and Accreditation

The preceptor-student relationship is pivotal to the implementation of didactic knowledge and development of clinical skills of health care students (Buchel & Edwards, 2005). These relationships include many variables including accreditation standards, preceptor knowledge, clinical competence, communication skills, professionalism, and teaching techniques. Accreditation standards dictate clinical education must be completed under a preceptor (CAATE, 2018; AOTA, 2018).

Health care education programs are predominantly overseen by national accreditation bodies (CHEA.org, 2017), such as the Accreditation Council for Occupational Therapy Education (ACOTE), the Accreditation Review Commission on Education for the Physician Assistant, (ARC-PA), the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), and The Commission on Accreditation of

Athletic Training Education (CAATE), and Liaison Committee on Medical Education (LCME) for medicine. Students must graduate from an accredited program to obtain licensure or certification to meet state regulations and enter the profession. As the only way a student can enter a profession is through an accredited program, accreditation bodies play a large role in the structure of the educational programs. In turn, accreditation entities play a large part in the structure of the clinical education of the students through the expected accreditation standards. Much like institutional accreditation, health care education accreditation adheres to standards specific to the professional discipline and are much more specific than institutional accreditation.

Accreditation standards dictate clinical education must be completed under a preceptor (CAATE, 2018; AOTA, 2018). Clinical experience is a program expectation, which is enforced by accreditation entities. The criterion in medicine (LCME, 2017) standard 8.6 requires a system with central oversight ensuring medical students complete required clinical experiences. Occupational therapy (ACOTE, 2011) standards specify that an occupational therapy graduate must "have achieved entry-level competence through a combination of academic and fieldwork education" (p. 1). The ACOTE standard c 1.1 goes on to stipulate the need to "Ensure that the fieldwork program reflects the sequence and scope of content in the curriculum design in collaboration with faculty so that fieldwork experiences strengthen the ties between didactic and fieldwork education." (p. 33). Physical Therapy (CAPTE, 2016) Standard 1C4 requires programs to provide evidence the students have demonstrated entry level clinical performance prior to graduating. Medical laboratory science (NAACLS, 2016) standard 1.D.5 requires programs to describe or guarantee that students will be able to finish their clinical

experience. Athletic Training (CAATE, 2012) standard 43 states "Formal instruction must involve teaching of required subject matter in structured classroom, clinical, or laboratory environments" (p. 6). Physician Assistant programs are required to provide clinical education for their students in Standard B3.06 (ARC-PA, 2016, p.20), stating "It is expected that the program will provide supervised clinical practice experience with preceptors who are prepared by advanced medical education or by experience." The previously mentioned standards show the expectations of an academic program in regards to clinical education of the students. These standards articulate the clinical education requirements academic programs must provide for their students. Essentially, all programs must provide a clinical education component to their curriculum.

Other similarities exist among the various accreditation bodies in regards to clinical education. All of the academic programs must have a contract or more commonly called an affiliation agreement with their clinical sites. This document recognizes the clinical site is agreeing to allow clinical education to occur in its facility as well as usually delineating the roles of the educational program, the clinical site, the student, and the preceptors. One academic discipline may have preceptors from different disciplines; however, the preceptors must be a licensed professional within the state in which they are clinically practicing. Of the previously mentioned accreditation bodies, all but the LCME and the ARC-PA require a specific faculty position within the academic program to oversee the clinical education of the students. Clinical Education Coordinators (physical therapy, athletic training, medical laboratory science) and Fieldwork Coordinators (occupational therapy) work to place students in clinical settings,

assess student learning within the clinical setting, ensure safety of students during clinical rotations, and ensure required clinical rotations are completed by students.

All of the accreditation bodies also expect academic programs to perform assessments or evaluations of clinical sites. This includes assessment of effective clinical education. Examples of this include occupational therapy (ACOTE) standard A.5.3 (2011) where

> Programs must routinely secure and document sufficient qualitative and quantitative information to allow for meaningful analysis about the extent to which the program is meeting its stated goals and objectives. This must include fieldwork performance evaluation and student evaluation of fieldwork experience (p.15)

NAACLS standard VIII.C 1-2 states that Clinical Laboratory Science programs must "describe the evaluation systems utilized by the program to assess the effectiveness of instruction, frequency of use of the various evaluation tools, and how the results of evaluation are utilized in program evaluation and revision" (p 32). Physical therapy (CAPTE Standard 2B) states the academic program must "Provide an analysis of data collected and the conclusions drawn to determine the extent to which the collective clinical education faculty meet program and curricular needs" (p. 5). CAATE requires athletic training programs to verify "All clinical education sites must be evaluated by the program on an annual and planned basis and the evaluations must serve as part of the program's comprehensive assessment plan" (p 7). The LCME requires MD programs to have a centralized system with a variety of measures for the assessment of student achievement including core clinical skills and other objectives specified within the

medical education objectives (p. 14). Physician Assistant programs must assess their clinic practice experiences to ensure sites and preceptors meet program expectations (ARC-PA, 2016, p. 23).

Despite the requisite nature of the clinical experiences by accreditation in the different disciplines, the preparation of the preceptors overseeing students varies. NAACLS (2016) has little expectations beyond the affiliation agreement and proof of communication between the medical laboratory science program and the preceptor. The LCME (2017) for the medicine degree states:

> In a medical school, residents, graduate students, postdoctoral fellows, and other non-faculty instructors in the medical education program who supervise or teach medical students are familiar with the learning objectives of the course or clerkship and are prepared for their roles in teaching and assessment. The medical school provides resources to enhance residents' and non-faculty instructors' teaching and assessment skills, and provides central monitoring of their participation in those opportunities (p. 14)

Occupational Therapy programs must "describe the ongoing professional responsibility for providing fieldwork education and the criteria for becoming a fieldwork educator" (ACOTE, 2011, p. 30). Preceptors in occupational therapy must also have no less than one year of professional experience prior to working with students (ACOTE, 2011). Physical therapy program preceptors must also have a minimum of one year experience; however, there are higher expectations from CAPTE including:

> Describe how the program determines that clinical instructors are meeting the expectations of this element, including but not limited to: the program's

> expectations for the clinical competence of the CIs; the program's expectations for clinical teaching effectiveness of the CIs; how the clinical education sites are informed of these expectations; and how these expectations are monitored (p. 15).

Physician Assistant clinical sites must not use resident physicians as preceptors because of lack of experience (ARC-PA, 2016, p. 12) and the educational program should orient the preceptor to the specific learning outcomes it requires of the physician assistant students (p. 17). Athletic training educational programs must give preceptors "planned and ongoing education from the program designed to promote a constructive learning environment." (CAATE, 2012, p. 6). In summary, although clinical education is a requirement of health education programs, expectations from the education programs of the preceptors and how preceptors are prepared vary widely amongst different disciplines. Also based on the standards given, how an educational program acquires feedback from the students about their clinical preceptors and what they do with that information should be a part of the assessment back to the accreditation bodies.

Accreditation standards specific to clinical education change over time. Specifically, the skills and knowledge the student must learn changes depending on such things as scope of practice within the profession, knowledge, and technology (CAATE, 2012; CAATE 2020). Although the specifics of clinical education may change within a profession, the overarching standards of clinical education are widely accepted by education programs because if a program does not comply with the standards, it risks losing its accreditation status (CAATE, 2020; CAPTE; 2019). The loss of accreditation by an academic program can jeopardize the ability of the student to take national boards or enter the profession.

Preceptor Knowledge and Characteristics

Preceptor knowledge or clinical competence is demonstrated when caring for patients and is observed by students as the students learn from the preceptor (Elcigil & Sari, 2006). The preceptors exhibit communication skills and professionalism and influence the clinical education setting with the students (Martin, Copley, & Tyack, 2014). The teaching techniques of the preceptors may vary depending on the background of the preceptor because the preceptors are primarily a clinician (Barker & Pittman, 2010).

Health care students have identified preceptor characteristics which they perceive as more "effective" than others for the purpose of learning (Jahangiri et. al.; 2012, Kilminster & Jolly, 2000; Tang, Chou, & Chiang, 2005). Examples of these characteristics include accessibility of the preceptor (Barker & Pittman, 2010), the ability of the preceptor to give positive versus negative feedback (Martin, Copley, & Tyack, 2014), and clinical competence of the preceptor (Tang, Chou, & Chiang, 2005). Accessibility includes the preceptor being available to guide a student who faces challenges and may have questions (Berg & Lindseth, 2003). Positive feedback from a preceptor to a student can enhance learning whereas negative feedback from a preceptor, particularly in front of a patient, does not encourage continued questioning and development by the student. Students have expressed preceptors with more extensive clinical competence are more effective than those preceptors lacking clinical competence. It is important to identify these characteristics because of a preceptor's role as educator during clinical experience and the impact this role plays in the overall growth and development of the student during the student's clinical experience. If a

characteristic of a preceptor can be improved, so might the educational experience of the student.

Rich (2009) identifies barriers to effective clinical education. One of them is the initiative of the student to engage in the learning process. The lack of initiative of students described by Rich is recognized by both students and preceptors. Preceptors rated lack of initiative by students as the third highest perceived barrier behind providing service to the patients and "other" duties. Students identified lack of initiative as the leading barrier to their own learning. The lack of initiative by the students was seen as occurring at certain times within the learning interaction but not always. However, it is assumed that because a student is participating in a health care education program and has engaged in clinical education, the student is willing to learn and interact with their clinical preceptor. It is assumed the student wants to have an effective clinical preceptor to interact with and to provide them guidance and development to progress their professional development to entry level. The current study is conducted with the assumption students want to engage in clinical education for their own professional development enroute to becoming a practicing clinician.

Theoretical Framework

This study considered different perspectives of health profession students in regards to their opinions of effective clinical preceptors. The students' academic major/health profession serves as the independent variable for this study. The identified characteristics of effective preceptors serve as the dependent variables.

As previously indicated, it is important to understand the perceptions of the students in the overall relationship with the preceptors in regards to interprofessional

education. A better understanding of this relationship is important because of the mandated nature of clinical education (ACOTA, 2011; CAPTE, 2016). An attempt to understand, and improve, the relationship between a student and a preceptor may provide for a better experiential learning experience for the student (Cotter & Dienemann, 2016; Luhanga et.al., 2010). Examining the preceptor-student relationship across professions gains insight into these relationships in an interdisciplinary approach. Clinical education is an experiential process of active participation. Because of the experiential nature of clinical education, the results of this study are considered through the lens of Kolb's Experiential Learning Theory.

Kolb's Experiential Learning Theory served as a framework for this study about health profession students' perceptions of clinical education preceptors. The four stages of learning identified by Kolb (Figure 1) start with a "Concrete Experience" which is obtained by health care students by participating in patient care. "Reflective Observation" should be done by the student as they proceed through their clinical education process. Next, "Abstract Conceptualization" by the student allows them to attempt to analyze what is observed. "Active Experimentation" is the purpose of clinical education to prepare the healthcare student for transition to becoming a practicing clinician by making decisions about patient care. Specifically, this study will look at the stages of "Concrete Experience" and "Active Experimentation." These stages may be modified through the characteristics of the preceptor to enhance the learning of the student.

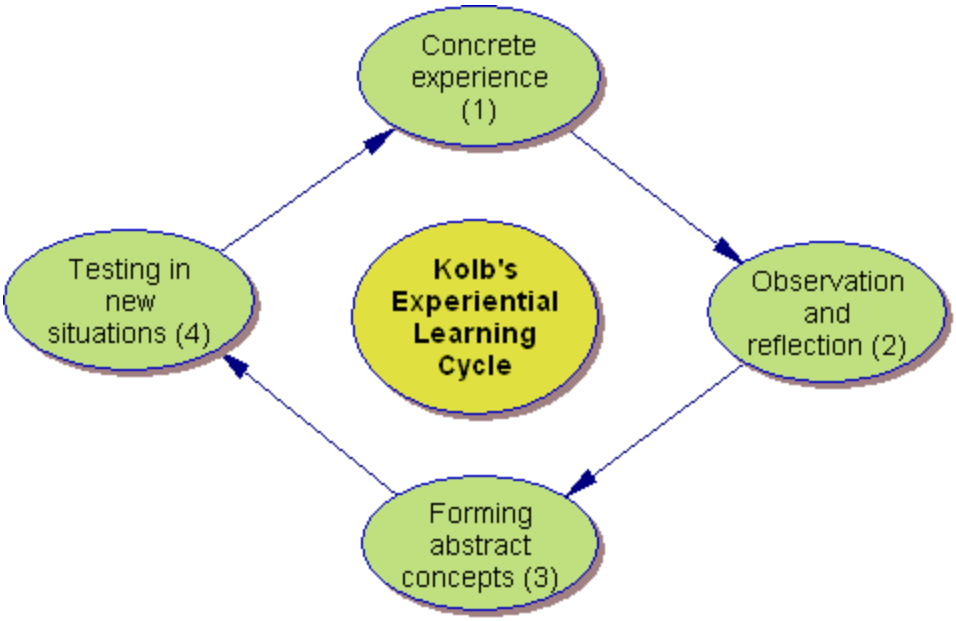

Figure 1. Kolb's Experiential Learning Theory, by D. A. Kolb, (2019) Retrieved from https://www.learning-theories.com/experiential-learning-kolb.html, Copyright 2007 by David Kolb.

Rationale for the Study

Students and teachers have experienced strained relationships in the clinical setting (Baird, Bracken, & Grierson, 2016), resulting in frustration and failure (Kirschling et al., 1995; Krichbaum, 1994). Part of this frustration arises from the different perspectives and expectations between the preceptors and the students. An example of this is shown when asking students and preceptors about "respect". Celkan, Green, and Hussain (2015) explain how the term "respect" has different definitions between students and preceptors and how it is not always mutual. The authors go on to state "Anticipations of instructors and students may not always converge. However, one side should not ignore the expectations of the other" (p. 2175). Moreover, the way in which students and preceptors define terms such as "respect" may vary across experiences and fields of study, similar to the way in which variation in characteristics or category of characteristics may occurs based on discipline, individual students'

beliefs, preceptor student interactions, and other factors. It was the goal of this study to consider effective characteristics of preceptors and to consider student perspectives from six different health care majors in doing so.

This study also asked students about their "ideal" preceptor characteristics to better understand the expectations the students have of their clinical instructors. Dondaville (2005) shows athletic training students consistently rated their current preceptor higher than the preceptors rated themselves, but still lower than their "ideal" preceptor. This difference indicates either one group or both hold inaccurate perceptions of preceptor behavior. Further research into students' perceptions of an ideal preceptor could lead to a better understanding of expectations by both the student and the preceptor. Also, does the ideal preceptor characteristics vary amongst professions?

Kelly (2006) did not see a significant change in students' perceptions of effective clinical precepting over a 14 year period, suggesting that the relationship, or at least the students' perceptions of the relationship, is constant and does not change over time. However, Mazerolle et al. (2016) argued that student perceptions should be continuously researched because of the changes in society, such as the "millennial" student. Thus, a better understanding of the students can be used to better prepare preceptors and to align the expectations of both parties.

Significance of the Study

Because of the agenda of educational programs and health care entities to make education more inter-professional (World Health Organization, 2015), it is important to examine if effective preceptor characteristics are consistent across disciplines because preceptors oversee students during actual patient care. Preceptors across disciplines are typically clinicians who take on these roles outside of their clinical responsibilities. This

is true throughout the professions included in this study such as athletic training (Wiedner & Henning, 2002), medicine (Barker and Pittman, 2008), physician assistants (Rogers, Dunn & Laurtar, 2008), and occupational therapy (Ottolini et.al., 2010). This is also seen in many other health care professions outside of this study such as dietetics (Sarcona, Burrowes & Fornari, 2015) and physical therapy assistant, radiological sciences, and mortuary sciences (Rogers, Dunn & Laurtar, 2008). Many times the preceptor responsibilities are not a priority for the clinician because of the perceived importance of their clinical duties (Barker & Pitman, 2008). Identifying common effective preceptor characteristics assists educational programs in recruitment of quality preceptors. The results of this study could assist in the selection and training of preceptors to ensure quality clinical education of a student. This is especially important as health care education programs look to move forward with inter-professional opportunities incorporating different disciplines within one clinical setting (World Health Organization, 2015). Inter-professional opportunities in the clinical setting have implications for institutions that house health professional academic programs to work as a team rather than in the silo of their own specialty. These institutions could focus on common effective clinical preceptor characteristics for all of its education programs through professional development or training programs to better prepare the preceptors. This development could better equip educational institutions in educating the health care work force of tomorrow, ultimately providing a better educational experience for the students. For differences of effective preceptor characteristics among the various professions, program specific preparation for preceptors is indicated.

Definitions

The terms preceptor and clinical education are common and relatively easily understood by those involved in health care education. However, it is not as easy to understand what makes an effective preceptor. Therefore, definitions of all three terms have been included for clarity for the reader.

Preceptor: A practicing health care professional who gives personal instruction, training, and supervision to a health care education student while in a clinical setting (Merriam-Webster, 2018).

Clinical education: Health care education conducted in health care facilities, outpatient clinics, emergency centers, hospitals, private offices or other health care setting under the supervision of a qualified practitioner or teaching staff (Medical Dictionary, 2018).

Effective preceptor: An individual who is able to provide a learning experience that assists students in meeting the required competencies outlined by a professional accrediting agency, in order to produce a well prepared entry-level practitioner. (Sarcona, Burrowes, & Fornari, 2015).

Methodological Overview

Data for this quantitative study were collected from students in Physical Therapy, Occupational Therapy, Medical Laboratory Science, Athletic Training, Physician Assistant Studies, and Medical Doctor programs in a health care school of a research intensive university in the Midwest. Participants completed a survey including previously identified characteristics of effective preceptors entitled “Effective and Ideal Preceptor Scale.” Participation was delimited to students enrolled into the professional programs who have completed no less than one clinical rotation. These students have common

resources within the school such as the library, simulation center, and learning communities. All degree programs are nationally accredited. Limitations to this study include being conducted at one institution and specific to the programs housed within that institution and may not be applied to all health care educational programs.

Organization of the Document

This research study is organized into five separate chapters that build upon one another. The first two chapters lay a foundation for fully understanding the scope and purpose behind this research study. Chapter I serves as the introduction to the study. The chapter starts with defining the need and purpose for the research and concludes with stating the research questions. Chapter II summarizes the relevant literature related to effective clinical precepting from a student's perspective. Chapter III describes the methodology used in this research project, as well as defining the sample population and setting in which the data was collected. This chapter defines the variables used in the research project. Chapter IV presents the statistical results of the collected data in response to the research questions. Chapter V includes a narrative discussion of the findings and recommends how this research can be used in professional health care education. It is through this process that a better understanding of effective clinical education emerges.

CHAPTER II

LITERATURE REVIEW

Clinical education as it is today has evolved from many different aspects. This evolution includes the history of medical education, academic accreditation standards, educational strategies as well as many other factors. This chapter reviews the relevant literature surrounding clinical education to provide a framework in which the study is conducted. This chapter contains information on the origins of present-day clinical education and preceptors. Information about accreditation standards of different professional educational programs is also included to show present day expectations. Next, relevant literature specifically focused on preceptors includes characteristics of effective clinical precepting, barriers to effective clinical education, and preceptor training. Finally, survey instruments that have been used to measure effective clinical education are discussed.

History of the Medical Education Model in the United States

The early 1800's had little in formal education of physicians (Flexner, 1910). As the profession grew, the number of medical colleges granting licenses grew from just over a dozen to 36 between 1830 and 1845 (Davis, 1855). The American Medical Association (AMA) was established in 1847 and among other objectives, began to address medical education in the United States. In that year, the AMA addressed specific issues including creating and elevating standard requirements for the M.D. degree (LCME.org, 2017). The AMA advanced the educational movement by accepting a

resolution recommending a minimum of three years for an educational program, required subject matter, clinical education in a hospital setting, qualifications of preceptors, and documentation of student attendance. Although these first steps were an attempt to elevate the minimum standards of education for physicians, there was no enforcement or accountability, so the recommendations were not followed closely at the time. The number of medical schools continued to grow in the decades to come. The Association of American Medical Colleges (AAMC) was formed in 1876 and directly addressed education of the medical doctor (LCME.org, 2017). The AAMC was the first to take meaningful steps to establish defined educational standards for membership. In 1900, the AAMC required students to participate outside of lectures in over 3,000 hours of experience. This experience included 500 hours of laboratory work, 150 hours of practical work, one obstetric case and 750 hours of clinical instruction. Because of the importance of learning in the clinical environment, the number of clinical hours increased to 900 in 1904 (LCME.org, 2017). In 1910, the AAMC initiated inspections of member institutions to verify the schools were meeting standards (Dezee et.al., 2012; Schuler, 2006)). The AMA and the AAMC guided medical education until the Liaison Committee on Medical Education (LCME) took over the accreditation process when the organization was formed in 1942. This medical model, established in the early 1900's, was the first time clinical education was required for medical students which set up a model of both didactic and clinical education. This medical model is still the model utilized by many healthcare education programs today (CHEA.org, 2017).

History of Preceptors

In 1910, a report by Abraham Flexner of the Carnegie Foundation focused on the abundance of ill-educated physicians across the United States. Because medical schools

were opening and closing rapidly, Flexner focused on some possible solutions to standardize medical education. His report transformed medical education by eliminating proprietary schools. The number of degree granting medical schools dropped significantly from 160 in 1910 to 66 in 1935 (Hiatt & Stockton, 2003). The biomedical model Flexner recommended established the medical model still much in use today. One of the five recommendations from Flexner included incorporating actual hospital care into medical school education:

> A hospital under complete educational control is as necessary to a medical school as is a laboratory of chemistry or pathology. High grade teaching within a hospital introduces a most wholesome and beneficial influence into its routine. Trustees of hospitals, public and private, should therefore go to the limit of their authority in opening hospital wards to teaching, providing only that the universities secure sufficient funds on their side to employ as teachers men who are devoted to clinical science (p. xi)

The first official preceptorships occurred in the 1920s (Rothstein, 1987). Preceptorships were originally enacted to encourage medical students to learn and practice in rural settings. Although not used by all medical schools at the time, by 1955 over 1400 medical students were participating in learning with a preceptor.

Kolb's Experiential Learning Cycle and Health Care Education

The Experiential Learning Theory by Kolb (1984) is based on works of Dewey, Lewin, and Piaget; however, it focuses on the role experience plays in the learning process. Kolb states:

> This differentiates experiential learning theory from rationalist or other cognitive theories of learning that tend to give primary emphasis to acquisition,

> manipulation, and recall of abstract symbols, and from behavioral learning theories that deny any role of consciousness and subjective process in the learning process (p. 20).

The four stages of learning identified by Kolb start with a "Concrete Experience" and is followed by "Reflective Observation" which should be done by the student as they proceed through their education process. Next, "Abstract Conceptualization" by the student allows them to attempt to analyze their knowledge and decision making throughout the educational process. "Active Experimentation" is the ability for the student to make decisions and carry out those decisions.

Kolb's Experiential Learning Theory has been used in health care education. Professional education programs meld nicely with experiential learning due to the mandatory supervised clinical experiences. During clinical education rotations, students should be provided the opportunity to learn new techniques and skills as well as apply previously acquired knowledge to real-life situations, which involves cognitive, affective and psychomotor skills (Spencer, 2003). The Experiential Learning Theory also explains the essence of the relationship between a student and a clinical preceptor. Brackenreg (2004) states

> Experiential learning is a powerful medium which needs to be mediated by an expert practitioner who is clear about their objectives and most importantly, provides appropriate time and means, for the participants to explore the implications and consequences of the experience facilitated (p. 270).

The further importance of the teacher, in this case a preceptor, is discussed by Brackenreg as she points the importance of the preceptor to be a "bridge" to allow the

student to refine affective and cognitive experiences. Witt, Colbert, and Kelly (2013) uses Kolb's theory to develop a preceptor training program as well as to assist previous preceptors in nursing. Experiential Learning Theory has also been used to build remediation models for medical students in various aspects such as on national board exams (Kosir, 2008) and history taking skills (Leung, 2009).

Kolb believes a student must go through all four stages of the experiential learning cycle to have a complete learning experience as well as start with the Concrete Experience stage (Smith & Kolb, 1986). As students go through the learning cycle, Kolb also believes different learning styles are affected differently at the various stages of the experiential learning cycle. Some students may spend more time and learn more in one stage of the model than others based on their individual learning style. In the same aspect, some students may not spend enough time in some stages to reach the potential of the learning experience. Raschick, Maypole, and Day (1998) believe that students may "lock on" to the stage they prefer based on their learning style and not experience the other stages. They agree with the sequence of Kolb's model however do not believe students have to enter the learning cycle at the concrete experience stage. Regardless if one agrees with Kolb or Raschick, Maypole, and Day, it is important to note that a preceptor can influence each stage of the experiential learning cycle based on the characteristics and behaviors of that preceptor. To varying degrees, the preceptor has an opportunity through their actions to enhance or diminish each stage of the experiential learning of the student.

Effective Preceptor Characteristics

Characteristics of effective preceptors are of interest to academic programs, as demonstrated by a series of studies on clinical instructors in the healthcare professions.

Stern et.al. (2000) demonstrates that attending clinical instructors of medical students who exhibited higher teacher rankings had a small but significant increase on success of the medical students' scores on a national board exam. Using this reference, better teaching should translate into higher learning for the students which should ultimately lead to better care for the patients. The attempt to increase the teaching ability of the preceptors has been researched over the last 30 years (Beitz & Wieland, 2005; Byrd, Hood, & Youtsey, 1997; Tang, 1993). One area of focus has been to identify the characteristics of effective preceptors with hopes of enriching those attributes as well as identifying barriers to clinical education (Sarcona, Burrowes & Fornari, 2015; Cotter & Dienemann, 2016). Examples of these characteristics include clinical competence professionalism, being a role model, communication skills, and availability.

Clinical Competence

As program specific academic standards require clinical education must occur under the supervision of clinicians (CAATE, 2012; ACOTE, 2011). Licensed clinicians have regulations within their professions to ensure the safety of the public. An example of this is seen in the State of North Dakota where the legislative branch century code (legis.nd.gov, 2019) regulates the professions of medicine (NDCC 43-17), athletic training (NDCC 43-39), physical therapy (NDCC43-26), occupational therapy (NDCC 43-40), and medical laboratory science (NDCC 43-48) within the state of North Dakota that has licensure laws regulating their professions. Clinicians are expected to uphold a standard of care and have knowledge in their area of healthcare based on these regulations. Prior to taking on preceptor responsibilities, clinicians must focus on their primary responsibilities of providing healthcare service (Barker & Pittman, 2008). The clinical competence of the preceptor is a highly regarded characteristic of a preceptor.

Clinical competence was the highest ranked characteristic by students across disciplines in many studies. Kelly (2007) finds clinical competence as the most important characteristic an effective clinical preceptor can possess. Students feel it was important for a preceptor to have clinical knowledge and relate that knowledge to the clinical educational experience of the student. Without clinical knowledge of the preceptor, the students learning experience is limited. Another study finds enthusiasm and clinical competence of the preceptor to be the most important characteristics of effective preceptors (Buchel & Edwards, 2005). Jahangiri, et. al. (2013) shows clinical competence along with character and communication as the attributes students say provide the best learning environment based on the characteristics of the preceptors. Huggett, Warrier, and Maio (2007) finds lack of clinical expertise of the preceptor becomes detrimental to medical students' learning and that the clinical knowledge deficits are in four areas: communication skills with patients, ability to develop rapport with patients, medical knowledge, and patient education skills. Tang, Chou and Chiang (2008) show that even though a nursing preceptor may be more ineffective as a teacher, the students still appreciate a preceptor who had sufficient professional knowledge and applied theory in clinical practice. Dietetics students surveyed found preceptors with current knowledge in their field of practice and being competent practitioners are essential components of being an effective preceptor (Sarcona et al, 2015). In a review of over 60 articles, Sutkin, Wagner, Harris, et al. (2008), found medical knowledge and clinical reasoning to be the top two themes of effective clinical preceptors from medical students' perspectives. Another meta-review of the literature shows nursing students desire a competent preceptor that exhibits "knowledge about nursing, remaining current in their specialty, and being a positive role model" (Collier, 2017, p.4).

Despite shortcomings in other aspects of precepting such as teaching ability, students see competent clinicians as effective preceptors (Tang, Chou, & Chiang, 2008). This emphasis on clinical competence may align with the students' image of how they see themselves wanting to practice healthcare as they enter the profession. Throughout the research, clinical competence is important to students.

Being a Role Model

Although not well defined, being a "role model" is regarded as a highly important characteristic of effective preceptors (Blevins, 2016). Being a positive role model is important because students often mimic or assimilate the attitudes and skills of the preceptor (Raines, 2012). Beyond clinical knowledge, students perceive that a preceptor who was also a good role model could communicate without prejudice, provide positive feedback, have empathy, expect students to do their own work and research, and offer students information to problem solve (Elcigil & Sari, 2006). These same traits were findings by Hugget, Warrier, and Maio (2008) who found from 110 medical students that five attributes of effective clinical precepting for early learners include professional expertise, actively engaging the student in learning, creating a positive learning environment, preceptor demonstrating collegiality and professionalism and discussing career-related topics. Being a good role model for the students also includes being a lifelong learner as well as practicing in an ethical and legal manner (Hand, 2005).

Many different individual characteristics of a good role model may be seen by a student. This information about being a role model is beneficial because it adds insight from a student's perspective of someone they aspire to become as they enter the profession. A role model to a student may be a faculty member, supervisor, upper

classmen or other person in or outside of their profession. A role model may not have an official responsibility in the education of the student. However, a preceptor will be seen and evaluated on the traits of a role model inherently because of their position.

Communication Skills

The communication skills of the preceptor are important to students. Studies show that students want feedback from preceptors (e.g., Kelly, 2007; Motley & Dolansky 2015). In Kelly's (2007) study, students made statements such as "If I'm not doing something right, I need to know about it and I need to know right then and there, not 6 weeks later" (p. 890) and "I need both positive and negative [feedback]" (p. 890). Kuen (1997) states students thought effective preceptors explain clearly, emphasize what is important, make specific suggestions for improvement, and answer carefully and precisely questions raised by student. All of these characteristics are in the top ten most important teaching behaviors of Kuen's study. Blevins (2016) states, "An effective preceptor demonstrates appropriate verbal and nonverbal communication skills when interacting with health care staff, patients, and families. Using these professional skills shows the novice nurse the importance of creating a positive work environment through communication" (p. 60). Feedback for the student also allows the student to be more successful because it allows students to recognize their weaknesses and improve their academic progression (Elcigil &Sari, 2006; Jahangiri, et.al. 2012). Honest and straight-forward communication is appreciated by the students (Kelly, 2006) as well as a preceptor that is open minded, non judgemental, and approachable (Kuen, 1997; Elicil and Sari, 2006; Hand, 2006; Huggett, Warrier, & Maio, 2007; Buchel & Edwards, 2005; Rich, 2009).

Archer (2010) focuses on effective feedback in health profession education in a review article and proposes three main areas of effective feedback. These include the provision of the feedback, the influence of the recipient, and the impact of the feedback. The provision of the feedback can include the type, structure, and time of feedback. Type of feedback can be specific or general feedback to the student to correct or improve behavior. Negative and positive feedback need to be balanced to improve performance and development. Structure of feedback can include how the feedback is delivered such as face to face or written. Structure also includes the information that is used to provide feedback such as data collection or scales. The timing of the feedback is most effective at different times depending on the situation. Immediate feedback improves performance on short term or procedural skills. Delayed feedback may be best for complex skill development or for transfer of in-depth knowledge. The influence of the recipient includes self-assessment or reflection of the student as well as setting goals. The impact of the feedback includes the credibility of the preceptor, the support of the organization, and the tone of the delivery.

Communication can be a detriment to student development as studies show that no feedback or negative communication from a preceptor to a student can be destructive instead of constructive (Elicil & Sari, 2006; Hand, 2005). Preceptor communication of the expectations and goals for students allows for development of the student's clinical rotation (Motley & Dolansky, 2015). Students feel they were unable to practice their psychomotor skills as they had expected to do during their clinical rotation (Demeester, et. al., 2017). Without clear communication about expectations, students struggle to clinically develop. Research finds negative communication between preceptors and students such as belittling a student while correcting the student, specifically in front of a

patient or peers, to be a barrier to students and their ability to engage in learning (Kuen, 1997). Students also feel they are listened to by effective preceptors more than ineffective preceptors (Kelly, 2007). Students feel they should be able to respond fully and give reasoning prior to be given feedback. Specifically, one student in the Kelly study stated "the best teachers are those who are willing to listen and value what we have to say even if it is lower level knowledge" (p. 888). Another aspect to note in Kelly's study is that even though the research was conducted over a 14-year period and some of the responses were worded differently, preceptor-student communication is a characteristic of importance that is ongoing over a long period of time. The inability for a preceptor to be open to dialogue with a student may also hinder the preceptor's own professional development. Studies show preceptors appreciate having students around because students are learning the latest techniques and technology which causes preceptors to re-evaluate their own clinical skills (Kleiser and Cox, 2008; Rogers, et.al. 2008;). Other benefits to the preceptor include improving the work environment as well as reducing burnout (Edwards, et al. 2006), and helping the clinician working in an isolated setting such as rural communities (Clough, 2003).

Communication is the key to any relationship. This is no different in the student-preceptor relationship. Communicating clearly expected objectives to the student as well as providing continuous or multiple rounds of feedback is vital to the development of the student as a health professional. Students are open to both praise and corrective feedback; however, corrective feedback needs to be balanced with time, place, and manner in which the message is delivered. Students also desire that communication happens both from preceptor to student and student to preceptor.

Availability

Sweet and Broadbent (2017) find availability of a preceptor to be one of the most important qualities in an effective preceptor. Availability to a student related to the time an individual facilitator afforded a student and how that time was spent. Essentially, students perceive the more time spent with a student, the more effective the learning outcome. Without the ability to reach a preceptor through technology or in person, communication cannot begin. Buchel and Edwards (2005) also show availability is important. They state that 22 percent of medical residents surveyed listed availability in their top three most important attributes out of fifteen for effective precepting. Other studies also find the availability of the preceptor was important to the student (Elcigil & Sari, 2006; Tang, Chou, and Chiang, 2005; Demeester et al., 2017).

Availability appears to be a priority of students across various professions when working with a preceptor. If the role of a preceptor is to guide a student who needs assistance or has a question, the learning process can be disrupted if the preceptor is inaccessible. Without the availability of the preceptor, the learning process for the student may still happen for the student; however, it will be self-directed and without guidance.

Barriers for Effective Preceptors

Although clinical competence is a characteristic of an effective preceptor, the commitment to patient care can also be a barrier to teaching in the clinical setting. Rich (2009) looks at "teachable moments" when a student was willing to learn and accept new information as well as the preceptor being prepared to respond immediately. On the average, Rich finds about 18 teachable moments per day between the student and the clinical instructor. The study identifies barriers to these teachable moments. Students

realize the clinicians have other responsibilities outside of precepting and identify this as a barrier to the teachable moment. Preceptors also identify caring for patients as well as other responsibilities not associated with precepting as barriers to the teaching moment. These other responsibilities could fall in categories such as administrative or research. Therefore, the preceptor is unable to engage in the learning process of the student because of their clinical responsibilities in directly or indirectly caring for patients. Preceptors are clinicians first and although they take on additional responsibility of clinically teaching a student, the clinician still must maintain their productivity within the patient care setting (Barker & Pitman, 2008). Although a preceptor may be an effective clinical instructor, their supervisor may not find clinical teaching a priority because this is not the mission of the health care facility in which the learning is taking place. This priority is somewhat ironic because studies (e.g., Lee-Hsieh, et.al., 2016; Rogers, et.al., 2008) show students are more likely to be recruited and employed by the health care entity if they have experienced a clinical rotation at that facility. The extra time and commitment to teaching clinically is shown by Levy, Gjerde, and Albrecht (1997), in which community physicians who were teaching third-year medical students saw 1.4 fewer patients a day and spent about 51 minutes longer at work than physicians not supervising students. This increased responsibility of teaching and lack of quality instruction time due to clinical responsibilities is also seen in other studies (Goertzen, Stewart & Weston, 1995; Hodges 2009).

Some barriers for effective precepting may not be isolated to the preceptor and the student. However, these barriers can affect the clinical education environment. Sometimes patients do not want to interact with a student or medical insurance entities dictate care and documentation to be delivered (Barker & Pitman, 2008). The facility

itself may not contain a layout for confidential communication between the preceptor and the student to discuss educational deficiencies or development (Gilmore 2001). Despite the facility, Riesenberg et al. (2001) shows the relationship with the preceptor made the difference for the student. The length of clinical rotations may vary by professions or even within a single program. There has been limited research on the varying lengths of clinical rotations completed by students and how this affects the relationship between the preceptor and the student. Early indications are that the length of the time of the rotation does not influence the effectiveness of a preceptor (Rich, 2005). Furthermore, it would be interesting to understand this factor more in the future as more research is conducted.

Preceptor Training

Although clinicians may have extensive knowledge within their scope of practice, they may not have experience in taking on the role and responsibilities of supervising clinical education of students as a preceptor. This is acknowledged by preceptors who are not confident in their ability to teach students clinically; however, it appears the longer a preceptor is in the health care profession, the more confident the clinician becomes to teach students (Rogers, et.al., 2008). Preceptor training administered by the academic program has been shown to be a benefit for the students. First, the training could include aspects of teaching methodology for the clinicians to better understand the students (Rogers, et. al. 2009). Demeester et al. (2017) shows a lack of knowledge of their role as a preceptor as well as what students were allowed to do, the students objectives, or how to coordinate the student's schedule. The same study shows students wanted more feedback which preceptors hesitated to provide. Also, preceptor training could focus on these concerns and clarify responsibilities of the preceptor. Preceptors are

not aware of individual learning styles to accommodate a wide variety of students (Byrd, Hood, & Youtsey, 1997).

Based on the literature that shows the benefits of preceptor training, it would be ideal if an academic program could train preceptors to enhance the learning environment for the student. This training would assist in a couple of areas. First, it would better define the relationship between the preceptor and the educational program. This could include roles of the preceptor, student and the educational program. This could also outline objectives and expectations of the clinical rotation. This would more formalize the expectations of the preceptor. Second, the educational program could assist the preceptor in identifying areas to develop their preceptor skills and better understanding the student and her or his learning style.

Measuring Preceptor Effectiveness

Many survey instruments have been developed for students to provide feedback to the educational program. Usually, these instruments are used by an academic program and are similar to classroom teaching evaluations but focus on the clinical education experience. This feedback mechanism is done to assess the quality of the clinical rotation and provide feedback to the preceptor about their performance as a preceptor. Fluit et al. (2010) systematically reviewed 32 commonly used surveys used by education programs to evaluate preceptors. These surveys asked questions about preceptor teaching strategies, role modeling, support for the student, and feedback. The number of items on the surveys varied from 1 to 58 and only two reported on internal consistency and reliability. Many survey instruments are used by students to evaluate preceptors and vary depending on program, assessment needs, and many other factors.

To a lesser extent, only a few survey instruments have been identified and validated to ask students about their perceptions of effective clinical preceptors. A survey called the Clinical Instructor Effectiveness Questionnaire (CIEQ) was developed by Tang in 1993. Over the years this survey was refined and modified. The latest survey instrument revision was by Tang, Chou, and Chiang in 2005. The purpose of their study included the following questions: "What are the characteristics of effective and ineffective clinical teachers?", "What are the differences between effective and ineffective clinical teachers?" and "Do students at different schools have the same opinions about what constitutes effective and ineffective clinical teachers?" (p 188).

The Clinical Instructor Effectiveness Questionnaire (CIEQ) developed by Tang in 1993 was adapted and used by Sarcona et. al, (2015). The questions were modified to reflect the proper wording of dietetics rather than the original profession of nursing. Sarcona also felt the category of "Professional Competence" should be retitled "Knowledge and Professional Competence" to properly reflect the questions contained within that section of the survey. After pilot testing, the survey was named the *Preceptor Behavior Scale*. Findings from Sarcona's study were that students found preceptors were more effective depending on the setting of the clinical experience. Preceptors were more effective if in the clinical setting versus food service setting, as well as the hospital based setting versus a university-based setting. AlRabeeah (2017) also used the survey developed from Tang, Chou, and Chiang as a basis for a mixed methods study. Along with administering the Preceptor Behavior Scale to respiratory therapy faculty and students, AlRabeeah also developed qualitative questions to (1) explore and compare respiratory care faculty and students' perceptions of the most important characteristics of an effective clinical instructor, (2) compare respiratory care academic and clinical

faculty perceptions of characteristics of an effective clinical instructor, and (3) compare respiratory care students' perceptions of effective clinical instructor characteristics as they progress through the respiratory care program (p. 4). In looking at the quantitative statistics of the respiratory care students, the students perceived the clinical instructors' interpersonal relationship with the students had the highest mean and clinical instructors' professional competence had the lowest mean. These findings emphasize students' perceptions of the importance of positive relationship between faculty and students during clinical education which were not formerly held by faculty. This contraindicates other studies findings mentioned previously and may be specific to the profession. This shows the importance of the current research project to see if there is a difference within various medical professions.

Another instrument of interest is the *Survey of Effective Clinical Educator Behaviors*, or SECEB (Dondaville, 2005). Through a series of 20 statement responses representing effective preceptor behaviors, the SECEB asked participants to rank both their Current Clinical Instructor and the Ideal Clinical Instructor on a Likert-type scale with responses ranging from 5 (very often) to 1 (never). The SECEB item statements were grouped according to four subcategories of effective clinical teaching behaviors: information, evaluation, critical thinking, and physical presence, all of which provided additional information for data analysis. The SECEB survey could also be used by preceptors to rate themselves and compare to students' opinions. In review of this survey instrument, some questions may not be clear for the participant. Of interest is how Dondaville asked the participant to rate the characteristics. Based on one characteristic, the participant was to rate their "Most Recent" preceptor and also their "ideal" preceptor. It is this aspect that is of interest to this research project as it may lead to insight into the

different student perspectives of various professions. Walker (2014) also used the SECEB survey to look at the difference between sex dyad combinations of preceptors and students. Although little difference among dyad combinations between preceptors and students was found, the study showed there was the existence of differences between the expectations of students and the actual behaviors of the preceptors. Prior research by Wright (2009) utilizing the same instrument indicated that preceptors often prioritized effective clinical educator behaviors significantly differently from students. Because it has been shown that there is a difference between clinical educators' behaviors and students' expectations, further exploration should be conducted into the opinion of students to see if there is a difference across professions.

Comparing Effective Preceptors between Health Care Professions

Only one study was found that directly compared health care professions as to the perception that the students had regarding effective clinical preceptors. Rogers, Dunn, and Lautar (2010) conducted research in the professions of physical therapy assistant, physician assistant, and radiological sciences. These programs ranged from two-year associate degrees to graduate level programs. Participants totaled 124 students, and they were asked to complete a 29 point Likert-type scale related specifically to the preceptors teaching skills. Rogers, Dunn, and Lautar used 4 main categories of questions including: 1) utilizing effective teaching methods, 2) ability to teach students experiencing difficulty, 3) understanding different styles, and 4) evaluating students and giving feedback. Recommendations based on the findings of this study included: 1) educational programs should teach preceptors teaching methods, 2) recognize good preceptors through training, and 3) developing a website to house educational resources for the preceptors.

Summary

Many factors lead to a preceptor being effective in the education of a health care student. Accreditation standards provide some guidance for preparation of preceptors. However, many standards vary depending upon profession and accreditation agency. Barriers to effective clinical education as well as characteristics of effective preceptors have been identified. Specific survey instruments have been used to assist in identifying and assessing effective clinical education. As inter-professional healthcare education progresses, it will be important to educational programs to understand not only their own profession but others as well. Based on the lack of information in the literature, it is the goal of this study to understand the difference in students' opinions of effective preceptors based on profession.

CHAPTER III

METHODOLOGY

This chapter contains a detailed explanation of the methods and procedures used to study the difference in health care students' perceptions of effective clinical preceptors. This chapter will identify the participants and setting in which the research took place, followed by a description of the selected survey instrument and concludes with a discussion of the data collection and analysis procedures used.

Purpose of the Study

The purpose of this study was to determine if there is a difference in identified characteristics of effective clinical education preceptors from the perspective of health care profession students. The healthcare professions included are athletic training, physical therapy, occupational therapy, medical laboratory science, physician assistant studies and medicine. As health care educational programs implement and emphasize interprofessional education, it is important to look at students' experience and perceptions to gain better understanding of how they will learn together. This includes the students' interactions with their respective preceptors. The information gathered in this study can be used to establish a baseline of students' perceptions to better understand the preceptor-student relationship among the various professions.

Research Questions

There are two primary research questions that were used in this study:

1) Is there a difference among various health profession students in identified characteristics of recent clinical education preceptors?
2) Is there a difference in identified characteristics of recent clinical education preceptors and characteristics of "ideal" preceptors for various health professional students.

Research Design

This study used a non-experimental design and was quantitative in nature. Using the "Effective and Ideal Preceptor Scale" as the survey instrument, data were collected from students to gain insight into their perceptions of preceptors. Then, a comparison was made among responses by students in different healthcare professions to determine if there was a difference in their perceptions of effective clinical preceptor characteristics.

Quantitative research is the systematic empirical investigation of observable phenomena through statistical techniques (Given, 2008). Through this analysis of data, the study can be generalized to a larger population. In this study, it is the perspectives of the respondents which may be generalized to other health care students. This study was done in a quantitative manner because the survey allowed students to share their perspectives concerning effective clinical preceptors on a measurable scale. The measurements recorded allowed data to be recorded across six different health-related educational professional programs.

The quantitative method also allowed data to be collected in an efficient manner during the academic year when clinical education had been completed by all the students.

The quantitative method allowed for a larger sample size than qualitative methods over the same time period. It is through the statistical analysis in which patterns about perceptions of preceptors and compare measurable differences among professions were observed.

Survey Instrument

The Effective and Ideal Preceptor Scale was adopted from Tangs', et.al (1993) Clinical Instructor Effectiveness Questionnaire (CIEQ) survey instrument used to find the difference between "effective" preceptor characteristics and "ineffective" preceptor characteristics. However, for this study, students were asked to provide feedback on their most recent preceptor characteristics as well as expectations of their "ideal" preceptor. The survey instrument has two parts: 1) demographic questionnaire and 2) student perceptions about the characteristics of effective preceptors. The demographic section of the survey instrument was designed specifically for this study. The only adaptation to the student perception portion of the survey instrument was in the "ideal" category. This included changing what the student had experienced to how important was that characteristic in their ideal preceptor.

The demographic questionnaire was used to collect information from participants about their age, sex, gender, and ethnicity, as well as information about their academic program. This line of questioning included requests to identify the educational program in which the student was housed, level of academic program (undergraduate, Master's, Doctoral), years completed in the academic program, and how many different clinical preceptors the student had experienced.

Remaining survey content centered on collecting student perceptions about the characteristics of effective preceptors. Using the same effective preceptor characteristics

in the categories of Professional Competence, Interpersonal Relationship, Personality Characteristics, and Teaching Ability developed by Tang et. al. (2005), students were asked to rate the effectiveness characteristics exhibited by the preceptor of their most recently completed clinical education rotation on a Likert-type scale. The Likert-type scale ranged from 1-5 with 1 representing "never" and 5 representing "very often". Students were then be asked about the importance of the same characteristics about their "ideal" preceptor. The complete survey instrument is provided in Appendix A. Permission was obtained from Dr. Tang to use a variation of his survey instrument in this study (Appendix C).

Tang started with 20 items based on a previous study by Brown (1981) identifying important characteristics of teachers. They then identified more characteristics totaling 57 and through pilot testing and statistical analysis, reduced the number to forty effective characteristics of preceptors. These forty characteristics were broken down into four categories suggested by Zimmerman and Waltman (1986): Professional Competence (6 questions), Interpersonal Relationships (9 questions), Personality Characteristics (10 questions), and Teaching Ability (15 questions). Students were asked to rate the same characteristic twice exhibited by their preceptor. Once for a preceptor they thought was effective and once for a preceptor they did not think was effective over the students' clinical experiences. Credibility using statistical results following the second pilot project revealed the Cronbach's coefficient alpha for the four categories showing: Professional Competence = .74, Interpersonal Relationships = .87, Personality Characteristics = .92, and Teaching Ability = .92. Tang, Chou, and Chiang (2005) compared 2 different institutions and found "In these two nursing schools, the Pearson correlation value was $r = .48$ ($p < .01$) for the effective teacher and $r = .87$ ($p <$

.000) for the ineffective teacher. The data demonstrated that these perceptions of teacher effectiveness are the same at different schools" (p. 190).

The reliability of the data in this study was similar to results from the study conducted by Tang et al. (2005). Of the four subcategories (professional competence, interpersonal relationship, personal characteristics, and teaching ability), Tang et.al. (2005) found professional competence had the lowest Cronbach's alpha score. This study is consistent with Tang et. al.'s (2005) previous reliability showing Cronbach's alpha was Professional competence $\alpha = .67$, Interpersonal relationships $\alpha = .82$, Personality characteristics $\alpha = .86$, Teaching ability $\alpha = .87$.

Demographic Variables

Variables within this survey instrument included demographic information about the student. Demographic variables included age, sex, race, gender, as well as past or present health care education information such as academic level of program enrolled, profession enrolled in, years completed in the academic program and other health education experience. Table 1 describes age, sex, race, and gender variables asked of the participants.

Table 1

Students Perspective of Effective Clinical Preceptor Variable List – Demographics

Variable Name	Variable Description	Data Type	Values
AGE	Age of student when enrolled	Ratio	17-45
SEX	Sex	Nominal	1-Male 2-Female 3-Intersex 4-Other

Table 1 cont.

Variable Name	Variable Description	Data Type	Values
Gender	Gender	Nominal	1-Male 2-Female 3-Transgender 4-Other
RACE	Race	Nominal	1- Amer. Indian or Alaska Native 2- Asian 3- Black or African American 4- Native Hawaiian or other Pacific Islander 5-Hispanic 6-White

Table 2 lists the variable of past or present health care education information such as academic level of program enrolled, profession enrolled in, years completed in the academic program and other health education experience. Once students completed the demographic information, the participants responded to effective characteristics of experiences they had completed as well as their ideal preceptor.

Table 2

Academic Demographic Variables

Variable Name	Variable Description	Data Type	Values
LEVAP	Level of Academic Program	Nominal	1-Undergraduate 2-Masters 3-Doctoral
PROF	Profession Enrolled	Nominal	1-Athletic Training 2-Medical Laboratory Science 3-Medicine 4-Occupational Therapy 5-Physical Therapy 6-Physician Assistant

Table 2 cont.

Variable Name	Variable Description	Data Type	Values
YRSCOM	Years Completed in the Academic Professional Program	Interval	<1-5+
NUMPRE	Number of Preceptors of Completed Clinical Educational Rotations	Interval	1-10+
ADDDEGREES	What other Health Profession Degrees or training have you had outside of current educational program	Open	Please Explain.

Research Variables

The following four tables show the characteristics students were surveyed in regards to their perception of effective clinical instructor characteristics. The same questions were asked for the students' most recently completed clinical instructor as well as an "ideal" clinical instructor. The Effective and Ideal Preceptor Scale variables are divided into four subscales: Professional Competence (ProfComp), Interpersonal Relationship (IR), Personality Characteristics (PersChar), and Teaching Abilities (TA). In this study, students were asked the same question on these subscales about their experiences with their most recently completed clinical instructor (CCEE) as well as an "ideal" clinical preceptor (ICP). Specific information about the variables are provided in Tables 3-6. For a full variable table, refer to Appendix D. The entire survey instrument as it was presented to students may provide clarity and can be seen in Appendix A. A composite variable was generated for each subscale. This composite variable was calculated using unit weighted across all items of the subscale.

Table 3 demonstrates the characteristics surveyed for Professional Competence of preceptors.

Table 3

Professional Competence (ProfComp) Variables for Completed Clinical Instructor Experiences (CCEE) and with Ideal Clinical Preceptors (ICP)

Variable Name	Variable Description	Data Type	Values
CCEEProfComp1 ICPProfComp1	Is interested in patient's care	Interval	1-5 (Never to Very Often)
CCEEProfComp2 ICPProfComp2	Applies theory in clinical practice	Interval	1-5 (Never to Very Often)
CCEEProfComp3 ICPProfComp3	Is a role model for students	Interval	1-5 (Never to Very Often)
CCEEProfComp4 ICPProfComp4	Is a skillful practitioner	Interval	1-5 (Never to Very Often)
CCEEProfComp5 ICPProfComp5	Has sufficient professional knowledge	Interval	1-5 (Never to Very Often)
CCEEProfComp6 ICPProfComp6	Explains and demonstrates new techniques	Interval	1-5 (Never to Very Often)
CCEEProf CompVCS ICPProfCompVCS	Professional Competence Variable Composite Score	Calculated Interval	1-5 (Never to Very Often)

Table 4 contains questions asking students about their preceptor Interpersonal Relationship (IR) characteristics.

Table 4

Interpersonal Relationship (IR) Variables for Completed Clinical Instructor Experiences (CCEE) and with Ideal Clinical Preceptor (ICP)

Variable Name	Variable Description	Data Type	Values
CCEEIR1 ICPIR1	Avoids over supervising students work	Interval	1-5 (Never to Very Often)
CCEEIR2 ICPIR2	Provides appropriate feedback from students' improvement	Interval	1-5 (Never to Very Often)
CCEEIR3 ICPIR3	Solves problems with students	Interval	1-5 (Never to Very Often)
CCEEIR4 ICPIR4	Treats students as people with thought and wisdom	Interval	1-5 (Never to Very Often)

Table 4 cont.

Variable Name	Variable Description	Data Type	Values
CCEEIR5 ICPIR5	Provides constructive criticism	Interval	1-5 (Never to Very Often)
CCEEIR6 ICPIR6	Avoids authoritarian and dominating attitudes	Interval	1-5 (Never to Very Often)
CCEEIR7 ICPIR7	Does not censure (criticize) students in front of others	Interval	1-5 (Never to Very Often)
CCEEIR8 ICPIR8	Gives students a chance to explain	Interval	1-5 (Never to Very Often)
CCEEIR9 ICPIR9	Has a good relationship with healthcare team members	Interval	1-5 (Never to Very Often)
CCEEIRVCS ICPIRVCS	Interpersonal Relationship Variable Composite Score	Calculated Interval	1-5 (Never to Very Often

Table 5 questions surveyed students' perception of preceptors' personality characteristics (PersChar) for both previous preceptors as well as an "Ideal" preceptor.

Table 5

Personality Characteristics (PersChar) Variables for Completed Clinical Instructor Experiences (CCEE) and with Ideal Clinical Preceptors (ICP)

Variable Name	Variable Description	Data Type	Values
CCEEPersChar1 ICPPersChar1	Controls temper and shows patience and cooperative attitude	Interval	1-5 (Never to Very Often)
CCEEPersChar2 ICPPersChar2	Treats students sincerely and objectively	Interval	1-5 (Never to Very Often)
CCEEPersChar3 ICPPersChar3	Has an enthusiastic attitude in teaching	Interval	1-5 (Never to Very Often)
CCEEPersChar4 ICPPersChar4	Manages incidents created by students reasonably	Interval	1-5 (Never to Very Often)
CCEEPersChar5 ICPPersChar5	Endures students' mistakes and avoids scolding	Interval	1-5 (Never to Very Often)
CCEEPersChar6 ICPPersChar6	Is empathetic toward students	Interval	1-5 (Never to Very Often)

Table 5 cont.

Variable Name	Variable Description	Data Type	Values
CCEEPersChar7 ICPPersChar7	Accepts reasonable opinions and methods	Interval	1-5 (Never to Very Often)
CCEEPersChar8 ICPPersChar8	Respect's students' right to privacy	Interval	1-5 (Never to Very Often)
CCEEPersChar9 ICPPersChar9	Accepts individual differences in students	Interval	1-5 (Never to Very Often)
CCEEPersChar10 ICPPersChar10	Avoids subjectively judging students	Interval	1-5 (Never to Very Often)
CCEEPerCharVCS ICPPerCharVCS	Personality Characteristics Variable Composite Score	Calculated Interval	1-5

Table 6 demonstrates questions about a preceptor's effective teaching abilities from a student's perspective.

Table 6

Teaching Abilities (TA) Variables for Completed Clinical Instructor Experiences (CCEE) and with Ideal Clinical Preceptors (ICP)

Variable Name	Variable Description	Data Type	Values
CCEETA1 ICPTA1	Clearly informs students of their responsibilities	Interval	1-5 (Never to Very Often)
CCEETA2 ICPTA2	Provides student with relevant knowledge	Interval	1-5 (Never to Very Often)
CCEETA3 ICPTA3	Does not intrude or take over process when students are trying a new technique	Interval	1-5 (Never to Very Often)
CCEETA4 ICPTA4	Has realistic expectations	Interval	1-5 (Never to Very Often)
CCEETA5 ICPTA5	Motivates students to learn	Interval	1-5 (Never to Very Often)
CCEETA6 ICPTA6	Permits students to freely discuss and express their feelings	Interval	1-5 (Never to Very Often)

Table 6 cont.

Variable Name	Variable Description	Data Type	Values
CCEETA7 ICPTA7	Uses hospital/clinic resources to gain more experience	Interval	1-5 (Never to Very Often)
CCEETA8 ICPTA8	Raises questions and stimulates students to think	Interval	1-5 (Never to Very Often)
CCEETA9 ICPTA9	Encourages students to think and learn independently	Interval	1-5 (Never to Very Often)
CCEETA10 ICPTA10	Tries to understand gaps in a student's learning experience	Interval	1-5 (Never to Very Often)
CCEETA11 ICPTA11	Uses time wisely and is organized and effective	Interval	1-5 (Never to Very Often)
CCEETA12 ICPTA12	Uses teaching activities that match the stated learning objective	Interval	1-5 (Never to Very Often)
CCEETA13 ICPTA13	Prepares teaching materials and activities in advance	Interval	1-5 (Never to Very Often)
CCEETA14 ICPTA14	Makes clinical practice a fulfilling experience	Interval	1-5 (Never to Very Often)
CCEETA15 ICPTA15	Fairly and objectively evaluates students	Interval	1-5 (Never to Very Often)
CCEETAVCS ICPTAVCS	Teaching Ability Variable Composite Score	Calculated Interval	1-5 (Never to Very Often)

Survey Instrument and Kolb's Learning Theory

Participants

Participants for this study were students at a research-intensive university in the Midwest. At the time of the study, the participants were enrolled within the following professional academic programs: medicine, physical therapy, occupational therapy, athletic training, medical laboratory science, and physician assistant studies. Students of

these programs vary from undergraduate to clinical doctoral levels. These programs are structured differently including when students experience clinical education, therefore students of these programs had completed at least one clinical rotation prior to participation in this study. Surveys were distributed in the spring semester 2019 in an attempt to collect data when students have experienced multiple clinical rotations based on timing of the academic year.

The academic programs varied in enrollment. Clinical education experience was needed by the participants for the basis of this study. Therefore, students without clinical experience were not approached to complete the survey. All of the students meeting the minimum criteria of one clinical rotation in the various programs are included in Table 7. Purposive criteria sampling was used to ensure each profession was represented within the study.

Table 7

Possible Participants Based on Enrollment and Completing Clinical Rotations

	Medicine	**Occupational Therapy**	**Physical Therapy**	**Medical Lab Science**	**Physician Assistant**	**Athletic Training**
Enrollment	156	120	104	75	60	27

All eligible participants were asked to contribute to the study. A sampling of different professions was used in an attempt to obtain data from no less than 25 participants from each profession. Because of the enrollment in some programs are relatively small, around 30 students, 25 participants from each group were chosen to allow for participants who did not want to participate. Institutional Review Board approval was sought and approved prior to administration of the survey.

Data Collection

Recruitment

Recruitment began with an email introduction of the study. This introduction was given first to the department chairs and faculty of academic programs so they fully understood the purpose of the study. The researcher communicated with chairs and faculty to establish timelines of clinical education of each of the programs. Dependent upon completion of at least one clinical rotation throughout the academic year, students were given the invitation communication as well as the statement of informed consent (see Appendix B). The elements identified in the informed consent statement encompass the: a) purpose of the research project, b) procedures to be followed, c) risks of the study, d) benefits of the study, e) duration of the study, f) statement of confidentiality, g) right to ask questions, h) compensation, and i) voluntary participation. After informed consent was understood, the students had the opportunity to complete the survey instrument.

To maximize survey response, the researcher requested from the program administrators the opportunity to present the survey in person to students who had completed the requisite clinical educational rotations. The researcher presented the reasons for the research in person and directed the students to a link to complete the survey which was emailed to them just prior to or at the time of the presentation by the researcher. The survey was administered via Qualtrics which was accessible to all students and was linked to an email sent to the students. For students who were unable to complete the survey in person, the survey invitation and instrument were sent in an electronic version without the researcher communicating the reasons for the research in person. Department Chairs of the various educational healthcare programs were informed of the study. The Chairs agreed to allow the researcher to present information

to students in person while attending a class period if possible (athletic training, physical therapy, occupational therapy, physician assistant, and medicine). Medical laboratory science has a completely online program and some of the students of the physical therapy, occupational therapy, physician assistant, and medicine students were off campus, so an electronic version without researcher being present was produced and distributed to that subset sample. The timing of the survey was completed it the spring of the 2019 semester.

All surveys were distributed prior to the end of the spring semester of 2019. When meeting in person with participants, the researcher provided informed consent through a link to the survey, explained the purpose of the study, clearly explained that the student did not have to participate, and clarified any questions generated by the participants. In delivery of the study to the students, the researcher explained the interest in learning about students experiences, both actual and "ideal," with clinical preceptors. The results of this research could benefit the entire academic school housing the various programs by providing generalized information about clinical education. Implications for this study could also assist in providing the program and school information which could lead to better preceptors. Participants were not be compensated for participation in this project. The survey instrument was presented to participants in April 2019, and students participated by submitting responses between the dates of April 4, 2019, and April 29, 2019.

The survey instrument was sent to 542 students in six different health care education programs. The number of participants who entered the survey link and entered any information was 232. Thirty seven participants chose to enter demographic information only and did not complete any survey items pertaining to precepting. This

data was removed from the calculations. 195 participants completed some or all of survey instrument. Data from these participants were analyzed.

The surveys did not ask for any information that would identify from whom the responses were submitted and therefore, the participation responses were recorded anonymously. All online survey responses were conducted via Qualtrics and were treated confidentially and uploaded into SPSS software. Participant identification and anonymity were maintained via Qualtrics. All data collected and analyzed by the researcher were accessible only by the researcher, and the researcher will not collect any identifiable information from the subjects. Research data was downloaded from the UND password-protected Qualtrics program to a password-protected computer of the researcher to perform data analysis. This computer is housed in a locked office of the researcher. Research data will be kept for a minimum of three years past data collection and analyzation.

Participant Demographics

Demographic Characteristics

The average age of the participants was 24.2 years old. Most students were represented in the 23-26 age category and almost 93% of the students were below the age of 30. Table 8 displays the age distribution of the participants.

Table 8

Age of Participants

Age Range (in years)	**Frequency**	**Percentage**
19-22	53	34.2%
23-26	75	48.4%
27-30	16	10.3%
30-33	4	2.6%
33+	7	4.5%
Total	155	100%

About two-thirds of the participants identified as a female for sex and gender, whereas only one-third identified as male. Table 9 shows the distribution of participants in both sex and gender.

Table 9

Sex and Gender of Participants

Sex	**N**	**Percentage**
Female	131	66.8%
Male	65	33.2%
Gender		
Female	131	67.2%
Male	64	32.8%
Intersex	0	0%

A vast majority of the participants were white, whereas less than 5% indicated their ethnicity was something other than white. Table 10 indicates the results for ethnicity.

Table 10

Ethnicity of Participants

Ethnicity	N	Percentage
American Indian	3	1.6%
Asian	3	1.6%
Black of African American	1	.5%
Native Hawaiian or Pacific Islander	0	.0%
Hispanic	1	.5%
White	183	95.3%
Did not identify	1	.5%
Total	192	100%

All three academic levels of education (undergraduate, master's, doctorate), were represented within the participants and distributed fairly evenly. Each academic level had at least 30% of the total participants as displayed in table 11.

Table 11

Level of Academic Program Enrolled

Level of Academic Program	N	Percentage
Doctoral	73	37.6%
Masters	59	30.4%
Undergraduate	63	32.5%
Total	195	100%

Although all six academic programs were represented in the survey, the number of responses from each program varied. Medical laboratory science and occupational therapy participated the most, whereas medicine participated the least. This may be reflective of the lack of opportunity to present to the medical students in person. Table 12 shows the distribution of participants by discipline.

Table 12

Professional Educational Program Enrolled by Participant

Academic Program	N	Percentage of Participants in Academic Program	Percentage of Participants in study by Profession
Athletic Training	26	96.3%	13.4%
Medical Laboratory Science	47	62.7%	24.2%
Medicine	17	10.9%	8.8%
Occupational Therapy	28	23.3%	14.4%
Physical Therapy	46	44.2%	23.7%
Physician Assistant Studies	30	50%	15.5%
Total	194	35.8%	100%

Fewer than 19% of participants were in their first year, and 81% of the participants had completed at least 2 years in the educational program. Table 13 demonstrates the years completed by the participants at the time of the survey.

Table 13

Years Completed in Academic Program Enrolled

Years completed in program	N	Percentage
<1	37	18.9%
2	86	43.9%
3	28	14.3%
4	36	18.4%
5+	8	4.1%
Total	195	100%

The participants had experienced clinical education under approximately 4.8 preceptors at the time of the survey. Thirty-two participants had a single preceptor, whereas 20.4% of the participants had at least 10 preceptors due to the length or structure in their program. Table 14 shows the distribution of preceptors with whom students had completed educational experiences in an clinical setting.

Table 14

Number of Clinical Preceptors of Participants Completed Clinical Rotations

Number of Preceptors	N	Percentage
1	32	16.3%
2	37	18.9%
3	21	10.7%
4	19	9.7%
5	11	5.6%
6	12	6.1%
7	12	6.1%
8	10	5.1%
9	1	.5%
10+	40	20.4%
Total	195	100%

Although not perfectly aligned between each variable and each stage of Kolb's Theory, some stages of experiential learning identified by Kolb can be seen within the survey instrument. Stage one of Kolb's theory, Concrete Experience, could be reflected

in questions such as “Is a skillful practitioner,” “Applies theory in practice,” “Has sufficient professional knowledge,” “Has a good relationship with coworkers or health team members,” “Clearly informs students of their responsibilities,” “Provides student with relevant knowledge,” “Makes clinical practice a fulfilling experience,” and “Is interested in patient’s care.” Reflective Observation stage by Kolb can be addressed through questions such as “Fairly and objectively evaluates students,” “provides constructive criticism,” and “Provides appropriate feedback from students’ improvement.” The Abstract Conceptualization stage is seen within questions such as “Permits students to freely discuss and express their feelings,” “Accepts reasonable opinions and methods,” “Gives students a chance to explain,” “Avoids over supervising students work,” and “Solves problems with students.” The last stage, Active Experimentation, can be seen in questions such as “Encourages students to think and learn independently,” “Raises questions and stimulates students to think,” “Manages incidents created by students reasonably,” “ Endures students mistakes and avoids scolding or condescending comments,” “ Motivates students to learn” and “Does not intrude or take over when students are trying a new technique.” The results of this study will use the survey instrument and overlay Kolb’s Learning Theory to assist in a working interpretation of how students perceive preceptors and make the precepting experience better for the student (see page 85 for more information).

Data Analysis

Data analysis began with the entering of the data into SPSS. Once data entry was complete, the data were reviewed and reported for number of participants who logged in to the survey, the number of incomplete surveys, and the number of surveys from each profession. Data was also reviewed for errors such as duplicate data and coding errors

and if errors were found, data was eliminated. During analyzation of the data, efforts were made to include all data possible in which participants met the minimum criteria of at least one clinical rotation under a preceptor. An example was if a participant left one question unanswered, that item was eliminated from the statistical analysis, but the rest of the items were included in the analysis. Once data was entered into SPSS and cleaned, statistical analysis included reporting descriptive statistics, calculating measures of reliability, running an exploratory factor analysis, and completing a series of analyses of variance (ANOVAs).

Descriptive Statistics

Descriptive statistics were calculated to summarize the general tendencies in the sample data within the four main categories identified by Tang et.al. (2005). These main concepts are based on several factors and these variables were combined to evaluate the concepts of Professional Competence, Interpersonal Relationships, Personality Characteristics, and Teaching Ability. Calculations were done for both actual experienced clinical rotations and also the perceived ideal preceptor. Descriptive statistics were analyzed in order to summarize the characteristics of the sample and provide information about the measurement scales. This was used to identify frequencies, skewness, kurtosis, and mean score. Analysis revealed skewness in most of the subcategories were either +1 to -1 which is considered a normal distribution of the categories. Two categories were moderately skewed. All subcategories had normal kurtosis. When normal distribution was not maintained, results could be interpreted as invalid and unreliable. Tests such as ANOVAs assume normality of data. Because the sample size was large enough, the ANOVA testing could be used.

Measures of Reliability

Reliability for the current study was calculated to show if participants responded similarly to all items on the survey instrument using Cronbach's Alpha. According to Warner (2013), internal consistency describes the agreement across a number of measures of the same construct, usually multiple items on a self-report test (p 1093). Cronbach's alpha (α) was evaluated in order to improve reliability of items and scales used and to consider removal of items which may be inconsistent with the construct being measured. It was the hope that item reliability of the subcategories would be greater than .70 but less than .95 (Warner, 2013). Only one subcategory of eight was below a Cronbach's Alpha of .70. That subcategory was Ideal Clinical Preceptor Professional Competence. After reliability was determined, the items within the data were combined to represent the overall construct in a more complex analysis.

Exploratory Factor Analysis

Factor analysis is a statistical method used to describe variance among correlated variables and was used to determine if any items in the subcategories could be reduced or combined to measure a few unobserved constructs (Warner, 2013). It is believed by the researcher the work done by Tang et al. (1993) to develop the survey instrument demonstrated satisfactory results of a factor analysis for each category on the *Clinical Instructor Effectiveness Questionnaire*. However, an exploratory factor analysis was conducted in this study to prove the statistical strength of the survey. Eigen values assisted in determining the amount of variance, per number items, explained by each factor. Also, a Scree plot was used to justify the factoral analysis. Factor rotation is to obtain a pattern of factoral loadings which made interpretation easier. A Varimax rotation method was used to determine rotation of data.

Analysis of Variance

An analysis of variance (ANOVA) according to Warner (2013) "is a statistical analysis that tests whether there are statistically significant differences between means on scores on a quantitative outcome variable across two or more groups" (p. 1071). This study considered the difference in students' opinions of their experienced clinical preceptors characteristics based on profession. This same concept would be applied to the students' ideal preceptor based on profession. Therefore, for research question 1, a series of one way ANOVAs was conducted to see if there was a difference in the categories of significant clinical characteristics for both experience completed with a clinical preceptor and ideal preceptor based on profession. See Table 15 for a summary of the Analyses of Variances that were completed in this study to answer research question #1. For research question 2, a repeated measures ANOVA was conducted to compare the actual clinical experience with the "ideal" preceptor scores by profession. This ANOVA is shown in Table 16.

Table 15

Completed Analyses of Variance for Research Question #1(ANOVAs)

Independent Variable	Dependent Variable Name	Dependent Variable Composite Variable Descriptions
Profession (PROF)	CCEEProf Comp COMPOSITE	Experienced Clinical Rotation Professional Competence
Profession (PROF)	CCEEIR COMPOSITE	Experienced Clinical Rotation Interpersonal Competence
Profession (PROF)	CCEEPersChar COMPOSITE	Experienced Clinical Rotation Personality Characteristics
Profession (PROF)	CCEETA COMPOSITE	Experienced Clinical Rotation Teaching Ability
Profession (PROF)	ICPProfCOMP COMPOSITE	Ideal Clinical Preceptor Professional Competence

Table 15 cont.

Independent Variable	Dependent Variable Name	Dependent Variable Composite Variable Descriptions
Profession (PROF)	ICPIR COMPOSITE	Ideal Clinical Preceptor Interpersonal Competence
Profession (PROF)	ICPPersChar COMPOSITE	Ideal Clinical Preceptor Personality Characteristics
Profession (PROF)	ICPTA COMPOSITE	Ideal Clinical Preceptor Teaching Ability

Table 16

Completed Analyses of Variance for Research Question #2 (ANOVAs)

Independent Variable	Dependent Variable Name	Dependent Variable Composite Variable Descriptions
Profession (PROF)	CCEEProfComp COMPOSITE ICPProfCOMP COMPOSITE	Professional Competence
Profession (PROF)	CCEEIR COMPOSITE ICPIR COMPOSITE	Interpersonal Competence
Profession (PROF)	CCEEPersChar COMPOSITE ICPPersChar COMPOSITE	Personality Characteristics
Profession (PROF)	CCEETA COMPOSITE ICPTA COMPOSITE	Teaching Ability

Limitations

This research is an attempt to gain data from the disciplines of Physical Therapy, Occupational Therapy, Medical Laboratory Science, Athletic Training, Physician Assistant Studies as well as the Medical Doctor Programs at a Midwestern public university. Participants identified for this study were students who completed clinical rotations. These students had common resources within the school such as the library, simulation center, learning communities, as well as all were enrolled in nationally accredited programs at the time of the study. Limitations to this study include being conducted at one institution and specific to the programs housed within that institution. Also, this university does not have a designated teaching hospital that is common to other

universities which may have an influence on the preceptors working within that university-owned hospital.

Summary

The goal of this study is to find if differences existed in the perceptions of health care students about their preceptors. Research methods included a quantitative study using an online survey of the students' perceptions of effective characteristics of their past and ideal preceptors. Input was provided from six different health care educational programs. Most respondents were between the ages of 23 to 26 years old and were white females. Over 80% of students were in at least their second year in the academic program and had a history of at least two preceptors. The remaining data collected in the "Effective and Ideal Preceptor Survey" provided insight into answering if there was a difference between perceptions of professions, which will be discussed further in Chapter 4.

CHAPTER IV

RESULTS

The purpose of this quantitative study was to determine if there is a difference amongst health care education students' perceptions as to the characteristics of effective clinical preceptors. There were two research questions that guided this study:

Research Question 1. Is there a difference among various health profession students in identified characteristics of recent clinical education preceptors?

Research Question 2. Is there a difference in identified characteristics of recent clinical education preceptors and characteristics of "ideal" preceptors for various health professional students?

Preparing Data to Respond to Research Questions

Once data collection was complete, the data was transferred from Qualtrics into SPSS so statistical analysis could begin. Descriptive statistics were calculated for each item on the survey instrument, including mean, standard deviation, skewness, and kurtosis. All variables were screened for normality. All individual characteristics under the Completed Clinical Education Experience (CCEE) category were considered normal after data screening. Of the forty variables under the Ideal Clinical Preceptor (ICP) category, eight individual characteristics showed severe skewness above a 1 and six showed severe kurtosis above 2.3. In addition, the individual survey items needed to be calculated into composite scores for each subcategory in both the Completed Clinical Education Experience (CCEE) category as well as the "Ideal" Clinical Preceptor (ICP).

The composite scores were generated to be able to compare the various professions in each of these subcategories. When combined to develop composite scores for the subcategories, two subcategories showed only moderate skewness above 1.0 but below 2.3. These subscales were the Completed Clinical Education Experience (CCEE) Personality Characteristics (skewness of -1.148) and the Ideal Clinical Preceptor (ICP) Professional Competence (-1.482). All of the other data showed normality.

Completed Clinical Education Experience (CCEE) Variables

The mean scores for the individual items under each subcategory are listed in tables 17 through 24. Full descriptive statistics for composite scores are shown in tables 25 and 26.

Professional Competence. In the subcategory of Professional Competence, participants perceived their preceptors "most often" had sufficient professional knowledge (*M*=4.63, *SD*=.55), which was the highest mean score on the subscale. Students perceived that their preceptors "fairly often" applied theory in clinical practice (*M*=4.02, *SD*=.98), which was the lowest reported mean in the subscale. No means fell below 4.00 (on a 5.00 scale). Table 17 displays the means of all items for the subcategory of Professional Competence of a past preceptor.

Table 17

Means for Individual Items in Completed Clinical Education Experience Professional Competence (CCEEProfComp)

Variable	Variable Description	Mean (SD)
CCEEProfComp1	Is interested in patient's care	4.64 (.60)
CCEEProfComp2	Applies theory in clinical practice	4.02 (.98)
CCEEProfComp3	Is a role model for students	4.39 (.78)
CCEEProfComp4	Is a skillful practitioner	4.54 (.60)
CCEEProfComp5	Has sufficient professional knowledge	4.63 (.54)
CCEEProfComp6	Explains and demonstrates new techniques	4.09 (.89)

Interpersonal Relationships. In the subcategory of Interpersonal Relationships of their most recent preceptor, participants experienced just below "Fairly Often" with their preceptors the item "Avoids over supervising student's work" (*M*=3.98, *SD*= .94), which ranked lowest. "Has a good relationship with healthcare team members" (*M*=4.49, *SD*= .76) was ranked the highest between "Fairly Often" and "Very Often." The means for all items of Interpersonal Relationships is shown in Table 18.

Table 18

Means for Individual Items in Completed Clinical Education Experience Interpersonal Relationships (CCEEIR)

Variable	Variable Description	Mean (*SD*)
CCEEIR1	Avoids over supervising students work	3.98 (.94)
CCEEIR2	Provides appropriate feedback from students' improvement	4.04 (.95)
CCEEIR3	Solves problems with students	4.07 (.99)
CCEEIR4	Treats students as people with thought and wisdom	4.37 (.85)
CCEEIR5	Provides constructive criticism	4.08 (.91)
CCEEIR6	Avoids authoritarian and dominating attitudes	4.29 (.94)
CCEEIR7	Does not censure (criticize) students in front of others	4.40 (.87)
CCEEIR8	Gives students a chance to explain	4.35 (.73)
CCEEIR9	Has a good relationship with healthcare team members	4.49 (.76)

Personality Characteristics. Participants thought the item of "respect's students' right to privacy" (*M*=4.65, *SD*=.61) ranked highest in the subcategory of Personality Characteristics for their preceptors, which was closest to "Very Often." Participants ranked "Has an enthusiastic attitude in teaching" (*M*=4.21, *SD*=.92) as the lowest item in this subcategory from their clinical experiences which related closest to "Fairly Often." Table 19 shows the means for all the items in the subcategory for Personality Characteristics experienced by participants.

Table 19

Means for Individual Items in Completed Clinical Education Experience Personality Characteristics (CCEEPerChar)

Variable	Variable Description	Mean (*SD*)
CCEEPersChar1	Controls temper and shows patience and cooperative attitude	4.52 (.72)
CCEEPersChar2	Treats students sincerely and objectively	4.49 (.74)
CCEEPersChar3	Has an enthusiastic attitude in teaching	4.21 (.92)
CCEEPersChar4	Manages incidents created by students reasonably	4.39 (.80)
CCEEPersChar5	Endures students' mistakes and avoids scolding	4.44 (.80)
CCEEPersChar6	Is empathetic toward students	4.38 (.85)
CCEEPersChar7	Accepts reasonable opinions and methods	4.41 (.74)
CCEEPersChar8	Respect's students' right to privacy	4.65 (.61)
CCEEPersChar9	Accepts individual differences in students	4.48 (.78)
CCEEPersChar10	Avoids subjectively judging students	4.40 (.82)

Teaching Ability. Participants ranked "Provides student with relevant knowledge" (*M*=4.49, *SD*=.69) highest in the Teaching Ability subcategory for their previous preceptor falling between "Fairly Often" and "Very Often." The lowest ranked items on this subcategory was "Clearly informs students of their responsibilities" (*M*=4.06, *SD*=.98), as well as "Tries to understand gaps in student's learning experiences" (*M*=4.06, *SD*=.71) for their past preceptors which related to "Fairly Often." Individual item means for Teaching Ability of past preceptors for students is shown in Table 20.

Table 20

Means for Individual Items in Completed Clinical Education Experience Teaching Ability (CCEETA)

Variable	Variable Description	Mean (*SD*)
CCEETA1	Clearly informs students of their responsibilities	4.06 (.98)
CCEETA2	Provides student with relevant knowledge	4.49 (.69)
CCEETA3	Does not intrude or take over process when students are trying a new technique	4.18 (.88)

Table 20 cont.

Variable	Variable Description	Mean (SD)
CCEETA4	Has realistic expectations	4.46 (.72)
CCEETA5	Motivates students to learn	4.28 (.90)
CCEETA6	Permits students to freely discuss and express their feelings	4.33 (.85)
CCEETA7	Uses hospital/clinic resources to gain more experience	4.22 (.87)
CCEETA8	Raises questions and stimulates students to think	4.20 (.87)
CCEETA9	Encourages students to think and learn independently	4.40 (.71)
CCEETA10	Tries to understand gaps in a student's learning experience	4.06 (.96)
CCEETA11	Uses time wisely and is organized and effective	4.11 (.94)
CCEETA12	Uses teaching activities that match the stated learning objective	4.11 (.92)
CCEETA13	Prepares teaching materials and activities in advance	4.51 (.78)
CCEETA14	Makes clinical practice a fulfilling experience	4.45 (.77)
CCEETA15	Fairly and objectively evaluates students	4.56 (.73)

Ideal Clinical Preceptor (ICP) Variables

*Professional Competence***.** Participants' ideal preceptor resulted in the item "Is interested in patient's care" (*M*=4.89, *SD*=.31) ranking highest, which was closest to "Very Important." The lowest ranked item was also the lowest ranked item in the Completed Clinical Educational Experience (CCEE) which was "Applies theory in clinical practice" (*M*=4.45, *SD*=.67). This mean fell between "Important" and "Very Important." Three individual variables showed severe skewness above 2.3: ProfComp1 (-2.49), ProfComp4 (-2.59), ProfComp5 (-3.5). One variable showed severe kurtosis ProfComp5 (15.9). All other data showed normality. Table 21 shows the means of all items for the participants' ideal preceptor in the subcategory of Professional Competence.

Table 21

Means for Individual Items in Ideal Clinical Preceptor Professional Competence (ICPProfComp)

Variable	Variable Description	Mean (*SD*)
ICPProfComp1	Is interested in patient's care	4.89 (.31)
ICPProfComp2	Applies theory in clinical practice	4.45 (.67)
ICPProfComp3	Is a role model for students	4.81 (.41)
ICPProfComp4	Is a skillful practitioner	4.85 (.38)
ICPProfComp5	Has sufficient professional knowledge	4.86 (.40)
ICPProfComp6	Explains and demonstrates new techniques	4.71 (.49)

Interpersonal Relationships. Participants felt it was "Very Important" they be treated as people with thought and wisdom which ranked highest (*M*=4.80, *SD*=.45) in their ideal preceptor Interpersonal Relationship subcategory. The lowest ranked item in this subcategory was "Avoids over supervising students work" (*M*=4.22, *SD*=.86) aligning with "Important." Table 22 displays the means for all the items in this subcategory.

Table 22

Means for Individual Items in Ideal Clinical Preceptor Interpersonal Relationships (ICPIR)

Variable	Variable Description	Mean (SD)
ICPIR1	Avoids over supervising students work	4.22 (.86)
ICPIR2	Provides appropriate feedback from students' improvement	4.78 (.45)
ICPIR3	Solves problems with students	4.58 (.61)
ICPIR4	Treats students as people with thought and wisdom	4.80 (.45)
ICPIR5	Provides constructive criticism	4.66 (.58)
ICPIR6	Avoids authoritarian and dominating attitudes	4.70 (.54)
ICPIR7	Does not censure (criticize) students in front of others	4.63 (.64)
ICPIR8	Gives students a chance to explain	4.67 (.53)
ICPIR9	Has a good relationship with healthcare team members	4.67 (.60)

Personality Characteristics. The item of "Is empathetic toward students" (*M*=4.56, *SD*=.70) ranked lowest in the subcategory of Personality Characteristics when

participants thought of their ideal preceptor. The highest mean in this subcategory was "Controls temper and shows patience and cooperative attitude" (*M*=4.79, *SD*=.42) relating to "Very Important." Two individual variables showed severe skewness: PersChar9 (-2.39) and PerChar10 (-2.55). Two individual characteristics showed severe kurtosis: PersChar9 (7.58), PersChar10 (8.73). All of the means for participants' ideal clinical preceptor in Personality Characteristics are displayed in table 23.

Table 23

Means for Individual Items in Ideal Clinical Preceptor Personality Characteristics (ICPPerChar)

Variable	Variable Description	Mean (*SD*)
ICPPersChar1	Controls temper and shows patience and cooperative attitude	4.79 (.42)
ICPPersChar2	Treats students sincerely and objectively	4.77 (.45)
ICPPersChar3	Has an enthusiastic attitude in teaching	4.62 (.61)
ICPPersChar4	Manages incidents created by students reasonably	4.60 (.60)
ICPPersChar5	Endures students' mistakes and avoids scolding	4.67 (.56)
ICPPersChar6	Is empathetic toward students	4.56 (.70)
ICPPersChar7	Accepts reasonable opinions and methods	4.61 (.55)
ICPPersChar8	Respect's students' right to privacy	4.57 (.67)
ICPPersChar9	Accepts individual differences in students	4.61 (.70)
ICPPersChar10	Avoids subjectively judging students	4.68 (.63)

Teaching Ability. The highest mean when participants thought it was "Very Important" their ideal preceptor's teaching ability included "Fairly and objectively evaluates students" (*M*=4.81, *SD*=.42). The lowest mean was reported for "Uses clinical/hospital resources to gain more experience" (*M*=4.45, *SD*=.72). Three variables showed severe skewness: TA2 (-3.31), TA4 (3.32), and TA14 (-2.99). Three variables also showed severe kurtosis: TA2 (19.9), TA4 (17.8) and TA14 (10.22). The means for all items in Teaching Ability when students think about their ideal preceptor is in table 24.

Table 24

Means for Individual Items in Ideal Clinical Preceptor Teaching Ability (ICPTA)

Variable	Variable Description	Mean (SD)
ICPTA1	Clearly informs students of their responsibilities	4.77 (.48)
ICPTA2	Provides student with relevant knowledge	4.78 (.50)
ICPTA3	Does not intrude or take over process when students are trying a new technique	4.51 (.65)
ICPTA4	Has realistic expectations	4.78 (.50)
ICPTA5	Motivates students to learn	4.70 (.59)
ICPTA6	Permits students to freely discuss and express their feelings	4.51 (.76)
ICPTA7	Uses hospital/clinic resources to gain more experience	4.45 (.72)
ICPTA8	Raises questions and stimulates students to think	4.72 (.50)
ICPTA9	Encourages students to think and learn independently	4.71 (.54)
ICPTA10	Tries to understand gaps in a student's learning experience	4.62 (.58)
ICPTA11	Uses time wisely and is organized and effective	4.61 (.59)
ICPTA12	Uses teaching activities that match the stated learning objective	4.51 (.71)
ICPTA13	Prepares teaching materials and activities in advance	4.76 (.51)
ICPTA14	Makes clinical practice a fulfilling experience	4.79 (.51)
ICPTA15	Fairly and objectively evaluates students	4.81 (.42)

Descriptive Statistics for Composite Scores

The mean composite scores of identified characteristics of clinical education preceptors were calculated and reported for each Completed Clinical Education Experience (CCEE) subscale. As a category, Personality Characteristics were “fairly often” displayed by preceptors (*M*=4.44, *SD*=.62); this was the highest mean score of the subscales. By contrast, Teaching Ability was “sometimes” displayed by preceptors (*m*=3.72, *SD*=.53); this was the lowest mean scores of the subscales. Table 25 contains a full panel of descriptive statistics for all four subscales (Professional Competence, Interpersonal Relationships, Personality Characteristics, and Teaching Ability) under Completed Clinical Education Experience (CCEE).

Table 25

Descriptive Statistics for Mean Composite Scores for All Subscales of Completed Clinical Educational Experiences

	Completed Clinical Preceptor Professional Competence	Completed Clinical Preceptor Interpersonal Relationship	Completed Clinical Preceptor Personality Characteristics	Completed Clinical Preceptor Teaching Ability
N	191	191	190	190
Mean	4.3770	4.2286	4.4442	3.7228
Std. Dev.	.51963	.64438	.61708	.52933
Skewness	-.799	-.799	-1.418	-.953
Kurtosis	.266	.074	1.734	.747
Minimum	2.67	2.22	2.20	1.73
Maximum	5	5	5	4.33

Descriptive statistics were calculated for the "Ideal" Clinical Preceptor composite scores in preparation for further analysis. Professional Competence had the highest overall mean score (M=4.76, SD=0.28), meaning that students thought that professional competence was most important in the ideal clinical preceptor. Interpersonal relationships were least important (M=4.63, SD=0.36)) when compared to the other subscales; however, it is noted that all sub-scale means were above 4.50 (on a 5.00 scale). Table 26 contains a full panel of descriptive statistics for all four subscales (Professional Competence, Interpersonal Relationships, Personality Characteristics, and Teaching Ability) under Ideal Clinical Preceptor (ICP).

Table 26

Descriptive Statistics for Mean Composite Scores for All Subscales of Ideal Clinical Preceptor

	Ideal Preceptor Professional Competence	Ideal Preceptor Interpersonal Relationship	Ideal Preceptor Personality Characteristics	Ideal Preceptor Teaching Ability
N	182	186	184	183
Mean	4.7656	4.6338	4.6571	4.6791

Table 26 cont.

	Ideal Preceptor Professional Competence	Ideal Preceptor Interpersonal Relationship	Ideal Preceptor Personality Characteristics	Ideal Preceptor Teaching Ability
Std. Dev.	.28193	.36154	.40966	.35469
Skewness	-1.482	-.872	-.905	-.952
Kurtosis	2.452	.045	-.408	.121
Minimum	3.5	3.44	3.4	3.4
Maximum	5	5	5	5

As a group, the eight subscales across Completed Clinical Education Experience (CCEE) and Ideal Clinical Preceptor (ICP) met the normal distribution for kurtosis (see Tables 25 and 26). Two subcategories showed moderate skewness above 1.0 but below 2.3. These subscales were the Completed Clinical Education Experience (CCEE) Personality Characteristics (skewness of -1.148) and the Ideal Clinical Preceptor (ICP) Professional Competence (-1.482).

Reliability

As discussed in Chapter 3, reliability of the survey instrument was conducted by Tang et. al. (2005). The reliability of the survey instrument in this study was tested using Cronbach's Alpha. Warner (2013) recommended a Cronbach's Alpha target between 0.7 and 0.95 to assure internal consistency of a multi-item scale. Seven of the eight subcategories met this standard for reliability with the exception of Ideal Clinical Preceptor/Professional Competence (0.679). Table 27 reports Cronbach's Alpha for all subscales of the instrument used in this study.

Table 27

Reliability of Subscales in Effective and Ideal Preceptor Survey Instrument

Categories	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Completed Clinical Experience Professional Competence	.781	.806	6
Completed Clinical Experience Interpersonal Relationship	.887	.888	9
Completed Clinical Experience Personal Characteristics	.935	.936	10
Completed Clinical Experience Teaching Ability	.936	.938	15
Ideal Clinical Preceptor Professional Competence	.679	.707	6
Ideal Clinical Preceptor Interpersonal Relationships	.788	.800	9
Ideal Clinical Preceptor Personal Characteristics	.891	.892	10
Ideal Clinical Preceptor Teaching Ability	.891	.893	15

Factor Analysis

The results of the factor analysis showed five of the eight subcategories aligned on one factor based on Eigenvalues greater than 1. Two subcategories had factor Eigenvalues greater than 1. The first was Completed Clinical Educational Experience Interpersonal Relationship which showed Eigenvalues for factor 1 of 4.793 and factor 2 of 1.039 (cumulative percentage of 53.25% and 64.80% respectively). The second was Ideal Clinical Preceptor Interpersonal Relationship which showed Eigenvalues for factor 1 of 3.48 and factor 2 of 1.13 (cumulative percentage of 38.63% and 51.15% respectively). The subcategory of Ideal Clinical Preceptor Teaching Ability had three factors with Eigenvalues above 1. This included an Eigenvalue of factor 1 of 6.06 (cumulative 40.41%), factor 2 of 1.29 (49.02%), and factor 3 of 1.02 (cumulative 55.83%). Factor analysis is further described in Table 28.

Table 28

Factor Analysis of Completed Clinical Educational Experience (CCEE) and Ideal Clinical Preceptor (ICP) Instrument Subcategories

Subcategory	Factors >1	Eigenvalues	Cumulative %
CCEE Professional Competence	1	3.08	51.4%
CCEE Interpersonal Relationship	2	4.80	53.25%
		1.04	64.8%
CCEE Personal Characteristics	1	6.37	63.67%
CCEE Teaching Ability	1	8.05	53.67%
ICP Competence	1	2.45	40.9%
ICP Interpersonal Relationships	2	3.48	38.6%
		1.127	51.154%
ICP Personal Characteristics	1	5.10	51.02%
ICPTeaching Ability	3	6.06	40.4%
		1.30	49.02%
		1.02	55.8%

Homogeneity of Variances

Prior to analyzing the data to identify any differences among professions using Analysis of Variance (ANOVA) testing, statistical assumption tests were performed. A Levene's test verified the equality of variances in the samples of six of the eight subcategories. See Table 29 for a summary of the homeogeneity of variance for responses in all subcategories.

Table 29

Test of Homogeneity of Variance for Students in All Subcategories

Subcategory	Levene Statistic	df1	df2	Sig.
Completed Clinical Experience Professional Competence	2.489	5	185	.033*
Completed Clinical Experience Interpersonal Relationship	2.106	5	185	.067
Completed Clinical Experience Personality Characteristics	4.028	5	184	.002*
Completed Clinical Experience Teaching Ability	1.61	5	184	.159

Table 29 cont.

Subcategory	Levene Statistic	df1	df2	Sig.
Ideal Clinical Preceptor Professional Competence	1.715	5	176	.133
Ideal Clinical Preceptor Interpersonal Relationships	1.915	5	180	.094
Ideal Clinical Preceptor Personality Characteristics	1.82	5	178	.111
Ideal Clinical Preceptor Teaching Ability	.753	5	177	.585

Because Completed Clinical Experience Professional Competence (CCEE) and Completed Clinical Experience (CCEE) Personality Characteristics both showed a significance of less than .05 for Levene's test, a non-parametric Levene's test was used to verify the equality of variances in these samples. Because both subcategories were above .05 for the non-parametric tests, as demonstrated in Table 30, equality of variance may be assumed.

Table 30

Non-Parametric Tests for Homogeneity of Variances

Subcategory		Levene's Test	df1	df2	Sig.
CCEE Professional Competence	Based on Mean	.587	5	185	.710
CCEE Personality Characteristics	Based on Mean	.521	5	184	.760

Responding to Research Questions

Completion of preparatory calculations resulted in the generation of composite means for the subcategories. The composite means were then used in analysis of variance calculations to answer both research questions. Using the ANOVA calculations, helped to determine if there were differences among the professions.

Research Question #1

Research question 1 asks: "Is there a difference among various health profession students in identified characteristics of recent clinical education preceptors?" Following the preparation of individual characteristic items into category composite scores,

statistical analysis was completed to answer research question 1. More specifically, one-way ANOVAs were used to illustrate differences in responses from participants between professions in Completed Clinical Education Experience (CCEE). When comparing CCEE subcategories across the professions, the overall mean scores were relatively high. The subcategories were negatively skewed showing the students experienced "Fairly Often" or "Very Often" their preceptor characteristics overall. CCEE Professional Competence exhibited a significant difference ($F(5,185) = 2.82$, $p = .017$) between groups as shown in Table 31. No other sub-scale produced significant F statistics, though it is noted that Personality Characteristics was approaching significance ($F(5,184)=1.94$, $p=.09$).

Table 31

ANOVA between Professions in Completed Clinical Education Experience Subcategories

Subcategory		Sum of Squares	df	Mean Square	F	Sig.
CCEE Professional Competence	Between Groups	3.640	5	.728	2.826	.017*
	Within Groups	47.663	185	.258		
	Total	51.303	190			
CCEE Interpersonal Relationship	Between Groups	3.758	5	.752	1.851	.105
	Within Groups	75.135	185	.406		
	Total	78.893	190			
CCEE Personality Characteristics	Between Groups	3.598	5	.720	1.937	.090
	Within Groups	68.370	184	.372		
	Total	71.969	189			
CCEE Teaching Ability	Between Groups	.974	5	.195	.689	.632
	Within Groups	51.983	184	.283		
	Total	52.957	189			

No significant differences between responses were noted at the .05 level in analyzing variance in the Ideal Clinical Preceptor (ICP) Subcategories (see Table 32). Interpersonal Relationships responses approached significance ($F(5,180) = 2.22$, $p = .054$).

Table 32

ANOVA between Professions in Ideal Clinical Preceptor Subcategories

Subcategory		Sum of Squares	df	Mean Square	F	Sig.
ICP Professional Competence	Between Groups	.496	5	.099	1.258	.284
	Within Groups	13.890	176	.079		
	Total	14.386	181			
ICP Interpersonal Relationship	Between Groups	1.406	5	.281	2.222	.054
	Within Groups	22.776	180	.127		
	Total	24.182	185			
ICP Personality Characteristics	Between Groups	1.194	5	.239	1.440	.212
	Within Groups	29.517	178	.116		
	Total	30.711	183			
ICP Teaching Ability	Between Groups	.641	5	.128	1.020	.407
	Within Groups	22.255	177	.126		
	Total	22.896	182			

Because a significant difference was calculated in Completed Clinical Educational Experience (CCEE) Professional Competence in the one-way ANOVA, a post-hoc test (Tukey) was run to determine which responses from students in the healthcare professions significantly differed. Within the subcategory of Completed Clinical Education Experience Professional Competence a significant difference ($p < .05$) was found between the professions of occupational therapy and physician assistant studies (Table 33). The occupational therapy students reported a mean of 4.15 on a scale of 5, whereas the physician assistant students had a significant higher mean at 4.61. No other significant differences were found among the professions.

Table 33

Completed Clinical Educational Experience Professional Competence Tukey Post-hoc Analysis

(J)Which Healthcare Profession Program are you a student	(J)Which Healthcare Profession Program are you a student	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Athletic Training	Medical Laboratory Science	-.6789	.74723	.944	-2.8308	1.4730
	Medicine	-.4949	.98745	.996	-3.3386	2.3488
	Occupational Therapy	1.1419	.82253	.734	-1.2268	3.5107
	Physical Therapy	.2124	.74723	1.00	-1.9395	2.3643
	Physician Assistant	-1.6167	.82253	.366	-3.5895	.7520
Medical Laboratory Science	Athletic Training	.6789	.74723	.944	-1.4730	2.8308
	Medicine	.1841	.90552	1.00	-2.4237	2.7918
	Occupational Therapy	1.8208	.72212	.123	-.2587	3.9004
	Physical Therapy	.8913	.63503	.725	-.9375	2.7201
	Physician Assistant	-.9378	.72212	.786	-3.0174	1.1418
Medicine	Athletic Training	.4949	.98745	.996	-2.3488	3.3386
	Medical Laboratory Science	-.1841	.90552	1.00	-2.7918	2.4237
	Occupational Therapy	1.6368	.96859	.540	-1.1526	4.4261
	Physical Therapy	.7072	.90552	.970	-1.9005	3.3150
	Physician Assistant	-1.1218	.96859	.856	-3.9112	1.6675
Occupational Therapy	Athletic Training	-1.1419	.82253	.734	-3.5107	1.2268
	Medical Laboratory Science	-1.8208	.72212	.123	-3.9004	.2587
	Medicine	-1.6368	.96859	.540	-4.4261	1.1526

Table 33 cont.

(J)Which Healthcare Profession Program are you a student	(J)Which Healthcare Profession Program are you a student	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Occupational Therapy	Physical Therapy	-.9295	.72212	.792	-3.0091	1.1500
	Physician Assistant	-2.7586	.79978	.009*	-5.0619	-.4554
Physical Therapy	Athletic Training	-.2124	.74723	1.00	-2.3643	1.9395
	Medical Laboratory Science	-.8913	.63503	.725	-2.7201	.9375
	Medicine	-.7072	.90552	.970	-3.3150	1.9005
	Occupational Therapy	.9295	.72212	.792	-1.1500	3.0091
	Physician Assistant	-1.8291	.72212	.120	-3.4987	.2505
Physician Assistant	Athletic Training	1.6167	.82253	.366	-.7520	3.9855
	Medical Laboratory Science	.9373	.72212	.786	-1.1418	3.0174
	Medicine	1.1218	.96859	.856	-1.6679	3.9112
	Occupational Therapy	2.7586	.79978	.009*	-.4554	5.0619
	Physical Therapy	1.8291	.72212	.120	-.2505	3.9087

Research Question 1 asks “Is there a difference among various health profession students in identified characteristics of recent clinical education preceptors?”. Overall there was little difference among the professions when comparing preceptors of previously completed clinical experiences. Although two professions out of six differed on Professional Competence, the other subcategories of Interpersonal Relationships, Personality Traits, and Teaching Ability did not show a significant difference between student responses across the six professions.

Research Question #2

Research question 2 asks **"**Is there a difference in identified characteristics of recent clinical education preceptors and characteristics of "ideal" preceptors for various health professional students?" Analysis indicates significant differences in student responses across all four subcategories (Professional Competence, Interpersonal Relationships, Personal Characteristics, and Teaching Ability), when comparing their observed characteristics from Completed Clinical Education Experiences (CCEE) characteristics to perceived characteristics of their "Ideal" Clinical Preceptor (ICP).

Table 34 summarizes the differences in each subcategory between the completed clinical experience and the "ideal." All of the pairs of subcategories demonstrated a significant difference (p=.005). The means closest to each other were in the Interpersonal Relationship subcategory (M= -.21). Table 34 also highlights the biggest significant difference mean (M= -.93) was in the subcategory of Teaching Ability. This shows students thought their preceptors should exhibit more of these Teaching Ability characteristics than what the students had experienced.

Taking into account the composite means from tables 25 and 26, as well as the paired mean difference in table 34, the negative trend of the paired mean difference indicates students experienced the characteristics in that subcategory "Fairly Often", whereas their expectations of their ideal preceptor should be "Very Important". This showed the disparity between what the students were exposed to in clinical education versus what they expect from their ideal preceptor.

Table 34

Paired Sample T-Test for Subcategories

Subcategory Pairs	CCEE Mean	ICP Mean	Paired Dif Mean	t	df	Sig (2-tailed)
Profession Competence	4.38	4.77	-.38	-10.44	178	.000
Interpersonal Relationship	4.23	4.63	-.39	-8.90	182	.000
Personality Characteristics	4.44	4.66	-.22	-4.63	179	.000
Teaching Ability	3.72	4.68	-.96	-24.27	178	.000

It should be noted that because of the significant differences between these paired means, it could be argued students answered the survey thoughtfully as the data shows ideal being higher than actual preceptor experiences.

A mixed ANOVA was then conducted to analyze differences between the professions when comparing clinical education under actual preceptors versus a student's "ideal" preceptor. Although the subcategory of Professional Competence trended towards showing a difference ($F(5,173) = 2.13$, $p = .064$), no significant differences were found between the student responses across athletic training, medicine, medical laboratory science, physical therapy, and occupational therapy (Table 35). This nearly significant difference is also illustrated in Figure 2.

Table 35

Mixed ANOVA – Completed Clinical Education Experience and Ideal Clinical Preceptor by Profession

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Professional Competence	Intercept	6435.214	1	6435.214	29677.616	.000
	Profession	2.313	5	.463	2.133	.064
	Error	37.513	173	.217		

Table 35 cont.

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Interpersonal Relationship	Intercept	6345.242	1	6345.242	18408.878	.000
	Profession	2.079	5	.416	1.207	.308
	Error	61.009	177	.345		
Personality Characteristics	Intercept	6553.491	1	6553.491	20394.962	.000
	Profession	2.165	5	.433	1.348	.247
	Error	55.911	174	.321		
Teaching Ability	Intercept	5598.785	1	5598.785	21481.354	.000
	Profession	.570	5	.114	.437	.822
	Error	45.090	173	.261		

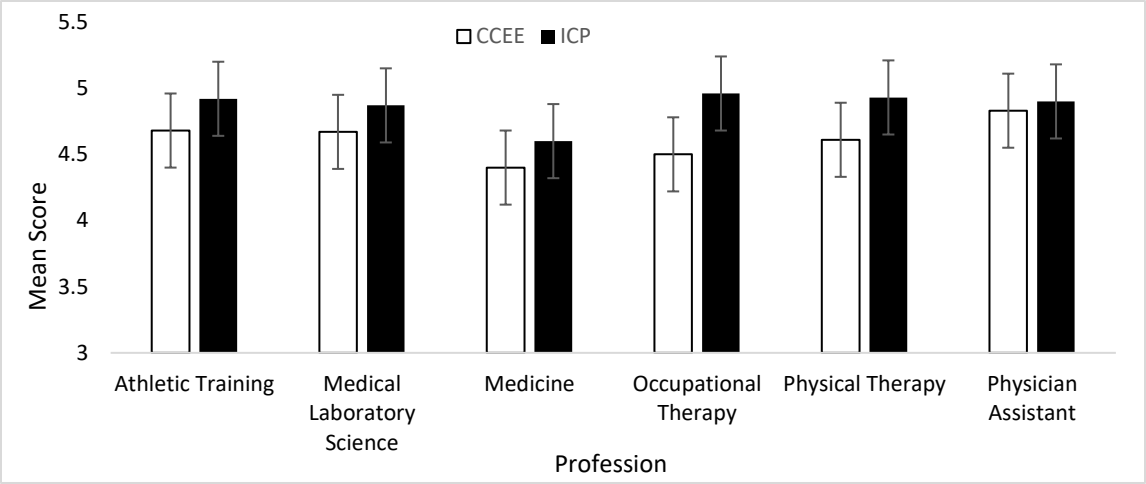

Figure 2. Mean Differences for Completed Clinical Educational Experience (CCEE) By Profession.

Summary

Although responses from all the professions surveyed were similar in their perspective of effective preceptors during their clinical education, a significant difference was seen between the professions of occupational therapy and physician assistants. This difference was seen in the Professional Competence of the preceptors. Overall, the

participants in this study show similar perspectives in their responses when thinking about the characteristics of their ideal preceptor.

CHAPTER V

DISCUSSION

The purpose of this study was to determine if there was a difference amongst health care education students' perceptions as to the characteristics of effective clinical preceptors. This includes preceptors with whom they had previously had clinical education experiences and also their ideal preceptor. In this chapter, I discuss my interpretation of the data, continuing with a discussion of the findings in relation to Kolb's Experiential Learning Theory. I then offer my thoughts on implications for the study and suggestions for future research.

Discussion

Completed Clinical Education Experience Perspectives

Participants completed a portion of the survey instrument asking them to provide feedback on the most recently Completed Clinical Educational Experience (CCEE) in the subcategories of Professional Competence, Interpersonal Relationship, Personality Characteristics, and Teaching Ability. Many similarities amongst the perceptions of students across healthcare professions were observed when analyzing the data. While three Completed Clinical Education Experience subcategories were somewhat scattered amongst the professions when ranking the mean scores, the Teaching Ability subcategory unanimously received the lowest mean score by students in all healthcare fields that were included in this study. This is slightly different than what Tang, Chou, and Chiang (2003) found, which was Interpersonal Characteristics ranking highest exhibited by their most

effective preceptors, whereas Professional Competence ranking lowest of the four subcategories. However, the findings in the current study are more consistent with Sarcona, Burrowes, and Fornari's 2015 study, in which students ranked Professional Competence highest in terms of effective preceptors and Teaching Ability the lowest in terms of effective preceptors. It should be noted the study by Tang, Chou, and Chiang was completed in Taiwan in the field of nursing whereas the study by Sarcona, Burrowes, and Fornari was completed in the United States in the field of dietetics and could be different because of cultural differences.

The lowest mean in Completed Clinical Education Experience was Teaching Ability (*m*=3.73, SD=.53) across all the professions. This means that students experienced the characteristics of an effective preceptor in this subcategory above "Sometimes" but less than "Very Often." This may be an indication the school in which the study was conducted could do a better job of identifying, recruiting, and training its preceptors specifically on teaching aspects. This includes specifically low-ranking individual items in the Teaching Ability of the students' previous preceptors such as "Clearly informs students of their responsibilities" as well as "Tries to understand gaps in student's learning experiences." Educational programs can and should help preceptors to improve on these areas.

Comparison of mean ranks of CCEE subcategories across participants' healthcare professions does provide additional insight into how much each profession experienced the traits of their preceptors (see Table 36). For example, physician assistant students felt their preceptors displayed professional competence more often than the occupational therapy students experienced regarding their preceptors. It should be noted, though, that

the occupational therapy students still rated their preceptors high, above a mean of 4.00 or "Fairly Often," for their level of professional competence displayed by their preceptor.

Table 36

Completed Clinical Educational Experience Subcategory Mean Rank

Profession	Professional Competence	Interpersonal Relationship	Personality Characteristics	Teaching Ability
Athletic Training	1	3	2	4
Medical Laboratory Science	1	3	2	4
Medicine	2	3	1	4
Occupational Therapy	3	2	1	4
Physical Therapy	1	3	1	4
Physician's Assistant	2	3	1	4

Ideal Clinical Preceptor Perceptions

As in the previous category of Completed Clinical Educational Experience, the subcategories for the Ideal Clinical Preceptor were negatively skewed and as expected, were relatively high on the 1 to 5 scale. All of the subcategories were above a 4.6 showing students expected preceptors to exhibit high quality characteristics in all areas.

When ranking the means for the subcategories by profession for Ideal Clinical Preceptor, the data showed a fairly random display (see Table 37). Of interest is every profession except occupational therapy showed the highest mean in the subcategory of Professional Competence. Professional Competence has been shown in many other studies to be one of the most important characteristics preceptors can exhibit (Kelly, 2007; Buchel & Edwards, 2005; Jahangiri et. al., 2013; Sutkin et. al., 2008). The subcategory of Personality Characteristics was the highest mean shown by occupational therapy students. Occupational therapy was also the only profession to rank both the Completed Clinical Education Experience (CCEE) and the Ideal Clinical Preceptor (ICP)

subcategories in the same order. All of the other professions showed variations in their ranking of means between the two main categories.

Table 37

Ideal Clinical Preceptor Subcategory Mean Rank

Profession	Professional Competence	Interpersonal Relationship	Personality Characteristics	Teaching Ability
Athletic Training	1	3	4	2
Medical Laboratory Science	1	4	3	2
Medicine	1	3	4	2
Occupational Therapy	3	2	1	4
Physical Therapy	1	3	4	2
Physician's Assistant	1	4	2	3

The results of this study were discussed with occupational therapy faculty to gain insight why their students ranked Personality Characteristics first and Interpersonal Relationships higher than the other professions whereas the other students ranked Professional Competence highest. In the occupational therapy program that was surveyed, one of the main objectives is getting to know the patient and building a relationship with that patient. In the first course taken by occupational therapy students in this program, students are required to read a professional book by Renee Taylor titled *The Intentional Relationship* published by F. A. Davis, (2008). This textbook teaches content such as communication skills, values, interpersonal behaviors, to form an effective relationship between the patient and therapist. The faculty member stated, "We teach the students that no matter how competent they are, without getting to know the patient and build a relationship with them first, it won't matter" (A. Haskins, personal communication, October 22, 2019). The theme of this book is continued throughout the curriculum in other courses as well as the student's clinical experiences with their

preceptor. Since many preceptors graduated from the same program, they likely exhibit the same behavior.

In the subcategory of Interpersonal Relationships in the Ideal Clinical Preceptor category, students ranked "Avoids over supervising students work" lowest among the nine items. This could indicate that students rely on the guidance of the preceptors and desire feedback. This finding is corroborated in the literature (Kelly, 2007; Motley & Dolansky, 2015).

Of interest, when comparing the single items under Professional Competence, the lowest ranking individual item on the survey for both Completed Clinical Education Experience and Ideal Clinical Preceptor was "Applies Theory into Practice." Students did not experience this trait as much as others in this category with their preceptors, but they also did not see it as important in their ideal preceptor. Are the theories being taught in the educational programs not being practiced in the clinical setting? A follow-up question might be, why is this not as important to students?

Teaching Ability and Kolb

Participants demonstrated through this project that they expect more effective characteristics from an "Ideal" preceptor than an actual preceptor demonstrated when the student participated in clinical education experience. The Teaching Ability subcategory had the biggest difference between past clinical experiences and their ideal preceptor. It is important to look at this subcategory because educational programs or schools may implement training to improve a preceptor's teaching ability. Many survey items under the Teaching Ability subcategory are controllable from the educational program or more directly, the preceptors. Knowing students want Teaching Abilities characteristics of

preceptors to be higher is important because then the preceptor may be able to adjust or focus on these characteristics to improve themselves and the educational experience of the student.

Two stages of Kolb's experiential learning theory are seen within the lowest scoring means in the Teaching Ability characteristics. Kolb defines a concrete experience as "the learner actively experiences an activity such as a lab session or field work" (Experiential Learning, 2019). The "Concrete Experience" stage of Kolb's theory is seen when health care students obtain clinical education in a patient care setting. It may be argued it is not just the clinical experience but also the structure and function of that experience. In the current study, results indicated the lower mean scores in the Teaching Ability subcategory characteristics, such as "Clearly informs student of their responsibilities"; "Uses hospital/clinic resources to gain more experience"; "Tries to understand gaps in a student's learning experiences"; "Uses time wisely and is organized and effective" and; "Uses teaching activities that match the stated learning objectives." These characteristics tie into how the clinical rotation is structured or functions for the student and should be maximized to better educate the student. By trying to understand the gaps in a student's learning experiences and using teaching activities to match the objectives, preceptors can enhance the experience of the student. Educational programs can inform preceptors about Kolb's view on different learning styles and encourage the use of different activities to accommodate the various learning styles. Some students may learn more from "hands on" experience, while other students may benefit from independent discovery or need more orientation prior to starting. Educational programs may not be able to assist the preceptor in maximizing the resources around the preceptor;

however, the educational program should be able to support preceptors to inform students of their responsibilities, communicate weaknesses of the student, and implement activities for the students learning objectives.

The other stage of Kolb's theory that aligns with the reported lower mean scores in the Teaching Ability subcategory was the stage of "Active Experimentation." Characteristic items with lower mean scores included "Does not intrude or take over process when students are trying new techniques"; "Motivates students to learn"; and "Raises questions and stimulates students to think." Because most patient care occurs in real time, students need to make decisions rapidly and in conjunction with their preceptor. Examples of this interaction include discussion occuring between the student and preceptor about the history of the patient, use of evaluation tools and techniques to determine diagnosis, differential diagnoses that may assimilate to the patient's current symptoms, and further testing, treatment or rehabilitation. It is these interactions that are aligned with the active experimentation stage of learning for the student. Preceptors and academic programs trying to improve their teaching ability can benefit from knowing these characteristics with the lowest means and attempt to improve upon them.

Implications

Implications for this study include healthcare educational programs recruiting and training preceptors to be more effective. The teaching ability was the lowest ranked subcategory by all students experienced during actual clinical rotations. As educational programs recruit preceptors, they can request information from a preceptor that indicates they have effective characteristics. Training preceptors is also shown in the literature to enhance the educational experience of the student (Rogers, et.al., 2009). Specifically, the

items of “Clearly informs students of their responsibilities” as well as “Tries to understand gaps in student’s learning experiences” were the lowest ranked items in the subcategory. The gaps in student knowledge is directly brought up as a weakness by Demeester et.al. (2017). Educational programs can assist preceptors by bringing forward the areas ranked low and addressing these areas. An education program should be able to identify the gaps in a students’ knowledge for the preceptor. The program faculty should be aware of the entire curriculum, what didactic content the student had completed, what gaps in knowledge are trying to be filled, and explain this to the preceptors. The program can also clearly outline the responsibilities of both the student and preceptor. Examples of this are defining to the preceptor what skills and knowledge the student should be assessed on as well as exactly what the student should and should not be encouraged to participate in during clinical rotations.

A significant difference was seen between the professions of occupational therapy and physician assistant studies in that they often experienced Professional Competence characteristics in their past clinical experiences. This discovery may have implications for the individual programs in how they structure their clinical education specific to preceptors. In all the subcategories, the six professions surveyed provided a spectrum on the measurement scale used in this study. It was discovered that occupational therapy and physician assistants’ perspectives on their preceptor’s Professional Competence was far enough apart on the scale to be significant. One can speculate why there is a difference between these professions. One reason for the difference may be the focus of occupational therapy on the Interpersonal Relationships and Personality Characteristics previously discussed that is intertwined with the occupational therapy curriculum. In

addition, occupational therapy originated from a mental health field. Yerxa (1991) writes about the history of occupational therapy and states “occupational therapy is concerned with the person and his or her occupation, which takes place in an environment” (p. 79). She goes on to explain the early occupational therapists believed in “Obtaining a comprehensive perspective of the patient through the use of a life history that focused on the personal, social and psychological experiences influencing the patient.” Yerxa also demonstrates a difference between occupational therapy and other professions which looked only at the science of the physical illness not the entire person including emotions and thoughts.

Regardless of the difference, programs can use this information in assessing their preceptors. Currently, assessment of preceptors varies among the professions and is usually tied to the accreditation standards which tend to be non-specific to allow for institutional autonomy. This includes Occupational Therapy which states: “Document a mechanism for evaluating the effectiveness of supervision (e.g., student evaluation of fieldwork) and for providing resources for enhancing supervision (e.g., materials on supervisory skills, continuing education opportunities, articles on theory and practice)” (ACOTE, 2013, p.36). Physical therapy accreditation standards state “Provide an analysis of data collected and the conclusions drawn to determine the extent to which the collective clinical education faculty meet program and curricular needs” (CAPTE, 2016, p.5). Athletic training accreditation states the responsibilities of the program “must assure the following: Student clinical progression, Clinical site evaluation, Student Evaluation, Preceptor training, and Preceptor evaluation” (CAATE, 2012, p.6). All these standards require some manner of assessment of a preceptor. Many other preceptor assessment

tools exist depending on the program. Looking at the effectiveness of the preceptors through a survey item as in this study is another tool that can be used to improve the preceptor experience.

As stated in Chapter 1, preceptor training varies widely among professions and is mostly related to accreditation standards. NAACLS (2016) for medical laboratory science has few expectations beyond the affiliation agreement and proof of communication between the medical laboratory science program and the preceptor. Physical therapy programs must "Describe how the program determines that clinical instructors are meeting the expectations of this element, including but not limited to: the program's expectations for the clinical competence of the CIs; the program's expectations for clinical teaching effectiveness of the CIs; how the clinical education sites are informed of these expectations; and how these expectations are monitored." Medical Schools accredited by the LCME (2017) are required to ensure

> …instructors in the medical education program who supervise or teach medical students are familiar with the learning objectives of the course or clerkship and are prepared for their roles in teaching and assessment. The medical school provides resources to enhance residents' and non-faculty instructors' teaching and assessment skills, and provides central monitoring of their participation in those opportunities (p. 14).

Occupational Therapy programs must "describe the ongoing professional responsibility for providing fieldwork education and the criteria for becoming a fieldwork educator" (ACOTE, 2011, p. 30). If programs looked at items on the survey instrument along with the literature review in this study, they could put together comprehensive information to

better inform their preceptors of barriers of precepting, possible manners in addressing those barriers, and the perspective of students in effective precepting.

Physician Assistant clinical sites must not use resident physicians as preceptors because of lack of experience (ARC-PA, 2016, p. 12) and the educational program should orient the preceptor to the specific learning outcomes it requires of the physician assistant students (p. 17). Athletic training educational programs must give preceptors "planned and ongoing education from the program designed to promote a constructive learning environment" (CAATE, 2012, p. 6). In summary, although clinical education is a requirement of health education programs, expectations from the education programs of the preceptors and how preceptors are prepared vary widely amongst different health disciplines. Also based on the standards given, how an educational program acquires feedback from the students about their clinical preceptors and what they do with that information should be a part of the assessment back to the accreditation bodies.

Suggestions for Future Research

This study attempted to better understand the relationship between students and their preceptors. Further research in this area could include how preceptors perceive their own effectiveness. Past research has shown preceptors rate themselves lower than students rate them (Wright, 2009). It would be interesting to see if this is also true across professions. This research would add to the understanding of the relationship between the student and the preceptor.

A research gap also exists in the perception from preceptors what an "ideal" preceptor should display for effective characteristics. It would be interesting to see preceptor expectations in the Ideal Clinical Preceptor category and compare it to the

students. Would Professional Knowledge be as highly ranked by preceptors as it was by most of the student groups? How would their time in the profession and their experience add to the data collected?

A qualitative approach to this topic may also help educators better understand why some professions rank the subcategories for the ideal preceptor differently. This might reveal findings such as the discussion with the occupational therapy faculty member in this study. Findings may reveal an intentional agenda to focus on one of the four subcategories, as it was in the occupational therapy program in this study.

Because teaching ability was the lowest ranked subcategory which students actually experienced, it may be an area of focus for academic programs or schools to attempt to assess and improve for their students. Although effective precepting can be one avenue, other could simply informing preceptors about various learning styles or methods such as active learning techniques to improve teaching skills.

Research could be conducted to evaluate if an increase in the mean occurs following focus on recruitment of preceptors with more experience with teaching abilities or preceptor training in these areas. This study would be more longitudinal to see if focused effort in these areas showed the intended improvement or not.

Conclusion

This study found few differences among professions in their perceptions of effective preceptor characteristics. Overall, this study has implications for health care education. As health care education curriculums move toward a more interprofessional model, students will interact more in both the classroom and clinical setting. Knowing students from various professions may perceive preceptor's characteristics alike prepares

us as educators better to build interprofessional education within academic homes. In the future, interprofessional education may try different techniques to maximize students' clinical education. For instance, academic programs could try using fewer, high-quality preceptors in conjunction with a variety of professions in an attempt to improve the precepting over the quantity of "average" or "poor" preceptors.

Health care professionals are clinicians first and have limited formal training or education in the area of teaching. This was demonstrated in this study when students were surveyed on past experiences in clinical education. The Teaching Ability subcategory was the lowest ranked mean for Completed Clinical Educational Experiences by all participating professions. Preceptor training should be done to maximize the teaching ability of the preceptors.

APPENDICES

Appendix A

Student's Perspective of Effective Clinical Preceptor Survey

Age: _____

Sex (Circle one):

Biological Male

Biological Female

Intersex

Other_____

Gender (Circle one):

Male

Female

Transgender

Other

Race (Circle one):

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or other Pacific Islander

Hispanic

White

Level of Academic Program:

Undergraduate

Master's

Doctoral

Which professional healthcare profession are you a student? (Circle one):

Athletic Training	Medical Laboratory Science Medicine
Medicine	Occupational Therapy
Physical Therapy	Physician Assistant

How many years have you completed in the professional healthcare education program (Circle one):

<1 1 2 3 4 5+

How many different clinical preceptors have you completed an educational rotation with?

1 2 3 4 5 6 7 8 9 10+

What other health professional degrees or training have you had outside of the current educational program you are in?

Directions for completing table: 1) On the left side of the table, circle the number that indicates the frequency of each characteristic you experienced with the preceptor/clinical instructor of your ***most recently completed*** clinical rotation. If you have not completed a clinical rotation leave the left-hand column blank. 2) On the right side of the table, circle the number that corresponds with the importance each preceptor characteristic is to you in thinking about your **"ideal"** preceptor.

	Most Recen Preceptor					Ideal Clinical Preceptor				
1 Never	2 Rarely	3 Sometimes	4 Fairly Often	5 Very Often	Effective and Ideal Preceptor Scale	1 Not Important	2 Low Importance	3 Neutral	4 Important	5 Very Important
1	2	3	4	5	Is interested in patient's care	1	2	3	4	5
1	2	3	4	5	Applies theory in clinical practice	1	2	3	4	5
1	2	3	4	5	Is a role model for students	1	2	3	4	5
1	2	3	4	5	Is a skillful practitioner	1	2	3	4	5
1	2	3	4	5	Has sufficient professional knowledge	1	2	3	4	5
1	2	3	4	5	Explains and demonstrates new techniques	1	2	3	4	5
1	2	3	4	5	Avoids over supervising students work	1	2	3	4	5
1	2	3	4	5	Provides feedback from students' improvement	1	2	3	4	5
1	2	3	4	5	Solves problems with students	1	2	3	4	5
1	2	3	4	5	Treats students as people with thought and wisdom	1	2	3	4	5
1	2	3	4	5	Provides constructive criticism	1	2	3	4	5
1	2	3	4	5	Avoids authoritarian and dominating attitudes	1	2	3	4	5
1	2	3	4	5	Does not censure (criticize) students in front of others	1	2	3	4	5
1	2	3	4	5	Gives students a chance to explain	1	2	3	4	5
1	2	3	4	5	Has a good relationship with health team members	1	2	3	4	5
1	2	3	4	5	Controls temper and shows patience and cooperative attitude	1	2	3	4	5
1	2	3	4	5	Treats students sincerely and objectively	1	2	3	4	5
1	2	3	4	5	Has an enthusiastic attitude in teaching	1	2	3	4	5
1	2	3	4	5	Manages incidents created by students reasonably	1	2	3	4	5
1	2	3	4	5	Endures students' mistakes and avoids scolding	1	2	3	4	5
1	2	3	4	5	Is empathetic toward students	1	2	3	4	5
1	2	3	4	5	Accepts reasonable opinions and methods	1	2	3	4	5
1	2	3	4	5	Respect's students' right to privacy	1	2	3	4	5
1	2	3	4	5	Accepts individual differences in students	1	2	3	4	5
1	2	3	4	5	Avoids subjectively judging students	1	2	3	4	5
1	2	3	4	5	Clearly informs students of their responsibilities	1	2	3	4	5
1	2	3	4	5	Provides student with relevant knowledge	1	2	3	4	5
1	2	3	4	5	Does not intrude or take over process when students are trying a new technique	1	2	3	4	5
1	2	3	4	5	Has realistic expectations	1	2	3	4	5
1	2	3	4	5	Motivates students to learn	1	2	3	4	5

1	2	3	4	5	Permits students to freely discuss and express their feelings	1	2	3	4	5
1	2	3	4	5	Uses hospital/clinic resources to gain more experience	1	2	3	4	5
1	2	3	4	5	Raises questions and stimulates students to think	1	2	3	4	5
1	2	3	4	5	Encourages students to think and learn independently	1	2	3	4	5
1	2	3	4	5	Tries to understand gaps in a student's learning experience	1	2	3	4	5
1	2	3	4	5	Uses time wisely and is organized and effective	1	2	3	4	5
1	2	3	4	5	Uses teaching activities that match the stated learning objective	1	2	3	4	5
1	2	3	4	5	Prepares teaching materials and activities in advance	1	2	3	4	5
1	2	3	4	5	Makes clinical practice a fulfilling experience	1	2	3	4	5
1	2	3	4	5	Fairly and objectively evaluates students	1	2	3	4	5

Knowledge and Professional Competence Interpersonal Relationships
Personality Characteristics Teaching Abilities

Appendix B

Informed Consent

UNIVERSITY OF NORTH DAKOTA
Institutional Review Board
Informed Consent Statement

Title of Project: Characteristics of Effective Clinical Preceptors: Is There a Difference in Various Health Profession Students' Perspective?

Principal Investigator: Steven Westereng; 701-777-3886; Steven.westereng@und.edu

Co-Investigator(s): *N/A*

Advisor: Dr. Deborah Worley @UND.edu; 701-777-3140; Deborah.worley@und.edu

Purpose of the Study:
You are invited to be in a research study that is interested in investigating the perception of students from various health care education programs as to the effectiveness of your actual and ideal clinical preceptors. You are identified as a potential participant because you are a health care student currently enrolled in a healthcare academic program.

The purpose of this quantitative study is to determine if there is a difference amongst health care education students' perceptions as to the characteristics of effective clinical preceptors as measured by a student's perspective of effective clinical preceptor survey.

Procedures to be followed:
You will be asked to complete a survey asking how often you experienced effective characteristics of your actual previous preceptor as well as your "ideal" preceptor. The survey will consist of demographic information as well as answering 40 Likert-type scale questions surrounding the effective preceptor characteristics. You will answer these 40 questions once for your most recently completed clinical rotation and once for what you consider to be an "ideal" preceptor. The completion of these surveys will take no longer than 20 minutes.

Risks:
There are no foreseeable risks to participating in this study beyond those experienced in everyday life. The surveys are utilized to gain a better understanding of your perceptions regarding effective clinical precepting.

Benefits:
You may benefit personally from being in this study by gaining a better understanding of the characteristics of an effective clinical preceptor. In addition, the academic program you

are enrolled as well as the entire school you are part of could benefit from the data collected. Effective clinical preceptors as perceived by the student from various professions may be the same or different. Either way, it is the hope that the findings of this study provides guidance on educational programming at the individual program and overall school level. Understanding effective clinical precepting from a student's perspective will help fill gaps in research and may lead to curriculum modifications.

Duration:
Your participation in the study will include a one-time completion of a survey instrument about effective preceptor characteristics. Survey completion should take approximately 15-20minutes.

Statement of Confidentiality:
The surveys do not ask for any information that would identify who the responses belong to. There is an identification code that is unique to you, so data between surveys may be analyzed and compared; however, there is no link between that number and your identification. Therefore, your responses are recorded anonymously. If this research is published, no information that would identify you will be included since your name is in no way linked to your responses.

All online survey responses will be conducted via Qualtrics and will be treated confidentially and uploaded into SPSS software. Participant identification and anonymity will be maintained via Qualtrics. However, given that the surveys can be completed from any computer (e.g., personal, work, school), we are unable to guarantee the security of the computer on which you choose to enter your responses. As a participant in this study, be aware that certain "key logging" software programs exist that can be used to track or capture data that you enter and/or websites that you visit.

Right to Ask Questions:
The researcher conducting this study is Steven Westereng. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Steven Westereng at 701-777-3886 or Steve's Doctoral Advisor Dr. Deborah Worley at 701-777-3140 during the day.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279. You may also call this number with problems, complaints, or concerns about the research. Please call this number if you cannot reach research staff, or you wish to talk with someone who is an informed individual who is independent of the research team.

General information about being a research subject can be found on the Institutional Review Board website "Information for Research Participants" http://und.edu/research/resources/human-subjects/research-participants.cfm

Compensation:
You will not receive compensation for your participation.

Voluntary Participation:
You do not have to participate in this research. You can stop your participation at any time. You may refuse to participate or choose to discontinue participation at any time without losing any benefits to which you are otherwise entitled.

You do not have to answer any questions you do not want to answer.

You must be 18 years of age older to consent to participate in this research study.

Completion and return of the surveys imply that you have read the information in this form and consent to participate in the research.

Please keep this form for your records or future reference.

Appendix C

3/4/2018

Dear Steve,

Thank you for interested in this article.
With a literature review I formulated this questionnaire.
You have my permission to use it in your study.

Good Luck

Fu-In Tang

From: Westereng, Steven [mailto:steven.westereng@med.und.edu]
Sent: Sunday, March 04, 2018 12:43 AM
To: fitang@ym.edu.tw; hhchiang@ym.edu.tw
Subject: Survey instrument

Dear Dr. Tang and Dr. Chian,

My name is Steve Westereng and I am the Chair of the Department of Sports Medicine at the University of North Dakota (USA). I am currently working on my PhD in Higher Education. I am interested in doing my dissertation on the difference between various professional students (medicine, occupational therapy, physical therapy, physicians assistants, ect) and their perspectives of effective clinical preceptors. I have come across the attached article and enjoyed it very much. I am wondering if it is possible to get more background on the development of your survey instrument as well as have permission to possibly use the survey within a research study?

Please let me know if you have any questions and thank you for your time.

Steve

Steven Westereng, LAT, ATC, MA, CSCS
Chair/Assistant Professor
Department of Sports Medicine, Room E373
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1301 N. Columbia Road, Stop 9037
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EMAIL DISCLAIMER:

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Appendix D

Complete Variable Table

Variable Name	Variable Description	Data Type	Values
Demographics			
AGE	Age of student when enrolled	Ratio	17-45
SEX	Sex	Nominal	1-Male 2-Female 3-Intersex 4-Other
RACE	Race	Nominal	1- Amer. Indian or Alaska Native 2- Asian 3- Black or African American 4- Native Hawaiian or other Pacific Islander 5-Hispanic 6-White
LEVAP	Level of Academic Program	Nominal	1-Undergraduate 2-Masters 3-Doctoral
PROF	Profession Enrolled	Nominal	1-Athletic Training 2-Medical Laboratory Science 3-Medicine 4-Occupational Therapy 5-Physical Therapy 6-Physician Assistant
YRSCOM	Years Completed in the Academic Professional Program	Interval	<1-5+
NUMPRE	Number of Preceptors of Completed Clinical Educational Rotations	Interval	1-10+
ADDDEGREES	What other Health Profession Degrees or training have you had outside of current educational program	Open	Please Explain.
Completed Clinical Educational Experiences	Frequency Student Experienced Characteristic of Preceptor in Last Completed Clinical Rotation	Interval	1-5 (Never to Very Often)

CCEEProfComp1	Is interested in patient's care	Interval	1-5 (Never to Very Often)
CCEEProfComp2	Applies theory in clinical practice	Interval	1-5 (Never to Very Often)
CCEEProfComp3	Is a role model for students	Interval	1-5 (Never to Very Often)
CCEEProfComp4	Is a skillful practitioners	Interval	1-5 (Never to Very Often)
CCEEProfComp5	Has sufficient professional knowledge	Interval	1-5 (Never to Very Often)
CCEEProfComp6	Explains and demonstrates new techniques	Interval	1-5 (Never to Very Often)
CCEEIR1	Avoids over supervising students work	Interval	1-5 (Never to Very Often)
CCEEIR2	Provides appropriate feedback from students' improvement	Interval	1-5 (Never to Very Often)
CCEEIR3	Solves problems with students	Interval	1-5 (Never to Very Often)
CCEEIR4	Treats students as people with thought and wisdom	Interval	1-5 (Never to Very Often)
CCEEIR5	Provides constructive criticism	Interval	1-5 (Never to Very Often)
CCEEIR6	Avoids authoritarian and dominating attitudes	Interval	1-5 (Never to Very Often)
CCEEIR7	Does not censure (criticize) students in front of others	Interval	1-5 (Never to Very Often)
CCEEIR8	Gives students a chance to explain	Interval	1-5 (Never to Very Often)
CCEEIR9	Has a good relationship with healthcare team members	Interval	1-5 (Never to Very Often)
CCEEPerChar1	Controls temper and shows patience and cooperative attitude	Interval	1-5 (Never to Very Often)
CCEEPerChar2	Treats students sincerely and objectively	Interval	1-5 (Never to Very Often)
CCEEPerChar3	Has an enthusiastic attitude in teaching	Interval	1-5 (Never to Very Often)
CCEEPerChar4	Manages incidents created by students reasonably	Interval	1-5 (Never to Very Often)
CCEEPerChar5	Endures students' mistakes and avoids scolding	Interval	1-5 (Never to Very Often)
CCEEPersChar6	Is empathetic toward students	Interval	1-5 (Never to Very Often)
CCEEPerChar7	Accepts reasonable opinions and methods	Interval	1-5 (Never to Very Often)
CCEEPerChar8	Respect's students' right to privacy	Interval	1-5 (Never to Very Often)
CCEEPerChar9	Accepts individual differences in students	Interval	1-5 (Never to Very Often)
CCEEPerChar10	Avoids subjectively judging students	Interval	1-5 (Never to Very Often)
CCEETA1	Clearly informs students of their responsibilities	Interval	1-5 (Never to Very Often)
CCEETA2	Provides student with relevant knowledge	Interval	1-5 (Never to Very Often)
CCEETA3	Does not intrude or take over process when students are trying a new technique	Interval	1-5 (Never to Very Often)
CCEETA4	Has realistic expectations	Interval	1-5 (Never to Very Often)
CCEETA5	Motivates students to learn	Interval	1-5 (Never to Very Often)
CCEETA6	Permits students to freely discuss and express their feelings	Interval	1-5 (Never to Very Often)
CCEETA7	Uses hospital/clinic resources to gain more experience	Interval	1-5 (Never to Very Often)
CCEETA8	Raises questions and stimulates students to think	Interval	1-5 (Never to Very Often)
CCEETA9	Encourages students to think and learn independently	Interval	1-5 (Never to Very Often)
CCEETA10	Tries to understand gaps in a student's learning experience	Interval	1-5 (Never to Very Often)
CCEETA11	Uses time wisely and is organized and effective	Interval	1-5 (Never to Very Often)
CCEETA12	Uses teaching activities that match the stated learning objective	Interval	1-5 (Never to Very Often)
CCEETA13	Prepares teaching materials and activities in advance	Interval	1-5 (Never to Very Often)

CCEETA14	Makes clinical practice a fulfilling experience	Interval	1-5 (Never to Very Often)
CCEETA15	Fairly and objectively evaluates students	Interval	1-5 (Never to Very Often)
Ideal Clinical Preceptor	Importance of Effective Preceptor Characteristics of an Ideal Preceptor from the Perspective of the Student.	Interval	1-5 (Not Important to Very Important)
ICPProfComp1	Is interested in patient's care	Interval	1-5 (Not Important to Very Important)
ICPProfCom2	Applies theory in clinical practice	Interval	1-5 (Not Important to Very Important)
ICPProfComp3	Is a role model for students	Interval	1-5 (Not Important to Very Important)
ICPProfComp4	Is a skillful practitioners	Interval	1-5 (Not Important to Very Important)
ICPProfComp5	Has sufficient professional knowledge	Interval	1-5 (Not Important to Very Important)
ICPProfComp6	Explains and demonstrates new techniques	Interval	1-5 (Not Important to Very Important)
ICPIR1	Avoids over supervising students work	Interval	1-5 (Not Important to Very Important)
ICPIR2	Provides appropriate feedback from students' improvement	Interval	1-5 (Not Important to Very Important)
ICPIR3	Solves problems with students	Interval	1-5 (Not Important to Very Important)
ICPIR4	Treats students as people with thought and wisdom	Interval	1-5 (Not Important to Very Important)
ICPIR5	Provides constructive criticism	Interval	1-5 (Not Important to Very Important)
ICPIR6	Avoids authoritarian and dominating attitudes	Interval	1-5 (Not Important to Very Important)
ICPIR7	Does not censure (criticize) students in front of others	Interval	1-5 (Not Important to Very Important)
ICPIR8	Gives students a chance to explain	Interval	1-5 (Not Important to Very Important)
ICPIR9	Has a good relationship with healthcare team members	Interval	1-5 (Not Important to Very Important)
ICPPerChar1	Controls temper and shows patience and cooperative attitude	Interval	1-5 (Not Important to Very Important)
ICPPerChar2	Treats students sincerely and objectively	Interval	1-5 (Not Important to Very Important)
ICPPerChar3	Has an enthusiastic attitude in teaching	Interval	1-5 (Not Important to Very Important)
ICPPerChar4	Manages incidents created by students reasonably	Interval	1-5 (Not Important to Very Important)
ICPPerChar5	Endures students' mistakes and avoids scolding	Interval	1-5 (Not Important to Very Important)
ICPPerChar6	Is empathetic toward students	Interval	1-5 (Not Important to Very Important)
ICPPerChar7	Accepts reasonable opinions and methods	Interval	1-5 (Not Important to Very Important)
ICPPerChar8	Respect's students' right to privacy	Interval	1-5 (Not Important to Very Important)
ICPPerChar9	Accepts individual differences in students	Interval	1-5 (Not Important to Very Important)
ICPPerChar10	Avoids subjectively judging students	Interval	1-5 (Not Important to Very Important)

ICPTA1	Clearly informs students of their responsibilities	Interval	1-5 (Not Important to Very Important)
ICPTA2	Provides student with relevant knowledge	Interval	1-5 (Not Important to Very Important)
ICPTA3	Does not intrude or take over process when students are trying a new technique	Interval	1-5 (Not Important to Very Important)
ICPTA4	Has realistic expectations	Interval	1-5 (Not Important to Very Important)
ICPTA5	Motivates students to learn	Interval	1-5 (Not Important to Very Important)
ICPTA6	Permits students to freely discuss and express their feelings	Interval	1-5 (Not Important to Very Important)
ICPTA7	Uses hospital/clinic resources to gain more experience	Interval	1-5 (Not Important to Very Important)
ICPTA8	Raises questions and stimulates students to think	Interval	1-5 (Not Important to Very Important)
ICPTA9	Encourages students to think and learn independently	Interval	1-5 (Not Important to Very Important)
ICPTA10	Tries to understand gaps in a student's learning experience	Interval	1-5 (Not Important to Very Important)
ICPTA11	Uses time wisely and is organized and effective	Interval	1-5 (Not Important to Very Important)
ICPTA12	Uses teaching activities that match the stated learning objective	Interval	1-5 (Not Important to Very Important)
ICPTA13	Prepares teaching materials and activities in advance	Interval	1-5 (Not Important to Very Important)
ICPTA14	Makes clinical practice a fulfilling experience	Interval	1-5 (Not Important to Very Important)
ICPTA15	Fairly and objectively evaluates students	Interval	1-5 (Not Important to Very Important)

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