THE ROLE OF ETHICAL LEADERSHIP IN THE CLINICAL DECISION MAKING OF PHYSICAL THERAPISTS IN CARING FOR PATIENTS OF DIFFERING SOCIOECONOMIC STATUS AND RACE WITH LOW BACK PAIN IN THE UNITED STATES

Sean F. Griech

A Dissertation Submitted to the
School of Graduate Studies of Alvernia University in
Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy
May, 2020

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Abstract

At the intersection of ethics and leadership is the emerging theory of ethical leadership. Ethical leadership is based on the premise that employees look outside of themselves for ethical guidance, and that leaders have an opportunity to provide this moral compass by making an ethical message salient enough to be recognized in the organizational context as well as allowing the leader to stand out against an ethically neutral ground. In 2018, the American Physical Therapy Association updated its mission statement: “Building a community that advances the profession of physical therapy (PT) to improve the health of society”. Improving the health of society implies a re-focus away from a traditional biomedical model, and moving towards contributing to addressing health disparity. This shift in beliefs and practice pattern will require effective and strategic leadership style. The mission recognizes that health is affected beyond just ease of access to care providers, and that social determinants of health (SDOH) likely play a significant role in an individual’s health. Embedded within the SDOH are elements of socioeconomic status (SES) and race. Identification of the proper leadership to help shepherd this change is needed. Ethical leadership aligns with goals of decreasing inequities and addressing health for all. Specifically, the ethical leadership domain aligns with both the vision of the APTA to transform society by optimizing movement to improve the human experience.

The purpose of this study was to determine the extent to which ethical leadership (EL) may affect potential implicit bias regarding non-biological factors of SES and race in regards to access to care. The sample population (*n* = 408) consisted of PTs from across the United States who were actively working with patients having low back pain (LBP). Case-based vignettes were used for this study to randomly present PTs with one of four versions of a typical case of LBP. Each version had identical clinical information, with the only difference being the patient’s SES (high versus low) or race (white versus black). Two instruments were used in this study. The Ethical Leadership Questionnaire (ELQ) measured EL of the PTs supervisor, and follow-up questions from the vignettes measured the clinical decision making regarding access to care across the three components of treatment initiation, frequency, and duration. The results demonstrated that EL showed positive differences in clinical decision making for both race (*p* = .026) and SES (*p* = .013). When examining differing SES of the patient when compared to the combined effect of the three dependent variables (treatment initiation, frequency, and duration) access to PT care (*p* = .011) was significantly affected. Follow-up univariate analysis demonstrated treatment frequency when considering SES (*p* = .043) and treatment duration when considering race (*p* = .027) were most significant. Interestingly, lower SES was found to positively impact access.

The results of this study demonstrate that although some implicit bias of PTs when considering the SES and race of a patient may exist, this impact was minimal and in the case of SES was positively affected. Most importantly, a higher degree of EL positively influenced access to care for patients with both low SES and under-represented race. These findings present and direct awareness of provider implicit bias, and even more importantly how leadership may have a positive impact on social determinants of health and access to care. Health care organizations interested in moving beyond being concerned about, but addressing social determinants of health should consider promoting and encouraging principles of ethical leadership within their organizations.

Dedication

I dedicate this dissertation to my children:

Madelyn Griech

Ashlyn Griech

Colin Griech

As much as I thought this journey was about me, it was really about you.

Please always follow your dreams and never be afraid to fail.

"Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible."

~ St. Francis of Assisi

Acknowledgments

I am so happy to be writing and preparing this section of my dissertation. As a little background, when I first started this endeavor, Dr. Tiglioglu recommended that we spend time reading previously completed dissertations as a learning tool to help develop our topics and research questions. I distinctly recalled being somewhat pessimistic in my ability to complete such a project and was overwhelmed by my lack of understanding of the content. My confidence was being challenged, and often found myself drawn to the acknowledgment and dedication sections. These were always written with such a positive tone that spoke of the finality of the doctoral journey. The encouragement these offered helped to fuel my desire to complete this journey. I made a promise to myself, that when I reached this point, this would be the very last section that I would type. This would be my exclamation point before hitting print. With many doubts along the way, I frequently reflected back to some of these acknowledgments, so it only seems fitting that I take time to thank those that have completed this journey before me – the unknowing individuals that helped to keep my drive to see this through to completion.

Throughout this experience there have been many individuals that I need to thank for their encouragement and support. First off, I would like to thank all the wonderful individuals in my cohort. I am so grateful for having been able to share this experience with each of you. Especially to Dan Lebo, whose friendship over these past five years has been a large part of my success and enjoyment of the process.

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To my parents, Francis and Kathleen Griech, who from an early age instilled the importance of education. I have come a long way from the days of sitting in my bedroom pretending to study while I "organized my desk" or argued about not wanting to read. I am sure that if someone told you back then that I would continue my education and receive two doctoral degrees you would have said they were crazy. I'm sure I don't tell you enough, but I love you guys so much, and appreciate all of the times you pushed me and encouraged me to keep going and never give up!

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And finally, to my wife, Meghan, for her unwavering and selfless support throughout these past five years. You kept me calm when things were overwhelming. You put up with evenings on the couch with my laptop. You adjusted your work schedule just to help support me. For all the evenings of dragging three kids to dance, soccer, twirling, music lessons (and many other things) by yourself. For helping to remind me when it was time to put down the work, and kept me grounded about what was important when I forgot. Without your willingness to take on as much as you did in ***all*** aspects of our daily lives I would have never achieved this goal. I truly can't thank you enough. This PhD is as much yours as it is mine. I love you, and am so blessed to have you in my life. Thank you. Thank you. Thank you.

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Chapter I: Introduction

Statement of the Problem

There is growing inequality in the world's health. Despite this growing disparity, research in this area is relatively new. According to a review by Adler and Rehkopf (2008), the keywords of "health disparity" were only present in one article in the 1980s and in fewer than 30 articles in the 1990s. Research in this area grew in the early 2000s; however, more questions than answers remain. Most research in health disparity has typically focused on health care delivery as opposed to universal concerns concerning health itself (Ruger, 2004). One reason for this lack of focus is the inability to measure a deliverable good when discussing health as opposed to health care (Daniels, 2001). Equality of health is affected beyond just ease of access to care providers. For example, social factors have been determined to play a significant role in an individual's health (Kunitz, 2007). Recently, there has been an increased focus by researchers in both medicine and public health when attempting to determine how social determinants influence health outcomes (Marmot & Wilkinson, 2005; World Health Organization, 2009). This change will take inter-professional collaboration (IPC), of which physical therapy (PT) can potentially play a unique role in this advancement.

In order for this IPC and paradigm shift in how we think about health care to be accomplished, it will be essential that leadership help to drive this change. Two leaderships theories have been described in the literature as effectively leading this change, transformational and authentic leadership (Murphy, 2005; Regan, Laschinger, & Wong, 2016). Transformational leaders are described as visionary, balanced, self-aware and confident. According to Murphy (2005) transformational leadership is effective at "breaking existing professional boundaries to develop a multidisciplinary team approach to patient care" (p. 135). Additionally, authentic leadership has been described as “transparent and ethical leader behavior that encourages openness in sharing information needed to make decisions while accepting input from those who follow” (Avolio, Walumbwa, & Weber, 2009, p. 423). Regan, Laschinger, and Wong (2016) were able to demonstrate that authentic leadership may enhance IPC along with structural empowerment based on a sample of registered nurses. At the core of both of these leadership styles is ethical underpinnings. A recent systematic review demonstrated that it is possible to affect the ethics of health care practices making it a natural leap in logic to examine ethically-framed leadership. At the intersection of ethics and leadership is the emerging theory of ethical leadership (Brown, Treviño, & Harrison, 2005). Ethical leadership has been defined by Brown et al. (2005) as “the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision-making” (p. 120). As will be demonstrated, this emerging theory may be best aligned to improve IPC and lead to narrowing of health disparities.

Significance of the Problem

According to the American Physical Therapy Association (APTA), one of the key roles of PT is to ameliorate impairments and to improve health (American Physical Therapy Association, 2015). This has long been accomplished by a focus on a traditional episodic model of care that treated the patient in front of the clinician in the office. In this approach, the reach of services is only extended to the individual that has the means to seek care. This model, which is sometimes referred to as a “sick care” model, has been recently challenged (Fani Marvasti & Stafford, 2012). Despite the United States spending more for medical care than any other country, its health care system continues to struggle to improve outcomes, and overall health and life expectancy of its citizens continues to decline (Redford, 2018).

Health care widely accepted a biomedical approach to patient care in response to the Flexner report (1910), which called for strict adherence to the protocols of mainstream science in medical teaching and research. Over a century later, the acute (or sick) care model and its cultural, technological, and economic underpinnings remain securely embedded in health care education. Although this has created excellence in science, the art of medicine, caring, and compassion for the patient has regressed (Duffy, 2011). In recent years, health research focused on "health disparity" has intensified with a recognition that health is affected beyond just ease of access to care providers, and that social factors likely play a significant role in an individual's health (Kunitz, 2007). Increased awareness of non-biological factors of health has led to increased interest in the social determinants of health (SDOH), which is guided by five elements: neighborhood and built environment, health and healthcare, social and community context, education, and economic stability (Figure 1) (Marmot & Wilkinson, 2005; World Health Organization, 2009). Embedded within the SDOH are elements of socioeconomic status (SES) and race.

In 2018, the APTA updated its mission statement to align with this goal of improving health and states: "Building a community that advances the profession of physical therapy to improve the health of society" (American Physical Therapy Association, 2018). If PTs truly want to contribute to improving the health of society, the profession will need to look beyond biologically-based factors and treatments, and instead must consider interventions that may potentially influence modifiable social factors. This will require PTs to focus on interventions that are specifically targeted toward those who are most vulnerable. Action is necessary to improve health and to move in the direction of meeting human needs (Marmot, 2005, p. 8).

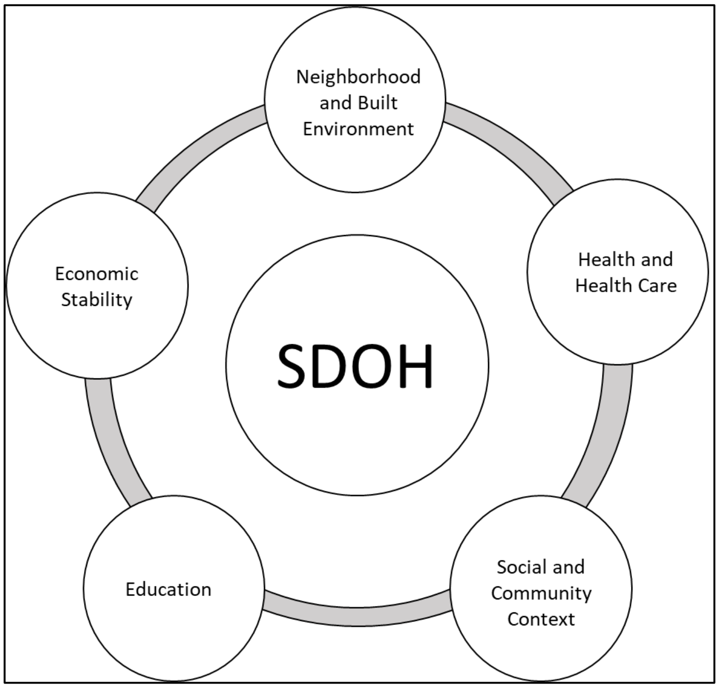


Figure 1. Five elements of SDOH. Adapted from Office of Disease Prevention and Health Promotion. (2018, August).

Purpose of the Study

The purpose of this study addresses two aims. The first aim is to determine whether non-biological patient-related factors (SES and race) influence the physical therapist's clinical decision making in regards to three dependent variables. These variables were initiation of treatment (time lapse between receiving a referral and beginning PT treatment), the frequency of visits throughout treatment, and duration of physical therapy treatment (time from initial evaluation to anticipated discharge from PT services). The second aim is to determine if a PTs perception of his or her manager's level of ethical leadership, as measured by the Ethical Leadership Questionnaire (ELQ) could positively influence clinical decision making when treating patients of differing SES and race (Yukl, Mahsud, Hassan, & Prussia, 2013). This study utilized case-based vignettes for a patient population with low back pain (LBP) seen for physical therapy in the United States health care system context.

Research Questions and Hypothesis

As previously discussed, there are two aims of this study: (1) to determine whether non-biological patient-related factors (SES and race) influence a physical therapist's clinical decision making regarding the timing of physical therapy; and (2) to examine if a PTs perception of his or her manager's level of ethical leadership, as measured by the ELQ can influence clinical decision making when treating patients of differing SES and race. To explore these aims, two over-arching research questions have been developed, along with corresponding hypotheses. Figure 2 provides a graphical representation of how these research questions and hypotheses are linked to the study's aims and variables. These variables, including how they will be represented and quantified, are outlined in more detail later in the methodology.

RQ1$_a$: Is there a difference in physical therapist's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different socioeconomic status?

> H$_0$1: There will be no difference in clinical decision making for low back pain among patients of differing socioeconomic status.

RQ1$_b$: Is there a difference in physical therapist's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different race?

> H$_0$2: There will be no difference in clinical decision making for low back pain among patients of differing race.

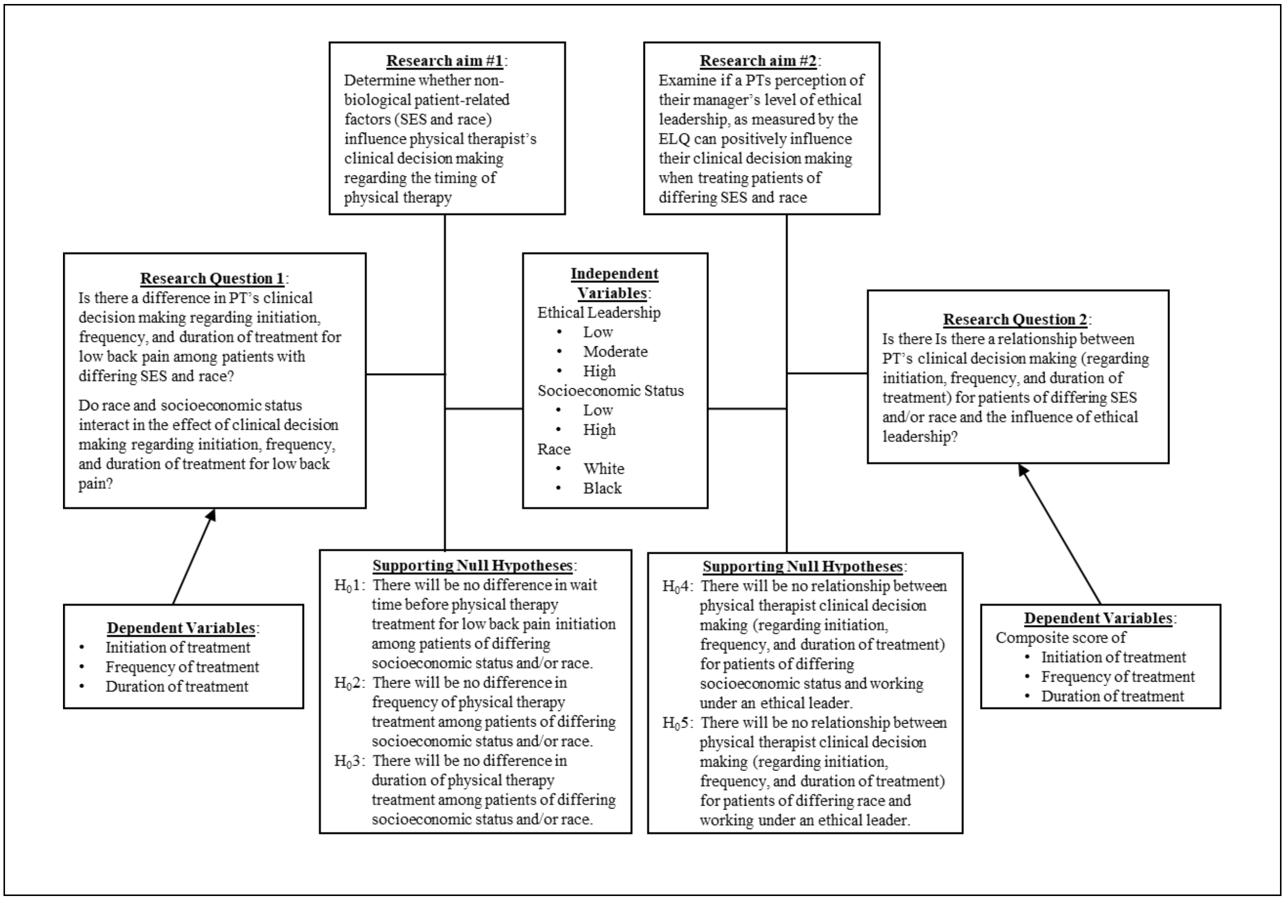
RQ1$_c$: Do race and socioeconomic status interact in the effect of clinical decision making regarding initiation, frequency, and duration of treatment for low back pain?

$H_0$3: There will be no interaction between patients with low back pain of differing socioeconomic status and race in the effect of clinical decision making.

RQ2: Is there a relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and/or race and the influence of ethical leadership?

$H_0$4: There will be no relationship between physical therapist clinical decision making for patients of differing socioeconomic status and working under an ethical leader.

$H_0$5: There will be no relationship between physical therapist clinical decision making for patients of differing race and working under an ethical leader.



Research aim #1: Determine whether non-biological patient-related factors (SES and race) influence physical therapist's clinical decision making regarding the timing of physical therapy

Research aim #2: Examine if a PTs perception of their manager's level of ethical leadership, as measured by the ELQ can positively influence their clinical decision making when treating patients of differing SES and race

Research Question 1: Is there a difference in PT's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with differing SES and race?

Do race and socioeconomic status interact in the effect of clinical decision making regarding initiation, frequency, and duration of treatment for low back pain?

Independent Variables:

Ethical Leadership
- Low
- Moderate
- High

Socioeconomic Status
- Low
- High

Race
- White
- Black

Research Question 2: Is there Is there a relationship between PT's clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing SES and/or race and the influence of ethical leadership?

Dependent Variables:
- Initiation of treatment
- Frequency of treatment
- Duration of treatment

Supporting Null Hypotheses:

$H_0$1: There will be no difference in wait time before physical therapy treatment for low back pain initiation among patients of differing socioeconomic status and/or race.

$H_0$2: There will be no difference in frequency of physical therapy treatment among patients of differing socioeconomic status and/or race.

$H_0$3: There will be no difference in duration of physical therapy treatment among patients of differing socioeconomic status and/or race.

Supporting Null Hypotheses:

$H_0$4: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and working under an ethical leader.

$H_0$5: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing race and working under an ethical leader.

Dependent Variables:

Composite score of
- Initiation of treatment
- Frequency of treatment
- Duration of treatment

Figure 2. Study Methodology Linking Aims, Research Questions, and Variables.

Importance and Implications of the Study

As previously stated, there is a significant disparity of the world's health. This inequality is not just limited to third world countries or to those with lower gross domestic product; it is also prevalent within countries such as the United States. Non-biological factors such as SES have been identified as potentially modifiable factors that could improve the health condition. Additionally, growing evidence presents a strong correlation between racial discrimination and adult health outcomes as a result of health inequality (Priest et al., 2013). This has led some researchers to suggest the potential for implicit bias playing a role in limiting progress (Laliberté et al., 2017; Smedley, Stith, & Nelson, 2002; van Ryn & Fu, 2003; White & Chanoff, 2011). In a study by Laliberté, et al. (2017), the authors demonstrated that patient characteristics such as age, sex, and SES are not associated with PT service delivery; however, there are some inequities concerning access to services and delivery specific to insurance status of the patients. With the different health care systems of the U.S. and Canada, it is important to study if SES would have an impact on the U.S. health care system. Canada and the U.S. are two thriving countries in close proximity; however, they differ significantly in their social policies (Mackillop, Zhang-Salomons, Boyd, & Groome, 2000, p. 902). The income gradient between rich and poor is much steeper in the U.S. (Boyd, Zhang-Salomons, Groome, & Mackillop, 1999). This discrepancy is highlighted by each country's respective Gini index, which measures the degree of inequality in the distribution of family income for a country. Higher scores positively correlate with more inequality. According to the World Fact Book (Central Intelligence Agency, n.d.), the Gini index for the U.S. is 45.0, which is the 39th worst recorded. Canada, on the other hand, has a Gini index of 32.1, which is among the 40 best recorded. Additionally, Canada has more comprehensive health and social programs, such as coverage by universal, publicly funded, comprehensive, health insurance programs. Americans, on the other hand, are primarily privately insured, with the very poor, disabled, and the elderly covered by publicly funded programs. Many, however, are still left with no health insurance whatsoever (Auckerman, 1991; Mackillop et al., 2000).

Delimitations

For this study, several intentional delimitations have been identified. These were deemed essential based on the aims and research questions proposed. First, only licensed PTs will be invited to participate in this study. It is important to recognize that two distinct practitioner levels exist within the profession of physical therapy; PTs and physical therapist assistants (PTAs). Only PTs are licensed to perform initial evaluations and are therefore responsible for generating the plan of care. The PTA operates under the license of a PT and does not directly contribute to the decision-making process being examined in this study. Second, the sample of physical therapists included for survey will be limited to only those who are licensed to practice in the United States. The prevalence of private insurance and a non-universal health care system within the U.S. makes the possible impact of non-biological factors significant compared to other health care systems.

Additionally, the diagnostic classification of the simulated case-based patients is a proposed delimitation. This study will utilize vignettes that will present a fabricated scenario for a patient with low back pain (LBP). There will be four versions of this case, each with identical clinical features, but differing by either the patient's race or SES. LBP was selected due to its overwhelming prevalence in PT practice. LBP is one of the most commonly seen complaints by patients in health care; accounting for between 2% and 5% of all physician visits and a 70% lifetime incidence (Deyo, Mirza, & Martin, 2006; Licciardone, 2008). Additionally, previously validated vignettes utilized in this study were developed around a diagnosis of LBP (Laliberté, et al., 2017).

Finally, although SES has been described as existing in three levels (low, middle, and high), this study will only consider high and low. This delimitation is in order to demonstrate the dichotomy of high versus low.

Definition of Terms

Physical Therapy. Physical therapists (PTs) are health care professionals who diagnose and treat individuals across the life span, “who have medical problems or other health-related conditions that limit their abilities to move and perform functional activities in their daily lives” (American Physical Therapy Association, 2014). PTs examine and develop a plan of care to promote mobility, reduce pain, restore function, and prevent disability. PTs may also provide preventative care by developing fitness and/or wellness programs.

Physical therapists not only provide care across the life span, but also in a variety of settings, including hospitals, private practices, outpatient clinics, home health agencies, schools, sports and fitness facilities, work settings, and nursing homes. State licensure is required in each state in which a physical therapist practices (American Physical Therapy Association, 2014).

Health. The World Health Organization (WHO), a specialized agency of the United Nations, first defined health in 1946 while establishing the organization’s constitution. This definition entered into force in 1948 with the signing of the constitution and has not been amended since. According to WHO, health is defined as: “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 1946, p. 100).

Population health. Some debate exists as to whether population health should be defined as a field of study of health determinants or as a concept of health (Kindig & Stoddart, 2003). Researchers identified the concept's "linking thread [to be] the common focus on trying to understand the determinants of health of populations" (Evans, Barer, & Marmor, 2017, p. 29) Although a fully endorsed definition is elusive, the most commonly cited is that of Kindig and Stoddart (2003): "the health outcomes of a group of individuals, including the distribution of such outcomes within the group" (p. 381). In other words, population health leads to equity of health.

Social determinants of health. The Commission of Social Determinants to Health (CSHD) defines social determinants of health (SDOH) as "the structural determinants and conditions of daily life responsible for a major part of health inequities between and within countries (World Health Organization, 2008)". This definition has been expanded by the Office of Disease Prevention and Health Promotion as part of the Healthy People 2020 initiative. This definition, supported by the Centers for Disease Control and Prevention (CDC) states that SDOH are the "conditions in the environments in which people live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (Office of Disease Prevention and Health Promotion, 2018). SDOH expands on SES to discuss its direct link to health as well as including additional factors such as place of residence and race.

Implicit bias. A bias is a systematic neglect or discrimination of one social group as compared to another that cannot be clinically justified (Blair, Steiner, & Havranek, 2011). Bias has been demonstrated to be explicit (freely and outwardly expressed) or implicit. Implicit bias operates subconsciously, and is unintentional. Additionally, implicit bias does not require the individual to validate or acknowledge its manifestation (Blair & Banaji, 1996; Blair et al., 2011).

It can be activated quickly and unknowingly by situational cues (e.g., a person's skin color), quietly exerting its influence on perception, memory, and behavior (Blair & Banaji, 1996; Blair et al., 2011; Dovidio, Kawakami, & Gaertner, 2002).

Dependent variables. For this study there are four different dependent variables that are examined through the two aims of the study. Each variable will be defined here, and will be further expanded and put into context during later chapters when methodology will be further discussed. All of the dependent variables will be measured by a follow-up questions from the clinical vignette that will be presented to the participant.

Initiation of treatment. Initiation of treatment represents the length of time that a patient would have to wait to begin physical therapy treatment. Typically a patient would be referred to physical therapy, call to schedule an appointment, and then be evaluated at this first visit. This time frame for a patient to wait between calling for an appointment and actually attending can be highly variable.

Frequency of treatment. Frequency refers to how often a patient would be seen during the course of physical therapy. This decision is made by the PT who performed the initial evaluation. Many factors can contribute to this decision making, and is not a standardized amount.

Duration of treatment. Duration is the expected length of time from initial visit to discharge that the physical therapist expects to see the patient (the entire course of treatment). Although this can vary and change depending on the patient's progress during therapy, a PT will have a general prognosis for a patient after the initial evaluation. This prognosis includes a prediction of how much PT will be needed.

Clinical decision making of the therapist. This variable is a composite score of the three aforementioned variables (treatment initiation, frequency, and duration), and was derived by recoding the answers to the three vignette follow-up questions. This recoding resulted in a 0-18 score with a higher number representing a patient who would be seen sooner, at a higher frequency, and for a longer duration than a patient with a lower score. A further explanation of this recoding will be discussed during the explanation of the methodology.

Independent variables. There will also be three independent variables that will be examined during this study. Each of these variables are categorical, and will be defined below with explanation of their different categories.

Ethical leadership. As previously explained, a primary aim of this study is to determine a PTs perception of his or her manager's level of ethical leadership, as measured by the ELQ, a valid and reliable measure (Yukl, Mahsud, Hassan, & Prussia, 2013). The score is easily calculated through a summation of all the answers, and then the results can be divided into levels of ethical leadership displayed including high (90-75), moderate (74-45), and low (44-15) (Yukl, Mahsud, Hassan, & Prussia, 2013).

Socioeconomic status. Socioeconomic status (SES) is the interaction between the sociological and economic factors of an individual. It is typically characterized as including three main components: economic status (measured by income), social status (measured by education), and work status (measured by occupation) (Dutton & Levine, 1989, p. 30). Additionally, SES is typically divided into three levels (high, moderate, and low), to designate the overall placement of the individual or group's position within a hierarchical social structure in society. For this study, SES will be measured by work status as a proxy for SES, which has been previously validated by Laliberté (2017).

Race. There is some disagreement in the literature regarding race in terms of a biological versus social construct. For the purposes of this work, race is defined as a social construct that may have potential biological implications. It is a grouping of humans based on shared physical or social qualities into categories generally viewed as distinct by society (Schaefer, 2008, pp. 1091-1093). Research has shown that there is more genetic variation within races than between races and that race is more of a social construct than a biological construct (Cooper & David, 1986; Egede, 2006). Race plays “an important role in determining how individuals are treated, where they live, their employment opportunities, the quality of their health care, and whether individuals can fully participate in the social, political, and economic mainstream of American life” (Smedley & Smedley, 2005, p. 23). In this study race will be categorized within the patient description of the vignette as either white or black.

Chapter II: Review of Literature

Introduction

In order to begin to understand this complex relationship between SES, race, and PT interventions, this section will provide a review of the current literature on the topic. For clarity, Figure 3 is provided as a literature map to visually outline the review. The three overarching topics discussed are (1) health, (2) health care, and (3) the conceptual framework of ethical leadership theory. Health will be defined, and then discussed in regards to the linkage of non-biological patient factors, sometimes referred to as the social determinants of health (SDOH). This will also review the literature pertinent to developing the independent variables for this study: socioeconomic status and race. Next, health care will be explored within a narrower scope of current PT practice. Specifically, the literature review will explore PT intervention for low back pain; the single leading cause of disability globally (World Health Organization, 2018). This section of the review will also link back to the APTA's vision statement to transform society, and how it can connect both the concept of health and leadership with health care. Finally, the conceptual framework of ethical leadership theory will be examined. This will include a discussion of ethical decision making within leadership, as well as discuss component theories of transformational and authentic leadership. Again, the APTA's vision statement will be discussed here, with support as to why ethical leadership is necessary to fulfill this goal.

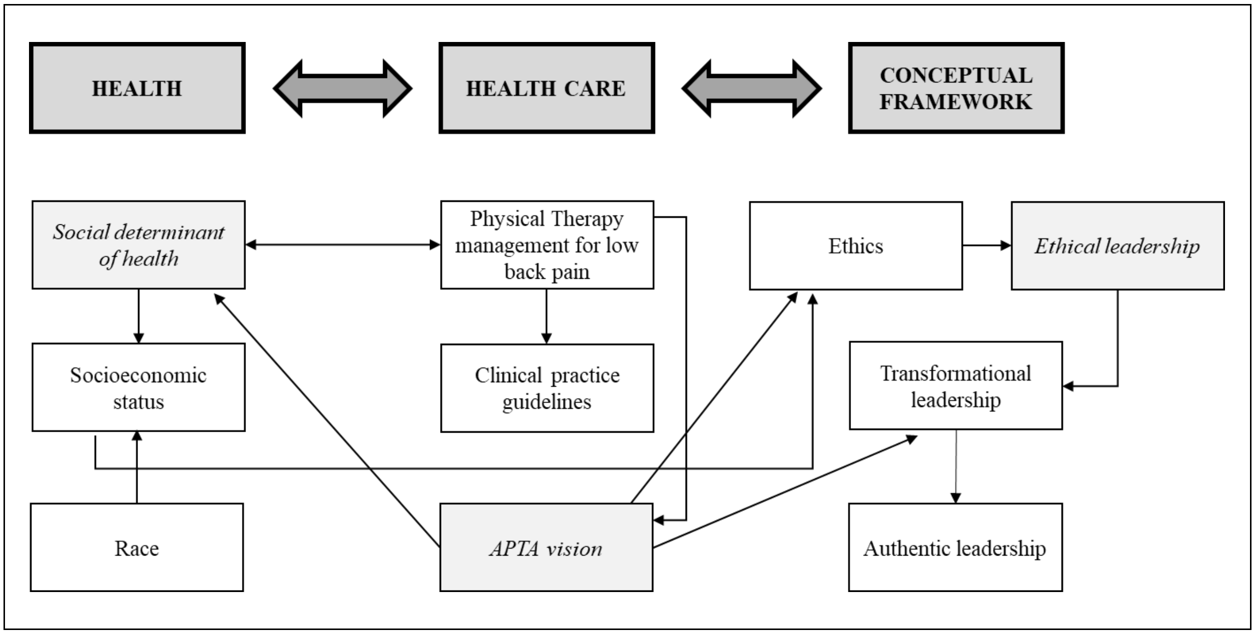


Figure 3. Literature Review Map.

Health

The World Health Organization (WHO) constitution states that its objective is the "attainment by all people of the highest possible level of health" (World Health Organization, 1946, p. 2). WHO first defined health in 1946 while establishing its Constitution. This definition, entered into force in 1948 with the signing of the constitution, has not been amended since. It states that health is: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1946, p. 100). WHO is responsible for several initiatives and collaborations to work towards the goal of improving the health condition, including the World Health Report, the Worldwide World Health Survey, and World Health Day (World Health Organization, n.d.).

The importance of health. In 1978, WHO reiterated its definition of health at the International Conference on Primary Health Care in Alma-Ata, Kazakhstan. The Declaration of Alma-Ata presented Primary Health Care (PHC) as the means of achieving Health for All (Christopher, Le May, Lewin, & Ross, 2011; World Health Organization, 1978). The focus of the Alma-Ata program was to employ community (or lay) health workers (CHWs) to assist in the delivery of preventative health measures such as vaccinations. Although some improvements were seen, such as improving childhood mortality in Sub-Saharan Africa in regards to malarial prophylaxis, other health concerns went largely unimproved (Christopher, Le May, Lewin, & Ross, 2011). In 2008, thirty years after the implementation of Alma-Ata, several reviews were published, including an entire themed issue of the Lancet (Horton, 2008). Reflection on this effort recognized that the role of community participation and CHWs, although often poorly implemented, were critically important in improving the health condition (Rifkin, 2009). This challenged the typical medical model that focuses on the delivery of care by a hierarchy of providers where the physician directs care from the top. It is a departure from the typical "sick-care" model that is traditionally used in health care. Other partners, including rehabilitation specialists such as PT's, have a significant role to play in preventative care delivery. Rifkin (2009), however, has identified several challenges in effectively integrating community participation in health programs (p. 31). First, the prevalence of a bio-medical paradigm that currently dominates the U.S. health care system unintentionally propagates the "sick care" model; and encourages health to be addressed only once a condition has been identified, instead of through a proactive preventative approach (Rifkin, 2009, p. 31). Additionally, a lack of in-depth community insight analysis limits the ability to address the non-biological social determinant of health that is necessary to implement a preventative health care model (Rifkin, 2009, p. 31). This lack of insight fails to capture the community's perception of this approach. Finally, there is a tendency to use frameworks that ultimately "limits investigation into what works, why, and how" (Rifkin, 2009, p. 31). Without quality research to investigate different structures, the best model is difficult to determine. Labonté, Sanders, Packer, and Schaay (2017) examined 13 cases of effort to implement primary health care. Through exploring these cases, several conclusions were drawn for future direction and success. An overarching theme was that in order to have the potential for success in equalizing population health in a global capacity, all members of both the community and health care industry would need to collaborate.

Social determinants of health. A 2008 report by the WHO: Commission on Social Determinants of Health released a strategy to focus on addressing social contributions to health. The Commission of Social Determinants to Health (CSHD) defines social determinants of health (SDOH) as “the structural determinants and conditions of daily life responsible for a major part of health inequities between and within countries (World Health Organization, 2008)”. This was a landmark declaration, as it provided directed attention to those social factors that can either negatively or positively affect the health of a society. This helped to divert attention away from targeting clinical services and instead highlighted the importance of other modifiable elements. This executive report (2008) was structured around three main principles which also embody the overall recommendations of the committee:

> (1) Improve the conditions of daily life – the circumstances in which people are born, grow, live, work, and age; (2) Tackle the inequitable distribution of power, money, and resources – the structural drivers of those conditions of daily life – globally, nationally, and locally; (3) Measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health. (p. 2)

SDOH opens the possibility for additional variables beyond those traditionally conceptualized by SES (economic status, social status, and work status) to expand to other known factors affecting health, such as race/ethnicity. Research regarding SDOH often examines the intersection of these variables. As White, Haas, and Williams (2012) point out, recent evidence suggests that health care resources often reflect the geographic distribution of race/ethnicity. Their work creates a framework to highlight the impact of segregation in influencing access, utilization, and quality of health care services across the entire clinical care continuum. “The inequitable distribution of the health care resources across this spectrum can have severe consequences for the longterm health of individuals and communities” (White, Haas, & Williams, 2012, p. 1292). This idea was further supported by Cooper et al. (2016) who combined these variables to examine the association of mortality with inequality and segregation among blacks and whites (less than 65 years of age) in 267 US metropolitan areas. They found that residential segregation demonstrated a moderate correlation to premature mortality and income inequality for blacks ($r = 0.38$ for both), however, segregation was only modestly correlated with premature mortality ($r = 0.19$) and was uncorrelated with income inequality in whites ($r = 0.06$) (p. 469).

National Initiatives to Address SDOH. The “Healthy People” program was introduced in 1979 by the United States Department of Health and Human Services shortly after the Alma-Ata declaration. It was formulated in response to an emerging consensus among researchers and health experts that national health priorities should underscore disease prevention (i.e., improve health). This program has been continuous since its genesis, with goals updated for Healthy People 2000, 2010, and now 2020 (Office of Disease Prevention and Health Promotion, 2017). The two overarching goals of this program include: "increase quality and years of healthy life" and "eliminate health disparities" (Office of Disease Prevention and Health Promotion, 2017). Updates to this initiative are regularly published with a midyear review available online.

Although significant progress has been made in the areas of oral health, immunization, and heart disease and stroke; many areas continue to struggle or even worsen. Healthy People defines SDOH as: "conditions in the environments in which people live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (Centers for Disease Control and Prevention, 2018).

The Institute of Health care Improvement (IHI) in 2006 identified the need for improvement in population health and launched the "triple aim" initiative (Institute for Healthcare Improvement, 2017). The triple aim includes three objectives: (1) improving the individual experience of care, (2) improving the health of populations, and (3) reducing the per capita costs of care for populations (Berwick, Nolan, & Whittington, 2008). A key variable in this aim's success is stakeholder buy-in. These stakeholders include: government sponsored or owned health care systems, classical staff and group-model health maintenance organizations (HMOs), and government health care systems such as the National Health Services (NHS) that aggregate tax revenue into the global budget to promote care for populations (Berwick et al., 2008). Although one tenant of this initiative is to improve population health, its success will be largely dependent on the ability to demonstrate cost savings. Maciosek et al. (2006) performed a systematic review of the literature with a meta-analysis to develop a ranking of services with evidence of effectiveness from the perspective of cost-effectiveness and clinically preventable burden. Currently, the US health care system (the most expensive in the world) accounts for 17% of the gross domestic product (GDP) and is estimated to grow to nearly 20% by 2020 (Centers for Medicare and Medicaid Sevices, 2017). This ability to demonstrate a decrease in a country's GDP dedicated to health care may help to encourage corporate support; however, provider buy-in will also be required. Some have suggested that a shift of the ethical and moral obligation of health care providers to improve health would encourage engagement.

Measuring health. Several strategies are frequently used to measure a population's health. Assessment of health can range from statistics about mortality and/or premature death to measurement of life expectancy (Thacker, et al., 2006). The Disability-Adjusted Life Year (DALY) is a widely accepted metric used to quantify the burden of disease by incorporating rates of mortality and morbidity. One DALY is equivalent to the loss of one "healthy" year of life. The sum of these DALYs forms a measurement that identifies the disparity between a population's current health status and that of an ideal health situation. Although widely used, some have raised concerns about the accuracy of this measurement. Grosse, Lollar, Campbell, and Chamie (2009) suggest that DALYs do not accurately measure the magnitude of disability, but rather the perceived appeal of a different health state. Another concern with using DALYs as a measure of public health is the exclusion of all non-health factors such as race, socioeconomic status, and occupation (Thacker, et al., 2006). Much of the difficulty in measuring health is the continued emergence of non-biological and non-genetic factors that contribute to an individual's health. These factors can be measured by evaluating and comparing an individual's, family's, or society's socioeconomic status.

Socioeconomic status. Socioeconomic status (SES), as the name implies, takes into account both sociological and economic attributes. It is the pooled total measure of a person's or family's work experience, economic, and social position concerning others in society. SES is typically characterized as including three main components: economic status (measured by income), social status (measured by education), and work status (measured by occupation) (Dutton & Levine, 1989, p. 30). SES is typically divided into three levels (high, moderate, and low), to designate the overall placement of the individual or group's position within a hierarchical social structure in society as a whole. The level of designation is determined by analyzing any or all of the variables (income, education, and occupation) traditionally described to be inclusive of SES. More recently, place of residence and the relationship of race/ethnicity to social class and socioeconomic resources has been recognized as a potential variable which affects an individual's SES (Adler & Rehkopf, 2008).

SES gradient. SES has long been linked to health, dating back to as early as the twelfth century (Kaplan, Haan, Syme, Minkler, & Winkleby, 1987). Even during periods when the leading causes of death were completely different, SES remained persistent (Glymour, Avendano, & Kawachi, 2014). Individuals with lower SES have been associated with higher rates of illness and death, while those higher in the social hierarchy generally enjoy better health (Adler N. E., et al., 1994; Adler & Rehkopf, 2008; Glymour et al., 2014; Kaplan et al., 1987). Despite this strong correlation between SES and health, the underlying rationale has remained elusive. For example, some researchers have dug deeper into the data to find hierarchal mortality differences descending the social strata (Smith & Egger, 1992, p. 1080). Adler et al. (1993) first explored this notion by examining SES at every level of the hierarchy and considered additional factors that contribute to health inequalities. It was found that rates of morbidity and mortality can fluctuate within all levels (low, moderate, and high) of the SES hierarchy, and a simple linear regression examining these two variables fails to fully outline the complexity of the intertwined intricacies of SES (Adler et al., 1993). This complex relationship is referred to as the social gradient or SES gradient (Adler N. E., et al., 1994). Socioeconomic inequalities affect health beyond just a threshold effect of poverty, such that higher levels of household income, wealth, education, or occupation ranking, lower risk of corresponding to a risk of morbidity and mortality (Glymour et al., 2014, p. 17). This discovery led to an increased awareness in research by challenging traditional models that concentrated their efforts toward examining lower, poverty-level SES while ignoring other tiers. Instead of simply controlling for SES, research can now more fully examine its effects with respect to this gradient (Adler N. E. et al., 1994).

Adler and Newman (2002) have proposed several pathways through which SES may influence health. Four pathways have been identified: (1) SES and environmental exposures (i.e. exposure to harmful agents at work or at home), (2) SES and social environment (i.e. social connections), (3) SES and health care (i.e. access, use, and quality of health care), and (4) SES and behavior and lifestyle. These pathways allow researchers to examine SES influence on health through several approaches.

Theoretical underpinnings for SES. Several theoretical frameworks have been described to support the effect of SES on health. Historically, public health efforts to improve SES were guided by either Marx's grand theory (Mills, 1959) or Weberian tradition (Weber, Henderson, & Parsones, 1964). These theories can be categorized as social stratification theory, which is a differentiation of groups of people into different SES classifications. This theory explains the existence and persistence of social classes (i.e., upper, moderate, and lower class). Both Marx's and Weber's theories identify the permanence of SES and social classes; however, they fall short when trying to pinpoint modifiable variables (Glymour, Avendano, & Kawachi, 2014). Current research in social epidemiology aims to identify SES factors that can be changed to affect health; not just to identify its persistence. In response to this dilemma, Link and Phelan (1995) developed the fundamental cause theory. This theory aimed to explain the persistence of SES effect on health by identifying that social factors such as SES and social support are likely "fundamental causes" of disease. These societal factors "embody access to important resources, affect multiple disease outcomes through multiple mechanisms, and consequently maintain an association with disease even when intervening mechanisms change" (Link & Phelan, 1995, p. 80), Health is not a unitary concept that can be elevated by a single or specific set of actions (Glymour, et al., 2014). For example, a youth from a poor SES background finds sudden fame when being drafted to a professional sports team. With this opportunity, the individual may experience a parallel increase in income, which in turn should cause an improved health condition. However, this sudden increase in income may also bring a change in social circles that expose the individual to health-damaging behaviors such as drug or alcohol abuse. Despite a change in SES, the health condition has not improved. Although this theory helped to advance the study of SES endurance, it is ineffective in guiding policymakers or clinicians to develop interventions within the context of ongoing social inequalities.

The fundamental cause theory implies a static state of SES that is assigned at birth and is unchangeable. This concept is challenged by recent life-cycle models of Galama and Van Kippersluis (2010) and Smith (2007) that propose a dynamic model of SES. This dynamic approach aims to advance the causal nature of SES inequalities in health. It helps to conceptualize the implied dynamic and reciprocal relationship between health and SES (Galama & Van Kippersluis, 2010; Smith J. P., 2007). Thinking about SES in this dynamic fashion is most appropriate for clinical practice due to its focus of identifying interventions directed toward changing SES to improve health.

As demonstrated, several theoretical frameworks have been identified to conceptualize SES; however, for this paper; SES will be examined through the lens of fundamental cause theory (Link & Phelan, 1995). Although the dynamic approach may be more fruitful in determining interventions to improve health, a relationship needs to be established first. A search of multiple databases (Academic Search Premier, Google Scholar, and Cinhal) with the keywords of “socioeconomic status” and “phys*” “ther*” and “intervention” or “treatment” was performed. This search did not produce a single study that examined SES as a variable manipulated with respect to physical therapy intervention. Additionally, only one study looked at SES effect on physical therapy; however, this was performed in Canada, which utilizes a different health care system as compared to the United States. This supports the need to determine if a relationship exists, which is most appropriate through a fundamental cause theory lens. Despite advances in screening techniques, vaccinations, or any other piece of health technology or knowledge, the underlying fact is that those from low SES communities lack resources to protect and/or to improve their health (Link & Phelan, 1995, p. 80).

Whichever theory is conceptualized; one fundamental principle remains — focus on just one element of SES will not be productive. Several distinct domains exist (income, education, occupation); however, each is interrelated. For example, education may affect income, which may present a distinctly different effect on health than a promotion at work. Each of these potential variables of SES will be described in greater detail in the following paragraphs to understand what has been done in each of these domains to improve health.

The relationship between income and health. The relationship between income inequality and health was first identified by Rodgers (1979) in an international cross-sectional analysis of 56 countries with differing economic disparities. The results of this study showed that life expectancy between a relatively “egalitarian and relatively non-egalitarian country” can differ by as much as five to ten years (Rodgers, 1979, p. 350). Since this landmark study, more than 200 analyses of this relationship have been performed (Wilkinson & Pickett, 2009). The overwhelming majority (90%) have supported this “income inequality thesis” (De Maio, 2012).

One review examined 168 analyses, classifying them according to the degree of support between smaller income disparity and better health (Wilkinson & Pickett, 2006). Results concluded that 87 studies were found to be completely statistically significant supportive of this concept, with 44 being partially supportive, and 37 demonstrating no support (Wilkinson & Pickett, 2006). In other words, 78% of the analyzed studies showed statistical support for a poorer health condition in societies with greater health inequality. Backlund, Sorlie, and Johnson (1996) examined this same relationship within the United States. The findings were similar to larger global studies. The income-mortality gradient was found to be much smaller at higher income levels than at lower to moderate income levels. This gradient was demonstrated in both the working age (25 to 64 years) as well as the elderly (over 65 years) populations; however, this gradient was much smaller in the elderly than working-age adults. The results were similar for both men and women (Backlund et al., 1996). These findings were supported with a comparison across all 50 states in the United States (Backlund et al., 2007). Altogther, these studies failed to identify a relationship for either men or women over the age of 65 when comparing mortality and state-level income inequality.

Despite this correlation, research has failed to demonstrate a causal relationship. The long-held “income inequality thesis” concludes that better income allows for better access to health-improving modifiers (i.e., access to health care, better housing, clothing). However, Galama and Van Kippersluis (2013) have challenged this relationship. They argue that a non-causal relationship may exist with poor health leading to decreased ability to be employable which in-turn will reduce income and wealth. Although this may be a plausible explanation in some situations, more circumstances continue to support a causal relationship, however, it is dependent on the population being studied, if income shock is either temporary or permanent, and the point in the lifecycle when the income change is experienced (Glymour et al., 2014).

Another focus of studies examining the relationship between health and income has evaluated the role of income support and other forms of welfare targeted at poor households. Many of these studies have been targeted toward analyzing the effect of income on childhood outcome (Clark-Kauffman, Duncan, & Morris, 2003; Duncan, Morris, & Rodrigues, 2011; Gennetian & Miller, 2002). All these studies have had similar conclusions; the best impact of a decrease in income disparity was found on children during the developing ages until five years old (Glymour et al., 2014). In fact, Duncan et al. (2011) found that a $1000 increase in yearly income sustained for at least two years will improve average achievement by 6% of a standard deviation (p. 1275).

Pop, Van Ingen, and Van Oorschot (2013) examined whether reducing societal income disparity was a viable strategy for improving population health. A positive relationship between a country's wealth and health were confirmed; however, a weaker relationship was found in more economically developed countries. These results imply that the largest positive impact on health is dependent on both a decrease in a country's income inequality parallel with an increase in its wealth, which can help to improve health in economically lesser-developed countries, but not in high-developed countries.

Another possible explanation for this relationship lies in access to health care. Several factors contribute to lack of access, but possibly none more so than the level of insurance that is afforded to an individual. According to the Organization for Economic Co-operation and Development (OECD) (2011), developed countries spend on average 9.5 percent GDP on healthcare costs annually. The United States was highest at 17.6 percent GDP (OECD, 2011).

These high costs, paired with being the only developed countries without an unrestricted universal health care can severely limit an individual's ability to achieve health. As an example, Tawk, Abner, Ashford, and Brown (2016) compared the impact of race and insurance status on colorectal cancer outcomes. The mortality rate from colorectal cancer is highest among African Americans compared to any other racial or ethnic group. The results of this study revealed that blacks were diagnosed at more advanced stages of disease than whites, which led to an increased risk of death from both colon and rectal cancers. This increase in deaths was associated with a lack of insurance (Tawk et al., 2016). Another example is provided by Casey and Mumma (2018). They examined the association of patient sex, race, and insurance status with hospital treatments and outcomes following out-of-hospital cardiac arrest (OHCA). Findings again demonstrated that lack of insurance played a significant role in outcome (Casey & Mumma, 2018). Specifically, patients who were female, non-white, Hispanic, or who lacked private insurance were less likely to be treated at a 24/7 percutaneous coronary intervention (PCI) center. Additionally, they concluded that insurance status might affect whether a patient is accepted for transfer by a 24/7 PCI center (Casey & Mumma, 2018).

In conclusion, a decrease in income inequality is related to improved health; however, this relationship is not fully understood. The causal nature has not been proven, yet, most research supports this type of relationship. It is possible that the connection between health and income may also result from overlooked or unmeasured characteristics such as early-life investments, SES of parents, or lifetime preferences (Glymour et al., 2014, p. 43). Some scholars do not feel that income disparity is the variable that needs to be fixed to improve population health, but rather the real problem is underlying political ideology (Kawachi &

Subramanian, 2014, p. 147). Coburn (2000) has claimed that political dogma has widened that gap between “have” and “have nots,” and that more attention should be paid to understanding the causes of income inequalities. Because income inequality is not inevitable, research should not just focus on the effects, but aim to understand the contextual causes of inequality. This understanding may influence our notion of the causal pathways involved in inequality-health status relationships (Coburn, 2000, p. 135). Currently, within the U.S., there is a divide in political views regarding universal access to health care. Since the Affordable Care Act (ACA) was passed, the Republican-controlled Congress has not attempted to reform or to strengthen the ACA but has instead sought to undermine its gains. For example, a full repeal of the ACA’s ban against discrimination based on pre-existing conditions was nearly passed in Congress. This negative political dogma makes a solution to inequality challenging.

The relationship between education and health. Educational achievement marks social status at the beginning of adulthood, functioning as the main connection between the status of one generation and the next, and also as the primary path for upward mobility (Mirowsky, 2003). Social status (measured by the level of education) has long been known as a variable of SES affecting health. Kitagawa and Hauser (1973) first studied this occurrence when examining the relationship between mortality and years of education. This landmark study found that ratios of observed to expected deaths in a population of white men (aged 25-64 years) grew as the years of education decreased. Those individuals with at a college education had a ratio of .70 compared to .91 for high school graduates and 1.15 for those with only four years or less of education. In a similar study 26 years later, Pappas, Queen, Hadden, and Fischer (1993), found that although the overall death rate declined, the decrease was much higher in those who were more educated.

Just as with income, research has been unable to determine the absolute causal relationship between education level and health. It has been hypothesized that education helps to develop necessary abilities that add to "learned effectiveness" such as habits and skills of autonomy (Mirowsky, 2003). Little research exists that isolates educational level as a variable of health equality, with a large majority of attention focused on a subcategory of health literacy. The science of health literacy is beyond the scope of this literature review.

The relationship between occupation and health. Work status, measured by employment, is a variable of SES that has been positively linked to health. According to Avendano and Berkman (2014), at any given point in time, those working are in better health than those out of the labor force. This is true regardless of confounding factors such as country of origin, race, gender, age group, marital status, or other SES factors (p. 182). As was the case for both economic and social status, work status is difficult to demonstrate a purely causal relationship. Although most research supports a positive correlation between health and work status (i.e., those employed enjoy better health), a non-causal relationship is possible (Avendano & Berkman, 2014). For example, work itself may expose an individual to hazardous environments or may restrict an individual's time to commit to health behaviors such as exercise. Fransson et al. (2012) argued that unfavorable work conditions could have a "spill-over" effect on recreational physical activity (p. 1087). Considering both of these arguments, it has been suggested that the relationship between health and employment is bidirectional. Additionally, the link between unemployment and health has been more robust for mental health than for physical health (van der Noordt, IJzelenberg, Droomers, & Proper, 2014, p. 734).

Another consideration of the relationship between health and employment is the stability of employment. Recently, research has begun to focus attention toward examining precarious work environment effects on an individual’s health. Benach et al. (2014) reported that workers under circumstances of precarious employment may face greater demands or have less control over the work process. Both of these scenarios have been associated with increased stress levels and dissatisfaction as well as more unfavorable health outcomes when compared to workers in more secure work environments (Benach et al., 2014, p. 245). This research was largely based on an individual’s control within their work environment. Many of these issues can be managed through appropriate policy. The United States is lagging in implementing such policies, and as a result, is losing ground in the health of its families when compared to most other industrialized countries (Berkman & O'Donnell, 2013). Despite challenges, identifying social and economic policies that impact the work/family interface as well as promote family health and well-being is critical to supporting the health condition (p. 157).

If employment is good for health, then, intuitively, policy should focus on the length and continuity of employment. Much of the early focus of policy is based on Schultz’s (1961) Human Capital Theory; however, this again assumes a causal relationship. A framework that accounts for the bidirectional nature of the relationship between work and health may be more effective (Avendano & Berkman, 2014, p. 184). The Grossman (1972) model helps to explain this bidirectional relationship by recognizing that each individual is both the producer and consumer of health. Work increases income which ultimately can help an individual to purchase goods which may help improve health (i.e., health insurance), yet at the same time reduces time to invest in health (i.e., exercise) or may itself directly harm health (i.e., hazardous work) (Currie & Madrian, 1999; Gordo, 2006). To further support this concept, van Rijn, Robroek, Brouwer, and Burdorf (2014) performed a systematic review with meta-analysis to examine the relationship between poor health and exit from work. It was determined that poor health, predominantly self-perceived health, is a risk factor for exit from paid employment through disability pension, unemployment, and early retirement (p. 300).

Despite continued efforts to determine the best way to impact employment as a modifiable variable of SES to affect health, research overwhelming supports this positive relationship (van der Noordt, IJzelenberg, Droomers, & Proper, 2014). One recommendation has been to place the responsibility on the employer to create and to promote good health in the workplace (van Rijn, Robroek, Brouwer, & Burdorf, 2014). This may help with sustaining employment, as well as improving self-perceived health and worker productivity by reducing sick days. These programs, supported by research, date back to the mid-1970s and have been justified by theory (Reardon, 1998). According to Reardon (1998), many of these employer-sponsored worksite wellness programs were developed largely in response to cost-containment efforts, especially in organizations which are self-insured or in a shared risk relationship for employee medical care. These programs can take several appearances. Some organizations have provided on-site fitness centers and programs; however, the majority of these programs incentivize their employees through reimbursement of fees to external health and wellness centers with which they contract.

Kaspin, Gorman, and Miller (2013) conducted a systematic review of the literature that demonstrated improved economic outcomes as well as decreased health risks with the implementation of employer-sponsored wellness programs. These outcomes included health care costs, return on investment (ROI), absenteeism, productivity, workers' compensation, and utilization (Kaspin et al., 2013). Not only do employer-sponsored programs improve health outcomes, but they are also a key strategy to lower health costs of the employer. Lowering health care costs may become more compelling for organizations which are self-insured for health care costs, or engage in shared-risk insurance options (Delbanco, Anderson, Major, Kiser, & Toner, 2011). Baicker, Cutler, and Song (2010) performed a critical meta-analysis of the literature and found ROI to be significant for medical and absenteeism costs. The authors determined that on average medical costs were reduced by $358 per employee (an ROI of 3.27), and that fall absenteeism costs fall on average by $294 per employee (an ROI of 2.73) (Baicker et al., 2010, p. 307). Similar findings were determined by a large-scale RAND employer survey (Mattke et al., 2013). The RAND study demonstrated a large annual change in health care cost of $378, which was very similar to previously published data. (Mattke et al., 2013, p. 10).

The relationship between race/ethnicity and health. Over the past forty years, a large number of studies have been published which compared the U.S. health care system's treatment of racial and ethnic minorities to non-minorities (Smedley & Smedley, 2005, p. 23). Evidence of racial and ethnic disparities in health care are consistently shown across many different disciplines and services (Nelson, 2002; Smedley & Smedley, 2005). In 2002, Congress asked the Institute of Medicine to assess the extent of racial and ethnic differences in the quality of health care received by patients (Nelson, 2002). Several discoveries came out of this study; however, two of these findings are very applicable to the current discussion. First, racial/ethnic disparities exist in the context of health care, even when confounding factors of insurance status, income, age, and severity of conditions are comparable. Second, many sources contribute to this inequality, including health care providers, patients, and managers; but also health systems were found to impact the present disparity. The team found that bias, stereotyping, prejudice, and clinical uncertainty on the part of health care providers contributed to racial/ethnic disparities in health care. Although tangential evidence from various avenues of research support this sentiment, more research should be aimed to develop a greater understanding of the prevalence and influence (Nelson, 2002, pp. 666-667).

One of the first studies to bring this issue to light was the landmark study by Schulman et al. (1999) which looked at the independent influence of race and gender on physician recommendations for cardiac catheterizations. This study of 720 physicians demonstrated that black patients were much less likely to be referred for catheterization than their white counterparts. This study also demonstrated a tendency for physicians to determine the personal characteristics of the patients based on race, with black women being deemed most "hostile," followed by black men (Schulman, et al., 1999, p. 623). More recently, Hollingshead, Matthias, Bair, and Hirsh (2015) demonstrated that race significantly impacted the clinical decision making of medical trainees regarding care for virtual patients with chronic pain. This mixed methods study showed that 15% of clinicians were reliably influenced by a patients race (Hollingshead et al., 2015). Both of these studies used virtual case-based vignettes to present similar clinical information, with only the demographic details being manipulated.

Defining racial discrimination in health. As shown, racism and racial discrimination are receiving increased attention as determinants of health inequality (Braveman, Egerter, & Williams, 2011). One of the challenges in isolating racial/ethnic discrimination as a variable affecting health is properly defining it. Priest et al. (2013) performed a large systematic review to evaluate the relationship between reported racism and health/wellbeing for children and young people. Racism can occur at three levels: internalized (incorporating racist attitudes and beliefs into one's worldview), interpersonal (between individuals) and systemic racism (occurring across society's major functions) (Berman & Paradies, 2010). The results of the systematic review revealed that only one-third of studies provided a definition of racial discrimination.

Most of these definitions documented both interpersonal and systemic forms of discrimination, with interpersonal being the most frequently occurring. Several definitions included the harmful effects of racial discrimination, with some of these also highlighting the privileges accrued through racial discrimination for dominant groups such as white people. Only a small percentage of studies defined racial discrimination as an ideology of inferiority or superiority, and it was generally not attributed to both (Priest, et al., 2013, p. 119).

Additionally, there is some disagreement in the literature regarding race in terms of a biological versus social construct. The study of racial variations in health is primarily driven by a genetic (biological) model that assumes that race is a valid biological category (Egede, 2006). This thinking assumes that the genes that determine race are linked with the genes that determine health and that the health of a population is determined predominantly by biological factors (Krieger, 1987). However, recent studies have shown that there is more genetic variation within races than between races and that race is more of a social construct than a biological construct (Cooper & David, 1986). Race plays "an important role in determining how individuals are treated, where they live, their employment opportunities, the quality of their health care, and whether individuals can fully participate in the social, political, and economic mainstream of American life" (Smedley & Smedley, 2005, p. 23). This implies that race is a social construct that has biological implications.

The connection between race and SES. These disparities in health and health care among underrepresented minorities have also been shown to be associated with differences in SES (Smedley & Smedley, 2005). Although studies have shown a tendency for this inequity to diminish or even to disappear altogether when SES factors are controlled, the majority of studies find that racial and ethnic disparities in health care still exist even after adjustments for SES have been made (Kressin & Petersen, 2001; Mayberry, Mili, & Ofili, 2000; Nelson, 2002).

Health Care

Health care has been defined as “efforts made to maintain or restore physical, mental, or emotional well-being, especially by trained and licensed professionals” (Merriam-Webster, n.d.). For this review of the literature, we will discuss health care from the perspective of physical therapy. A physical therapist (PT) is a health care professional that diagnoses and provides therapeutic interventions to individuals across the life span, “who have medical problems or other health-related conditions that limit their abilities to move and perform functional activities in their daily lives” (American Physical Therapy Association, 2014). PTs examine the patient and develop a plan of care to promote mobility, to reduce pain, to restore function, and to prevent disability. The remainder of this section will include a brief overview of current best practice in PT for the treatment of LBP, followed by a review of the literature of what has been done in regards to the effects of SES on PT interventions for LBP.

Physical therapy for low back pain. Currently in the United States, approximately 25% of adults will report an episode of low back pain (LBP) occurring within the last three months, with a lifetime prevalence of approximately 70% (Deyo, Mirza, & Martin, 2006; Fritz et al., 2015). This makes LBP one of the most commonly addressed patient complaints, accounting for between 2% and 5% of all physician visits (Deyo et al., 2006; Licciardone, 2008). Additionally, health care cost for LBP has risen faster than overall health care spending, with total costs approaching $100 billion (Fritz et al., 2015). Despite the increasing use of resources (monetary and personnel), outcomes in LBP have gotten worse (Davis, 2012; Freburger, et al., 2009; Fritz, et al., 2015).

Current best practice for low back pain in physical therapy. When determining the best care for a patient, a clinician must practice evidence-based medicine (EBM). This concept of EBM was first discussed by Sackett, Rosenberg, Gray, Haynes, and Richardson (1996) in their groundbreaking editorial *Evidence-based medicine: what it is and what it isn't*. This concept combined clinical expertise, best available evidence, and the patient's values to determine the most appropriate plan of care. In recent years, as the volume and quantity of available research have grown, clinicians have turned to more efficient methods of synthesizing the literature. One well-accepted avenue to gain this information is through something known as a clinical practice guideline (CPG). CPGs include recommendations aimed at improving patient care. A CPG consists of a systematic review of evidence using transparent and accepted methodological guidelines, as well as an analysis of the benefits and harms of alternative care. The overarching aim of the CPG is to improve outcomes. To date, the PT community supports nine CPGs for the treatment of LBP across four different countries (O'connell & Ward, 2018). In the U.S., the Academy of Orthopedic Physical Therapy has published a comprehensive and widely accepted CPG for the management of LBP (Delitto, George, Van Dillen, Whitman, & Sowa, 2012). This CPG summarizes recommendations within subcategories of risk factors, clinical course, diagnosis, examination, and intervention. In a recent review of all known international LBP CPGs, O'Connell and Ward (2018) provided a narrative analysis of the recommendations (Table 1). Upon analysis, absent from all of these CPGs is the management of SDOH and SES factors. Although psychosocial features are discussed, these aim to address the interrelationship between social issues and an individual's thoughts or behaviors. These CPGs rely on management and interventions that focus on biological and psychosocial interventions while failing to address non-biological modifiable features of SES, race, and ultimately SDOH.

Table 1

Analysis of Commonly Agreed Upon Recommendations Across all LBP CPGs

- Rule out specific spinal pathology and then offer high-quality education with encouragement for an early return to activity
- Promotion of self-management
- Discourage the use of routine imaging
- Encourage exercise
- Advocate for cautious use of opioids
- Incorporation of assessment and management of psychosocial factors

Note. Adapted from O'connell & Ward (2018, p. 54).

Addressing SES in the management of LBP. A simple literature search using the search terms "low back pain" and "physical therapy" returned over 2600 related articles with a date limitation of post 2000. When this search was refined to include "socioeconomic status," the return was reduced to only four articles over this same time period. Of these articles, three were based on a patient population outside of the United States. Both Laliberté et al. (2017) and Suman, Bostick, Schaafsma, Anema, and Gross (2017) utilized subjects within Canada, while (Beneciuk et al. (2014) took place in the United Kingdom (UK). Additionally, 2 of these articles (Beneciuk et al., 2017; Valencia et al., 2011) are based on a secondary analysis of data from previously randomized control trials. Each of these four studies contributes to the body of knowledge for relating SES and LBP across the spectrum of health care. Only one article, Laliberté, et al. (2017), specifically identified the contribution of physical therapists in treating LBP with consideration for SES contribution, primarily framed in observing implicit bias in PTs.

In 2011 a landmark clinical trial was undertaken in the UK, the STarT Back trial. This study compared the clinical and cost-effectiveness of a stratified management approach for LBP. Essentially, patients were allocated to different treatment pathways based on their prognosis (low, medium, or high risk of poor outcome), with current best practice (Hill, et al., 2011). This trial demonstrated that categorizing individuals by risk stratification allowed patients to achieve greater health benefits while reducing overall societal costs. Several years later, Beneciuk et al. (2017) performed a secondary analysis of this data from the STarT Back trial. They aimed to identify treatment-effect modifiers to more comprehensively understand prognostic indicators within stratified care. They found SES to be an effect modifier for disability outcomes (OR = 1.71, $p = .028$). High SES patients receiving prognostic stratified care were 2.5 times less likely to have a poor outcome as compared to low SES patients receiving best current care (OR = 0.40, $p = .006$) (Beneciuk, et al., 2017, p. 6). Although this makes a good argument for the effect of SES on the treatment of LBP, it must be noted that the authors only utilized one dimension of SES —occupation. SES was assessed using the National Statistics Socio-economic Classification (NS-SEC) reduced method, which is solely based on job occupation and does not account for income or education levels. Although educational levels were examined separately, it was not characterized as an SES variable in this study.

Suman et al. (2017) also attempted to analyze the relationship between LBP and SES by examining the association between beliefs about activity during LBP with self-reported exposure to a LBP mass media health education campaign. Univariate logistic regression analysis identified a statistically significant association between beliefs about the continuation of activity with income, employment, and education; all three being characteristics of SES. When these same variables were examined as multivariable logistic regression analysis, only income remained statistically significant (Suman et al., 2017, p. 508). Although this study did account for the multiple dimensions of SES (education, income, and occupation), not all categories within each variable were easily translatable. For example, the 11 original categories under occupation were collapsed into five meaningful categories (Suman et al., 2017, p. 514).

The only study to examine relationships between LBP and SES in the US was a secondary analysis of data performed by Valencia, Robinson, and George (2011). As in the study by Beneciuk et al. (2017), not all dimensions of SES were studied. Additionally, the authors found conflicting results with previous studies as no statistically significant associations with disability, pain intensity, or physical impairment were found (Valencia et al., 2011).

All three of the papers mentioned above discussed the lack of research attention examining the relationship between SES and LBP (Beneciuk et al., 2017; Suman et al., 2017; Valencia et al., 2011). Although SES disparities are linked to health inequalities for a variety of conditions (including musculoskeletal disorders), SES influence on LBP outcomes has not been extensively evaluated particularly in comparison to other health conditions (Beneciuk, et al., 2017; Carr & Klaber Moffett, 2005; Murray, et al., 2015; Newton, et al., 2015; Varghese, et al., 2014).

Physical therapists addressing SES in the management of LBP. To date, only one published paper specifically analyzed PTs management of patients with LBP, which considered the contribution of SES. This study investigated biases of outpatient Physical Therapists in Canada (Laliberté, et al., 2017). This study utilized a cross-sectional online survey design to examine if patient-related factors (such as SES) had an effect on treatment initiation, visit frequency, and duration for patients with LBP. The study presented PTs with a randomly assigned vignette (patient case scenario) that utilized common clinical features and altered contextual factors such as age, sex, and SES, as well as insurance status. This study was conducted in Canada, which makes considerations for insurance and reimbursement not easily generalizable to the structures within the United States. The study identified several hypotheses through a lens of examining implicit bias among PTs treating patients with LBP in outpatient clinics (Table 2).

The authors found that patient characteristics (including SES) did not demonstrate a statistically significant difference in treatment initiation, treatment frequency, or total duration; however, they did find an apparent implicit bias based on the patient's insurance status. One possible explanation for this finding is based on the vast differences in health care systems in Canada versus that of the United States. Essentially, the Canadian health care system operates like the Medicare system within the U.S., only it is provided free for everyone. A study comparing the differences in health care access between the U.S. and Canada was published in 2006 (Lasser, Himmelstein, & Woolhandler, 2006). It concluded that U.S. residents are one third less likely to have a regular medical doctor, one fourth more likely to have unmet health care needs, and are more than twice as likely to forgo needed medicines (Lasser et al., 2006, p. 1306). Additionally, the authors concluded that "U.S. residents are less able to access care than are Canadians, and that universal coverage appears to reduce most disparities in access to care" (p. 1300). This is a strong argument for a more detailed examination of SES effects on specific treatments within the U.S. As previously stated, LBP is one of the most commonly seen musculoskeletal disorders in the U.S. "SES is often investigated in health disparities research, but as of yet, not much is known about the relationship between socioeconomic factors and LBP" (Suman et al., 2017, p. 506).

Table 2

Laliberté et al. (2017) Study Hypotheses

- Older patients, women, and patients with lower SES would:
    - Have a longer wait time before treatment was initiated (1° in the public sector)
    - Be seen less frequently and for a shorter duration (1° in the private sector) than other patients
- Patients with WCB insurance would
    - Have a shorter wait time before the initiation of treatment (1° in the public sector)
    - Be seen more frequently and for a longer duration (1° in the private sector) than patients without WCB insurance.

Note. Private sector: individual covered by third-party insurance; public sector: provincial insurance coverage; WCB: worker's compensation board.

Use of Clinical Vignettes

History and validity. The use of written simulations (now commonly referred to as vignettes) was first reported by McGuire, Solomon, and Bashook (1976), as they aimed to mimic the data-gathering and decision process involved in diagnosing and resolving a problem. This concept was further developed by Flaskerud (1979), who described vignettes in research as a valid and desirable measure of eliciting responses among health care providers. This study established both internal and construct validity through a detailed three-step methodological approach utilizing (1) literature review, (2) expert panels, and (3) pre-testing (Flaskerud, 1979). Since this time, other researchers desiring to examine clinical decision making through vignettes have utilized variations of this same methodology (Davis & Slater, 1989; Lanza, 1988). This use of expert panels was further described by Lanza and Carifio (1992) to establish construct validity of their vignettes. Additionally, Cazale et al. (2006), established a transferable six-step methodological approach to ensure content validity of vignettes used to help understand clinical practices. These landmark methodological studies have been used frequently in social science research, as well as in clinical research. Many populations of subjects have been examined, including the intended target sample of this study —licensed physical therapists in the United States. Laliberté et al. (2017) utilized a combination of Flaskerud's (1979) and Cazale's, et al. (2006) approaches in determining the validity of their vignettes used to study the implicit bias of practicing physical therapists. This further supports the approach of measurement as a valid option in exploring the planned research question. Using these pre-established methodological constructs will assist in also establishing the internal validity of the vignettes being developed (Flaskerud, 1979; Gould, 1996; Lanza et al., 1992).

Advantages. According to Gould (1996), there are several advantages associated with the use of vignettes as research tools. Modern survey and vignette distribution techniques allow for the researcher to simultaneously gather information from large numbers of subjects (Gould, 1996; Hughes & Huby, 2012). Additionally, using vignettes allows for the manipulation of several variables at once (Gould, 1996). This flexibility would not be possible in observational studies. Finally, Gould (1996) presented that the use of vignettes can eliminate observer effect and avoidance of the ethical dilemmas that are commonly faced during observation. Again, these advantages are based on the notion that internal validity has been established.

Bradbury-Jones, Taylor, and Herber (2014) reiterate the flexibility of using vignettes to cover a geographical region that may not be possible with traditional observational methods. Additionally, the use of vignettes allows researchers to study more sensitive subject matter due to creating scenarios regarding hypothetical situations, such as child abuse (Bradbury-Jones et al., 2014). This will be of particular usefulness for the proposed study since it may expose implicit bias that may not otherwise be detected. Furthermore, the subject matter of differing socioeconomic backgrounds of patients will be much easier to study in a theoretical scenario. Finally, Bradbury-Jones (2014) discussed vignettes being employed when exploring moral codes (Barter & Renold, 1999) or in attempting to understand subjects' beliefs, perceptions, values or dispositions (Barnatt, Shakman, Enterline, Cochran-Smith, & Ludlow, 2007; Finch, 1987). This was referred to by Schoenberg and Ravdel (2000) as "depersonalization," which encourages participants to think beyond their circumstances (p. 63).

As previously outlined, there has been a recent increased focus by researchers in both medicine and public health in attempting to determine how social determinants influence health outcomes (Marmot & Wilkinson, 2005; World Health Organization, 2009). Despite these studies designed to identify determinants, very few have examined provider's attitudes and behaviors toward their treatment of patients concerning socioeconomic factors. Some authors have suggested the potential for unconscious (implicit) bias to play a role in this occurrence (Smedley, Stith, & Nelson, 2002; van Ryn & Fu, 2003; White & Chanoff, 2011). According to Blair, Steiner, and Havranek (2011), "implicit bias cannot be measured with standard (self-report) survey questions" (p. 71), because participants are often unable to report the underlying reasons for the choices that they make. However, these biases may be effectively measured using clinical vignettes, in which clinicians are given a brief description of a situation to which they then have to respond with their opinion (Taylor, 2005; Schoenberg & Ravdel, 2000; Veloski, Tai, Evans, & Nash, 2005). Clinical vignettes are a relatively simple and inexpensive survey tool that, as the remainder of this paper will highlight, can be a valid measurement for attitudinal research (Peabody, et al., 2004). According to Schoenberg & Ravdel, (2000): "The vignette is carefully designed to depict a circumstance or represent a germane issue and to elicit rich but focused responses from informants" (p. 63).

Conceptual Framework

This study is being undertaken through the lens of ethical leadership. Ethical leadership is an emerging construct that has been traditionally described as a characteristic of other leadership theories, primarily transformational and authentic (Brown, Treviño, & Harrison, 2005). One of the key characteristics of ethical leadership that underpins the current study is the idea that the ethical leader promotes followers to make ethical decisions by emulating their own behaviors and actions (Brown & Treviño, 2006). This is based on social learning theory, which explains the antecedents and outcomes of ethical leadership (Bandura, 1977, 1986).

The following section of this literature review will explain the historical development of ethical leadership and why it is the most appropriate framework for this study. It will begin with a brief explanation of ethics followed by a historical narrative on the development of the ethical leadership construct.

Ethics. The study of ethics takes its roots in the time of Plato (427-347 B.C.) and Aristotle (384-322 B.C.) (Northouse, 2013). Theories of ethics consist of three domains: teleological, deontological, and virtue-based. Stated another way, it is often explained as good, right, and just. All of these theories can function independently; however, to truly function with ethical autonomy, all three should work together. Goodness is that which is beneficial, profitable, useful, or effective. One can judge the goodness of an act by examining the outcome. It does not concern itself with the process instead of focusing on if the result is something that can be viewed as favorable. This is often associated with utilitarianism. Rightness, on the other hand, is concerned with being in compliance with a sense of duty and moral integrity. The focus is not on the outcome, but more how to arrive at a decision. The individual must decide if the quality of an action is reasonable, responsible, and/or appropriate. Deontological ethics (in particular, Kantian) is often associated with a high degree of rightness. Finally, the third domain, justice, focuses on a sense of the balance and fairness in relation to other people and social institutions.

To best conceptualize the relationship between ethics and leaders, Northouse (2013) suggested considering two domains: theories about leaders' conduct and theories about leaders' character. As will be discussed later in this review, ethical leadership itself as a theory remains an emerging construct, but its antecedents are based on the character of the leader as well as his or her actions within the leadership role.

Ethical theories concerned with leaders' conduct. The ethical theories that help to explain the conduct of a leader include teleological theories and deontological theories. The crossroads of these two domains involve consequences versus duty.

Teleological theory of ethics deals with consequences and includes ethical egoism, utilitarianism, and altruism. The goal is an attempt to answer whether something is right or wrong. A leader that displays ethical egoism pursues self-interest in decision-making and often makes decisions that create the greatest good for himself or herself. Conversely, leaders conducting themselves in a utilitarian fashion create the greatest good for the greatest number of people by maximizing social benefits while minimizing social costs (Schumann, 2001). Altruism, on the other hand, is closely related to utilitarianism but contrary to egoism. It allows leaders to act to promote the best interests of others even to the detriment of their own personal interests (Avolio & Locke, 2002; Resick, Hanges, Dickson, & Mitchelson, 2006). Altruistic principles are largely displayed in authentic transformational leadership (Bass & Steidlmeier, 1999).

The deontological theory of ethical leadership emphasizes the duties or rules that govern a leader's action and indicates whether the action in itself is good or bad. These actions are independent of the consequences (teleological) and include telling the moral obligations, telling the truth, keeping promises, being fair, and respecting others (Schumann, 2001). These are inherently good and desirable qualities that a leader should hold, and if present, they should produce good outcomes.

Ethical theories concerned with leaders' character. The virtue-based theory of ethical leadership defines leaders by their characters rather than by their actions, conducts, or behaviors. Hackett and Wang (2012) have attempted to consolidate the cardinal virtues of Aristotle and Confucius to help how virtue theory applies to leadership. Separately, Aristotle and Confucius determined that six virtues: courage, temperance, justice, prudence, humanity, and truthfulness were common to most leadership theories. Although people may possess these virtues in their character, leaders can learn and develop good values over time (Northouse, 2013). Moral virtues are the developed dispositions that are valued as part of the appeal of a morally good human being as demonstrated in the person's habitual behaviors (Pojman, 1995).

Ethical leadership. At the intersection of ethics and leadership is the emerging theory of ethical leadership (Brown et al., 2005). The genesis of evaluating ethical leadership as its own domain, as opposed to just a component of another leadership theory, was largely based on several scandals that took place in the business world in the early 2000s (Brown, et al., 2005; Brown & Treviño, 2006; Treviño & Brown, 2007; Treviño, Brown, & Hartman, 2003). These apparent breaches in ethics sparked an increased interest in more clearly defining the ethical dimension of leadership. It has been established that leaders can influence followers; therefore it is reasonable to assume that leaders can also influence people to behave in either an ethical or unethical manner (Treviño & Brown, 2007, p. 101).

Rost (1991) first defined ethical leadership as a leader-follower relationship in which both parties agree that decisions are fair, reciprocally satisfying, and do not compromise integrity while enhancing independence. According to Brown et al. (2005), ethical leadership requires "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct among followers through two-way communication, reinforcement, and decision-making" (p. 130). Both of these working definitions share a common assumption that ethical leadership is based more in the domain of a leaders' conduct as opposed to that of character or virtue (Hackett & Wang, 2012). Conversely, others argue that ethical leadership is based on the leaders' moral character (Fry & Slocum, 2008; Fry & Cohen, 2009). Smith (1995) and Voegtlin and Patzer (2013) further stressed that integrity and trustworthiness are essential for ethical leadership. To help frame this construct, the broad topic of the ethical dimension of leadership will be examined by first exploring the ethical content of two leadership theories, transformational leadership and authentic leadership. Next, ethical leadership as its own framework will be conceptualized and defined by both qualitative and quantitative research done in this area (Brown et al., 2005; Treviño et al., 2000, 2003). Finally, this framework will be applied to the current research by drawing parallels to the APTA's mission, vision, and code of ethics.

The ethical domain of transformational leadership. Treviño and Brown (2007) have nicely summarized the relationship of the ethical domain of transformational leadership as it relates to the idea of ethical leadership within its own framework. Burns (1978) first used the term “transforming leadership” in his book entitled *Leadership*. In this work, he states: “The transforming leader recognizes and exploits an existing need or demand of a potential follower. But, beyond that…looks for potential motives,…seeks to satisfy higher needs, and engages the full person…” (Burns, 1978, p. 4). Transformational leaders have been defined as: “The leader who elevates the follower morally about what is important, valued, and goes beyond simpler transactional relationship of providing reward or avoidance of punishment for compliance” (Bass B. M., 2008, p. 1217). Burns utilized the humanist approach presented by Maslow (1943), the moral reasoning stages as originated by Kohlberg (1969), and Rokeach’s (1973) values classification theory to define a transformational leader. Later, moral reasoning and its stages of development were identified as the basis for ethical behavior (Kohlberg, 1974).

Burn’s work was further expanded by Bass (1985) and applied to a business model before being developed into its own construct of what we know today as transformational leadership (Bass & Avolio, 2000). Within transformational leadership, four behaviors were identified: (1) individualized consideration, (2) intellectual stimulation, (3) idealized influence, and (4) inspirational motivation (Bass & Avolio, 2000). Individualized consideration accounts for a transformational leader putting the needs of individual followers above the leader’s own development. Intellectual stimulation explains how transformational leaders encourage their followers to challenge the status quo and to question largely held ideals. The moral values of the transformational leader are explained by the idealized influence that they have on followers to imitate their behaviors. This characteristic is often explained by the charismatic nature of transformation leaders. Finally, transformation leaders were found to display inspirational motivation, encouraging followers to connect on a common mission that is value-based.

Although it is often assumed that transformational leaders are moral and encourage followers toward only positive (ethical) outcomes, it has been noted that transformational leaders can transform followers to follow both ethical and unethical paths (Bass B. M., 1985; Howell & Avolio, 1992). To help distinguish these leaders, Bass and Steidlmeier (1999) proposed the terms "authentic transformational" versus "pseudo-transformational" leadership. In this context, authentic transformational leaders are involved in ethical outcomes and are associated with moral values. This may help to explain the merging of a leaders conduct and character, as was previously discussed.

According to Treviño and Brown (2007), transformational leadership appears to be consistent with an ethically positive leadership style; however, this construct is much broader than ethical orientation (including vision, change orientation, etc.). The premise of transformational leadership was not developed as a primary explanation of a leader's ethical influence on followers (p. 104). Although similarities between transformational and ethical leadership exist, such as altruism, integrity, and role modeling, there are key differences. These differences relate to the more transactional views of "moral management," as opposed to transformational leadership's emphasis on vision, values, and intellectual stimulation (Brown & Treviño, 2006, p. 598).

The ethical domain of authentic leadership. Although authenticity was discussed as a component of transformational leadership, it was never explicitly expressed (Northouse, 2013). This concept was first introduced as its own distinct construct by Luthans and Avolia (2003) to explain a gap between positive organizational behavior and transformational/full-range leadership (p. 257). Although many characteristics of transformational leadership are inherent in authentic leadership, there is no need to change (or to transform) followers. Authentic leaders do not need to be charismatic, nor do they need to be seen as charismatic or visionary by others (Treviño & Brown, 2007). Authentic leaders possess characteristics described as: “genuine, reliable, trustworthy, real, and veritable” (Luthans & Avolia, 2003, p. 242). Authentic leaders are motivated by positive outcomes and concern for others (as opposed to self-interest), model positive qualities such as hope and resiliency, and are capable of judging complex ethical issues using a moral compass. Authentic leaders have been shown to develop trust and to become role models, leading by example and encouraging followers to make ethically sound decisions. According to Treviño and Brown (2007), authentic leadership is clearly concerned with the ethical dimension of leadership. “It focuses on a self-aware leader who has ethical intentions and makes good ethical decisions, becoming a role model for others in the process” (p. 105).

As was the case with transformational leadership, authentic leadership also shares similar attributes of altruism, integrity, and role modeling with ethical leadership. A primary difference is authentic leadership’s emphasis on authenticity and self-awareness (Brown & Treviño, 2006, p. 598).

The ethical leadership construct. As already discussed, the concept of ethical leadership has been widely discussed with previous attempts to define it as an independent dimension of leadership (Fry & Slocum, 2008; Fry & Cohen, 2009; Rost, Leadership for the Twenty-First Century, 1991; Smith D. C., 1995; Voegtlin & Patzer, 2013). The developing construct of ethical leadership as its own theory was based on both qualitative and quantitative research aimed at understanding how it was perceived by followers and how it related to employee outcomes (Brown et al., 2005; Treviño et al., 2000, 2003). The antecedents of ethical leadership are based widely on two key ideas: employees look outside of themselves for ethical guidance (Kohlberg, 1974; Treviño, 1986) and social learning theory (Bandura, 1977, 1986). With these frameworks in mind, it was found that ethical leaders gain awareness of followers by making an ethical message salient enough to be recognized in the organizational context as well as allowing the leader to stand out against an ethically neutral ground. (Brown, et al., 2005; Treviño et al., 2003). Guiding followers attention to ethical standards by highlighting their significance is a crucial aspect of ethical leadership (Brown et al., 2005).

As previously stated, the operational definition of ethical leadership as proposed by Brown et al. (2005) is: "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision-making" (p. 120). This definition can be broken down into four elements to help further understanding (Table 3). The first part of this definition ("demonstration of normatively appropriate conduct through personal actions and interpersonal relationships…") implies that those who are viewed as ethical leaders model behaviors that followers consider to be "normatively appropriate" (e.g., honest, trustworthy, fair) making them credible role models. According to Brown et al. (2005) the term "normatively appropriate" was intentionally vague to account for context-dependent scenarios beyond those highlighted above. The second element of the definition ("…promotion of such conduct to followers through two-way communication…") suggests that ethical leaders must prominently draw attention to ethical decisions by explicitly discussing them with their followers. Additionally, the ethical leader must provide a process by which followers have a voice in ethical decision making. The next component ("…reinforement…") implies that ethical leaders set ethical standards and then reward or discipline followers based on their ethical conduct. The final element ("…decision making") denotes that the ethical leader considers the consequences of their decisions and ensures that these ethically sound judgments are observed and emulated by their followers (pp. 120-121).

Table 3

Antecedents of the Definition for the Ethical Leadership Construct

Definition element	Antecedent
1. "… normatively appropriate conduct…"	Treviño et al., 2000
2. "…promotion of …conduct …through two-way communication.."	Bass and Steidlmeier, 1999; Howell and Avolio, 1992
3. "…reinforcement…"	Gini, 1998; Treviño, et al., 2003
4. "…decision-making"	Bass and Avolio, 2000; Burns, 1978; Howell and Avolio, 1992

Note. Four elements of the definition based on the work of Brown et al. (2005, pp. 120-121).

The effect of ethical leaders on followers. As previously stated, one of the key characteristics of ethical leadership that also underpins the current study is the idea that the ethical leaders promote their followers to make ethical decisions by modeling ethical behaviors and actions (Brown & Treviño, 2006). All leaders, regardless of label, should be a fundamental source of ethical guidance for their followers, and should simultaneously be responsible for the moral development of an organization (Mihelic, Lipicnik, & Tekaavcic, 2010). Often, ethics is thought of as a private matter between an individual and his or her conscience, with no relationship to management and leadership. The study of ethical leadership has shown just the opposite. Mehelic et al. (2010) state that "ethics has a lot if not everything to do with management/leadership" (p. 31). A manager or leaders' behavior, regardless of style, is disseminated throughout an organization and becomes an integral part of the corporation's culture. Ethical leaders, by definition, strive for high ethical standards and act consistently with these standards. As leaders, they impart influence of ethical values within the organization simply by the behaviors they demonstrate. This places the ethical leaders in the position of role model, allowing them to set boundaries of behaviors that they want to be emulated. Although many characteristics and personal traits (such as honest, trustworthy, demonstrating integrity) have been linked with ethical leaders, the "more the leader 'walks the talk', by translating internalized values into action, the higher level of trust and respect he generates from followers" (Mehelic et al., 2010, p. 31). In a recent review of the literature, Moore et al. (2019) examined how ethical leadership can influence moral cognition and misconduct. Congruent with previous findings, ethical leadership was shown to decrease follower's tendency to morally disengage (Moore, et al., 2019). This ultimately led to a positive effect of an employees' unethical decisions and negative behavior by improving moral cognition (Moore, et al., 2019).

One of the largest studies conducted to examine this hypothesis of follower influence was a large scale meta-analysis that included 134 independent samples involving 54,920 employees (Bedi, Alpaslan, & Green, 2016). The study included ten different aims, one of which was to determine if ethical leadership had a positive influence on followers' behaviors. They determined that perceptions of ethical leadership did indeed have statistically significant beneficial outcomes for the followers' ethical behaviors within an organization (Bedi et al., 2016). "Overall, the positive relations that exist between ethical leadership and a wide range of attitudinal and behavioral variables suggest that ethical leadership has potentially significant direct and indirect benefits for individuals and organizations" (Bedi et al., 2016, p. 529). The belief that ethical leadership can direct and guide followers towards goals and objectives, which benefit the organization, its members, other stakeholders, and society, is the key foundation for choosing this framework (Kanungo, 2001).

Applying ethical leadership to physical therapy practice. The governing body of PT in the United States is the American Physical Therapy Association (APTA). The APTA is a nonprofit organization, based in Alexandria Virginia, that seeks to "improve the health and quality of life of individuals in society by advancing physical therapist practice, education, and research, and by increasing the awareness and understanding of physical therapy's role in the nation's health care system" (American Physical Therapy Association, 2018). Like most organizations, the APTA has developed a mission statement to help guide the organization and its constituents as well as a vision statement to help direct future its endeavors and goals. As previously mentioned, the APTA updated their mission statement in 2018 to align with this goal of improving health, and states: "Building a community that advances the profession of physical therapy to improve the health of society" (American Physical Therapy Association, 2018). Additionally, the APTA's vision statement was adopted for the physical therapy profession by the APTA House of Delegates in 2013. This vision, "Transforming society by optimizing movement to improve the human experience," is supported by eight guiding principles: identity, quality, collaboration, value, innovation, consumer-centricity, access/equity, and advocacy (American Physical Therapy Association, 2018). Inherent in this vision is to move the profession forward by addressing population health.

This mission and vision will take leadership to fully actualize, and not just leadership at the national level, but at the clinical level as well. According to Mountford and Webb (2009), clinicians (such as PTs) not only make frontline decisions that determine the quality of care but also have the technical knowledge to help make sound decisions about service delivery. Within the health care system, it has been acknowledged that clinical leadership is not the exclusive domain of any particular professional group (Daly, Jackson, Mannix, Davidson, & Hutchinson, 2014; Howieson & Thiagarajah, 2011). Instead, all members of the health care team are identified as potential leaders (Davidson, Elliot, & Daly, 2006). This is supported by Rost (1993) who advocated for the follower theory of leadership which states that leaders discover what their followers (operationalized to mean patients in this example) need or should need but have not been able to articulate or to mobilize themselves (Bass & Bass, 2008). Stated another way, it is a health care professional's job to determine the best treatment required to help achieve better health. Applied specifically to the profession of PT, and supporting both the mission and vision of the APTA, PTs act as leaders for their patients by improving societal health. This is the basis for viewing PTs as leaders within their profession.

To add support to the ethical domain of leadership, the APTA has authored and supported its own code of ethics. All health care professions, including PTs, govern themselves through a code of ethics that helps to guide their professional behavior (Greenfield & Jensen, 2010). The first code of ethics for the PT profession was introduced in 1936, 15 years after the first organizational meeting of the American Woman's Physiotherapeutic Association, which existed as the precursor to the APTA (Kirsch, 2009). Since then, this document has undergone significant changes, modifications, and update. The most recent version of the Code of Ethics for the Physical Therapist was adopted in 2009 by the HOD and went into effect on July 1, 2010 (American Physical Therapy Association, 2010). According to this document, its purpose is to:

1. Define the ethical principles that form the foundation of physical therapist practice in patient/client management, consultation, education, research, and administration.

2. Provide standards of behavior and performance that form the basis of professional accountability to the public.
3. Provide guidance for physical therapists facing ethical challenges, regardless of their professional roles and responsibilities.
4. Educate physical therapists, students, other health care professionals, regulators, and the public regarding the core values, ethical principles, and standards that guide the professional conduct of the physical therapist.
5. Establish the standards by which the American Physical Therapy Association can determine if a physical therapist has engaged in unethical conduct.

The Code of Ethics is comprehensive, but is not exhaustive, with its preamble transparently stating that not every situation can be addressed, and recommending advice or consultation on matters not discussed (Griech, 2018).

Summary

Leadership has been described as the conduct of an individual when directing the activities of a group of followers toward a shared goal. According to Al-Sawai (2013), the difficulty when contemplating leadership of health care professionals is that most theories were developed for the business setting and subsequently applied to health care, often without consideration for context (p. 285). Recently, a focus on clinical leadership (i.e., front line clinicians) has gained attention in the literature but has only led to further anecdotal investigations (Al-Sawai, 2013; Daly et al., 2014; Mountford & Webb, 2009). Through a narrative review of the literature, Daly and colleagues (2014) determined the common characteristics and attributes of clinical leaders. Some of these attributes include locus of control, enabling and motivating others, working well within a team, and being a role model

(Daly et al., 2014, p. 76). When examing these in the context of the attributes of an ethical leader, there are significant similarities (Brown & Treviño, 2006). Ethical leadership may be a potential bridge to merge the need for clinical leaders and to provide a theoretical framework for them to operate. Leadership scholars and researchers have long been pragmatically involved in research that aims to add to effective leadership. According to Brown and Treviño(2006): "because ethical leadership and effective leadership are related, the topic of ethical leadership should appeal to scholars with diverse motivations and interests" (p. 613). This is especially true when examining health care in the context of improving the overall health condition by addressing none biological factors such as SES and SDOH. An ethical leader acting as a role model in the clinic and displaying characteristics of integrity and strong moral character can help to fulfill the moral obligation of health care providers to improve the human condition. Ethical leadership, especially displayed by clinicians, aligns with goals of decreasing inequities and addressing health for all. Specifically, the ethical leadership domain aligns with both the vision of the APTA (2018) to transform society by optimizing movement to improve the human experience.

Chapter III: Methodology

Introduction

As previously outlined, health care has adopted a strong biomedical approach, largely in response to a call for strict adherence to mainstream science in medical training and research (Flexner, 1910). Over a century later, the acute (or sick) care model and its cultural, technological, and economic underpinnings remain securely embedded in health care education. Recently, however, there has been an increased awareness of non-biological factors, collectively known as the social determinants of health (SDOH). These SDOH are guided by five elements: neighborhood and built environment, health and healthcare, social and community context, education, and economic stability (Marmot & Wilkinson, 2005; World Health Organization, 2009). Embedded within the SDOH are elements of socioeconomic status (SES) and race. This study intended to link the need for heightened awareness of SDOH with ethical leadership to support the updated mission statement of the American Physical Therapy Association (APTA) of "Building a community that advances the profession of physical therapy to improve the health of society" (American Physical Therapy Association, 2018). To accomplish this task, this study is anchored by two overarching aims: (1) to determine whether non-biological patient-related factors (SES and race) influence a physical therapist's clinical decision making regarding the timing of physical therapy; and (2) to examine if a PTs perception of his or her manager's level of ethical leadership, as measured by the ELQ, can positively influence clinical decision making when treating patients of differing SES and race.

Research Design

Participants. This study was designed as a cross-sectional survey conducted with licensed PTs practicing within the U.S. As of 2016, there were 239,800 PT's in the U.S (U.S.

Department of Labor, 2019). Of these, just over 100,000 are members of the American Physical Therapy Association (APTA) (American Physical Therapy Association, 2018). The APTA has several subsections, known as academies, which represent different areas of practice. One of the subsections, the Academy of Orthopedic Physical Therapists (AOPT) represents PTs that work with a primary patient population of orthopedic conditions. At the time of this study, there are over 19,000 members of the AOPT (including PTs, PTAs, and students) in the U.S., of which 16,639 are physical therapists. Members who have given permission to receive surveys were contacted directly by the Academy through their email dissemination procedure (policy available online, https://www.orthopt.org/uploads/content_files/files/ RESEARCH%20Policy_FINAL_4-29-16%282%29.pdf) with a copy of the recruitment email (Appendix A). Additionally, this invitation email allowed for members to also forward and to share a copy of the recruitment letter with non-member Physical Therapists to help improve the reach of the participants.

Inclusion and exclusion criteria. Inclusion criteria for this study were physical therapists who are licensed in the U.S. and who treat patients with low back pain at a frequency of at least one patient per month. The field of physical therapy can include two distinct practitioner levels: Physical Therapists (PTs) and Physical Therapy Assistants (PTAs). Only PTs are licensed to perform initial evaluations, making them responsible for the generation of a plan of care, including decisions regarding frequency and duration of care. PTAs operate under the license of a PT, and therefore, do not play a role in the decision-making process examined in this study. The sample of physical therapists included for survey was limited to those who are licensed to practice in the United States due to the vast differences in health care coverage, including private insurance and the lack of a universal health care system.

Exclusion criteria were individuals licensed as PTAs for the reasons stated above. Additionally, PTs who do not treat patients with low back pain at a frequency of at least once per month were excluded. Due to the focus of the vignettes examining clinical decision making that may vary depending on the patient's non-biological factors of SES and race, PTs who practice primarily in a pro bono (free) clinic were excluded. Due to an aim of this study to examine a possible relationship between a PTs perception of their supervisor's ethical leadership and effect on clinical decision making on the clinician, PTs who are self-employed without direct supervisors were also excluded. Finally, all incomplete surveys or those that were found to not meet the inclusion criteria through a review of the demographic information were also excluded.

Variables Operationalized. For this study, two independent variables and three dependent variables were identified, each linked to the aims of the study (Table 4). The independent variables were SES and race, with each containing two separate categories. SES will be divided into high or low, while race will be divided into either black or white. The determination of high versus low SES was operationalized by the occupation of the case-based patient in the presented vignette. Using occupation as a proxy for SES has been previously validated by Laliberté (2017). Avendano and Berkman (2014) found that occupation significantly affects health outcomes, regardless of confounding factors such as country of origin, race, gender, age group, marital status, or other SES factors (p. 182). Dependent variables were used both independently and jointly to explain the clinical decision making of the participant. These variables include initiation of the first visit, the frequency of follow-up visits, and duration of total treatment. An additional dependent variable which examined the clinical decision making of the therapist, derived by recoding the answers to the three vignette follow-up questions, was added (Table 5). This composite score (0-18) is a simple method to provide a description of the therapist's clinical decision making process regarding perceived care for the patient, as presented in the vignette. Higher scores are associated with lower wait time to initiate treatment and more frequent care, while a lower score would show longer wait times and less frequent care. The Ethical Leadership Questionnaire (ELQ) will also be utilized by categorizing the results into high, moderate, and low levels of ethical leadership as described in the next section. The use of each of these variables and proposed statistical analysis will be outlined later in this section.

Table 4

Variables Associated with Each Aim

Research Aims	Associated variables
Aim #1: Determine whether non-biological patient-related factors (SES and race) influence the physical therapist's clinical decision making regarding the timing of physical therapy	DVs: Initiation, frequency, and duration of treatment IVs: SES (high/low), race (black/white)
Aim #2: Examine if a PTs perception of their manager's level of ethical leadership, as measured by the ELQ can positively influence their clinical decision making when treating patients of differing SES and race	DVs: composite score of DVs IVs: SES (high/low), race (black/white)

Note. DV = Dependent Variable, IV – Independent Variable.

Instruments

Two instruments will be used for this study. The first will be previously developed clinical vignettes that will describe a common musculoskeletal condition of LBP (Laliberté, et al., 2017). One of four versions of these vignettes will be randomly presented to each participant with the only modified information being SES and race of the patient described (Appendix D). The second will be the Ethical Leadership Questionnaire (ELQ) (Appendix G). The score is easily calculated through a summation of all the answers, and then the results can be divided into levels of ethical leadership displayed including high (90-75), moderate (74-45), and low (44-15) (Yukl, Mahsud, Hassan, & Prussia, 2013).

Table 5

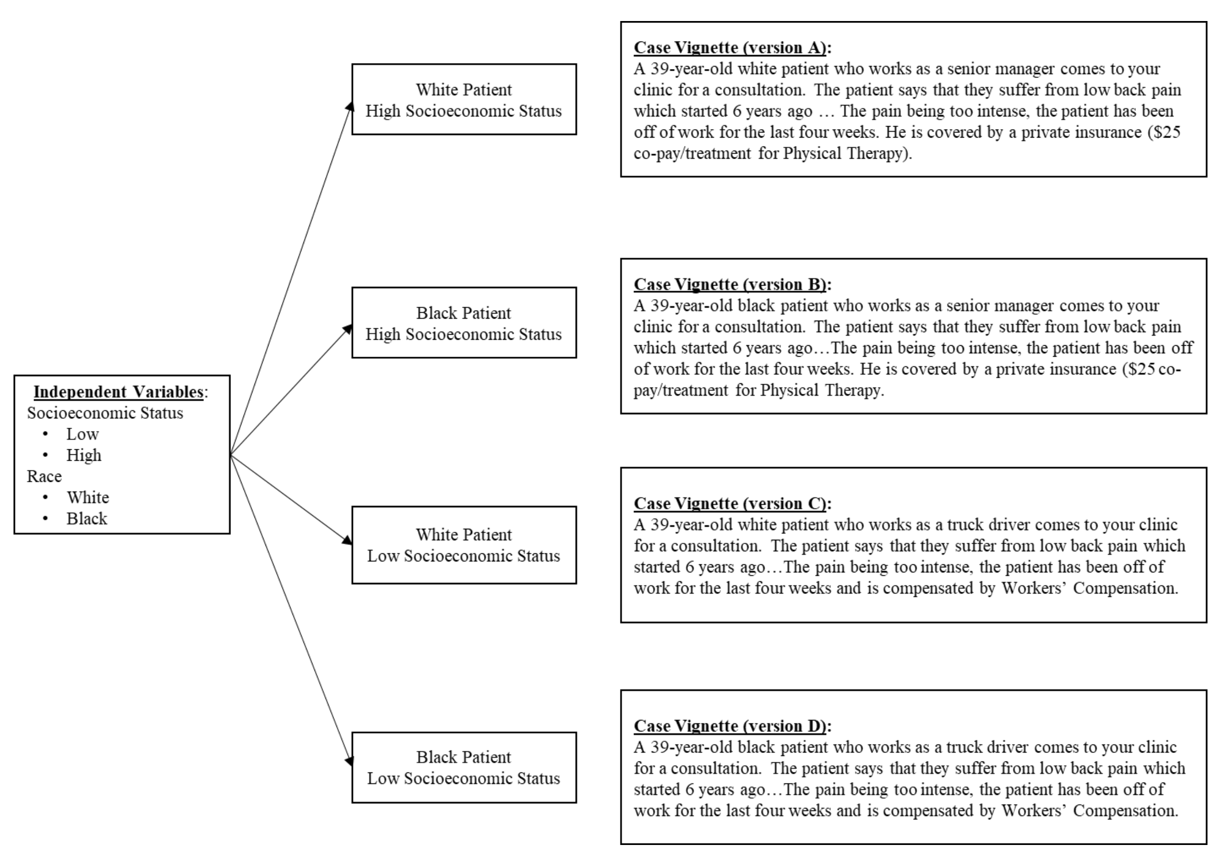
Recoded Values for the Clinical Vignette Follow-up Questions

Question Number	Answer options	Recoded value
1. What is the expected wait time for this patient to be seen in your work setting?	None – will be seen same day	6
	1 to 2 days	5
	3 to 4 days	4
	5 to 6 days	3
	7 to 10 days	2
	11 to 14 days	1
	More than 2 weeks	0
2. What will be the frequency of treatment for this patient (how many times per week)?	1 time a week	2
	2 times a week	3
	3 times a week	4
	4 times a week	5
	5 times a week	6
	Once every 2 weeks	1
	Less than once every 2 weeks	0
3. What will be the total duration of treatment for this patient (how many weeks)?	0 to 2 weeks	0
	2 to 4 weeks	1
	4 to 6 weeks	2
	6 to 8 weeks	3
	8 to 10 weeks	4
	10 to 12 weeks	5
	Greater than 12 weeks	6

Controlling for bias. The decision to utilize case vignettes as a method of data collection was largely based on the desire to control for participant bias. According to Blair, Steiner, and Havranek (2011), “implicit bias cannot be measured with standard (self-report) survey questions” (p. 71), because participants are very often unable to report the underlying reasons for the choices they make. However, these biases may be effectively measured using clinical vignettes, in which clinicians are given a brief description of a situation to which they then have to respond by giving their opinion (Taylor, 2005; Schoenberg & Ravdel, 2000; Veloski, Tai, Evans, & Nash, 2005). This methodology has shown to be effective in multiple studies to examine both SES and race in health care (Hollingshead et al., 2015; Laliberté et al., 2017; Schulman et al., 1999). Specifically, this approach was implemented by Laliberté et al. (2017), when studying the incidence of implicit bias among PTs in Canada. Use of clinical vignettes was utilized in this study to help answer the research questions as well as control for potential threats to bias. These vignettes will help to randomly introduce the participants to the different independent variables by altering either the SES or race of the fabricated case-based patient. The dependent variables will be measured by completing a short questionnaire based on this vignette. Figure 4 provides a graphic outline of how each of these four vignettes (the abbreviated form is shown here, for complete version see Appendix D) represents the different independent variables.

Validity and reliability of case vignettes. The case vignettes (Appendix D) have been validated and previously used by Laliberté (2017). The validation process was well described and followed the best practice for clinical vignette validation methodology as outline by Flaskerud (1979). This study supported vignettes in research as valid and desirable measures of eliciting responses among health care providers. Additionally, Flaskerud (1979) established both internal and construct validity through a detailed three-step methodological approach utilizing (1) literature review, (2) expert panels, and (3) pre-testing. Each of these steps was documented in the validation process. Additionally, Laliberté (2017) described using a second stage of validation through the methodology of Cazale et al. (2006). This six-step methodological approach ensures the content validity of vignettes used to help understand clinical practices.

These vignettes have only been utilized on a population of physical therapist in Canada and have not yet been used in the United States. Additionally, fewer versions will be used for this study. Permission was granted to use these vignettes by the author (Appendix F).



Case Vignette (version A): A 39-year-old white patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago … The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy).

Case Vignette (version B): A 39-year-old black patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago…The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy.

Case Vignette (version C): A 39-year-old white patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago…The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Case Vignette (version D): A 39-year-old black patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago…The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Figure 4. Representation of the Independent Variables Within the Case-based Vignettes.

Validity and reliability of the Ethical Leadership Questionnaire. The Ethical Leadership Questionnaire (ELQ) (Appendix G) was originally developed by Yukl, et al. (2013) to fill a need for an isolated ethical leadership measure. Previously, ethical leadership had been measured as a part of other leadership instruments. The ELQ proved to have good reliability as measured by Cronbach's alpha for all six measures included in the instrument ($\alpha = .89$). Additionally, the ELQ demonstrated high discriminant and criterion-related validity. Exploratory and confirmatory factor analyses were utilized to assess discriminant validity, demonstrating that subordinates can rate the ethical leadership of their immediate boss independently from other leadership behaviors. Criterion-related validity, showing that ethical leadership can explain additional variance in indicators of the leader's influence on the quality of relationships with subordinates and unit performance, was demonstrated using regression analysis (Yukl et al., 2013, p. 45).

Procedures

Approval for this study was submitted to the Alvernia University Institutional Review Board (IRB) and was granted full permission to conduct the study as outlined in this proposal (Appendix I).

Survey software. The survey was developed using Qualtrics® software (Provo, UT). This software allows for the management of all data as well as easy distribution of the survey electronically. Additionally, the software allows for the creation of a multi-use anonymous hyperlink. This will prevent any transfer or recording of participant's information, and all data was returned with no identifiers attached. By default, this anonymous link will collect the user's IP address; however, this was also removed by enabling the "anonymize responses" option. This function in Qualtrics® (Provo, UT), which scrubs all IP address information, further improved the security and privacy of the participant. By creating each of the four versions of the clinical vignettes as separate "blocks" within Qualtrics® (Provo, UT), it allowed for the randomization of which version each participant viewed and helped to control the uniform distribution of the various versions.

Study flow. A graphical representation of the study is shown in Figure 5. If individuals chose to participate, they clicked the anonymous link within the recruitment letter, which

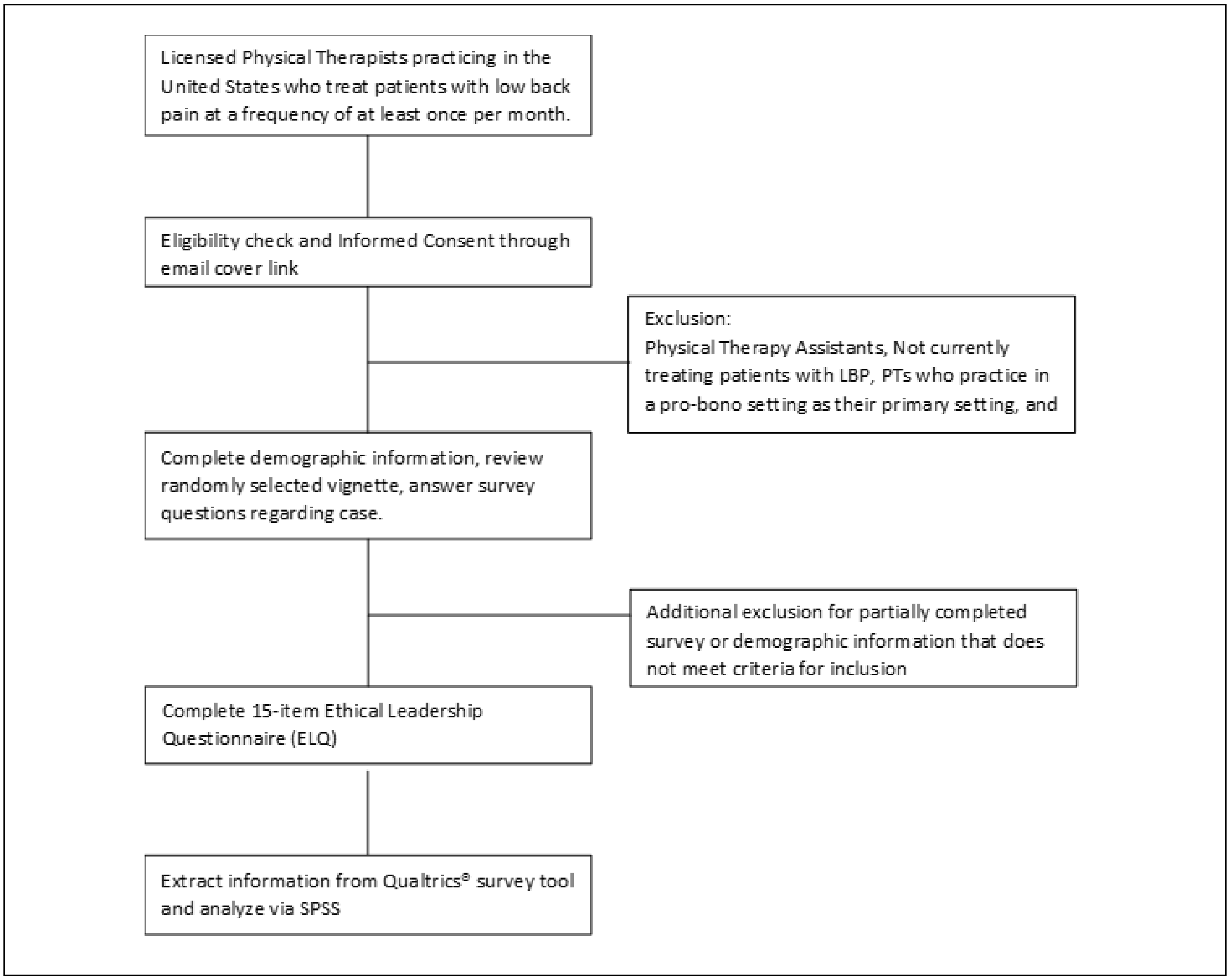


Figure 5. Research Methodology Flow Diagram.

transferred them to the anonymous consent form (Appendix B). If they then consented to the study and chose to participate, they were enrolled in the study. The participant began by completing a brief eight-question demographic form (Appendix C). The purpose of this information was to confirm that the participant met the inclusion criteria (questions #1, 6, and 8). Additional questions (#2 - 5 and 7) were used to help define the participants work environments as well as to report descriptive statistics in the final analysis based on work experience and setting. The participant next reviewed one (of four) randomly assigned versions of the case vignette (Appendix D). As previously outlined, these versions were equally and randomly distributed within the software. The vignettes are designed to have the same clinical features for a patient with typical non-specific LBP, with the only change being the non-biological factors of the patients differing SES (high versus low) and race (black versus white). SES includes economic status (measured by income), social status (measured by education), and work status (measured by occupation) (Dutton & Levine, 1989, p. 30). Based on the validation process of Laliberté (2017), differing occupations served as the proxy for SES. Each participant was only able to see one version (the one randomly assigned through the survey software) of the case as a control for any bias which may occur if the comparison of different versions were allowed. These vignettes, as well as the single version distribution technique, have been previously determined to be both valid and reliable (Laliberté, 2017; Laliberté et al., 2017). Permission to use these vignettes along with slight modifications to information that did not affect the psychometric properties of the cases was granted via email by the original author, Laliberté (2017) (Appendix F). This information includes changes in the titles of the occupation and addition of the patient's race. Participants were asked to answer three follow-up questions for the vignette (Appendix E). These questions were designed to assess the participants' clinical decision making regarding access to care. The participants will then complete the Ethical Leadership Questionnaire (ELQ) (Yukl, Mahsud, Hassan, & Prussia, 2013). This 15 question six-option Likert-scale questionnaire (Appendix G) is a valid and reliable measure of a follower's perception of his/her leader's display of ethical leadership characteristics (Yukl et al., 2013). The participant will then submit all answers using an anonymous link provided through Qualtrics® (Provo, UT). The entire survey is estimated to take 10 – 15 minutes to complete, and the expected response rate is 12%. A review of the literature of survey-based studies of Physical Therapist in the U.S. did not reveal a specifically reported response rate, however, pooled data from a search using Academic Search Premier (using Boolean phrase: "Phys* and Ther*" AND "survey response rate" AND "United States" OR "U.S." with limiter of 2014 to present) revealed six articles matching this criterion with a mean return rate of 12.68% (*SD* = 5.44).

Study preparation. Before full-scale distribution of the survey, a pre-test system check was performed as well as an a priori power analysis to determine sample size.

System check. A copy of the survey link was created and distributed to eight individuals, including members of the dissertation committee and five other non-eligible (excluded) individuals. This system check served several purposes. First, it ensured that the vignettes would be randomly distributed uniformly. Because eight people were invited, the return data should demonstrate that each of the four cases was distributed twice. Second, this system check was used to visualize how the live survey data would be returned within the distribution system. The result of this pre-test revealed that all systems were functioning properly, and the survey was ready for full distribution.

Power analysis. An a priori power analysis was completed using G*Power software (Version 3.0.10; Heinrich-Heine Universität, Düsseldorf, Germany) to estimate the minimum number of participants used in order to have a statistically meaningful effect. The power was set to 80% with a large effect size of 0.5 and a significance level of .05, resulting in an estimated sample size of 48 per variable. Since this study will include three dependent variables, the estimated sample size should be a minimum of 144 participants.

Data Analysis

All data was downloaded from the Qualtrics® software (Provo, UT) into SPSS 25.0 (IBM, Armonk, NY) for analysis. Prior to any analysis, the data was screened to look for missing data, normality, and homogeneity. Additionally, the demographic data was visually screened for any exclusion criteria. Table 6 demonstrates the linkage of the research questions and hypotheses with the particular statistical analysis completed. The following statistical analysis was performed:

1. Descriptive analysis - examination of the mean, median, standard deviation, and histograms for each of the responses for both the vignette follow-up questions as well as the ELQ were performed. Results were also analyzed by the version of vignette completed and demographics of the respondents.
2. Factorial MANOVA – was performed to compare the means of the three dependent variables (initiation, frequency, and duration of treatment) with the independent variables of SES and race. SES was divided into high or low and the race was either white or black. These categories were determined by the version of the case the participant randomly received. Appendix H graphically outlines these distinctions.
3. Factorial ANOVA - was used to compare the means of the clinical decision making score (0-18) and the ELQ (15-90) divided into three subscales (high, moderate, low). The clinical decision making score was a composite score of treatment initiation, frequency and duration as previously outlined (Table 5). A separate ANOVA was run for the category of SES as well as the race of the patient described in the vignette.

Summary

This chapter summarized the purpose, research design and questions, and instruments used in the study. It also addressed the threats to the study, outlined the procedure, and concluded with an overview of the variables and statistical analysis that was completed. In order to answer the two overarching research questions, various statistical analyses were executed which will be outlined in the following chapter.

Table 6

Statistical Analysis

Research Question/Hypotheses	Statistical analysis
Is there a difference in physical therapist's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different socioeconomic status and race?	Factorial MANOVA
$H_0$1: There will be no difference in treatment initiation before beginning physical therapy treatment for low back pain among patients of differing socioeconomic status and/or race.	
$H_0$2: There will be no difference in the frequency of physical therapy treatment among patients of differing socioeconomic status and/or race.	
$H_0$3: There will be no difference in the duration of physical therapy treatment among patients of differing socioeconomic status and/or race.	
Is there a relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and/or race and the influence of ethical leadership?	Factorial ANOVA
$H_0$4: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and working under an ethical leader.	
$H_0$5: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing race and working under an ethical leader.	

Note. MANOVA = Multivariate Analysis of Variance, ANOVA = Analysis of Variance. $\alpha = .05$.

Chapter IV: Results

Introduction

The purpose of this study was to address two aims. The first aim was to determine whether non-biological patient-related factors (SES and race) influence the physical therapist's clinical decision making in regards to three dependent variables. These variables were (1) treatment initiation (time lapse between referral from a physician and beginning PT treatment), (2) the frequency of visits throughout treatment, and (3) duration of physical therapy treatment (time from initial evaluation to anticipated discharge from PT services). The second aim was to determine if a PTs perception of his or her manager's level of ethical leadership, as measured by the Ethical Leadership Questionnaire (ELQ), could positively influence clinical decision making when treating patients of differing SES and race (Yukl, Mahsud, Hassan, & Prussia, 2013). This study utilized case-based vignettes for a patient population with low back pain (LBP) seen for physical therapy in the United States health care system context. This chapter will report the results of this study and will be organized into three sections to detail: (1) the data screening process, (2) the descriptive statistical analysis to help define the population studied, and (3) inferential statistical analyses as they pertain to the research aims and questions.

Data Screening

Using Qualtrics® software (Provo, UT), an internet survey engine, an email was sent to physical therapists who were members of the Academy of Orthopedic Physical Therapy (AOPT). All members were contacted directly by the Academy through their email dissemination procedure (policy available online, https://www.orthopt.org/uploads/content_files/files/RESEARCH%20Policy_FINAL_4-29-16%282%29.pdf) with a copy of the recruitment email (Appendix A). In total, 408 surveys were returned for analysis. Based on statistics received from the AOPT, between 6,500 and 7,000 emails were sent to eligible members who have opted-in to receive surveys. Due to a malfunction in the tracking software by AOPT, an exact number of emails was not available, and only an estimate could be provided. It was reported that 1,770 surveys were returned due to "error" and were unable to be delivered. This resulted in an estimated response rate of just over 8.5%. This fell within the expected range which was determined to be 12.68% (*SD* = 5.44), based on review of literature previously described.

Missing data. Returned surveys (*n* = 408) were initially inspected visually to screen for the inclusion criteria that all participants must be licensed PTs that treat at least one patient with low back pain (LBP) per month. This process resulted in 7 total participants being excluded. Next, screening for missing data was performed by observing frequencies for the two questionnaires being completed (vignette follow-up questions and the ELQ). This screening resulted in 24 additional cases being eliminated due to failure to answer all three follow-up questions to the vignette. Additionally, there were 52 participants that did not fully complete the ELQ. This resulted in 377 participants that fully completed the vignette follow-up questions being included to answer the first research question ('Is there a difference in physical therapist's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different socioeconomic status and race?'). The second research question ('Is there a relationship between physical therapist clinical decision making for patients of differing socioeconomic status and/or race and the influence of ethical leadership?') included the 348 participants who completed the entire ELQ (Table 7). The next step in data screening would typically be to look for outliers. It was decided to not perform any adjustments for outliers due to the nature of the study. Since all data were a result of close-ended questionnaires, all information was necessary to fully investigate the research questions. An additional screening (re-sampling) was done after the initial statistical analysis to equalize the sample size. The basis for this decision and explanation of the justification will be explained later in this chapter. The result of the data screening and sampling methods is demonstrated in Figure 6.

Table 7

Screening for Missing Data

Variable	Valid *n*	Missing *n*	Total *n*
ELQ score	348	53	401
Vignette follow-up questions	377	24	401

Note. ELQ = Ethical Leadership Questionnaire.

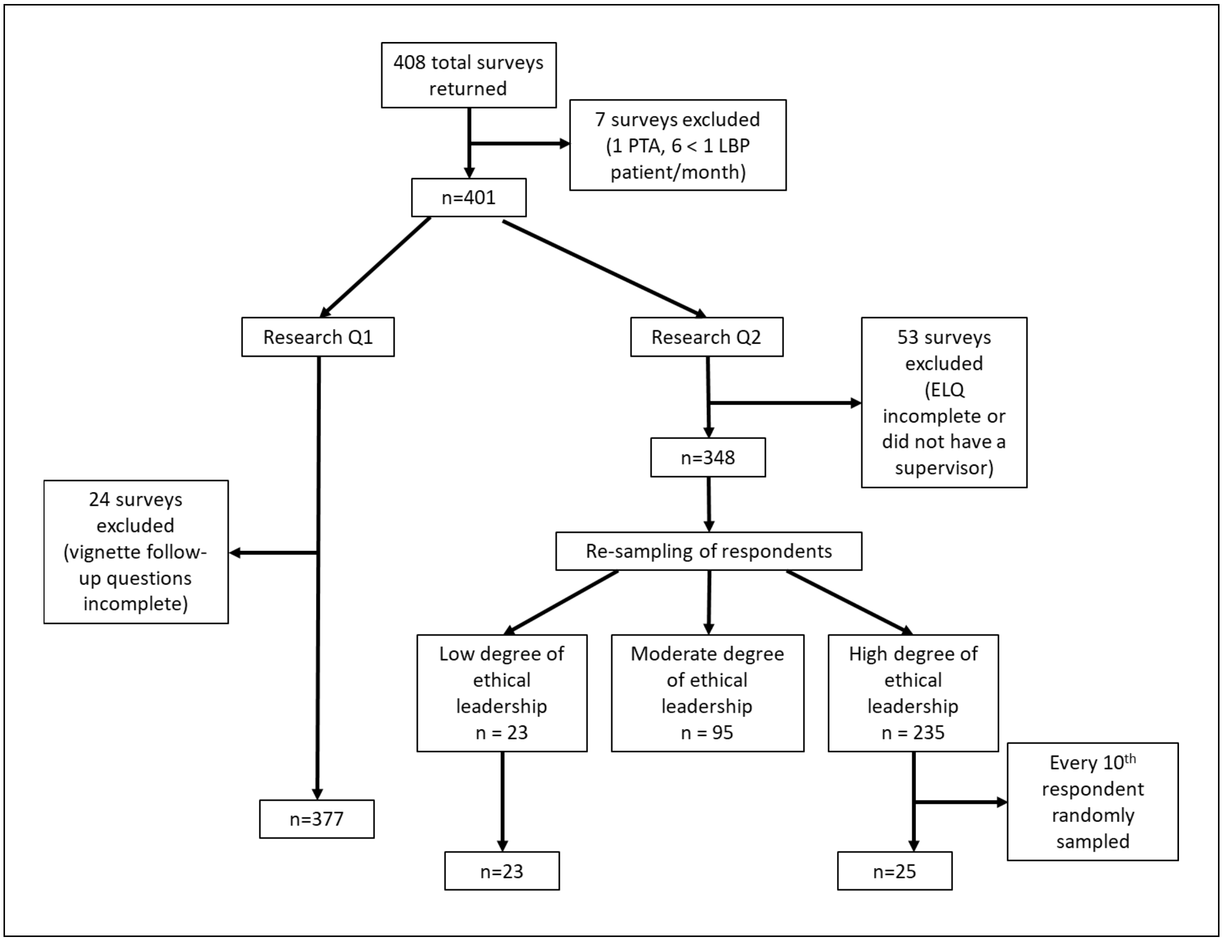


Figure 6. Data screening results by research question.

Normality. Before full analysis, the data was also screened for normality. Grouped data variables of race (white or black), SES (high or low), and ELQ score category (high, moderate, or low) were examined in reference to treatment initiation, frequency, duration, and clinical decision making score. All three independent variables of race, SES and ELQ score category revealed non-normality as evidenced by observation of histograms and demonstrated by a mix of negative and positive skewness across all dependent variables (Table 8). Additionally, all variables demonstrated some deviation from normality as evidenced by their respective Q-Q plots (Appendix J). Normality was tested using Shapiro-Wilk for multivariate analysis (Tables 9 and 10) and the K-S for univariate analysis (Table 11). Both showed significance ($p = .000$) for all variables examined, and therefore the null hypothesis supporting non-normality was rejected. The data could be transformed; however, due the robustness of the statistical analysis methods used, this was not necessary. Details of how this was addressed will be described later.

Table 8

Skewness Values for Clinical Decision Making, Initiation, Frequency, and Duration in reference to Race, SES, and ELQ

Variables	CDM	Treatment Initiation	Treatment Frequency	Treatment Duration
Race				
White	-.314	-818	.356	.699
Black	-.595	-.912	-.940	.553
SES				
High	-.485	-.141	-.257	.887
Low	-.361	-.813	-.197	.497
ELQ				
High	-.363	-.776	-.315	.503
Moderate	-.413	-.706	.067	.713
Low	1.944	-1.180	-.538	1.402

Note. SES=Socioeconomic Status, ELQ=Ethical Leadership Questionnaire, CDM=Clinical Decision Making.

Table 9

Shapiro-Wilk Test for Normality for Initiation, Frequency, and Duration in Reference to Race

	Race	Statistic	df	Sig.
Treatment Initiation	White	.858	189	.000***
	Black	.855	188	.000***
Treatment Frequency	White	.788	189	.000***
	Black	.742	188	.000***
Treatment Duration	White	.887	189	.000***
	Black	.893	188	.000***

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 10

Shapiro-Wilk Test for Normality for Initiation, Frequency, and Duration in Reference to SES

	SES	Statistic	df	Sig.
Treatment Initiation	High	.865	187	.000***
	Low	.855	190	.000***
Treatment Frequency	High	.777	187	.000***
	Low	.757	190	.000***
Treatment Duration	High	.868	187	.000***
	Low	.905	190	.000***

Note. SES=Socioeconomic status.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 11

K-S Test for Normality for Clinical Decision Making in Reference to Degree Ethical Leadership, Race, and SES

	Statistic	df	Sig.
Degree Ethical Leadership			
Low	.252	23	.001**
Moderate	.147	90	.000***
High	.147	235	.000***
Race			
White	.151	174	.000***
Black	.160	174	.000***
SES			
High	.171	176	.000***
Low	.139	172	.000***

Note. EL= Ethical leadership, SES = socioeconomic status.
*$p < .05$. **$p < .01$. ***$p < .001$.

Homoscedasticity. The data set was screened for homogeneity of variance. Treatment initiation, frequency, and duration) were examined in reference to race (white or black) and SES (high or low). A second screening of homogeneity of variance was performed to examine clinical decision making against the ELQ score category (high, moderate, or low) considering race and SES separately. The Levene's test for equal variance showed significance for treatment initiation and treatment duration, but not treatment frequency. Additionally, clinical decision making was significant when considering race but not SES. Levene's test for homogeneity is a negative test; therefore, those variables demonstrating significance are interpreted that univariate homogeneity of variance cannot be assumed (Table 12). Additionally, a Box's M test of equality of covariance was performed to assess multivariate homogeneity (Table 13).

Table 12

Test for Homogeneity of Variance Based on Mean

	Levene's statistic	Sig.
Treatment Initiation	4.132	.007**
Treatment Frequency	0.463	.708
Treatment Duration	3.538	.015*
Clinical Decision Making		
Race	2.506	.030*
SES	1.580	.165

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 13

Box's M Test for Equality of Covariance

Box's M	F	df1	df2	Sig.
32.109	1.758	18	491341.040	.024*

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Descriptive Statistics

After the data were screened and all participants were checked for inclusion eligibility, a total of 377 responses were left for final analysis. Prior to addressing the primary research questions, the participants were analyzed to assess the descriptive characteristics. The survey included eight questions related to the demographics of the participants, including the type of licensure, employment status, geographic location, years of practice, practice setting, patient volume, patient volume with a diagnosis of LBP, and whether they had a supervisor (Appendix C). Several questions were developed to assess inclusion and exclusion criteria of the participants. These questions, as previously described, included the type of licensure (PT versus PTA), the volume of patients seen with LBP (minimum of 1 patient per month), and whether they had a direct supervisor (as reference while completing the ELQ for the second aim of the study) (Figure 6). Other information was gathered to define the population studied (Table 14).

Table 14

Description of Sample (n=377)

Variable	Frequency	Percent
LBP patient volume		
At least one per week	192	39.8
At least one per month	35	9.3
At least one per day	150	50.9
Total Patient Volume (Per Day)		
>20 patients	8	2.1
0-5 patients	45	11.9
11-15 patients	158	41.9
16-20 patients	29	7.7
6-10 patients	137	36.3
Years of Experience		
0-5 years	144	38.2
6-10 years	66	17.5
11-15 years	44	11.7
16-20 years	33	8.8
21-25 years	29	7.7
26-30 years	21	5.6
> 30 years	40	10.6
Region[a]		
Midwest	88	23.3
Northeast	133	35.3
South	74	19.6
West	79	21.0
Did Not Answer	3	.8

Note. [a] Midwest (IN, IL, MI, OH, WI, IO, KS, MN, MO, NE, ND, SD), Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA), South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KT, MS, TN, AR, LA, OK, TX), West (AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA).

Additionally, information regarding their employment status (full-time versus part-time) and practice setting was asked (Table 15).

Table 15

Summary of Employment Status and Current Practice Setting (n=377)

Variable	Frequency	Percent
Employment status		
Full-time	338	89.7
Part-time	38	10.1
Did Not Answer	1	.3
Practice setting		
Academic	13	3.4
Home Health	4	1.1
Hospital-based OP	153	40.6
Hospital-based OP, Academic	4	1.1
Hospital-based OP, Private Practice	2	.5
Hospital	6	1.6
Hospital, Home Health	1	.3
Hospital, Hospital-based OP	8	2.1
Hospital, Hospital-based OP, Long Term Care	1	.3
Hospital, Hospital-based OP, School-based	1	.3
Long Term Care	1	.3
Private Practice	165	43.8
Private Practice, Academic	4	1.1
Private Practice, Home Health	3	.8
Private Practice, Rehab, Long Term Care	1	.3
Pro-Bono[a]	0	0
Rehab	8	2.1
Did Not Answer	2	.5

Note. OP = out-patient.

[a] Three participants described their practice as Pro-Bono (which was an exclusion criterion); however, these participants were already eliminated in previous screening.

The geographic region where the participant works was also regulated to assess for an equitable distribution of surveys, and to add generalizability of results nationally (Table 14). The regions used (Northeast, Midwest, South, and West) were determined based on the criteria of the U.S. Census Bureau determination of regions and divisions (U.S. Census Bureau). As can be seen, there was a fairly even distribution from each geographic region represented (NE: 35.3%, Midwest: 23.3%, South: 19.6%, and West: 21%). This distribution was also used as an additional independent variable during analysis to see if there was any correlation between region and decision making in respect to access to care and either SES or race.

Research Aim #1

The first research question was to determine if there was a difference in physical therapists' clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different socioeconomic status and race. To frame this research question, the following hypotheses were developed:

$H_0$1: There will be no difference in initiation of PT treatment for low back pain among patients of differing socioeconomic status and/or race.

$H_0$2: There will be no difference in the frequency of physical therapy treatment among patients of differing socioeconomic status and/or race.

$H_0$3: There will be no difference in the duration of physical therapy treatment among patients of differing socioeconomic status and/or race.

To assist in answering this question, it was determined that the best analysis would be to utilize a multivariate analysis of variance (MANOVA). A MANOVA is used to test the significance of group differences when more than one dependent variable is present (Mertler & Reinhart, 2017, p. 125). There are four assumptions, according to Mertler and Reinhart (2017) that must be considered prior to conducting a MANOVA, including:

1. Random sampling of observations must be independent from each other.
2. Dependent variables must follow a multivariate normal distribution in each group.
3. Covariance of the dependent variables in each group must be equal (homogeneity).

4. A linear relationship must exist among all pairs of dependent variables.

Prior to analysis, these assumptions were assessed for violations or discrepancies. Details of these outcomes and how they were addressed are detailed below.

A two-way MANOVA was conducted to determine the effect of the independent variables of race and SES on the three dependent variables of treatment initiation, frequency, and duration. Treatment initiation represents the length of time that a patient would have to wait to begin physical therapy treatment. Frequency refers to how often a patient would be seen during the course of physical therapy. Duration is the expected length of time from initial visit to discharge that the physical therapist expects to see the patient (the entire course of treatment). As previously outlined, the data was first screened prior to analysis. The Box's M test F(18, 491341) = 1.758, $p = .024$ was significant, indicating that the homogeneity of variance-covariance assumption was not fulfilled, however, if group sizes are over 30 the MANOVA is robust against violations of homogeneity of variance or covariance (Allen & Bennett, 2007) (Table 13). Tabachnick and Fidell (2001) recommend that although the test may be robust enough, it is best to use Pillai's Trace over Wilks' Lambda in this situation.

MANOVA results indicated that SES significantly affected the combined dependent variables of treatment initiation, frequency, and duration [Pillai's Trace = .029, $F(3, 371) = 3.752$, $p < .05$, $\eta^2 = .029$], however, the multivariate effect size was small. Race was shown to not have any significant effect on the combined dependent variables [Pillai's Trace = .02, $F(3, 371) = 2.496$, $p = .06$, $\eta^2 = .020$]. Table 16 displays the results of the multivariate test. Univariate ANOVA was subsequently conducted as a follow-up test. These results demonstrated that treatment frequency significantly differs by SES $F(1, 373) = 4.125$, $p = .043$, $\eta^2 = .011$, however, treatment duration $F(1, 373) = 1.406$, $p = .236$, $\eta^2 = .004$ and initiation $F(1, 373) =$

2.039, p = .154, η^2 = .005 did not demonstrate significant difference. Treatment duration significantly differs by race $F(1, 373)$ = 4.909, p =.027, η^2 = .013, however, treatment initiation $F(1, 373)$ = .155, p =.694, η^2 = .000 and frequency $F(1, 373)$ = .894, p =.345, η^2 = .002 did not seem to be affected by race (Table 17). Table 18 presents the mean scores for treatment initiation, frequency, and duration when considering both SES and race. Only a single mean score was represented for each dependent variable as both the adjusted and unadjusted means were identical for all variables. These values represent a score between 0-6 for each variable (Table 5). For treatment initiation, a lower score represents a longer wait time to be seen, while a lower score on treatment duration would suggest being seen less frequently. Finally, treatment duration scores that are lower represent shorter length of overall treatment course. A graphical representation of this data is also represented for SES in Figure 7 and for race in Figure 8.

Table 16

MANOVA Summary Table (n = 377)

Effect	Value	*F*	Hypothesis df	Error df	Sig.	Partial Eta Squared
SES	.029	3.752	3.000	371.000	.011*	.029
Race	.020	2.496	3.000	371.000	.060	.020
SES * Race	.017	2.086	3.000	371.000	.102	.017

Note. SES = Socioeconomic status. Values were determined using Pillai’s trace.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 17

ANOVA Summary Table (n = 377)

	SS	*df*	*MS*	*F*	*p*	η^2
Socioeconomic status						
Initiation	5.822	1	5.822	2.039	.154	.005
Frequency	1.775	1	1.775	4.125	.043*	.011
Duration	1.598	1	1.598	1.406	.236	.004
Race						
Initiation	.443	1	.443	.155	.694	.000
Frequency	.385	1	.385	.894	.345	.002
Duration	5.579	1	5.579	4.909	.027*	.013
Socioeconomic status x Race						
Initiation	.939	1	.939	.329	.567	.001
Frequency	.045	1	.045	.104	.747	.000
Duration	5.579	1	5.579	4.909	.027*	.013
Error						
Initiation	1065.014	373	2.855			
Frequency	160.520	373	.430			
Duration	423.889	373	1.136			
Total						
Initiation	2922.000	377				
Frequency	3689.000	377				
Duration	6969.000	377				

Note. *p < .05. **p < .01. ***p < .001.

Table 18

Adjusted and Unadjusted Group Means for Treatment Initiation, Frequency, and Duration

	Treatment Initiation		Treatment Frequency		Treatment Duration	
	M	*SD*	*M*	*SD*	*M*	*SD*
SES						
High	4.08	1.555	2.99	.711	2.50	1.075
Low	3.83	1.806	3.13	.595	2.63	1.079
Race						
White	3.92	1.798	3.09	.658	2.69	1.150
Black	3.99	1.575	3.03	.658	2.45	.988

Note. SES = Socioeconomic status, M = mean (both adjusted and unadjusted means were identical).

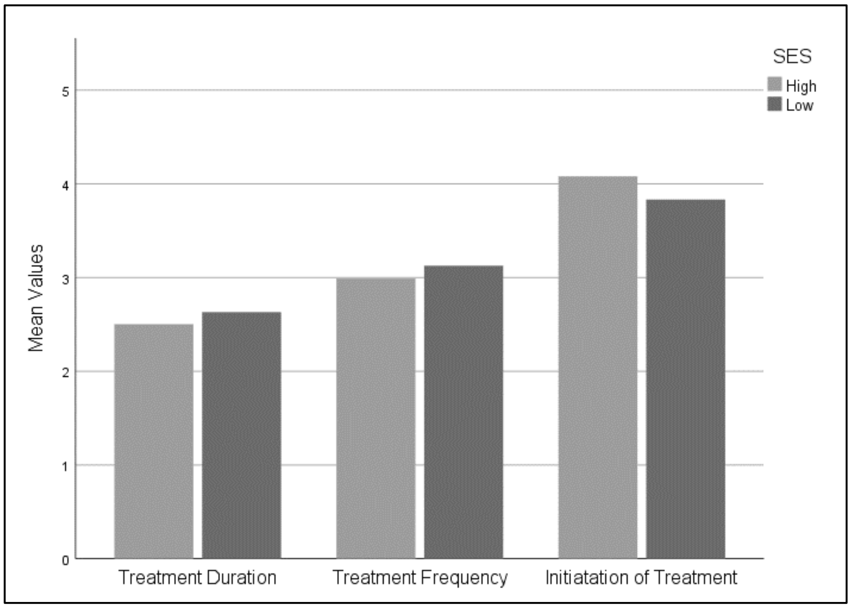


Figure 7. Group means for treatment initiation, frequency, and duration with respect to SES.

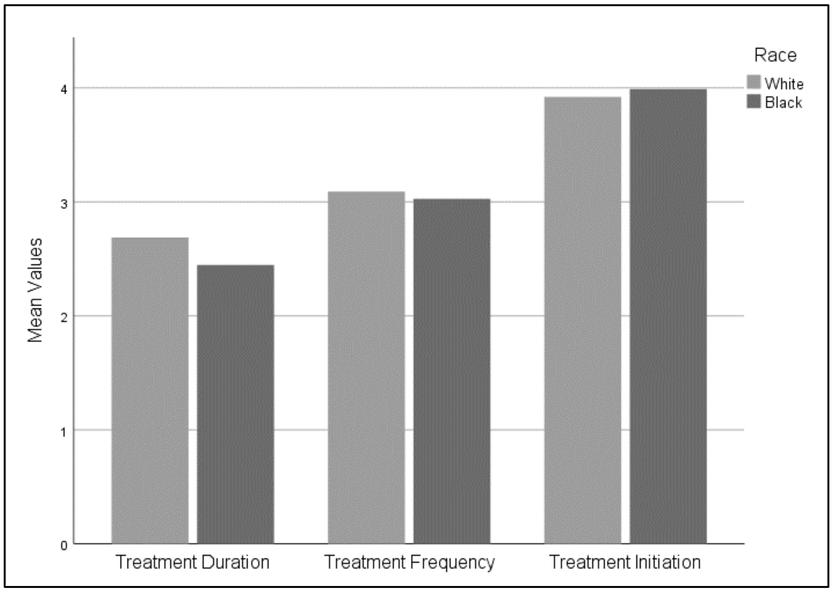


Figure 8. Group means for treatment initiation, frequency, and duration with respect to race.

Research Aim #2

The second research question was aimed to determine if there was a relationship between PT clinical decision making for patients of differing SES and/or race and the influence of EL.

$H_0$4: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and working under an ethical leader.

$H_0$5: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing race and working under an ethical leader.

To assist in answering this questions, it was determined that the best analysis would be to utilize an analysis of variance (ANOVA). An ANOVA is used to simultaneously assess if there are differences in the means of a single dependent variable between two or more conditions or groups. These conditions or groups are defined by the different levels within the factors (independent variable) (Mertler & Reinhart, 2017, p. 71). Since this study evaluated more than one factor, a two-way ANOVA was used. Mertler and Reinhart (2017) define three assumptions that must be considered prior to conducting an ANOVA:

1. The randomly sampled observations must be independent of each other.
2. The dependent variable must be normally distributed in the population from which the data was sampled.
3. The dependent variable must have equal variances among the distribution of scores.

Prior to analysis the data was screened to ensure that the assumptions of factorial ANOVA were fulfilled. The Levene's test for homogeneity (Table 12) demonstrated issues in variance with clinical decision making and race (2.506, $p = .030$), but not with SES (1.580, $p = .165$). To address this issue, the significance level was reset to = .01 to account for any unwanted error in the results.

A two-way ANOVA utilizing a 2x3 table was conducted to determine if EL could influence clinical decision making when considering race (white or black) of the patient. A second two-way ANOVA was performed to look for significant effects of EL on clinical decision making when considering SES (high or low) of the patient. The clinical decision making of the participants was measured as a cumulatively weighted score based on the previously established variables of treatment initiation, frequency, and duration. This score was constructed on a scale of 0-18 where a lower score would suggest longer wait times, less frequency of visits, and shorter duration of care (Table 5). The ELQ was scored and then divided into three established levels of EL (high, moderate, low) as previously described. As previously mentioned, the ELQ proved to have good reliability as measured by Cronbach's alpha for all six measures included in the instrument ($\alpha = .89$). The reliabliy of the data collected was very similar ($\alpha = .977$). Mean values for the results are displayed in Tables 19 and 20. A summary of the results of these ANOVA's is presented in Table 21 and 22. The main effect revealed that clinical reasoning of PTs was not significantly different depending on the degree of ethical leadership of their supervisor, $F(2, 342) = 1.152$, $p = .317$, partial $\eta^2 = .007$ or SES of their patients $F(1, 342) = .091$, $p = .764$, partial $\eta^2 = .000$. Although Figure 9 reveals some interaction between EL and clinical decision making when the SES of patients differ, this interaction was not significant $F(2, 342) = .353$, $p = .703$, partial $\eta^2 = .002$. Additionally, clinical reasoning of PTs was not significantly different depending on the degree of ethical leadership of their supervisor, $F(2, 342) = .953$, $p = .387$, partial $\eta^2 = .006$ or race of their patients $F(1, 342) = .358$, $p = .550$, partial $\eta^2 = .001$. As with SES, Figure 10 demonstrates some interaction between ethical leadership of supervisors and clinical decision making in regards to patients of differing race, but the interaction was not significant $F(2, 342) = 1.917$, $p = .149$, partial $\eta^2 = .011$.

Table 19

Mean Values for the Effects of the Degree of EL on Clinical Reasoning with Respect to Race

Degree of EL	Race	*M*	*SD*	*N*
Low	Black	8.62	2.142	13
	White	9.80	.919	10
	Total	9.13	1.792	23
Moderate	Black	9.42	2.417	45
	White	9.33	1.883	45
	Total	9.38	2.155	90
High	Black	9.91	1.987	116
	White	9.40	2.022	119
	Total	9.65	2.016	235
Total	Black	9.68	2.136	174
	White	9.41	1.935	174
	Total	9.55	2.040	348

Note. EL = Ethical Leadership.

Table 20

Mean Values for the Effects of the Degree of Ethical Leadership on Clinical Reasoning with Respect to SES

Degree of EL	SES	*M*	*SD*	*N*
Low	High	9.42	1.443	12
	Low	8.82	2.136	11
	Total	9.13	1.792	23
Moderate	High	9.29	1.979	42
	Low	9.46	2.315	48
	Total	9.38	2.155	90
High	High	9.59	1.923	122
	Low	9.72	2.119	113
	Total	9.65	2.016	235
Total	High	9.51	1.903	176
	Low	9.59	2.176	172
	Total	9.55	2.040	348

Note. SES = Socioeconomic status, EL = Ethical Leadership.

Table 21

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering SES (n = 348)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	13428.045	1	13428.045	3208.126	.000***	.904
EL	9.640	2	4.820	1.152	.317	.007
SES	.379	1	.379	.091	.764	.000
EL x SES	2.952	2	1.476	.353	.703	.002
Within treatments	1431.487	342	4.186			
Total	33156.000	348				

Note. SES = Socioeconomic status, EL = Ethical Leadership.
**p* < .05. ***p* < .01. ****p* < .001.

Table 22

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering Race (n = 348)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	13381.056	1	13381.056	3240.446	.000***	.905
EL	7.868	2	3.934	.953	.387	.006
Race	1.480	1	1.480	.358	.550	.001
EL x Race	15.834	2	7.917	1.917	.149	.011
Within treatments	1412.250	342	4.129			
Total	33156.000	348				

Note. EL = Ethical Leadership.
**p* < .05. ***p* < .01. ****p* < .001.

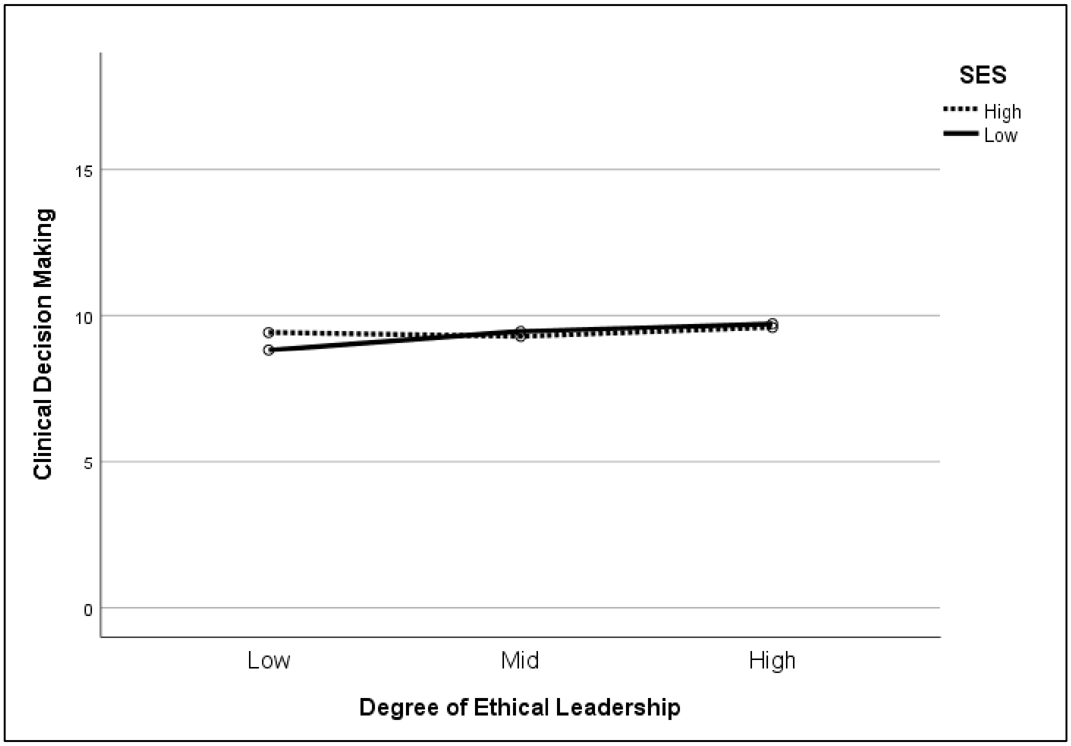


Figure 9. Line plot of interaction between ethical leadership and socioeconomic status.

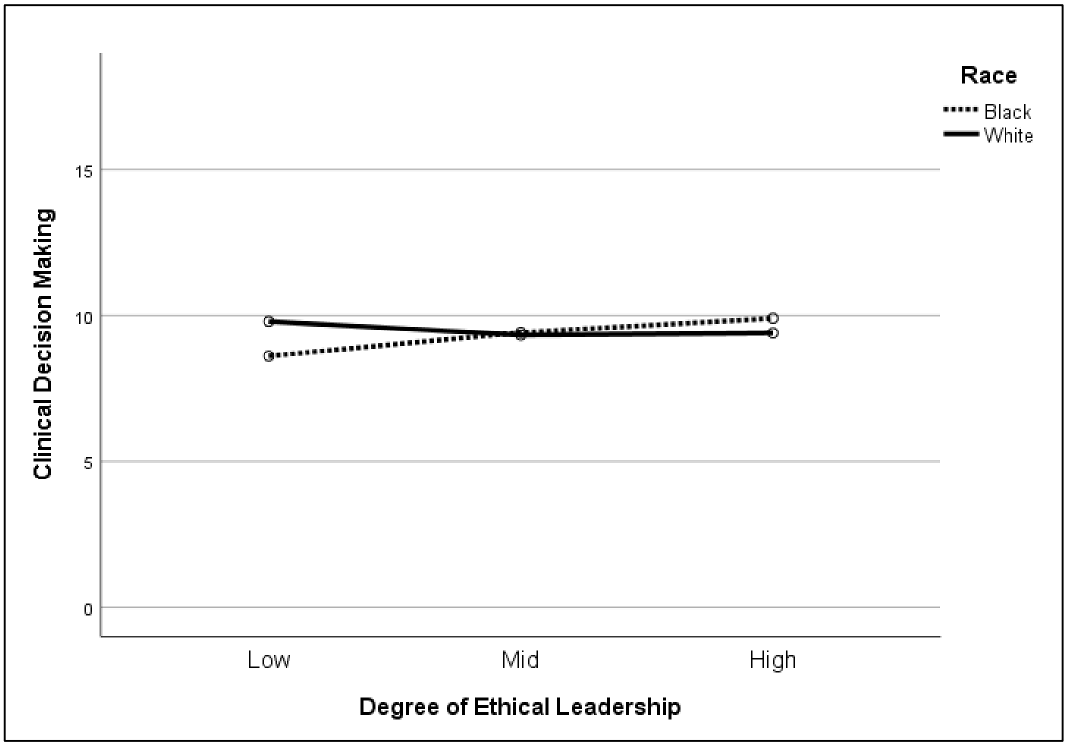


Figure 10. Line plot of interaction between ethical leadership and race.

Additionally, Tukey's post hoc analysis was conducted to examine significance within the degree of EL of an individual's supervisor and their own clinical decision making regarding patients of differing race or SES (Table 23). No significance was difference was observed.

Table 23

Tukey HSD Post Hoc Multiple Comparisons for Ethical Leadership

					95% Confidence Interval	
		Mean Difference	Std. Error	Sig.	Lower Bound	Upper Bound
Low	Mid	-.25	.475	.861	-1.36	.87
	High	-.52	.444	.470	-1.57	.52
Mid	Low	.25	.475	.861	-.87	1.36
	High	-.27	.252	.524	-.87	.32
High	Low	.52	.444	.470	-.52	1.57
	Mid	.27	.252	.524	-.32	.87

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Reconsideration of sampling. Large discrepancies in sample sizes between groups is a known limitation of ANOVA. The respondents in this study resulted in a large inconsistency between group sizes of differing degrees of EL. The high EL group (*n* =235) had ten times the responses as the low EL (*n* = 23) group. To address this issue, a resampling of the data was performed. It was decided to randomly select every tenth respondent that identified their supervisor has having a high degree of EL. This resulted in re-equalizing the sample sizes (high EL *n* =25, low EL *n* =23), while maintaining scientific methodology of random sampling. Two-way ANOVAs utilizing this new sample was conducted to determine if EL could influence clinical decision making when considering race (white or black) or SES (high or low) of the patient. The same criteria were utilized as previously outlined. A summary of the results of these ANOVA's is presented in Tables 24 and 25. After equalizing the size of the groups, the main effect revealed that clinical reasoning of PTs was significantly different depending on the degree of ethical leadership of the supervisor, $F(1, 44) = 5.298$, $p = .026$, partial $\eta^2 = .107$, but not for the race of their patients $F(1, 44) = .091$, $p = .001$, partial $\eta^2 = .000$. Figure 11 reveals some interaction between ethical leadership of supervisors and clinical decision making when the race of patients differ. This interaction was found to be statistically significant $F(1, 44) = 5.499$, $p = .024$, partial $\eta^2 = .111$. Additionally, the line graph in Figure 11 demonstrates the linear relationship between low degree of EL and low clinical decision making with higher levels of EL and greater clinical decision making being demonstrated when the patient is black compared to very little effect when the patient is not black. Additionally, when considering the patients SES, clinical reasoning of PTs was found to be significantly different depending on the degree of ethical leadership of their supervisor, $F(1, 44) = 6.725$, $p = .013$, partial $\eta^2 = .133$. or race of their patients $F(1, 44) = .786$, $p = .380$, partial $\eta^2 = .018$. Unlike the results for race, Figure 12 shows that there does not appear to be any interaction between ethical leadership of supervisors and clinical decision making in regards to patients of differing SES $F(1, 44) = .052$, $p = .821$, partial $\eta^2 = .001$.

Because these resampled results are representative of a smaller sample size, it was decided to perform a second random sample of evenly matched groups to also analyze. This sample was constructed using a random number generator and then ordering each participant from highest to lowest. Every tenth respondent was then selected. This analysis resulted in similar findings (Appendix K).

Table 24

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering Race after resampling (n = 48)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	4382.180	1	4382.180	1458.159	.000***	.971
EL	15.921	1	15.921	5.298	.026*	.107
Race	.004	1	.004	.001	.971	.000
EL x Race	16.526	1	16.526	5.499	.024*	.111
Within treatments	132.232	44	3.005			
Total	4854.000	48				

Note. EL = Ethical Leadership
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 25

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering SES after resampling (n = 48)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	4430.050	1	4430.050	1335.170	.000***	.968
EL	22.313	1	22.313	6.725	.013*	.133
SES	2.609	1	2.609	.786	.380	.018
EL x SES	.172	1	.172	.052	.821	.001
Within treatments	145.991	44	3.318			
Total	4854.000	48				

Note. SES = Socioeconomic status, EL = Ethical Leadership.
$*p < .05$. $**p < .01$. $***p < .001$.

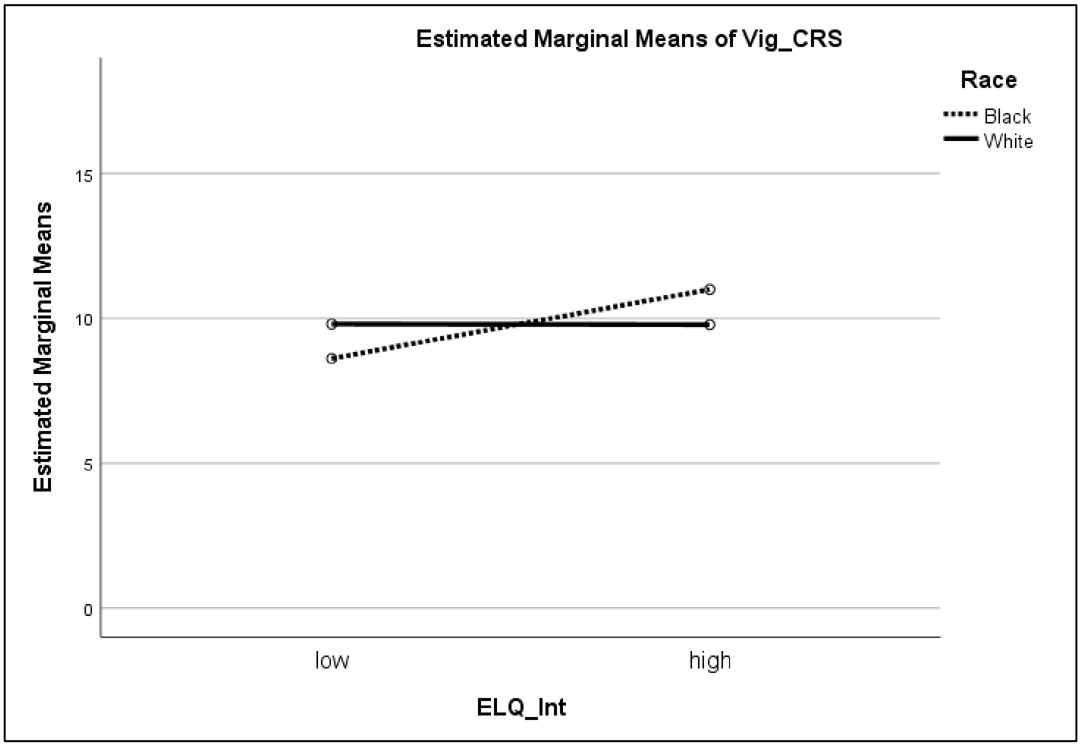


Figure 11. Line plot of interaction between ethical leadership and race.

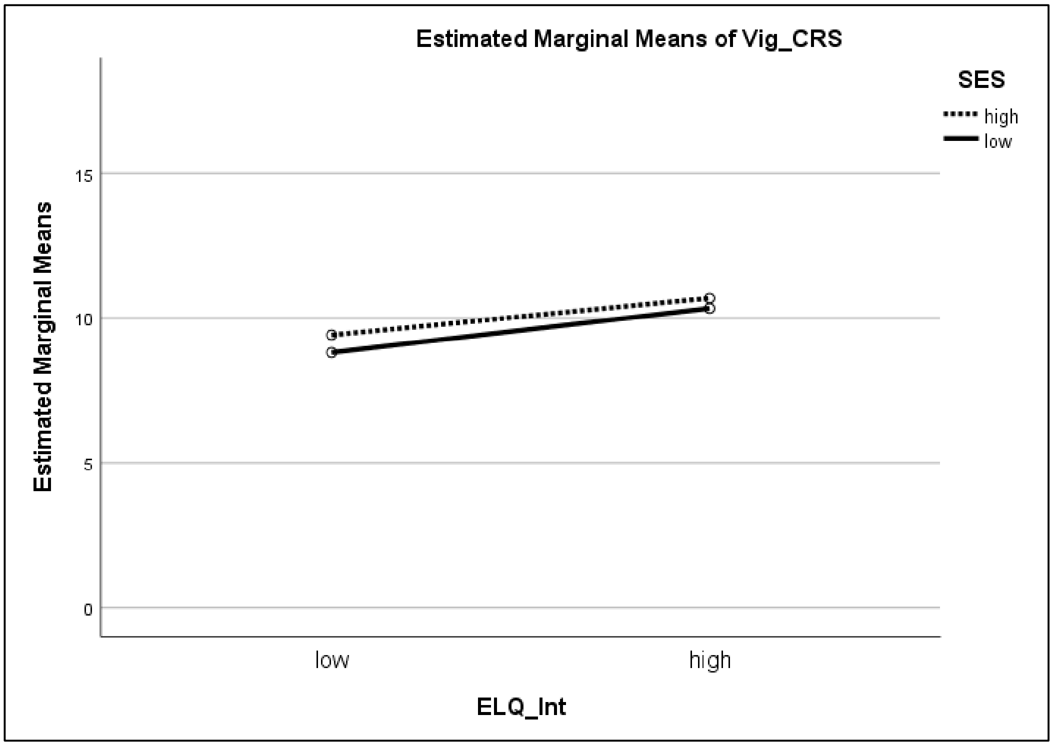


Figure 12. Line plot of interaction between ethical leadership and SES.

Summary

This chapter has outlined and reviewed the results of this study to help answer the two research questions that were posed. Details regarding data screening were outlined, as well as how threats to the assumptions of the statistical analysis performed were addressed. A detailed description of the sample population was explained in order to help define the population regarding their experience and employment as physical therapists. The regions of the country in which they worked were also explained in order to demonstrate an even distribution of the survey nationally. Finally, detailed descriptions of the specific statistical analysis and their results were outlined.

Research aim #1 results. This first aim was grounded in the following research question: Is there a difference in physical therapist’s clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with different socioeconomic status and race?

Based on the results from the MANOVA statistical analysis, there was statistical significance found when comparing differing SES of the patient to the combined effect of the three dependent variables of treatment initiation, frequency, and duration ($p = .011$). The univariate ANOVA demonstrated significance for two conditions, treatment frequency when considering SES ($p = .043$), and treatment duration when considering race ($p = .027$). When considering the direction of this difference, SES demonstrated a longer frequency for those with lower SES while race demonstrated longer duration for patients that were white. Results of the hypothesis testing are summarized in Table 26.

Table 26

Summary of Hypothesis Testing Results for Research Question #1

	Null Hypothesis	Result
$H_0 1$	There will be no difference in treatment initiation before beginning physical therapy for low back pain initiation among patients of differing socioeconomic status.	Fail to reject
	There will be no difference in treatment initiation before beginning physical therapy for low back pain initiation among patients of differing race.	Fail to reject
$H_0 2$	There will be no difference in the frequency of physical therapy treatment among patients of differing socioeconomic status.	Reject
	There will be no difference in the frequency of physical therapy treatment among patients of differing race.	Fail to reject
$H_0 3$	There will be no difference in the duration of physical therapy treatment among patients of differing socioeconomic status.	Fail to reject
	There will be no difference in the duration of physical therapy treatment among patients of differing race.	Reject

Note. $\alpha = .05$.

Research aim #2 results. This second aim was developed to consider the following research question: Is there a relationship between physical therapist clinical decision making for patients of differing socioeconomic status and/or race and the influence of ethical leadership?

Based on the results from the initial ANOVAs, there was no statistical significance found when comparing clinical decision making and the degree of EL that a PTs supervisor displayed for either SES or race. This result would result in failing to reject both of the null hypotheses associated with this question. Upon examining the sample; however, it was observed that the difference in size between the groups of interest (high EL versus low EL) were almost ten-fold, resulting in possible unreliable results from the ANOVA. The sample was re-distributed to improve equality by randomly including only every tenth respondent that classified their supervisor as high EL. This re-distribution resulted in finding significant differences in clinical decision making when considering EL for both race (p = .026) and SES (p = .013) as well as a significant interaction between EL and race (p = .024). Results of the hypothesis testing are summarized in Table 27.

Table 27

Summary of Hypothesis Testing Results for Research Question #2

	Null Hypothesis	Result prior to resampling (*n* = 348)	Result after resampling (*n* = 48)[a]
$H_0 4$	There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and working under an ethical leader.	Fail to reject	Reject
$H_0 5$	There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing race and working under an ethical leader.	Fail to reject	Reject

Note. $\alpha = .05$.

[a] Results were the same after two independent randomly generated samples.

Chapter V: Discussion

Introduction

The purpose of this study was two-fold. First, it sought to determine whether social factors of race and SES of a patient influenced the physical therapist's clinical decision making in regards to treatment initiation, frequency, and duration. Treatment initiation (wait time) referred to the time lapse between receiving a referral and initiation of PT treatment. Frequency referred to the number of visits the patient was anticipated to be seen throughout treatment. Duration of physical therapy treatment was the time from the initial evaluation (first visit) to the anticipated discharge (last visit) from PT services. Second, the study aimed to examine if a PTs perception of his or her manager's degree of ethical leadership, as measured by the Ethical Leadership Questionnaire (ELQ), could positively influence clinical decision making when treating patients of differing SES and race (Yukl, et al., 2013). This study utilized case-based vignettes for a patient population with low back pain (LBP) seen for physical therapy in the United States health care system context.

Research has recognized that equality of health is affected beyond just ease of access to care providers. Social factors, such as race and SES, have been shown to significantly impact an individual's health (Kunitz, 2007). Recent research attention has been directed at demonstrating how social determinants influence health outcomes (Marmot & Wilkinson, 2005; World Health Organization, 2009). This has led to greater emphasis of identifying and addressing social determinants of health (Palacio, et al., 2018). A recent publication in the Journal of Physical Therapy stated "…we must enhance our profession's capacity to better understand and address factors beyond the individual and the health care system that influence one's opportunity to lead a healthy life" (Magnusson, Eisenhart, Gorman, Kennedy, & Davenport, 2019, p. 1045). In order for this to translate to practice, studies such as this one must aim to define variations in practice that might affect one's ability to pursue health.

To help direct this shift in thinking, it is imperative to identify the most appropriate leadership. Ethical leadership is an emerging construct with a theoretical underpinning of both transformational and authentic leadership, making it a natural fit for this objective (Brown, Treviño, & Harrison, 2005). Ethical leaders, based on social learning theory, have the ability to elevate the ethical decision making of their followers through emulating their own behaviors and actions (Bandura, 1977, 1986; Brown & Treviño, 2006).

Limitations of the Study

An online survey was utilized because it gave access to a unique population while simultaneously remaining a cost effective method. Additionally, this platform allowed anonymity of the participants which was crucial for gathering the sensitive data needed. According to Dillman, Smyth, and Christia (2014), online survey methodology is at risk for four types of errors that researchers should attempt to minimize: coverage, sampling, nonresponsiveness, and measurement. This section will discuss each of these potential errors, and how their presence may have affected the study outcomes.

Coverage. Coverage error refers to the sampled population not correctly representing the intended demographic (Dillman et al., 2014). This error was mitigated by utilizing the Academy of Orthopedic Physical Therapists (AOPT), a subsection of the APTA, to disseminate the survey. This ensured that the intended demographic would be reached to maximize inclusion criterion while minimizing exclusion criterion. Additionally, the demographic questionnaire inquired about the participant's geographic region to assure equal national distribution. Four regions (Northeast, Midwest, South, and West) were utilized in alignment with the U.S. Census Bureau determination of regions and divisions (U.S. Census Bureau). An even distribution from each geographic region was indeed represented among participants (mean distribution was 24.8% from each of the four regions).

Sampling. Sampling error, according to Dillman et al. (2014) occurs when there are not enough participants to represent the population adequately. Prior to survey distribution, an a priori power analysis was completed to estimate the minimum number of participants needed in order to have a statistically meaningful effect. The power was set to 80% with a large effect size of 0.5 and a significance level of .05, resulting in an estimated sample size of 48 per variable, or 144 total participants. As previously outlined, the survey resulted in a yield of 408 total responses which was reduced to 377 with the screening process. Although this number exceeds the anticipated result needed, the response rate was only 8.5%. Although a higher response rate would improve the generalizability of the results, Van Mol (2017) stated that response rate below 10% are not uncommon, and that surveys with a 10% or lower response rate can be considered trustworthy if the researcher checks the response quality (Nair, Adams, & Mertova, 2008). There are several indicators of response quality including response times and item non-response (Galesic & Bosnjak, 2009). Other matrixes exist, however, they are more applicable to surveys with open-ended questions which were not present in this study. Response quality was examined through reviewing the completion time of the survey in minutes (*M* = 9.16, *SD* = 2.6) and the item non-responses (92% completion rate).

Nonresponsiveness. The third error, nonresponsiveness, is introduced when there is an identifiable difference in the characteristics of the participants who chose to respond from those who decided not to complete the survey. This is different from response rate, and according to Dillman et al. (2014), although high response rate minimizes nonresponsive error, it does not eliminate altogether. The response rate was optimized by making the survey easy to use, ensuring anonymity of the participant, and reducing the number of questions and time required to complete. Nonresponse was controlled by insuring that the population sampled all shared very similar characteristics which helped reduce variability. This was accomplished by surveying PTs who were members of the AOPT, which is a subsection of the APTA made up of members that self-identify as treating orthopedic conditions. The hypothetical scenario in the vignette cases was an individual with LBP, the most commonly seen condition in orthopedic physical therapy practices (Deyo, Mirza, & Martin, 2006; Licciardone, 2008). Additionally, participants were asked about the frequency with which they saw this diagnosis in their practice resulting in 90% of participants answering at least 1 per week.

Measurement. The final error, measurement, occurs when respondents do not provide accurate answers to the questions, or when the questions do not measure their intended targets (Dillman et al., 2014). Two previously validated instruments were used in this study to help reduce this error. The clinical vignettes in this study were previously validated by Laliberté et al. (2017) using a combination of Flaskerud's (1979) and Cazale's, et al. (2006) approaches in determining the validity. Specifically, these vignettes were previously used to determine implicit bias of practicing physical therapists. The second instrument, the ELQ, demonstrated good reliability as measured by Cronbach's alpha for all six measures included in the instrument (α = .89), as well as g excellent criterion-related validity (Yukl et al., 2013, p. 45).

At the heart of this study was the need to gather information that could potentially expose implicit bias of the participant. According to Blair, Steiner, and Havranek (2011), "implicit bias cannot be measured with standard (self-report) survey questions" (p. 71), because participants are often unable to report the underlying reasons for the choices that they make. However, these biases may be effectively measured using clinical vignettes, in which clinicians are given a brief description of a situation to which they then have to respond with their opinion (Taylor, 2005; Schoenberg & Ravdel, 2000; Veloski, Tai, Evans, & Nash, 2005). Clinical vignettes are a relatively simple and inexpensive survey tool that can be a valid measurement for attitudinal research (Peabody, et al., 2004). According to Schoenberg & Ravdel, (2000): “The vignette is carefully designed to depict a circumstance or represent a germane issue and to elicit rich but focused responses from informants” (p. 63). Although great care was taken to minimize measurement error, it could not be eliminated. It is certainly possible that the participant was able to realize the underlying intent of the vignette, and answer in a more socially acceptable fashion. In other words, it is possible that when posed with a clinical scenario that begins specifically with the race of a patient, the participant may have been able to identify the intent of the follow-up questions. Using employment as a proxy for SES, however, it was much easier to conceal the underlying intent. This could possible explain why more significance was seen in this variable compared to race.

Interpretation of the Findings

The previous chapter outlined the results through presentation of the statistical analysis and hypothesis testing. This section will be dedicated to discussing and interpreting these finding through the lens of ethical leadership that has been established as the theoretical framework for this study. When examining the results of this study, several themes emerge from the data that affect patient access to PT: (1) the effects of SES and race individually, (2) the compounding effect of low SES with an under-represented race, and (3) the effects of ethical leadership.

Relationship between patient access to PT with SES and race. Statistical significance was found when comparing differing SES (high versus low) of the patient to the combined effect of the three dependent variables of treatment initiation, frequency, and duration (p = .011). Most surprising was the inconsistent effect that SES had on access to PT services. When reviewing mean scores, treatment frequency demonstrated slight favor toward those with lower SES, with this being the only variable to be found statistically significant with univariate analysis (p = .043). In other words, patients that represented a lower SES classification were likely to be seen more often than those of a higher SES. Likewise, the duration of treatment was seen to be longer for those of low SES compared to high, but the difference was not statistically significant. The only variable of access to care that was negatively impacted by a lower SES was the initiation of treatment. This could imply some bias of prioritizing patients' need for services, and would be the first decision that a clinician makes regarding patient access. If a PT decides to delay onset of treatment based on SES, the frequency and duration no longer become as important. The design of this study only provided each respondent with a single version of the case, so decision making through direct comparison of patients with low to high SES was not possible. However, we can infer from these results that prioritization of access to PT was for those of a higher SES and the decision regarding their care after that (frequency and duration) would trickle down from this original decision.

Differing race (white versus black) of the patient also showed a difference in treatment initiation, frequency and duration, although this difference was not statistically significant (p = .060). Clinical decision making regarding treatment initiation and frequency of treatment were nearly identical regardless of the patients race. The duration of the treatment, however, was shown to be significantly different (p = .027), with black patients demonstrating a shorter duration of treatment compared to their white counterparts. It is unclear why duration showed the largest difference, which would support the need for qualitative data to delve into this further.

The compounding effect of low SES with under-represented race. Previous research has shown significant bias of health care in regards to non-biological factors, including race and SES (Hollingshead , et al., 2015; Nelson, 2002; Schulman, et al., 1999). In fact, racial/ethnic disparities were found to exist in the context of health care, even when confounding factors of insurance status, income, age, and severity of conditions are comparable (Nelson, 2002). Based on these previous findings, it was assumed that the combined effect of patients that were identified as black and low SES would have a significant impact on treatment initiation, frequency, and duration. However, the interaction of SES with race did not show statistical significance for the combined effect of treatment initiation, frequency, and duration (p = .102). Similar to the univariate findings for race, this interaction did show significant difference for duration (p = .027), but not for initiation or frequency.

The effects of ethical leadership on access to physical therapy. Potentially the largest impact found in this study was the relationship between ethical leadership and the clinical decision making of PTs regarding access to care of patients with differing SES and race. The original data analysis did not demonstrate any statistical relationship; however, a large discrepancy in group sizes was observed. Respondents that viewed their supervisor as having a high degree of EL were ten-fold compared to those who viewed their supervisors as low EL. Due to the limitations of the ANOVA with this mismatch of groups sizes, it was decided to equalize the sample by randomly selecting every tenth respondent that identified their supervisor as having high EL. This resulted in equal groups sizes between high and low EL (n = 25, n =23 respectively). When a statistical analysis was repeated, a significant difference was found in patient's overall accessibility to PT services based on the degree of EL when considering both SES ($p = .013$) and race ($p = .026$). Lower degrees of ethical leadership generally resulted in decreased level of access to PT as observed through longer time to initiate treatment, shorter frequency of treatment, and shorter duration of treatment. This trend was seen to be somewhat parallel for SES in that lower EL was associated with decreased access to care regardless of SES. However, this degree of difference was much steeper for low SES. This was also true when observing the results from the original analysis. Race, on the other hand, showed to be significantly influenced by EL when comparing patients identified as black versus those identified as being white. There was very little variation in access to physical therapy for white patients, but a very steep and significant difference was seen when comparing black patients access to PT under a leader with high EL versus low EL. The potential impact of these finding will be discussed later in this chapter.

Delimitations and Potential Weaknesses of the Study

When retrospectively reflecting on the delimitations of this study and the results, several potential weaknesses emerge. One such weakness may be in the transparency of the vignettes. Although vignettes have been shown to valid measures of implicit bias, there is a potential that respondents were able to identify the intent through identifying the patient as either black or white. This possible effect is compounded by the requirement from the institutional review board to include the purpose of the study in the consent. Approval was given to modify this title slightly, however, it still identified 'examining access to physical therapy services' as an aim. In today's social climate, it is entirely possible that respondents were able to see through the underlying intentions of the study and an accurate assessment of implicit bias limited. Attempts to minimize this were taken by only allowing respondents to have access to one version of the case (to eliminate comparison); however, this possible weakness of the study cannot be overlooked. When examining the results of the first aim of this study, this may explain why statistical significance was only found in respect to the impact of SES on access to PT. It was far less likely that a respondent would have identified that the employment status of a patient was aimed to look at their implicit bias when compared to a very obvious difference in identified race. Other studies that have identified implicit bias in regards to race utilized images and video cases instead of written vignettes (Hollingshead, et al., 2015; Schulman, et al., 1999).

Another delimitation of this study was the use of occupation as a proxy to measure SES. SES is typically characterized as including three main components: economic status (measured by income), social status (measured by education), and work status (measured by occupation) (Dutton & Levine, 1989, p. 30). Occupation has been previously validated as a representation to measure SES, it did exclude known contributors to SES (Avendano & Berkman, 2014; Laliberté, et al., 2017). Although careful consideration was given to choosing these occupations in the context of low back pain (i.e. both truck drivers and managers are assumed to require long periods of time sitting), it is possible that respondents associated truck drivers as a laborer when compared to a more sedentary manager. When considering the profession of physical therapy, this context would potentially impact the clinician's clinical judgement. It is very likely that a PT would assume the truck driver was in greater need of treatment to be able to return to their full duty job (as a laborer), as opposed to an office manager who may be perceived as having little to no impact on his or her job performance due to LBP.

A final delimitation of the study that may have negatively impacted the strength of the study was using the ELQ to measure EL. Although this questionnaire has been found to be a reliable and valid measure of EL, it resulted in a large discrepancy in group sizes between high and low EL (Yukl, et al., 2013). A different measure of EL could potentially be identified that would have more flexibility in measurement, or more accurately categorize the perceived degree of EL. Although the resampling method described maintained scientific validity through randomization, it significantly decreased the sample size which negatively impacts the generalizability of the results.

Implications

As previously stated, the largest implication for this study is demonstrating the effect that ethical leadership had on the follower's clinical decision making regarding access to PT services. According to Brown et al. (2005), ethical leadership requires "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct among followers through two-way communication, reinforcement, and decision-making" (p. 130). With the notion that leaders can influence followers, it is reasonable to assume that leaders can also influence people to behave in either an ethical or unethical manner (Treviño & Brown, 2007, p. 101). This ability to influence follower behavior is a pillar of ethical leadership theory, and is based widely on two key ideas: employees look outside of themselves for ethical guidance (Kohlberg, 1974; Treviño, 1986) and social learning theory (Bandura, 1977, 1986). With these frameworks in mind, it was found that ethical leaders gain awareness of followers by making salient ethical message which are recognized in the organizational context as well as allowing the leader to stand out against an ethically neutral ground. (Brown, et al., 2005; Treviño et al., 2003). Guiding followers attention to ethical standards by highlighting their significance is a crucial aspect of ethical leadership (Brown et al., 2005).

This study was able to demonstrate a correlation between making ethically neutral decisions regarding access to physical therapy, regardless of the patient's SES or race. In other words, those respondents who identified their direct supervisor as having a high degree of ethical leadership (measured by the ELQ) also made decisions about access for their patients that was more ethically sound than those who worked with supervisors who displayed low ethical leadership. Ethically sound decisions, in this case, refers to equitable access to PT regardless of the patient's SES or identified race.

Equality of health is affected beyond just ease of access to care providers. As previously identified, social factors (such as SES and race) have been determined to play a significant role in an individual's health (Kunitz, 2007). Recently, there has been a significant shift in research within the health sector aimed at ways to improve value-based care and reducing these health inequities. The increased focus by researchers in both medicine and public health has been directed at attempting to determine how social determinants influence health outcomes (Marmot & Wilkinson, 2005; World Health Organization, 2009). PT can potentially play a vital role in this endeavor, but proper leadership to spearhead this change is crucial. This study provides a demonstration of the possibilities of affecting health outcomes through identifying and promoting ethical leadership.

Recommendations for Future Directions

The initial findings of this study are promising, however, further investigation is necessary to improve generalizability, to reduce identified limitations, and to produce more meaningful context to the results.

Improving generalizability. This study focused primarily on a single physical therapy diagnosis of LBP. The clinical information was kept uniform across all vignettes to control for confounding variables, and the diagnosis of LBP represents the most commonly seen issue within PT. Despite these strengths, it is difficult to draw global conclusions across all settings and potential diagnoses within the field of physical therapy. Future studies should explore ways to identify how other practice settings may be vulnerable to implicit bias (e.g. pediatric and acute care). Additionally, other independent variables should be explored. SES should be broadened beyond just looking at occupation, but also to explore education level and income level. Additionally, other factors such as English as a second language, or refugee patient populations that have been deemed at high risk for health inequities should be explored.

With over 200,000 total licensed PTs currently in the U.S., increased reach and participation would also greatly contribute to overall generalizability. However, there is not presently a good mechanism to facilitate the needed broad dissemination of instruments to measure this. Membership in the APTA is voluntary, and even those who are members have limited access to studies due to significant security obstacles and cost prohibitedness.

Reducing limitation. Previously in this section, several limitations were identified. Future studies should focus on reducing these limitations to improve the quality and validity of the results. One of the primary limitations is the potential breach in transparency of the studies focus. The combined effect of the participant knowing the studies general purpose (access to PT) and the blatant identification of a patient’s race could have potentially affected the study’s results. Exploring ways to help mask these variables will lead to much more dependable data and will improve the overall strength the study’s results. Additionally, the potential for the occupation used as a proxy for SES may have inadvertently led to inaccurate information regarding consideration for SES. Using multiple alternatives of measuring SES across the continuum will help to create better control of the data, and to improve the trustworthiness of the results.

Improving context for results. Future studies should consider a mixed methods or purely qualitative design methodology to help add context to the quantitative findings presented in this study. The qualitative data would allow for rich descriptions to enhance the efforts to translate evidence to practice. The deeper understanding as to why PTs make the decisions they do regarding access to care will not only lead to improved guidance for leadership, but more fully offer suggestions to positively affect change in practice.

Conclusion

The purpose of this study was to determine whether social factors of SES and race of a potential patient influenced the clinical decision making of PTs in regards to treatment initiation, frequency, and duration. Additionally, the study aimed to examine if a PTs perception of his or her manager's degree of ethical leadership could positively influence clinical decision making when considering access to PT for these patients. This study utilized case-based vignettes for a patient population with low back pain (LBP) seen for physical therapy in the United States health care system context.

The key findings of this study demonstrate that although some implicit bias among PTs (when considering the SES and race of a patient) may exist, the impact was minimal. When examining the variables of access to care individually, SES was found to have the most impact on treatment frequency while race had the largest effect on duration of treatment. Interestingly, SES appeared to actually have a positive influence on treatment frequency, while race had a negative effect on duration. When considering the degree of EL displayed by a supervisor, it appears that lower levels of EL negatively influenced the clinical decision making of PTs regarding patient access to services when presented with patients of lower SES or under-represented race. The findings of this study are important to present and to direct awareness of provider implicit bias, but even more importantly they illustrate how leadership may have a positive impact on social determinants of health and access to care. Health care organizations interested in moving beyond being concerned about, but addressing social determinants of health, should consider promoting and encouraging principles of ethical leadership within their organizations.

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Appendix A

Recruitment Letter

Dear Physical Therapist,

My name is Sean Griech, PT, DPT, OCS, COMT, a faculty member in the Doctor of Physical Therapy Program at DeSales University in Center Valley, PA and a Ph.D. candidate at Alvernia University in Reading, PA. I am conducting a study under the guidance of my dissertation chair (Dr. Spence Stober) and committee members (Dr. Stephen Carp and Dr. David Shoup) for my dissertation as a partial requirement of my Ph.D. I invite you to participate in this survey about access to physical therapy services. This project's overall goal is to explore if specific leadership can effect challenges related to access to physical therapy services and wait list management.

To participate in this study, you must:

- Be a licensed physical therapist in the United States
- Treats patients with low back pain (at least one patient per month)
- Agree to the informed consent document available at the link below.

Participation in this study is completely voluntary and anonymous, and you are able to withdraw at any time without penalization. Your agreement to participate in the study involves:

- First, complete a brief demographic form.
- Second, read a brief case vignette regarding a patient with low back pain, and answering a few short questions that follow.
- Third, you will be asked to complete a 15-question Likert-scale questionnaire regarding your perception of your current direct leadership (manager, boss, etc.).
- All three parts of this survey should take no longer than 10- 15 minutes to complete.

All information you provide is anonymous, and all identifiable information will be removed – including IP addresses.

If you wish to participate, please click on the following link *<survey link>* to view the informed consent and access the survey.

Additionally, in order to improve reach of this study, I invite you to please forward this email to **other physical therapists** that are **NOT** members of the Academy of Orthopedic Physical Therapy who match the description outlined above.

Thank you for your time and participation in advance,

Sean F. Griech, PT, DPT, OCS, COMT

PhD candidate, Alvernia University
Assistant Professor, DeSales University

Appendix B

ALVERNIA UNIVERSITY

ANONYMOUS SURVEY

February 7, 2019

CLINICAL DECISION MAKING OF PHYSICAL THERAPISTS REGARDING ACCESS FOR PATIENT WITH LOW BACK PAIN IN THE UNITED STATES

You are being invited to participate in a research study to explore if specific leadership can effect challenges related to access to physical therapy services and wait list management. The study is being conducted by Sean F. Griech PT, DPT, OCS, COMT under the advisement of Dr. Spencer Stober from the Department of Leadership at Alvernia University. This study is being conducted as partial fulfillment of the requirement of the Doctor of Philosophy degree. No funding has been received for this project.

You were selected as a possible participant in this study because you are a licensed physical therapist in the United States who treats patients with low back pain.

There is no more than minimal psychological risk associated with this study, including the time it will take to complete, and by the virtue of completing a survey concerning your manager's leadership style. If you decide to participate in this research study, however, your responses will remain anonymous, and all information will be aggregated. There are no costs to you for participating in this study. The information you provide will provide insight into the clinical reasoning of physical therapist's decision making treatment decisions for patients with low back pain. The questionnaire will take about 10-15 minutes to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits to the field of physical therapy and information regarding patient access to physical therapy services.
This survey and responses are completely anonymous. Your personal identity cannot be

determined – including IP addresses.

No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. Individuals from the Institutional Review Board may inspect these records. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing and submitting this survey, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer for any reason.

If you have any questions about the study, please contact
Sean F. Griech, PT, DPT, OCS, COMT – Primary investigator, doctoral candidate
Alvernia University
sean.griech@alvernia.edu

Spencer Stober, EdD – Faculty advisor
Alvernia University
spencer.stober@alvernia.edu

Peggy C. Bowen-Hartung, Ph.D., CTS – IRB chair
Alvernia University
peggy.bowen-hartung@alvernia.edu

The Alvernia University Institutional Review Board (IRB) has reviewed my request to conduct this project. If you have any concerns about your rights in this study, please contact Peggy C. Bowen-Hartung, Ph.D., CTS, Chair of the Alvernia University IRB by phone 610.796.8483 or email Peggy.Bowen-Hartung@alvernia.edu

Appendix C

Patient Packet: Demographic Information

1. Which of the following describes your current licensure?
    - ○ Physical Therapist
    - ○ Physical Therapist Assistant

2. What best describes your current employment status?
    - ○ Full time
    - ○ Part-time

3. What geographic region do you currently practice?
    - ○ Northeast
    - ○ Midwest
    - ○ South
    - ○ West

4. How many years have you practiced as a Physical Therapist?
    - ○ 0-5 years
    - ○ 6-10 years
    - ○ 11-15 years
    - ○ 16-20 years
    - ○ 21-25 years
    - ○ 26-30 years
    - ○ More than 30 years

5. Which of the following describes your current practice setting? *(Check all that apply)*
    - ○ Hospital
    - ○ Hospital-based outpatient clinic
    - ○ Private practice
    - ○ Rehabilitation center
    - ○ Long-term care facility
    - ○ School system
    - ○ Home care services
    - ○ Pro bono (free) clinic
    - ○ Academic/University

6. Approximately, how often do you evaluate patients with a diagnosis of low back pain?
    - ○ At least one per day
    - ○ At least one per week
    - ○ At least one per month
    - ○ Less than once per month

7. On average, how many patients do you treat per day?
    - ○ 0-5 patients
    - ○ 6-10 patients
    - ○ 11-15 patients
    - ○ 16-20 patients
    - ○ More than 20 patients

8. Do you have a direct supervisor that you report to?
    - ○ Yes
    - ○ No

Appendix D

Participant packet: Clinical Vignette (participants will get one of four versions labeled here as Version A through D) (Laliberté, et al., 2017)

Version A

Instructions: The following questions are related to a clinical vignette that will be presented to you. It is essential for you to know that we are not looking to test your knowledge on the subject. We actually want to characterize as accurately as possible the practice patterns of Physical Therapist in the United States. We ask that you answer the following questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer.

Vignette: A 39-year-old white patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful and the patient cannot endure long hours sitting in their office anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy).

Version B

Instructions: The following questions are related to a clinical vignette that will be presented to you. It is essential for you to know that we are not looking to test your knowledge on the subject. We actually want to characterize as accurately as possible the practice patterns of Physical Therapist in the United States. We ask that you answer the following questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer.

Vignette: A 39-year-old black patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago, but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful, and the patient cannot endure long hours sitting in their office anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy.

Version C

Instructions: The following questions are related to a clinical vignette that will be presented to you. It is essential for you to know that we are not looking to test your knowledge on the subject. We actually want to characterize as accurately as possible the practice patterns of Physical Therapist in the United States. We ask that you answer the following questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer.

Vignette: A 39-year-old white patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago, but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful, and the patient cannot endure long hours sitting in their truck anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Version D

Instructions: The following questions are related to a clinical vignette that will be presented to you. It is essential for you to know that we are not looking to test your knowledge on the subject. We actually want to characterize as accurately as possible the practice patterns of Physical Therapist in the United States. We ask that you answer the following questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer.

Vignette: A 39-year-old black patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago, but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful, and the patient cannot endure long hours sitting in their truck anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Appendix E

Patient Packet: case vignette follow-up questions (Laliberté, 2017; Laliberté, et al., 2017)

Instructions: Using the information provided in the case vignette above, please answer these questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer.

Vignette Questions:

1. What is the expected wait time for this patient to be seen in your work setting?
   - None – will be seen same day
   - 1 to 2 days
   - 3 to 4 days
   - 5 to 6 days
   - 7 to 10 days
   - 11 to 14 days
   - More than2 weeks

2. What will be the frequency of treatment for this patient (how many times per week)?
   - 1 time a week
   - 2 times a week
   - 3 times a week
   - 4 times a week
   - 5 times a week
   - Once every 2 weeks
   - Less than once every 2 weeks

3. What will be the total duration of treatment for this patient (how many weeks)?
   - 0 to 2 weeks
   - 2 to 4 weeks
   - 4 to 6 weeks
   - 6 to 8 weeks
   - 8 to 10 weeks
   - 10 to 12 weeks
   - Greater than 12 weeks

Appendix F

Email confirmation for permission to use vignettes

From: aimlaliberte@gmail.com
To: Griech, Sean
Cc: spencer.stober@alvernia.edu
Subject: Re: Low Back Pain: Investigation of Biases in Outpatient Canadian Physical Therapy
Date: Monday, July 09, 2018 3:35:51 PM

Good day,
sorry for the delay in my response! (I just delivered twins).
I am really honored to see the vignette survey being used again, especially given the highly relevant focus of your research! And, of course, you can modify the vignette in order to better capture your research questions. If you need more methods information on the vignette development, my PhD dissertation is published but.... is in french. Let me know if you need any further information.
Looking forward reading your research.
Best regards,
Maude Laliberté pht MSc PhD

2018-06-19 9:00 GMT-04:00 Griech, Sean <Sean.Griech@desales.edu>:

> Dear Ms. Laliberté:
>
> I wanted to compliment you on this very important and interesting research in exploring potential implicit bias among Canadian Physical Therapists. I am currently an assistant professor at DeSales University; a Physical Therapy program in the U.S., as well as a PhD student at Alvernia University. My PhD will be a social science degree in Leadership with a focus on community and ethical leadership under the guidance of my dissertation chair, Dr. Spencer Stober. My current research efforts have been concentrated in exploring a connection in social determinants of health and ethical leadership among physical therapists. Upon reading your article I truly believe that your work helps to support what I have been doing as well.
>
> I am preparing to enter the dissertation phase of my program this fall, and have been evaluating different measurement tools that would assist in answering my research question. My potential work aims to explore Physical Therapy interventions and socioeconomic indicators among PT's in the U.S. through the lens of ethical leadership theory. I am reaching out to inquire if you would be willing to grant me permission to use the vignettes published in your dissertation as well as your publication in the Journal of Physical Therapy. You described a rigorous process of developing reliability and validity that would be very

beneficial as I prepare my survey of U.S. Physical Therapists as well. I would use the vignettes under the following guidelines:

- I will use the vignettes only for my research study and will not sell or use it with any compensated activities.
- I will include the proper citation to your work along with an acknowledgement of support.
- I will send a copy of my completed research study to your attention upon completion of the dissertation.

I truly appreciate your willingness to consider this request, and if you have any questions please feel free to contact me via email or by phone at the number in my signature line.

Sean Griech

Sean Griech, PT, DPT, OCS, COMT

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sean.griech@desales.edu

About email from DeSales University

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Maude

Appendix G

Participant packet: Ethical Leadership Questionnaire (ELQ) (Yukl, Mahsud, Hassan, & Prussia, 2013)

Instructions: This questionnaire is designed to study the relevance of ethics to effective leadership. The term “unit” refers to the team, department, division, or company for which your boss is the formal leader, and the term “members” refers to the people in the unit who report directly to your boss. Please indicate how well each of the following statements describes your current boss by selecting one of the following response choices. Write the number of the choice on the line provided. Leave the item blank if you do not know the answer.

1. Strongly Disagree
2. Moderately Disagree
3. Slightly Disagree
4. Slightly Agree
5. Moderately Agree
6. Strongly Agree

My boss:

______ 1. Shows a strong concern for ethical and moral values.

______ 2. Communicates clear ethical standards for members.

______ 3. Sets an example of ethical behavior in his/her decisions and actions.

______ 4. Is honest and can be trusted to tell the truth.

______ 5. Keeps his/her actions consistent with his/her stated values (“walks the talk”).

______ 6. Is fair and unbiased when assigning tasks to members.

______ 7. Can be trusted to carry out promises and commitments.

______ 8. Insists on doing what is fair and ethical even when it is not easy.

______ 9. Acknowledges mistakes and takes responsibility for them.

______ 10. Regards honesty and integrity as important personal values.

______ 11. Sets an example of dedication and self-sacrifice for the organization.

______ 12. Opposes the use of unethical practices to increase performance.

______ 13. Is fair and objective when evaluating member performance and providing rewards.

_____ 14. Puts the needs of others above his/her own self-interest.

_____ 15. Holds members accountable for using ethical practices in their work.

Appendix H

Complete research design flow (composite of Figures 2 and 4)

Research aim #1:
Determine whether non-biological patient-related factors (SES and race) influence physical therapist's clinical decision making regarding the timing of physical therapy

Research aim #2:
Examine if a PTs perception of their manager's level of ethical leadership, as measured by the ELQ can positively influence their clinical decision making when treating patients of differing SES and race

Research Question 1:
Is there a difference in PT's clinical decision making regarding initiation, frequency, and duration of treatment for low back pain among patients with differing SES and race?

Research Question 2:
Is there Is there a relationship between PT's clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing SES and/or race and the influence of ethical leadership?

Dependent Variables:
- Initiation of treatment
- Frequency of treatment
- Duration of treatment

Supporting Null Hypotheses:
$H_0$1: There will be no difference in wait time before physical therapy treatment for low back pain initiation among patients of differing socioeconomic status and/or race.
$H_0$2: There will be no difference in frequency of physical therapy treatment among patients of differing socioeconomic status and/or race.
$H_0$3: There will be no difference in duration of physical therapy treatment among patients of differing socioeconomic status and/or race.

Supporting Null Hypotheses:
$H_0$4: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing socioeconomic status and working under an ethical leader.
$H_0$5: There will be no relationship between physical therapist clinical decision making (regarding initiation, frequency, and duration of treatment) for patients of differing race and working under an ethical leader.

Dependent Variables:
Composite score of
- Initiation of treatment
- Frequency of treatment
- Duration of treatment

Independent Variables:
Socioeconomic Status
- Low
- High

Race
- White
- Black

White Patient
High Socioeconomic Status

Black Patient
High Socioeconomic Status

White Patient
Low Socioeconomic Status

Black Patient
Low Socioeconomic Status

Case Vignette (version A):
A 39-year-old white patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful and the patient cannot endure long hours sitting in their office anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy).

Case Vignette (version B):
A 39-year-old black patient who works as a senior manager comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful and the patient cannot endure long hours sitting in their office anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks. He is covered by a private insurance ($25 co-pay/treatment for Physical Therapy.

Case Vignette (version C):
A 39-year-old white patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful and the patient cannot endure long hours sitting in their truck anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Case Vignette (version D):
A 39-year-old black patient who works as a truck driver comes to your clinic for a consultation. The patient says that they suffer from low back pain which started 6 years ago but their condition has gotten worse in the last few months after a fall. For almost a year, in addition to their usual pain in the lower back, they now feel the pain radiating down their buttock, thigh and left leg which causes them much discomfort. Flexion of the spine is very painful and the patient cannot endure long hours sitting in their truck anymore. Their work station does not provide optimal ergonomics and has not for several years now. The pain being too intense, the patient has been off of work for the last four weeks and is compensated by Workers' Compensation.

Appendix I

ALVERNIA UNIVERSITY
INSTITUTIONAL REVIEW BOARD

IRB DECISION
NOTIFICATION TO INVESTIGATOR

Application: 0319-033 **Date: April 26, 2019**

Title: The Role of Ethical Leadership in the Clinical Decision Making of Physical Therapists in Caring for Patients of Differing Socioeconomic Status and Race with Low Back in the United States

Principal Investigator:	Sean F. Greich
Email:	**Sean.Greich@Alvernia.edu**
Faculty Advisor:	Spencer Stober, Ed.D
Email:	**Spencer.stober @alvernia.edu**
Doctoral	Resubmission
Resubmission:	**Received April 9, 2019**
IRB Decision:	**Approved: by Chair on April 24, 2019**

Comments:

The IRB Chair has **approved** your resubmitted study. You may begin your research project at this time. IRB approval is valid for **one year** from the date of approval, thus, additional documentation will be required by **April 24, 2020.**

Research must be conducted in accordance with this approved submission. You must seek approval from the IRB for changes and ensure that such changes will not be initiated without IRB review and approval, except when necessary to eliminate apparent immediate danger to research participants. You must file a **Study Modification Application** form found on the IRB website which indicates the changes you will be implementing prior to making changes.

It is your responsibility to report all adverse events/unanticipated problems to the IRB. You must report adverse events that are unanticipated, regardless of the seriousness, or report events that are more serious or more frequent than expected. You must use the **Unanticipated Problem Report** found on the IRB website to report these adverse events/unanticipated problems.

Your research study requires continuing review by the IRB on a yearly basis. **One month** before your approval ends, you must submit the **Study Continuing Review Report** form found on the IRB website to the IRB.

Once your study has completed, please submit the **Study Completion Report** to the IRB. If the IRB does not receive either report, it will be assumed the study has ended. Research conducted after expiration of approval or termination of any kind will not be considered approved by the IRB and will be in violation of Alvernia University policy and federal regulations.

Records relating to the approved research (e.g. consent forms), must be retained for at least three (3) years after completion of research. Refer to the IRB procedures regarding records.

Please refer to the IRB website to review procedures and to obtain forms. The most up to date forms may be found on the MyAlvernia Portal (on the login page with Self-service).

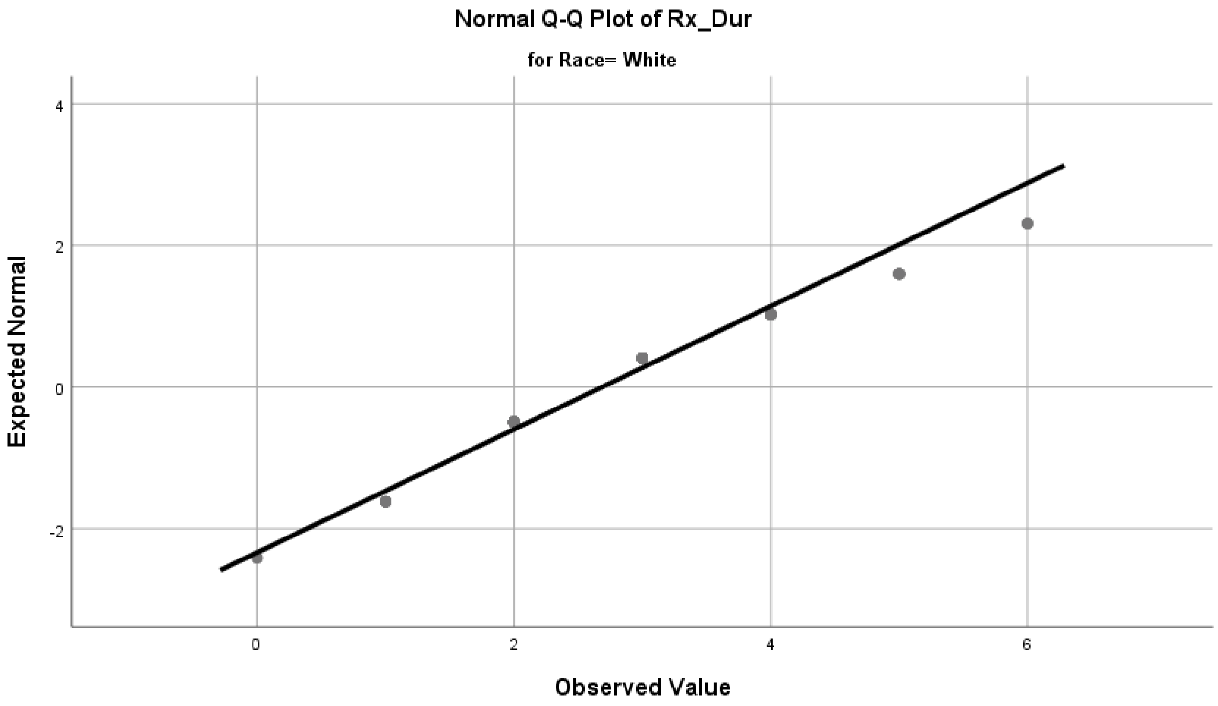
If you have any questions, please contact the IRB. Please be sure to resubmit your CITI asap.

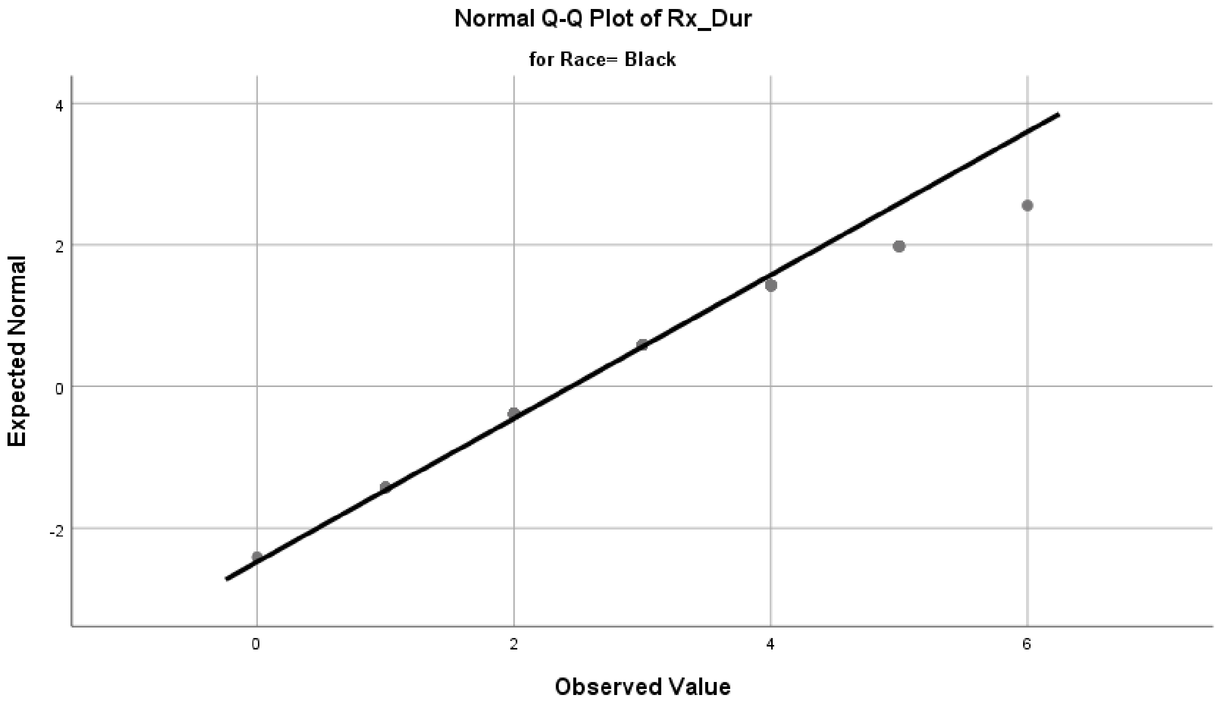
Thank you.

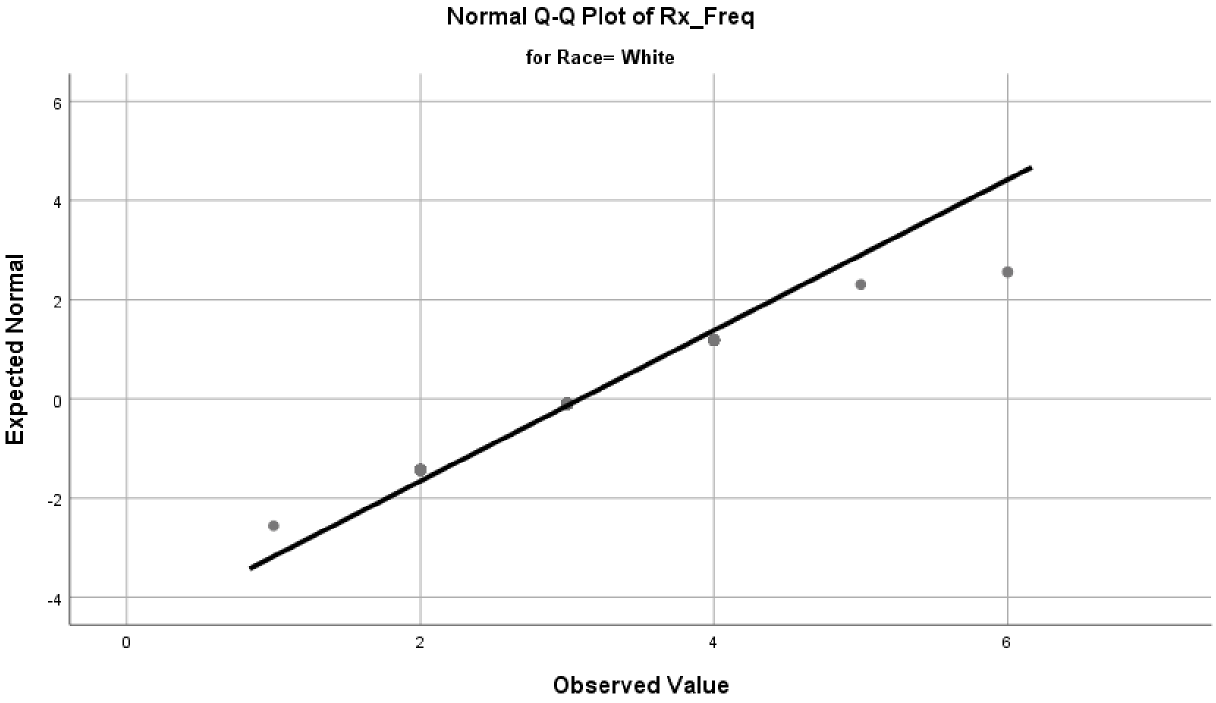
Peggy Bowen-Hartung, Ph.D., C.T.S.
Chair, IRB
Upland Center 126 C
Alvernia University
610.796.8483
peggy.bowen-hartung@Alvernia.edu

Appendix J

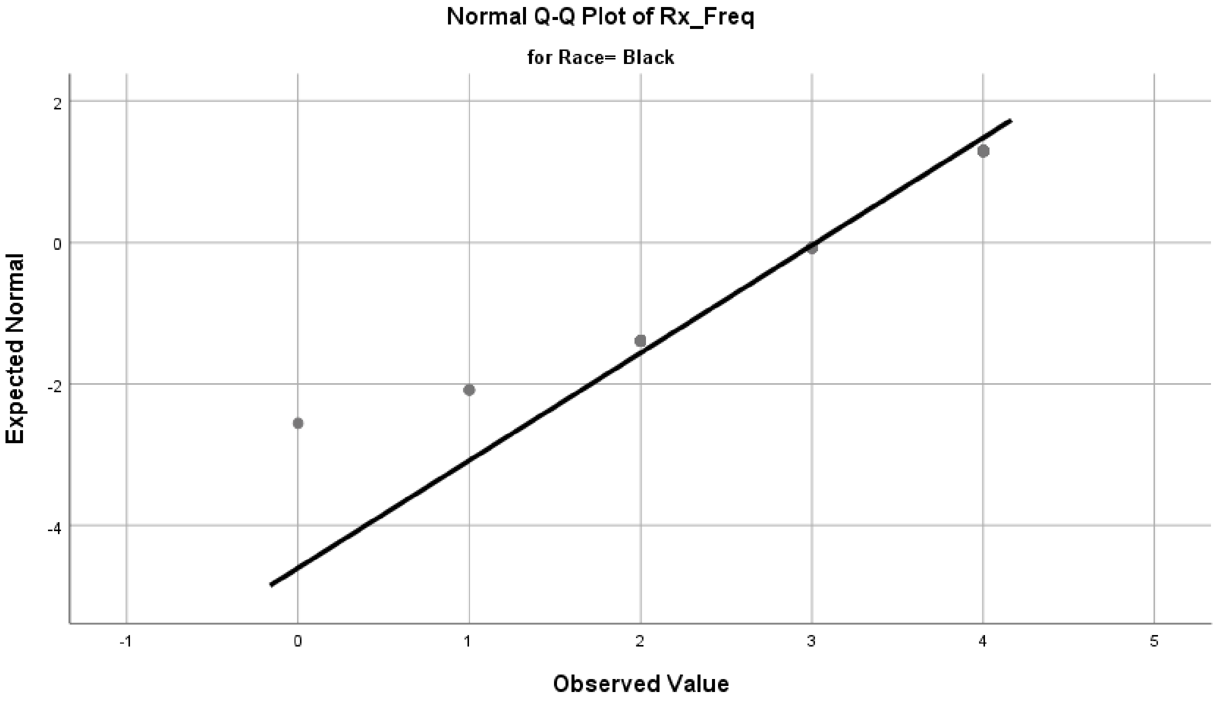
Q-Q Plots







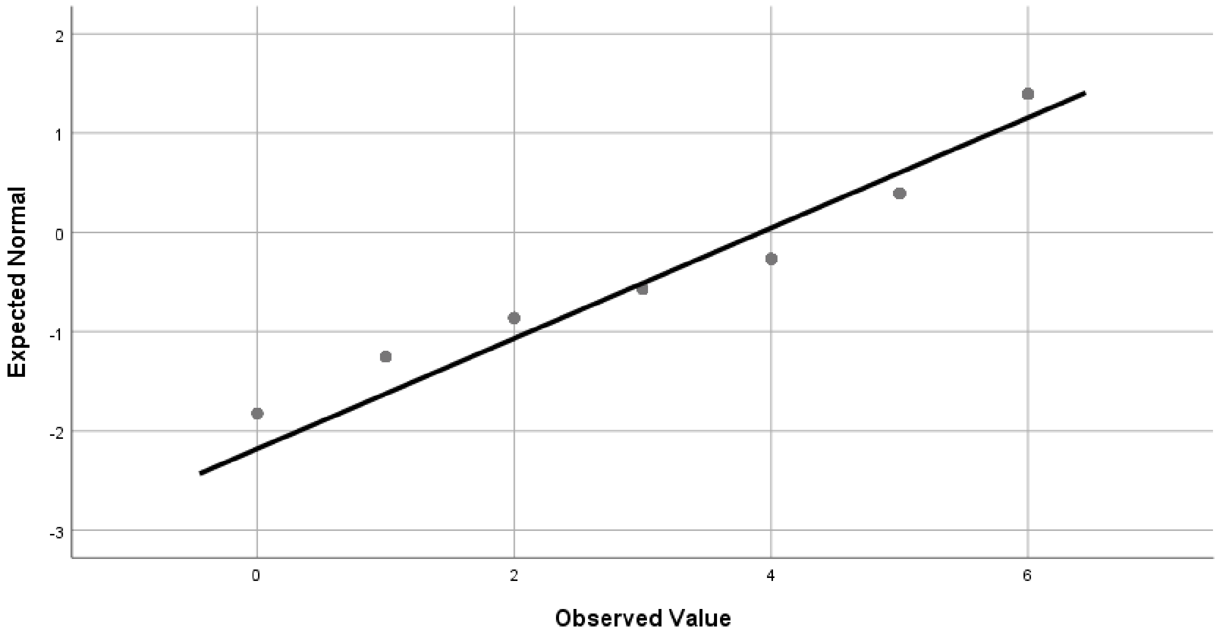
Normal Q-Q Plot of Rx_Freq
for Race= White
Expected Normal
Observed Value
6
4
2
0
-2
-4
0
2
4
6



Normal Q-Q Plot of Rx_Freq
for Race= Black
Expected Normal
Observed Value
2
0
-2
-4
-1
0
1
2
3
4
5

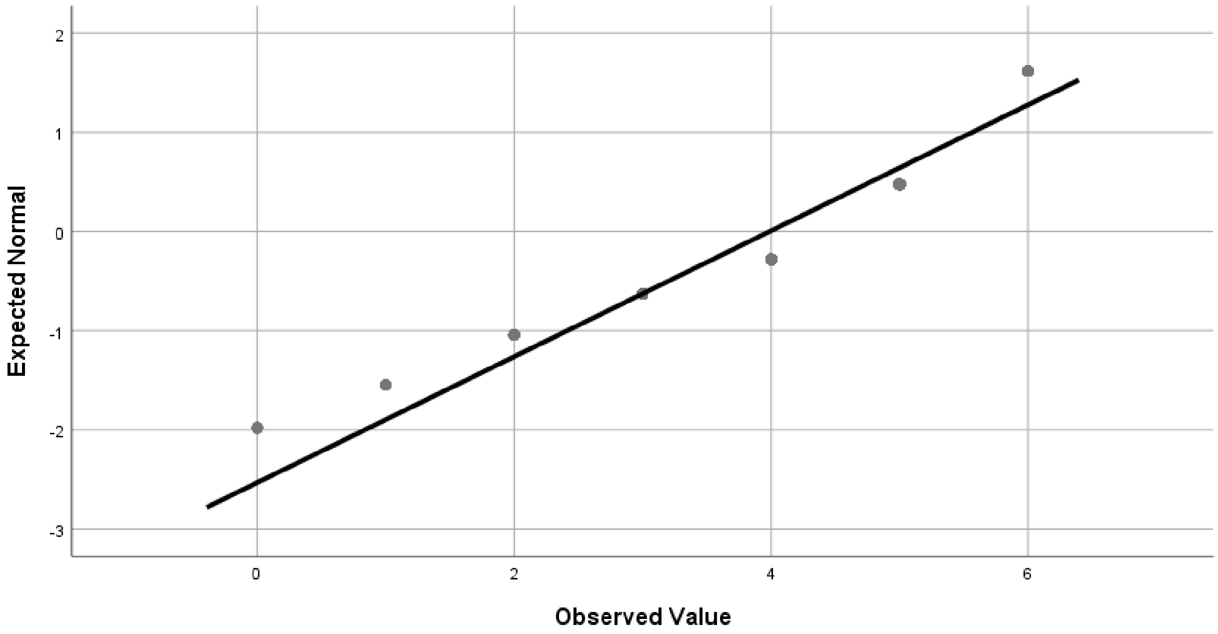
Normal Q-Q Plot of Rx_Initiate

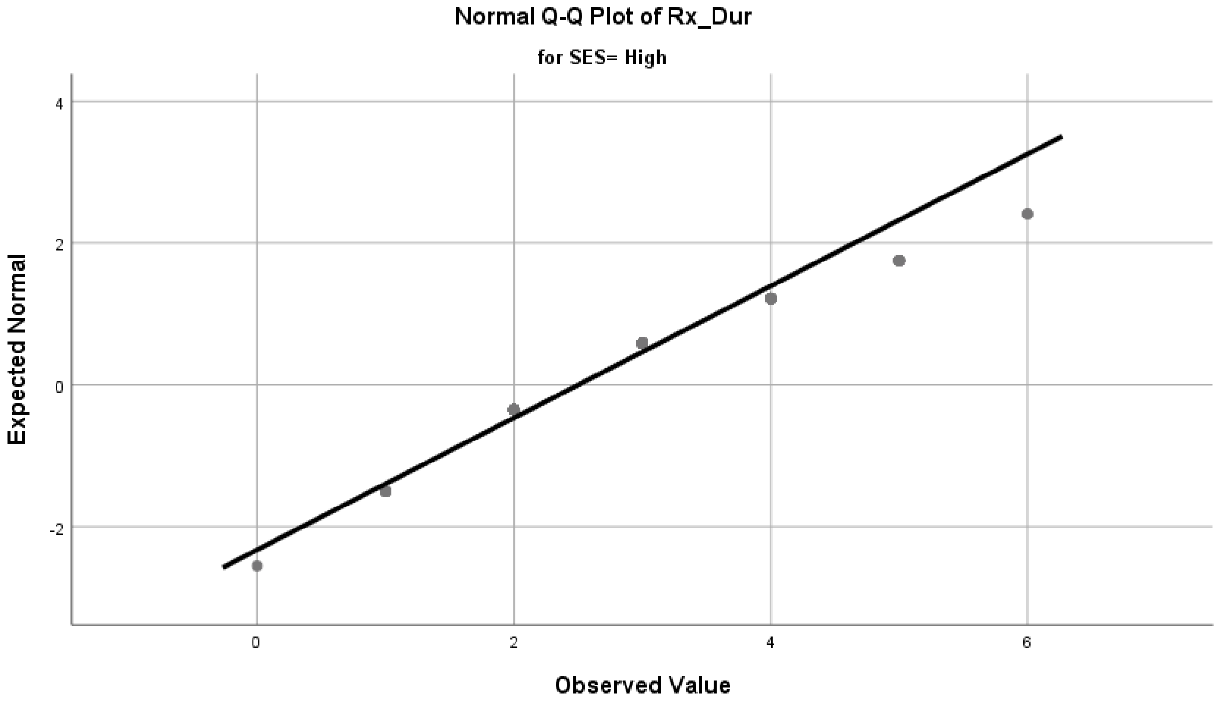
for Race= White

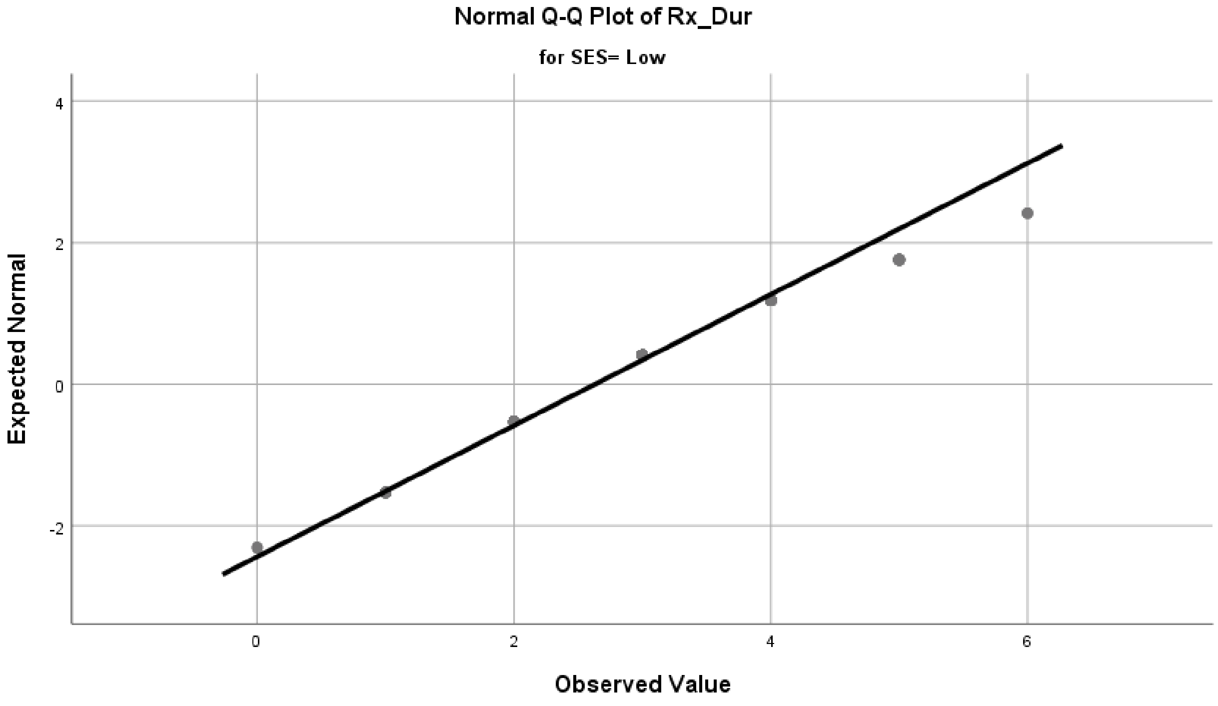


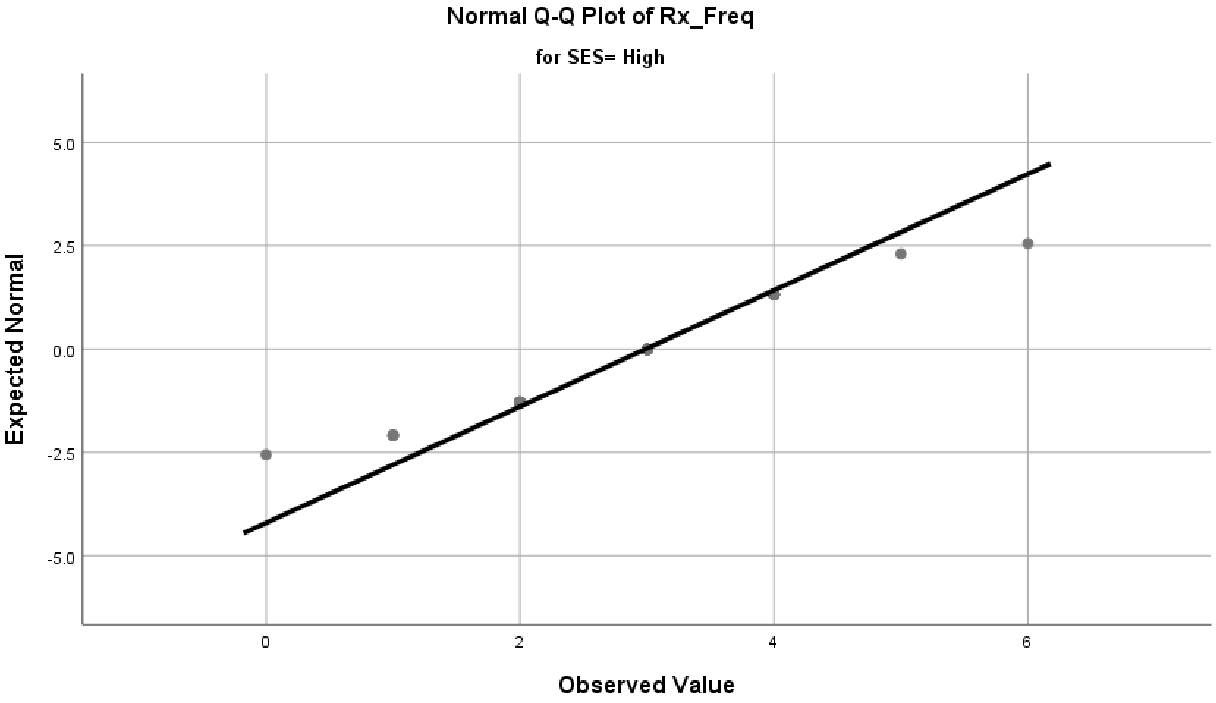
Normal Q-Q Plot of Rx_Initiate

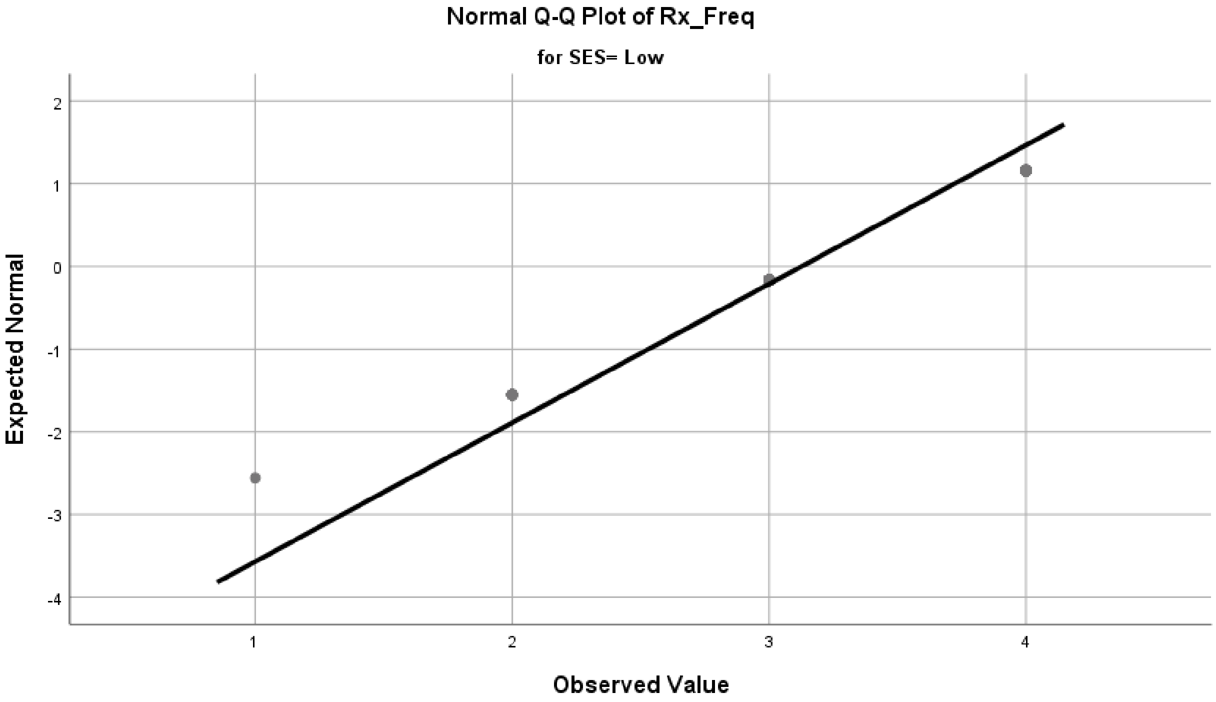
for Race= Black

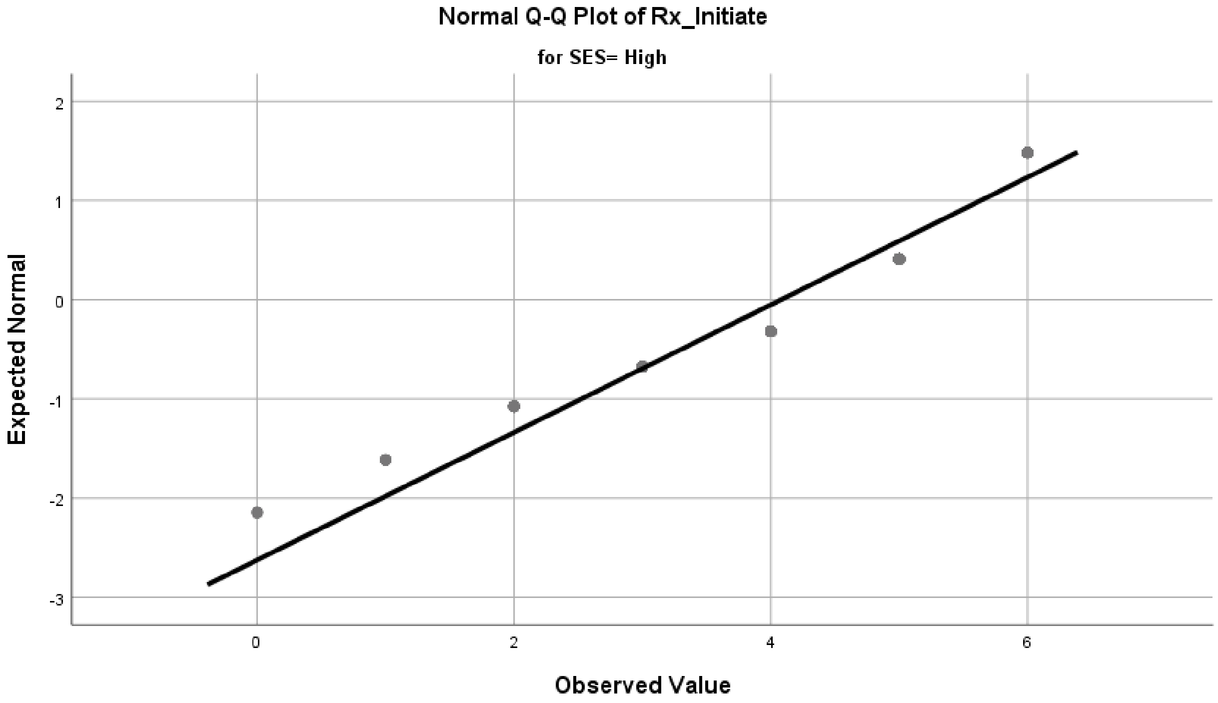



Normal Q-Q Plot of Rx_Dur
for SES= High
Expected Normal
4
2
0
-2
0
2
4
6
Observed Value

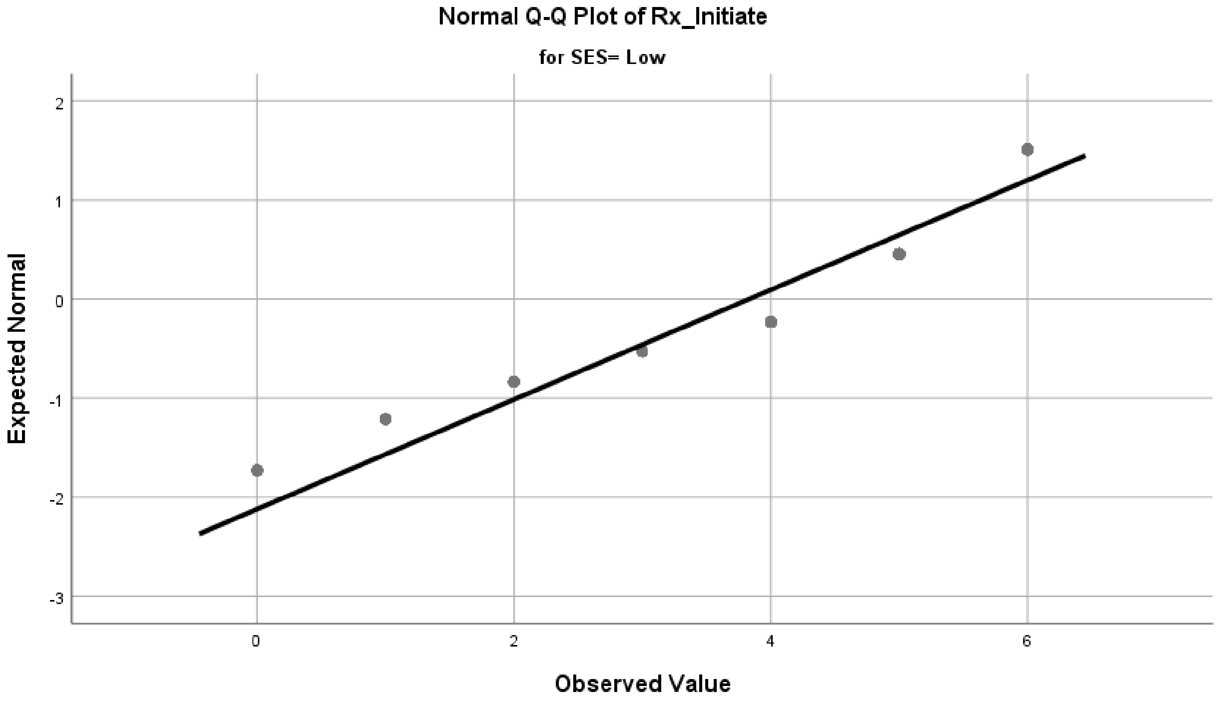

Normal Q-Q Plot of Rx_Dur
for SES= Low
Expected Normal
4
2
0
-2
0
2
4
6
Observed Value


Normal Q-Q Plot of Rx_Freq
for SES= High
Expected Normal
5.0
2.5
0.0
-2.5
-5.0
0
2
4
6
Observed Value


Normal Q-Q Plot of Rx_Freq
for SES= Low
Expected Normal
2
1
0
-1
-2
-3
-4
1
2
3
4
Observed Value


Normal Q-Q Plot of Rx_Initiate

for SES= High


Normal Q-Q Plot of Rx_Initiate

for SES= Low

Appendix K

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering Race after second resampling (n = 48)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	4730.439	1	4730.439	2376.646	.000	.982
Ethical leadership	35.340	1	35.340	17.755	.000***	.288
Race	4.803	1	4.803	2.413	.127	.052
Ethical leadership x Race	3.424	1	3.424	1.720	.196	.038
Within treatments	87.577	44	1.990			
Total	5016.000	48				

Note. **p* < .05. ***p* < .01. ****p* < .001.

ANOVA Summary Table for Effects of Ethical Leadership on Clinical Decision Making when Considering SES after second resampling (n = 48)

	SS	*df*	*MS*	*F*	*p*	η^2
Between treatments	4756.478	1	4756.478	2285.111	.000	.981
Ethical leadership	42.324	1	42.324	20.333	.000***	.316
Socioeconomic status	.003	1	.003	.001	.970	.000
Ethical leadership x SES	3.982	1	3.982	1.913	.174	.042
Within treatments	91.586	44	2.082			
Total	5016.000	48				

Note. SES = Socioeconomic status.
**p* < .05. ***p* < .01. ****p* < .001.

Appendix L

IRB Study Completion Notification

ALVERNIA UNIVERSITY
INSTITUTIONAL REVIEW BOARD

RECEIPT OF APPLICATION
NOTIFICATION TO INVESTIGATOR

Application: 0319-033R1 **Date: October 3, 2019**

Title: The Role of Ethical Leadership in the Clinical Decision Making of Physical Therapists in Caring for Patients of Differing Socioeconomic Status and Race with Low Back in the United States

Principal Investigator:	Sean F. Greich
Email:	**Sean.Greich@Alvernia.edu**
Faculty Advisor:	Spencer Stober, Ed.D
Email:	**Spencer.stober @alvernia.edu**
IRB Decision:	**Study completion form received on October 3, 2019.**

Thank you.

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