MEDICAL STUDENTS' PERSPECTIVES ON THEIR EXPERIENCES AS MEDICAL SCRIBES

By

John Evan Lowry

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Higher, Adult, and Lifelong Education—Doctor of Philosophy

2017

ABSTRACT

MEDICAL STUDENTS' PERSPECTIVES ON THEIR EXPERIENCES AS MEDICAL SCRIBES

By

John E. Lowry

Many pre-medical students look for work experience in the medical field that will help them gain some medical knowledge and give a boost to their medical school applications. Today, many are finding employment as medical scribes as they prepare to apply to medical schools. Medical scribes are relatively new in medicine, but the number of medical scribe jobs is increasing rapidly. To date, there is no reported literature about the experiences of medical scribes, or about how this unique work experience relates to what they do in medical school.

The purpose of this study was to learn about the pre-medical experiences of medical students who worked as medical scribes, and how the medical students made meaning of their experiences. I used qualitative research methods to interview 16 medical students who worked as medical scribes before entering medical school. I used thematic analysis to identify the themes in how they described their experiences, and how they relate their experiences to what they are doing in medical school.

My study showed that medical scribe work experience can give medical students a rich framework for learning, provide them with an informed commitment to the profession of a physician, and confidence in their abilities and career choices. By taking an active role in documenting many patient encounters, and by being a part of the medical team in the clinical setting, medical scribes can develop their knowledge, grow as professionals, and develop a positive outlook about medical school and their professional future.

ACKNOWLEDGEMENTS

I would like to acknowledge many individuals who have played a role in my dissertation. First, I want to acknowledge the overwhelming support and encouragement from my family. Thanks for your patience, understanding, and encouragement over these many years of "dad being in school." You all are the reason for everything I do, and I love you all so much!

Next, I would like to acknowledge the great help and support from my advisor, Dr. Kris Renn. Ever the optimist, your positive energy was needed many times along this journey, and I greatly appreciate it. I am grateful to have worked with someone whose research and perspectives are somewhat different from my own, and you have allowed me to understand things I otherwise would not have. Thank you so much!

Of course, this entire project would not be possible without the partnership and cooperation of my friend and colleague, Matthew Deibel, MD and Covenant Healthcare in Saginaw, MI. Matt, I am grateful for that conversation in your back yard that started this whole thing, and for our ability to work together to make something uniquely awesome. I am glad that it has made a difference for pre-medical students, physicians, and patients, and our community. I am also grateful to all of the physicians in the Covenant Emergency Care Center who have made our scribe program the success that it has been, and for being outstanding role models to my students.

Many other people have contributed to the success of this project. I would like to thank John Mayer, Eric Clapton, B.B. King (may he rest in peace), and many other musicians for their musical contributions. Their music sustained my motivation for many years, and has helped me through the hard times.

Last, but not least, I would like to acknowledge the support and encouragement of my colleagues at Saginaw Valley State University. From the beginning, I have been supported in this endeavor, and the university has fully embraced this program, as well as the research that I have been able to do. It is evidence of the commitment to real community engagement, and the positive impact that a regional university can have in the community. I appreciate the support of Dr. Donald Bachand, president of SVSU, who puts a plug in for this program at every opportunity, and has been one of the biggest supporters of it. I also greatly appreciate the support of my friend and colleague, J. Blake Johnson, MFA, for his contribution to the graphics in this dissertation. I also appreciate the editorial assistance of Ms. Ann Garcia.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

Healthcare in the United States is in high demand, especially with a growing population of people over age 65 (Aging Statistics, 2013). In order to address a greater number of increasingly complex medical needs, physicians and healthcare professionals must be able to provide quality medical care that is timely, patient-centered, effective, and safe for a wide range of diverse patients. Advances in medical technology can contribute healthcare quality, but practitioners still need a solid foundation of biomedical knowledge and clinical diagnostic skills. Government agencies, health systems, professional organizations, and medical schools work every day to find ways to keep patient safety and healthcare quality as high as possible.

Adding to this challenge is the shortage of physicians in the United States. The Association of American Colleges of Medicine estimates that the supply of physicians will be nearly 100,000 short of the demand by the year 2020 (AAMC, 2014). As the population in the United States continues to grow in age and number, the demand for medical services is only expected to increase. However, this overwhelming shortage of physicians adds tremendous strain to healthcare systems. To help address this shortage, medical schools are increasing their enrollments in both allopathic medicine (AAMC, 2013) and osteopathic medicine (AACOM, 2013). It is also necessary to increase the number of residency positions in the different medical specialties, but these positions are limited by funding. Calls for increasing funding for medical residencies (AAMC, 2014) have led to legislative proposals, and there are currently two major bills in hearings that would increase the number of funded residency positions by15,000 per year (AAMC, 2016).

Challenges in Pre-medical Education

There are a number of issues with pre-medical education. The first is that college students preparing for a career in medicine face many diverse challenges, and there is no consensus about what the pre-medical years should entail for college students. Many ideas on reforming higher education focus on improving public accountability for institutions and learning outcomes for populations of students (Bok, 2006). In contrast to this, many feel that medical schools expect applicants to use their pre-medical years as focused preparation for the application process (Gunderman & Kanter, 2008). The debate continues about whether the pre-medical years should be to prepare someone for a career in medicine or simply to prepare the best applicants (Kanter, 2008).

To enter medical school in the United States, applicants must complete a bachelor's degree with a high grade point average (GPA), take numerous courses in biological and physical sciences, have satisfactory Medical College Admission Test (MCAT) score, and do well in interviews or other application procedures designed to select the top students. There are many criticisms of this process (Sklar, 2013). Some of the biggest criticisms of the pre-medical curriculum are that it is too narrow in scope (Gunderman & Kanter, 2008), and it should be broadened to emphasize many of the traditional liberal arts (Thomas, 1978). Another criticism is that the application process can be dehumanizing (Coombs & Paulson, 1990) because the drive for grades and achievement can create a negative competitive atmosphere among pre-medical students, termed "pre-med syndrome" (Conrad, 1986).

Perhaps the issue in pre-medical education most relevant to this study is that many who desire to go to medical school are not fully aware of what a career in medicine entails. Too many students choose to apply for medical school without a clear understanding of what they are

getting into (Chuck, 1996). It is difficult for students and institutions to offer significant shadowing opportunities to each pre-medical student because of the time, cost, and barriers associated with observation in the clinical setting (Kitsis & Goldsammler, 2013). Some do not realize they have made a poor career choice until they are in medical school (Alexander et al., 1992). Stress and burnout are significant issues in the field of medicine and medical education (O'Connell & Gupta, 2009), due in part to the lack of understanding of and a commitment to a career as a physician.

While there is no simple solution to these challenges, there is a growing trend to expand the opportunities for pre-medical students to have meaningful, active experiences in the clinical setting before medical school. The University of Wisconsin Tobacco Science Scholars Program (Davis, Anderson, & Stankevitz, 2013) provides students the chance to engage with professionals in both research and patient care. The Minnneapolis Heart Institute Foundation offers pre-medical students the opportunity to complete a summer internship that also involves both research and clinical care (Willenbring, McKee, Wilson, & Henry, 2008). Stanford University offers the Stanford Immersion in Medicine Series (SIMS), which creates professional mentoring opportunities for pre-medical students in addition to rotations with physicians (Wang, Lin, Lewis, Fetterman, & Gesundheit, 2015). All of these programs create opportunities for college students to actively participate in different aspects of medical care. These programs report favorable outcomes in career exploration, fostering meaningful medical scholarship, and workplace learning among undergraduate college students.

The programs described above offer many potential advantages to someone preparing for a career as a physician. First, having meaningful experiences with physicians that go beyond shadowing is vital to truly learn about the profession (Davis et al., 2013). Having mentors who

can provide realistic expectations of the profession is also very helpful to potential physicians (Siddiqui, 2014). Finally, these opportunities enrich the pre-medical experience, and provide a rich context to help teach things commonly found in the "hidden curriculum" (Gross, Mommaerts, Earl, & De Vries, 2008). It is clear that these programs are beneficial to students, and more programs like these would allow more medical school applicants to have a more solid grounding in the realities of medicine, as well as support to overcome challenging times in medical school, residency, and entering the workforce. More research is needed to fully understand exactly how these programs can be beneficial to medical students.

Challenges in Medical Education

An ongoing challenge in medical education is to help students to learn and apply vast amounts of biomedical and clinical information, with minimal clinical experience upon which to build a foundation of learning. While all medical students today have academic preparation in basic sciences such as biology, chemistry, and physics, most students enter medical school with very limited exposure to the field of medicine, without having seen or experienced much of what being a physician entails. Cooke, Irby, and O'Brien (2010) state that medical students have minimal experience with the applications of basic science, as well as limited exposure to clinical information. Some undergraduate programs allow students to gain experience with the applications of basic sciences, but the majority of medical students major in the basic sciences as undergraduate students, and they do not, as a whole, have significant experiences with the medical applications of the sciences. In addition, medical students receive no formal training in clinical information prior to entering medical school. What each student knows about clinical information, such as pediatrics, comes from the personal experiences they have in the field,

which are generally limited in size and scope, unless students have had training or work experience in an allied health field, such as working as a nurse or an x-ray technician.

Professional Development

One of the biggest challenges for medical schools is helping medical students establish a professional identity as a physician. In a seminal work on medical education, Cooke, Irby, and O'Brien (2010) make the case that professional formation should be a central goal of medical education, which includes developing the thoughts, feelings, and actions of physicians. They also state that medical students become less empathetic and altruistic as they progress through medical school. More research is needed in this area to more fully understand this phenomenon, and how to educate medical students in ways that can preserve and develop positive professional characteristics. It is possible that pre-clinical experiences in medicine may play a role in this area (Goldstein, Storey-Johnson, & Beck, 2014).

Wear and Castellani (2000) add to the discussion on professional development in medical education. They suggest that the biggest challenges to medical education are teaching clinical reasoning and professional identity development. Both of these require knowledge, methods and skills in order to be developed. Professional development is context-specific, and must include the social context in order to be learned and practiced. Medical students do not study professional development aspects, like philosophy and sociology, and therefore may not have a solid context to learn professional identity. They recommend expanding the medical curriculum to include "a broader intellectual experience than those provided by traditional medical curricula." They go on to suggest that experiences working or volunteering in medical clinics should be more valued by medical school application committees, because they would be more

indicative of the applicants' ability to see healthcare in terms of the full context of individuals and communities.

Personal Development

Medical school is a stressful experience (Lyndon et al., 2014). There is stress to do well on medical school assessments, and from the students themselves (Guthrie et al., 1997). Being able to manage stress is an important part of making it through the medical school experience (Stewart, Lam, Betson, & WongWong, 1999). High levels of stress can lead to academic burnout among medical students and residents (IsHak et al., 2013). Similarly, emotional intelligence is important to the success of developing physicians who can deliver safe and compassionate healthcare (Cherry, Fletcher, O'Sullivan, & Dornan, 2014).

Medical students can experience stress because they lack exposure to, and an understanding of what it means to have a career as a physician. Because the typical pre-medical curriculum does not offer students opportunities to see the field of medicine in great depth, work experiences as a medical scribe may be instrumental in providing this information and perspective to medical students, and it may reduce the stress of medical school.

Medical Scribes

Medical scribes are usually pre-medical students who work directly with physicians, and are commonly seen in emergency departments and other medical offices. Medical scribes receive formal training in medical terminology, electronic medical records (EMR), common medical conditions and procedures. Their primary function is to capture information that is expressed during the patient encounter, and develop the medical record for the physician, who will ultimately complete it and sign it. Medical scribes work directly with physicians, so they see nearly everything that the physicians do for their patients, how physicians make important

medical decisions, and the full spectrum of the work they do. Medical scribes also have many social experiences with physicians, nurses, and hospital staff. Many medical scribes are pre-medical students between the ages of 18-25, who aspire to become a physician one day.

Purpose, Problem, and Research Questions

With the current study, I sought to discover the experiences of medical students who worked as medical scribes prior to entering medical school, and to gather their perceptions of their experiences. Prior to this study, it was not known if these experiences have helped these medical students in some way. If the experiences of seeing patient care delivered and working directly with physicians can be helpful, more medical students will want to obtain this experience.

Problem Statements. The process of becoming a medical student entails a number of identified challenges, such as a lack of exposure to clinical medicine and limited experiences within the profession of medicine.

1. Pre-medical workplace experiences in healthcare may be able to address some of these challenges. Working as a medical scribe in an emergency department is one example of a pre-medical experience.
2. There is currently no literature to describe what medical scribe work experience does for those who go on to medical school.
3. It is important to learn about the features of experiences that make good pre-medical encounters, and what role pre-medical contact can play in the development of medical students.

Purpose of the Study

The purpose of this study is to learn about the pre-medical experiences of medical students who worked as medical scribes.

Research Questions

1. What experiences do medical scribes have in the course of their pre-medical work?
2. How do medical students relate experiences from working as a medical scribe to experiences in medical school?

Importance of the Study

This study is important for several reasons. First, there is a great need for enhancing professional development in medical education. Medical educators are always looking for new ways to develop knowledgeable, competent, caring physicians who are committed to a career as a physician, which are in high demand and short supply. This study examines the impact of pre-medical workplace learning on several important medical education outcomes. Second, it is important to know if experiences as a medical scribe can help students learn more effectively in medical school, develop a professional identity, and/or develop personally. Not only do these aspects relate to developing physicians, but they also directly relate to retention of medical students. Next, there are many post-baccalaureate programs for pre-medical students that strive to offer experiences to prospective medical students to enhance their viability for admission into medical schools. Some of the common offerings include MCAT preparation and brief shadowing opportunities with physicians. If medical scribe experiences can demonstrate beneficial effects to pre-medical students, other institutions may wish to develop medical scribe programs. Finally, knowing if and how medical scribe experiences can help medical students,

medical scribe training programs may be able to market their programs and attract more interested students.

Definition of Terms

Medical scribe—An individual who has completed medical scribe training, and who has worked as a scribe in an emergency department for at least six months

Medical scribe training—A course where students learn medical terminology, electronic medical records, common medical conditions and procedures, and medical documentation

Medical school—An accredited school/college of allopathic medicine (M.D.) or osteopathic medicine (D.O.)

Medical student—A current student in a medical school, as defined above

Medical resident—An individual who has completed a degree in medicine (M.D. or D.O.) and is involved in a training program to work in a medical specialty, such as emergency medicine or surgery

Clerkship—A structured clinical experience in which medical students observe and participate in patient care under the supervision of a clinical instructor. Medical schools include numerous clerkships, typically during the last years of medical school in acute care, surgery, community health, and other medical specialties.

CHAPTER 2: REVIEW OF THE LITERATURE

There are a number of bodies of literature that provide the framework for this study. This section begins with a look at the history of medical education in the United States, as well as some current education reforms. Next, I discuss the theories and applications of workplace learning, and how they are used in medical education. Later, I explore the literature around medical scribes, clinical reasoning, and electronic medical records. Lastly, I present relevant theories of professional, career, and personal development. In each section, I will outline the key points of these theories and illustrate how these theories are relevant to this study and to medical education in general.

History of Medical Education

In 1910, Abraham Flexner published a report on the state of medical education in the United States (Flexner, 1910). Commissioned by Henry Pritchett, the president of the Carnegie Foundation, Flexner spent years investigating medical schools to learn about the training of physicians. He found that medical schools were remarkably inconsistent in their admissions policies, curriculum, and clinical experiences. He found that analytic reasoning founded in the natural sciences was overwhelmingly lacking. Another disturbing trend was that medical schools were producing "an enormous over-production of un-educated and ill trained medical practitioners" (Flexner, p. x). A notable and related finding was that many medical schools were private institutions that lacked adequate instructional facilities, laboratories, and clinical teaching settings to fully prepare students for medical practice. Lastly, some medical schools would accept anyone who could pay the tuition, regardless of prior academic training. His report detailed the discrepancies between current practices and best practices in medical education, and it was a powerful tool used to implement reform and standardization in medical education. Flexner included many specific recommendations for reform in his report. Many of his

recommendations would become accreditation standards for medical schools, such as the curriculum structure including two years of basic science and medical science instruction, followed by two years of structured clinical experiences (Cooke, Irby, Sullivan, & Ludmerer, 2006). By reforming medical education, Flexner and others were able to reform the practice of medicine to keep up with new advances and evidence-based practice in the field.

In addition to improving medical practice, Abraham Flexner's report also laid the foundation for further study and continuous improvements in medical education. Over the century since Flexner's report, there has been a greater awareness of, and support for advances in medical education. The Carnegie Foundation for the Advancement of Teaching has continued to champion reforms in medical education (Cooke, Irby, & O'Brien, 2010), and many different initiatives have been established to support research and best practices in medical education.

Workplace Learning

This study aims to discover what medical students learned from working as medical scribes prior to medical school. It is therefore relevant to frame the study within the theory and context of workplace learning. The workplace offers different ways to view learning. The workplace offers many different learning experiences stemming from interactions with others and from the nature of the tasks they perform, and these experiences help them learn technical and social aspects of a profession (Billett, 1995). Also, programs that aim to develop or train employees for their current job, or for future opportunities are also part of workplace learning. Both of these views of workplace learning are applicable to the current study.

Stephen Billett has written extensively about workplace learning, and has helped to define and describe what it is, and what it is not. One aspect that he continuously emphasizes is that the social aspect of the workplace must be considered when looking at how learning occurs,

and in how learning is used (Billett, 1995). This means that the social aspects of the workplace will play a role in determining what workers learn, and how they will implement their knowledge. It is possible that a workplace may offer many opportunities for employees to learn, but few opportunities to use what they have learned, or vice versa. Some social factors may create or inhibit opportunities for employees to learn. For example, some employees may be selected to learn a new technology or train for a leadership position based on their abilities shown in the workplace. However, workplace politics, hierarchies, or other dynamics my keep employees from these opportunities to learn and develop. Employers may train their employees well, but may make it difficult for them to use their learning to make changes in the workplace, through regulations and other factors. For these reasons, Billett (2001) says that is it not accurate to describe workplace learning experiences as either "unstructured" or "informal, because the learning that occurs in the workplace is regulated by the practices, policies, and values from the workplace.

In many cases, the goals and objectives of the workplace determine the tasks that workers perform, the interactions they have with others, the support they receive, and therefore the learning opportunities they will have (Billett 2004). As each workplace has its own set of desirable outcomes, employees' tasks will focus on contributing to the goals of the workplace, so learning opportunities may relate to ways to improve their performance of these tasks. Formal policies and the social nature of the workplace will dictate the human interaction and support that employees receive.

As stated earlier, workplace learning encompasses programs used to train or develop workers. One of the primary mechanisms used in the workplace to train workers comes from Kurt Lewin's model of learning (O'Connor, 2004).

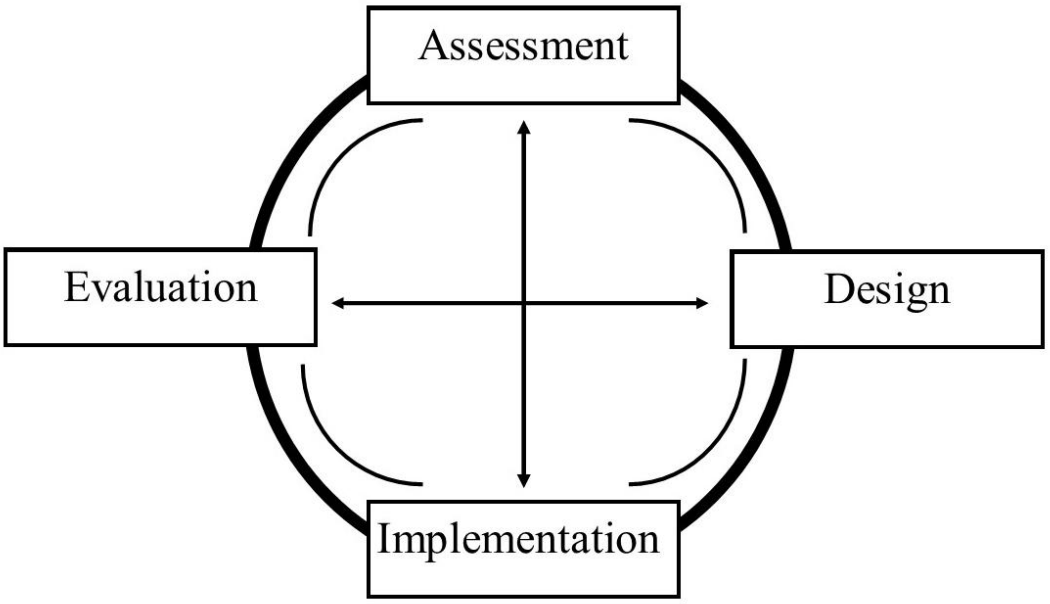


FIGURE 1: Model of Workplace Learning

In this model, a worker analyzes a situation, and then designs plans to approach it in a different or better way. After implementing the new approach, the worker (or others in the workplace) evaluate it to see if it was effective. The cycle then continues to continue to refine the approach to that situation. Inherent in this cycle are the need for assessing the work being done, resources for implementing new designs, and feedback via evaluations. Not all workplaces offer the same opportunities for these aspects of workplace learning, and therefore limit how rich or extensive this process can be.

According to Billett (1995), there are four key aspects of workplace learning that can make it distinct from other learning situations. The first is the ability of the workplace to provide authentic experiences to the workers. Unlike classroom or simulated environments, performing tasks in a real environment, with real outcomes and stakeholders makes it a more robust experience. The second is the availability of experts, who are able to train and mentor younger or less-experienced workers. Third, having other workers who can provide guidance and role

models to workers enhances the experiences. Lastly, having employees actively engaged in constructive tasks, some of which may be challenging, helps them to seek for new ways of learning. Workplaces that successfully use these four things can provide the opportunity for workers to develop propositional knowledge (facts and information) and procedural knowledge (techniques and skills), referred to collectively as cognitive structures, which help the worker become successful. These qualities in the workplace also help workers develop dispositions (values and attitudes) that are suitable for the workplace, and which will help them to continue their learning in new environments.

Workplace Learning in Medical Education

Medical education in the United States has many of its roots in workplace learning. In Flexner's report (1910), he describes how, beginning in the seventeenth century, those who would become physicians would gain knowledge through an apprenticeship, which would begin with the most menial tasks, and the apprentice would then progress to the more specific work of a physician. As medical education progressed, it added some coursework in the basic sciences. Ironically, there were many sub-standard physicians training medical students, and the quality of medicine in the country was not improving. Flexner recommended that medical schools closely standardize and evaluate the education that medical students receive in the clinical setting, which would help medical schools maximize the workplace learning they provided to students.

Since that time, and even more so within the past 30 years, medical education has sought to learn more about (and optimize) the clinical education experience. Examining medical education within the framework of workplace learning provides many ways to enhance the development of physicians. Dornan's (2012) review of medical education research reinforces the rich tradition of workplace learning, and identified some specific ways in which this is

beneficial. He states that physicians, medical residents and medical students working in the clinical environment provides the ideal place for residents to teach and mentor, and for students to receive feedback from their near-peers as well as attending physicians. He identified a challenge in workplace learning, which is that while medical students and residents learn well from experiences, work pressures can sometimes get in the way of learning opportunities, especially for medical residents. To help maximize learning in the clinical setting, Sajjad and Mahboob (2015) describe the FAIR model for workplace learning, which stands for Feedback while Actively participating in clinical activities, with attention to Individualization and Relevance to student needs. This model helps remind both the student and the preceptor about some of the important aspects of the experience, so that the pressures of the workplace do not detract from the educational value of the experience. Indeed, having enough "supported participation" throughout the workplace learning process is critical, because factors that take away from that support, such as having too many students in the clinic, can greatly inhibit the learning that should occur in the workplace (Dornan et al., 2007). The presence of peer groups that work together in the workplace can be a great benefit to students, because their peers can help to clarify roles, answer questions, and share experiences (Chou, 2014).

Contemporary medical education research examines in more depth the roles that different experiences have in helping medical students to develop their knowledge and professional skills. Many medical schools are increasing the number and scope of authentic early clinical experiences that medical students have prior to their clerkships (Erich, 2014). These experiences have shown a number of promising positive effects. For example, pre-clinical patient contact has been shown to keep students motivated to study, develop clinical reasoning, and enhance knowledge construction (Diemers, Dolmans, Verwijnen, Heineman, & Scherpbier, 2008). Pre-

clinical patient contact helps medical students see how biomedical knowledge is connected to clinical applications (Diemers, van de Wiel, Scherpbier, Heineman, & Dolmans, 2011). In addition, a systematic review done by Yardley et al. (2010) found that early experiences help students understand patient and community perspectives about illness and healthcare. Dornan et al. (2006) discovered that experience in clinical settings helps medical students become more socialized to their profession, and students find learning to be more real and relevant. There are likely many different professional and social factors that are beneficial to medical students in authentic early experiences (Yardley, Brosnan, Richardson, & Hays, 2013). As medical students reflect on their experiences, they make meaning and construct knowledge from them (Yardley, Brosnan, & Richardson, 2013) which guides them in medical school, residency, and as practitioners. Medical students also experience emotional development (Helmich, Bolhuis, Laan, Dornan, & Koopmans, 2013) as they have meaningful work experiences with real patients. Stephen Billett (2004) described how the workplace can be a rich, complex learning environment. Building on this philosophy, Dornan et al. (2007) found that workplace learning for medical students helped to develop knowledge, confidence, and professional attitudes required for successful medical practice. By participating in authentic activities with real patients, students become active participants in a range of healthcare tasks, and this helps them overcome fears and feel like they are making a difference (Dornan, Scherpbier, & Boshuizen, 2009). Contributing to care of real patients has been shown to help medical students develop knowledge and contribute to their professional identity formation (Smith et al., 2013). Medical students and residents learn what it means to be a physician from supervision, working with a wide range of patients, and providing quality medical care to real patients (Dornan, 2012). Some have advocated for more authentic workplace experiences as a way to advance the medical

curriculum (Gonzalo, Haidet, & Wolpaw, 2014). Karani et al. (2014) found that using medical residents as teachers provided students with strong role models, created a safe learning environment, and helped them to develop their career and professional goals. Even practicing physicians can benefit greatly from workplace learning. Cuyvers, Donche, and Van den Bossche (2016) found that newly practicing specialty physicians learned diagnostic and treatment practices, as well as professional communication skill and organizational functions.

In order to experience learning in the clinical setting, a number of factors must be present. Dornan and colleagues (2014) developed a model for how medical students learn from experiences in the workplace, and it involves the right combination of learning conditions, processes, and outcomes. Because observing is part of the learning process, it is possible that simply observing physicians work with patients can help medical scribes learn. Observing real patient care is another vital aspect of this model, and this is the very essence of the work that medical scribes do. Therefore, the potential for learning is great based on the model from Dornan et al.

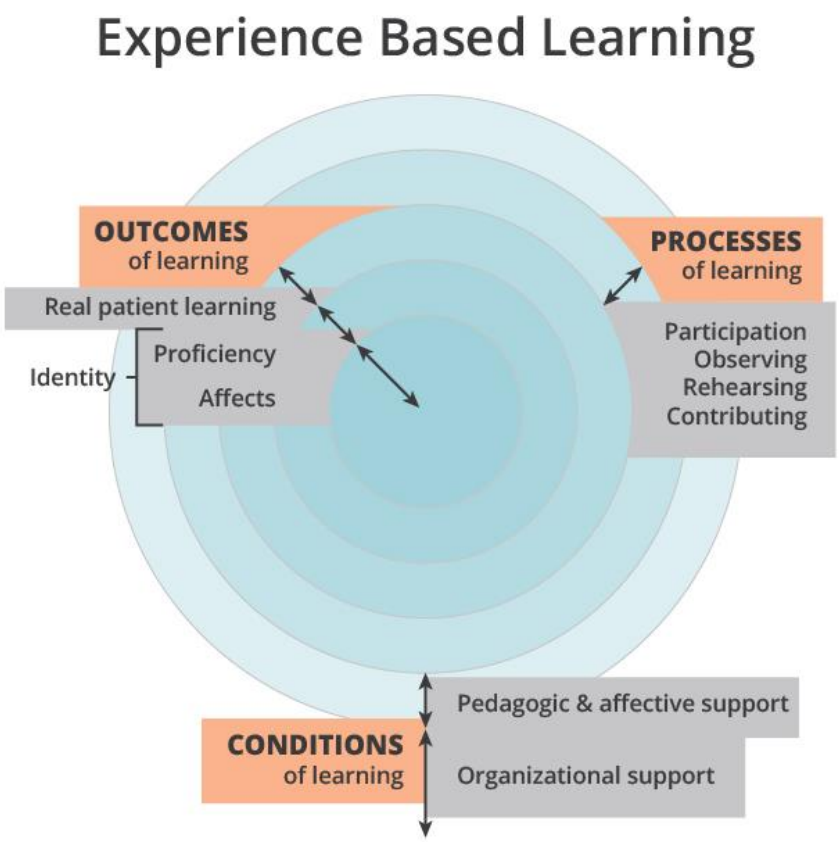


FIGURE 2: Experience Based Learning

A transitional clerkship, where medical students spent a week working at a hospital prior to engaging in a clerkship, allowed students to understand their roles and be more confident in the clerkship (Chittenden, Henry, Saxena, Loeser, & O'Sullivan, 2009). Medical students who provided direct patient care at student-run clinics had legitimate patient experiences that enhanced their readiness for learning about disease and healthcare practices in medical school (Chen et al., 2014). Because of the authentic experiences they have, as well as performance expectations, workplace learning shows an encouraging role in medical education.

Learning through clinical experiences is also a central part to many other health professions. Through observation, simulation, supervised clinical experiences, service learning, and interprofessional activities, workplace learning has been shown to be valuable in many allied

health fields. The American College of Clinical Pharmacy (ACCP) has developed a position statement on experiential learning for pharmacy students, and requires that students spend no less than 25% of their program learning in practice with pharmacists (Haase, Smythe, Orlando, Resman-Targoff, & Smith, 2008). Students in physical therapy and dental hygiene have had meaningful learning experiences together by applying their professional skills (Johannsen et al., 2012). Occupational therapy students have improved their readiness for clinical practice through experiential learning (Knecht-Sabres, 2010) Nurses in their last year of school developed confidence and professionalism, and felt more included in the profession by completing some autonomous clinical experiences (Anderson & Kiger, 2008). Similarly, dieticians can develop clinical confidence through work-related experiences (Barr, Walters, & Hagan, 2002). Through service learning, dental students have shown the ability to develop positive attitudes about the needs of geriatric patients and the role of dental care in long-term care (Brondani et al., 2012). And, perhaps most relevant to the current study, completing a health-related internship has been shown to help pre-medical students develop career plans and non-cognitive skills (Almy, Cohen, Ham, Hornig, & Price, 1983).

Workplace learning is an appropriate theoretical framework for two reasons. The first reason is that the current study aims to learn about the work experiences the participants had prior to medical school. Understanding what they did at work, and what they learned from their experiences, is the central focus of this study. The other reason is that workplace learning provides a broad context for other theories, such as experiential learning, social cognitive theory, and others, which are also relevant for this study.

Experiential Learning

Experiential learning has been studied in detail, and has many applications in medical education. It is a way of acquiring knowledge through interacting within an environment (Kolb, 1984). When a learner is actively involved in a particular environment, it is possible to learn many different things, as long as certain elements are present. The theories of experiential learning provide models for understanding how experiential learning can take place.

Experiential learning theory. Some of the earliest ideas on experiential learning theory come from the writings of John Dewey. In his work titled *Experience in Education*, Dewey (1938) makes a very strong case that experiences are a major factor in learning, and that education should strive to provide the ideal experiences to foster learning outcomes. Piaget showed that by creating the right situations, educators can influence or facilitate learning, because learning is provoked by situations, conflicts, and opportunities (Piaget, 1972). In his seminal book on experiential learning, David Kolb (1984) describes some variations of the experiential learning model. The ideas presented from these authors continue to serve as the foundation for research and practice related to experiential learning today.

Experiential Learning in Medical Education

Medical education programs in the U.S. and Canada rely heavily on several different educational methods. In medical school, students experience traditional classroom lectures, small-group discussions, laboratory experiences, along with simulation and external clinical experiences. This variety of learning environments is designed to help students gain and apply knowledge in different contexts, and it allows medical school administrators to ensure students are ready for progressive increases in patient exposure and clinical care.

In two separate yet related articles, Yardley, Teunissen and Dornan (2012a, 2012b) explore both the theoretical aspects as well as the practical applications of experiential learning in medical education, which has many similarities to workplace learning. They point out several important fundamental principles of learning, namely that learning cannot be separated from the context in which it occurs, learning is a process (and not an outcome), and that experiential learning in medical education comes from authentic experiences obtained in the workplace (Yardley et al., 2012a). Workplace education in particular fits quite well in medical education for several reasons. The clinical environment provides a community of practice, and the medical student is a legitimate, peripheral participant in providing medical care. Being a legitimate part of the workplace is designed to enhance professional attitudes and professional socialization opportunities. Students are peripheral, because experienced physicians and hospital staff are there to provide patient care. Contributing to patient care as a participant is what provides the experiential learning opportunities. With instruction, feedback, and supervision, students gradually do more, and therefore learn more. During this process, students learn how to connect clinical knowledge with biomedical knowledge, progress in their clinical reasoning abilities, and develop a professional identity as a physician. As students progress in their education, they develop more expertise which allows them to do even more as a participant in medical school and residency.

When clerkships capture the essential elements of experiential learning, these experiences prove to be powerful learning environments. Many of the benefits of experiential learning through clerkships have to do with gaining authentic experiences and developing clinical reasoning. However, workplace learning can be effective in expanding professional knowledge and promoting critical thinking in medical students (Maudsley & Strivens, 2000). Workplace

learning programs have also led to positive outcomes with learning communication skills (Koponen, Pyörälä, & Isotalus, 2012) and reflective listening (Carr & Carmody, 2006). As medical students also learn about different careers in medicine, they begin to develop desires to choose one of the medical specialties as they experience the social and career-oriented aspects of their clerkships (Maiorova, Stevens, Scherpbier, & van der Zee, 2008).

Something worth pointing out at this point is that, in many cases, the term "medical scribe" can be used in place of "medical student." Medical scribes work directly with physicians in the clinical setting. They play an integral role in the medical team by helping with the documentation, as well as facilitating the work done by physicians. They receive training, supervision and evaluation. They work the same shifts as the physicians, and they interact with many of the same individuals during the course of their work. These aspects make medical scribe experience similar to clinical clerkships, where medical students learn primarily through workplace learning. If medical students with this experience have learned important things about medical practice, professionalism, or other things, their learning in medical school may be enhanced. This study aims to learn whether or not this is the case.

A major difference between the current study and many of the studies on workplace learning is that they traditionally focus on what medical students learn by working in the clinical setting for a few weeks or months. My study examines the impact of a longer experience. The medical scribes in my study have worked for at least six months, and some of them worked for much longer periods. Also, the medical scribes in my study did this as an elective experience, which may make it a different experience from something which students are compelled to do.

Medical Scribes

Medical scribes were first described in the literature in 1974. The system described by Lynch (1974) used nurses to document aspects of the patient encounter in an emergency department. Witt and Haedtler (1975) described a similar system a year later. Some years later, Allred & Ewer (1983) described a system of medical scribes who were not nurses, but who had been trained in medical terminology, anatomy, and medical records. They also described some of the benefits of employing medical scribes, which included the ability to produce medical records that were more accurate and complete, and improved patient flow in an emergency department. Recent studies (Arya, Salovich, Ohman-Strickland, & Merlin, 2010; Marshall et al., 2012; Meyer, 2010) expand on the benefits of scribes in emergency departments. Scribes can also benefit physicians in other settings (Bank et al., 2013; Koshy, Feustel, Hong, and Kogan, 2010; Norris, Harris, and Stringer, 2011). Though there are not many studies on medical scribes, those in existence seem to indicate that physicians like working with them, patients overwhelmingly accept having a scribe in the room with them, and medical scribes save time and money for physicians and hospitals.

This study will add to the literature on medical scribes in a unique way. Because the body of work in this area focuses on the medical impact of medical scribes, my study will expand the literature to include the educational impact of medical scribe experience. There is a growing body of literature about experiential learning for students in medical school, but very little on how experiences before medical school may be helpful to students.

Clinical Diagnostic Reasoning

A major theme in medical education is the development of clinical reasoning, or the ability to sort through a set of clinical features in order to find an accurate diagnosis (Pinnock &

Welch, 2014). While biomedical knowledge and formal study of medical conditions is necessary, clinical experiences that allow students to see medical conditions first-hand and learn how to make appropriate clinical decisions are vital. Improvements in clinical reasoning are vital to effective medical care, avoiding unnecessary medical tests, practicing evidence-based medicine, and minimizing diagnostic errors (Zwaan, Schiff, & Singh, 2013).

Researchers have been studying clinical reasoning for roughly the past 30 years. In 1990, Schmidt and colleagues (Schmidt, Norman, & Boshuizen, 1990) proposed the idea of "illness scripts." From seeing many different patients and clinical presentations of disease, medical students begin to associate things they see in the medical clinic with specific diagnoses, which allow students to gradually build a foundation for clinical reasoning on the experiences they have during their clerkships and residency. Schmidt and colleagues (1990) also proposed a stage theory of clinical reasoning. In this model, students learning clinical reasoning move through a progression of thought processes, eventually leading to effective and efficient diagnosis. Stage 1 is the development of elaborated causal networks, in which individual concepts, once stored in memory as discrete facts, begin to connect with each other as the student perceives relationships and new connections. In Stage 2, repeated experience with patients' medical histories and signs and symptoms of disease begin to form more specific networks, combining biomedical science with some of the patient encounters a student has experienced. Illness scripts begin to form in Stage 3, but not without extensive experience, study, practice, and feedback from clinical instructors. With many years of patient encounters, students may progress to Stage 4, where detailed facts from specific patient encounters are used to form "instance scripts," which are powerful learned experiences. It is believed that physicians recognize diseases by how similar

one patient is to one that is stored as an instance script. This method of pattern recognition is one of the things that distinguishes expert physicians from novices.

Clinical reasoning involves the use of two different types of cognitive processing. Monteiro and Norman (2013) describe the first is a fast, unconscious retrieval process (System 1), and the second is a slower system where logic and analytical reasoning dominate thought (System 2). System 1 thinking helps to quickly arrive at a diagnosis, but it can also lead to biases and errors. System 2 helps to self-correct errors that can arise with System 1, leading to more accurate decision-making.

Clinical reasoning is a very important part of medical education, and several authors have discussed ways to teach and evaluate it. Bowen (2006) strongly advocates for students to have extensive, rich experiences with patients, especially patients with common problems, in order to develop illness scripts and pattern recognition skills. She believes that different questioning strategies based on the extent of prior experience should be used by supervisors in the clinical setting. Bowen also advocates for students to receive feedback on their reasoning skills, and for students to read about diseases in ways that foster clinical reasoning. Elstein (2009) states that appropriate use of algorithms in medical education, reflection and deliberation, and improved feedback about the diagnostic process may improve clinical reasoning and overall patient care.

Many authors (Artino, Cleary, Dong, Hemmer, & Durning, 2014; Eva, 2005; Norman, 2005 and 2006; Norman, Young, & Brooks, 2007; Pinnock & Welch, 2014) have shown the connection between clinical reasoning and learning experiences, or that clinical reasoning can be developed through properly-constructed clinical experiences. The keys to success seem to be clinical instructors who make the clinical thought process more concrete, feedback on the clinical reasoning process, and experience with a large number of patients. There appears to be a solid

case to be made that experiential learning is effective in developing clinical reasoning, and that improved clinical reasoning is one way to reduce medical errors (Zwaan et al., 2013).

Because of the nature of their work experiences, I believe that medical scribes learn some things about clinical reasoning. Anecdotally, I have heard about times when they could anticipate the questions that patients were asked by the physician, and other times when they have been an active participant in the clinical reasoning process. Learning clinical reasoning may come from the nature of the medical records they use. In the emergency department (ED), each patient's chart has a section called the ED Course, which contains a narrative of the procedures done and responses to them while in the emergency department. Often times this section includes some of the physician's thought processes that demonstrate the need to take certain actions. As the scribes dictate this narrative directly from the physicians, it is logical to believe that they may learn about clinical reasoning by hearing it directly from the experts and writing it in the medical record.

Self-efficacy

Medical education literature cites self-efficacy as a critical component of student success (Turner et al., 2008) Albert Bandura has written extensively on this topic, and he defines self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). These beliefs become significant determinants of the course of action individuals take in their lives. Self-efficacy, or rather a person's perception of his/her own self-efficacy, can have an effect on the choices a person makes, expectations of success, and the effort one puts into the choices he or she makes (Bandura, 1977). If a person perceives a high degree of self-efficacy, he or she is more likely to make certain lifestyle, educational, or career choices, and persist in setting and

obtaining goals relating to them. This comes if one believes that he or she is capable of accomplishing certain tasks, and if he or she is confident that accomplishing these tasks will lead to the expected outcome. On the other hand, a low perception of self-efficacy will result in lower expectations and less effort expended to obtain them.

Perceived self-efficacy can influence how people think and act through cognitive, motivational, affective, and selection processes (Bandura, 1993). Cognitive processes are related to human behavior by the type and quality of goals that a person sets. Greater self-efficacy results in higher goals, and more commitment to achieving them. As individuals think about their goals, and the benefits of achieving them, they create incentives and take action based on their motivation. Affective processes reflect the degree to which individuals feel stresses, depression, anxiety, or motivation as they set and work on their goals. People with high self-efficacy focus on the benefits of achieving their goals primarily feel they are in control of the process, while those who have low self-efficacy may feel overwhelming anxiety, and will focus on the barriers and threats to their goals. People with low self-efficacy may experience anxiety and depression, especially when they try to cope with things with which they are not confident they can successfully overcome. Interestingly, Bandura (1993) states that these individuals may do better after their efficacy improves due to "guided mastery experiences," perhaps linking experiential learning to improved self-efficacy. All of these factors have a direct influence on the choices (selections) people make. It is natural for people to avoid activities in which they do not believe they can successfully participate, or in which negative consequences may arise. Conversely, people frequently choose to participate in activities in which they believe they will be successful, and activities that will bring desired outcomes. The choices people make in education, vocations, and social circles will determine the long-term outcomes of their lives.

Self-efficacy and experiences are linked to each other in several ways. Prior experiences in certain situations will give feedback to the individual to be able to assess the external environment, and will provide information that will influence motivation and progress toward achieving one's goals. For example, a person may perceive a high degree of self-efficacy in activities that he or she has done before, or for activities that resemble previous experiences. Similarly, activities that are unlike past experiences may cause an individual to perceive less self-efficacy. However, when an individual seeks new and unfamiliar opportunities, the lack of prior experiences may be a good thing, as a person is motivated to avoid negative past experiences.

Academic self-efficacy is a particular component of success in medical school (Gandomkar et al., 2016). Along these lines, academic self-efficacy may have a specific role in this study. The belief that one can be successful in an academic situation may be due to prior experiences with the academic material. A high degree of academic self-efficacy has been shown to be correlated with academic success in college students (Chemers, Hu, & Garcia, 2001). Yu, Chae, and Chang (2016) found that academic burnout in medical students was related to low levels of academic self-efficacy, and that a high amount of academic self-efficacy could offset academic burnout caused by socially-prescribed perfectionism.

Social Cognitive Theory

There are many ways in which the social environment can influence how individuals think. When studying work experiences, it is important to understand how the work environment can influence the way people think about themselves. Albert Bandura has also written about social cognitive theory of self-regulation (Bandura, 1991), which builds on the concept of self-efficacy. Individuals will self-regulate their behavior based on the interpretation of the social

and physical environment, their own thoughts, feelings, and relationships, prior experiences, and an individual's perception of his or her ability to make choices (self-efficacy). The process of self-regulation involves a series of psychological functions which allow the individual to be aware of environmental influences and internal motivational factors, and then evaluate the consequences of actions to be able to repeat or avoid certain outcomes. Individuals can be agents by taking their own actions within a broad social network (Bandura, 2001) after they consider their environment and the potential consequences of the proposed actions.

Part of social cognitive theory examines the interplay between cognition and motivation. If individuals set goals, they will demonstrate higher motivation and give more effort to achieve the goals, compared to situations where goals or expectations come from an external source (Bandura, 1991). During the goal-achievement process, individuals look for positive and negative motivators to provide a sense of how well the goals are being accomplished. As people work on achieving their goals, they regulate their motivation and effort with an "anticipatory proactive system," and not just negative feedback (Bandura, 1991).

Social Cognitive Career Theory

There appears to be a solid link between an individual's career choices and the thoughts and perceptions he or she has about their career choices. Building further from the concepts of social cognitive theory, Lent, Brown, and Hackett (1994) introduced a way in which career choices are developed. Social cognitive career theory (SCCT) provides a conceptual framework to help explain the social and cognitive factors that can influence career decisions. These factors include the perception of self-efficacy, outcome expectations, the development of enduring interests, and learning experiences. See the figure below. Because of the cognitive and social effects of experiential learning opportunities, career interests and decisions can be influenced by

the external environment as well as one's own cognitive and affective processes. People make career decisions based in part on their interests, partly on the inputs they bring with them (gender, race, etc.), and also due to their perception of self-efficacy as it applies to various tasks and vocations. In SCCT, the social and cognitive factors listed can influence their expectations, interests, goals, and actions related to career plans.

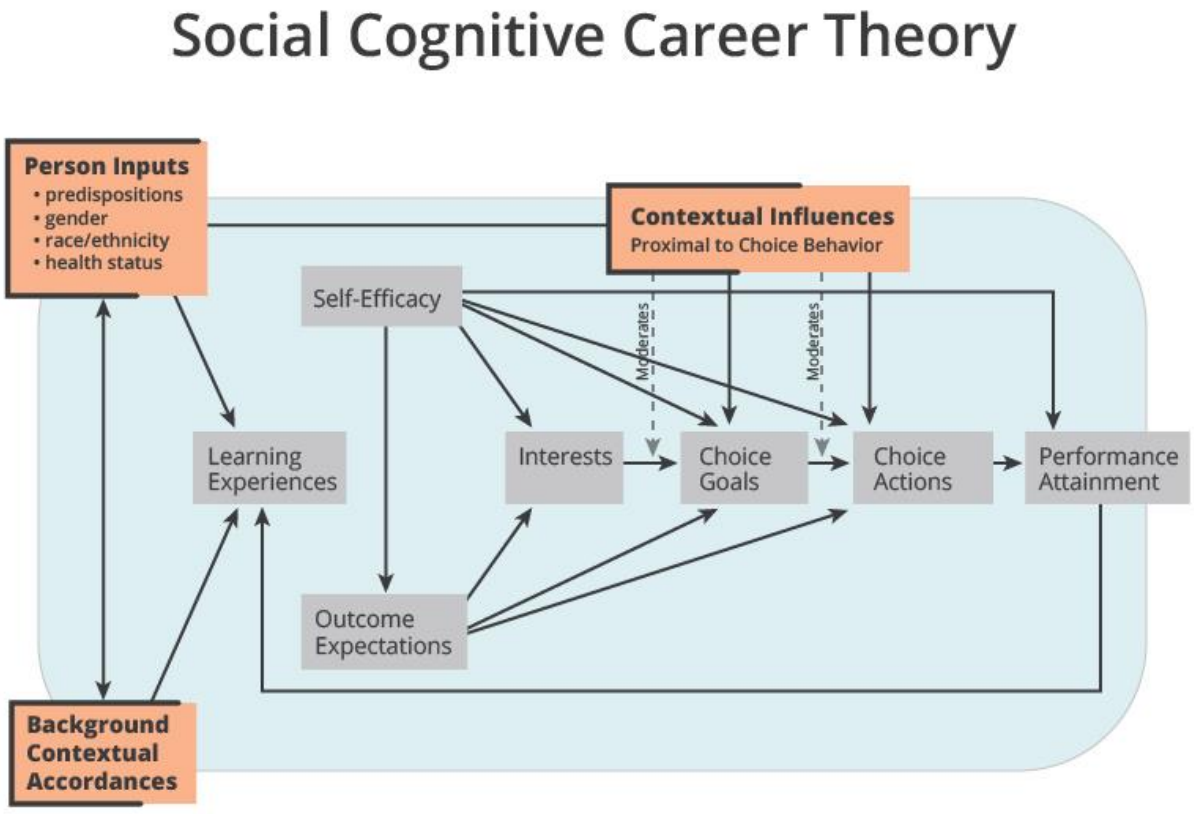


FIGURE 3: Social Cognitive Career Theory

In a later paper, Lent, Brown, and Hacket (2000) add to the discussion of SCCT by addressing career barriers. SCCT may help explain how individuals perceive and overcome traditional barriers to careers. For example, environmental supports, such as faculty support and quality learning experiences may be able to facilitate, support, and enable students from racial-ethnic minority groups to pursue certain careers, despite perceptions of difficulty. Perception of support (or the lack of it) can influence the ability to cope with difficult situations, the degree to

which people have a positive outlook on their career, and the goals and outcomes they choose to set for themselves (Lent et al., 2000).

Experience and learning are closely tied to SCCT in several ways. Schaub and Tokar (2005) found that individuals' personality can directly and indirectly relate to vocational interests, and that this manifests itself through learning experiences and sociocognitive aspects. They also found that learning experiences relate strongly to self-efficacy perceptions and outcome expectations. A further study (Tokar, Thompson, Plaufcan, and Williams, 2007) found that personality traits, gender, and conformity to gender roles played a role in relating to some types of vocational learning experiences. More recently, Thompson and Dahling (2012) examined how the perception of social status and learning experiences fits within SCCT. Perception of social status (PSS) is loosely tied to socioeconomic status (SES) as well as race/ethnicity and social class, and is a measure of one's own perception of social status identity. They found that PSS was positively related to learning experiences in some career domains, self-efficacy, and outcome expectations. They also found that learning experiences were positively associated with self-efficacy and outcome expectations. Therefore, there is reason to believe that PSS may relate to career interests, actions, and decisions, and it may be useful to assess PSS in career counseling. What remains to be seen is if a change in PSS, particularly during the college or vocational years, can bring the same correlations in career choices, self-efficacy, and learning experiences. Finally, Conklin, Dahling, and Garcia (2013) found that career decision self-efficacy was related to affective commitment to a college major, expected career performance, and when students perceived that their abilities and demands fit with their major.

Professional Identity Development

In addition to knowledgeable physicians, medical schools strive to help medical students develop as caring, competent members of a profession who serve the community and society. Cruess et al. define profession as:

> An occupation where core element is work based upon the mastery of a complex body of knowledge and skills. It is a vocation in which knowledge of some department of science or learning or the practice of an art founded upon it is used in the service of others. Its members are governed by codes of ethics and profess a commitment to competence, integrity, and morality, altruism, and the promotion of the public good within their domain. These commitments form the basis of a social contract between a profession and society, which in return grants the profession a monopoly over the use of its knowledge base, the right to considerable autonomy in practice and the privilege of self-regulation. Professions and their members are accountable to those served and to society. (p. 74)

While inspiring and noble, this complex description of a profession poses challenges to educators. Demonstrating mastery of knowledge and skill can be done through the medical curriculum, but is not always easy to do, even with the best students. Developing affective traits like altruism, commitment to service, and ethics can be even more difficult to identify, instill, and assess. Nonetheless, developing a sense of professionalism and professional identity is a major part of medical education in the United States (Cooke et al., 2010).

Although medical education has traditionally been heavily-rooted in traditional sciences, the social science aspects of medical education (professional identity, commitment to service, etc.) are being increasingly emphasized and studied. Historically, there has been funding and support for research in the traditional sciences of biology, chemistry, and physics, as well as their

medical applications. As Monrouxe and Rees (2009) point out, there are several factors that have contributed to this shift. One is the expanded number of journals devoted to medical and health sciences education, which are included in the "hard science" categories in most indexing programs. Another reason is that medical education research has been published in many different journals, with many different target audiences. Medical education research has been used to develop new policies and guidelines used in many different aspects of healthcare and education.

Professional Identity Development in Medical Education

There appears to be a solid link between professional identity development and experiences with professionals in the field. One group of literature in this area gives a solid array of theories that are useful in the process of "becoming a doctor." Because of the interpersonal experiences that occur in medical education, Monrouxe and Rees (2009) propose that the full spectrum of medical education is as much a social science as it is part of the traditional sciences. Howe's (2002) review on literature in professional development in undergraduate medical students found that successful professional development was based on explicit values demonstrated in the work/learning environment that are modeled by colleagues. Wilson and colleagues (2013) argue that medical educators need to be aware of the social factors that contribute to professional identity formation, and structure the clinical learning environment to take advantage of the opportunities for medical students to successfully develop a positive identity in the profession. Burford (2012) relates professional identity formation in medical education to the framework of social identity theory, and suggests that educators use this theoretical framework to address changes in medical education. Helmich and Dornan (2012) build on Burford's work by comparing social identity theory to some other theoretical

frameworks that are useful in medical education. Holden et al. (2012) expand the discussion on professional identity formation in medical education to include the overlapping domains of professionalism, psychosocial identity development, and formation. Recently, Goldie (2012) summarized many of the contemporary theories and strategies for professional identity development, and gave medical educators a rich foundation on which to structure experiences that will allow medical students to develop into competent and caring physicians. Lastly, Monrouxe (2010) reminds us that learning to talk, act, and think like a doctor are important aspects of medical education, because they relate closely with success for medical students and residents.

There is also a large body of research that examines the impact of experiences on the development of a professional identity. Smith et al. (2013) found that medical students enhanced their professional identity by contributing directly to patient care. Finn, Garner, and Sawdon (2010) discovered the ways that medical students perceive professionalism, and how they feel they are judged in both the clinical and online environments contribute to their development of a professional identity. Helmich et al. (2012) found that medical students have a wide range of ways that they relate to other people and make meaning of their initial clinical experiences in medical school. In an earlier study, Helmich et al. (2010) found that medical students developed new respect for nurses by working directly with them. Interestingly, this study showed no change in the students' views about physicians, demonstrating that experiences with a specific group of professionals may only have an effect related to that group. Furthermore, feeling included in the exclusive social network of physicians can greatly enhance the sense of professional identity among medical students (Weaver, Peters, Koch, & Wilson, 2011). Having clinical and social experiences in medical school has been shown to contribute to the formation

of a professional identity, and to contribute to the thought processes during professional dilemmas (Ginsburg & Lingard, 2011). Finally, Monrouxe, Rees, and Hu. (2011) found that medical students with more clinical experience had a better understanding of professionalism than novice students, and suggested that clinical experiences may be necessary to help teach professionalism in ways that lecturing simply cannot.

Another factor in professional identity development is the idea of students learning from role models. In a recent systematic review of the literature, Passi et al. (2013) summarize the primary themes of role modelling in medical education. They identified six themes from the best research articles on role models in medical education. The first was the attributes of positive doctor role models, which includes clinical attributes, teaching skills, and personal qualities. The second was the personality profile of positive role models, and this included attributes such as high achievement striving, competence, and conscientiousness. The next theme was how positive role models influence students' career choice. Many medical students identify role models before graduation, and their career choices are shaped in part by these role models, even if the role models do not try to recruit students into their choice of medical specialty. Another theme explained the process of positive doctor role modelling for medical students. This process involves observation, reflection, and reinforcement, and it may be informal and unplanned by the student. On the other hand, another theme was centered on the idea of negative doctor role modelling. Negative role modelling may occur when students see doctors use derogatory humor, display extensive criticism of patients or colleagues, and other behavior that students perceive that is not appropriate or acceptable based on their values and the values that have been instilled in them by their institutions. The last theme recognizes the importance of culture, gender, and diversity. When students identify a role model, they take these factors into consideration, and

diversity training is important for medical school faculty to allow them to gain an appreciation for students from other backgrounds and cultures. All of these factors are important in my study, because I have heard the medical scribes describe many positive and negative role models they have identified during their time working with the group of physicians, and I am confident that the impact of their role models will be an important part of their experiences.

Research on education in similar allied health professions sheds some additional light on professional development that may be useful to this study. Worthington et al. (2013) found that nursing students with a greater sense of professional identity persisted in school at a higher rate than students with less professional identity. Heung and colleagues (2005) found that being involved in the severe acute respiratory syndrome (SARS) outbreak of 2003 helped nursing students develop their sense of professional identity, because they banded together and used their knowledge and skills in a situation where they perceived a moral obligation to act. Gallagher (2007) found that nursing students rely heavily on their preconceptions and personal beliefs about nurses to construct their views of nursing care and what it means to be a nurse. Their preconceptions came primarily from their personal and educational experiences interacting with nurses. Additionally, professional identity is important as nursing students transition out of education and into practice (Johnson, Cowin, Wilson, & Young, 2012). New physical therapists develop a sense of professional identity as they learn formally and informally, increase their confidence and skills, and feel a part of a professional environment (Hayward et al., 2013). Directly measuring professional identity in allied health professionals can be problematic (Cowin, Johnson, Wilson, & Borgese, 2013), but it has been well-established that professional identity develops in part due to the experiences that students and professionals have in their professional environment.

Anticipatory socialization is another concept that may be applicable to this study. This concept refers to the idea that prior interaction with a group of professionals, along with other lived experiences, can shape professional identity (Weidman, Twale, & Stein, 2001). It is possible that medical scribes may base their decision to go into medicine partly on their experiences working with physicians, and that they can begin to form a professional identity that is based on their interaction with the physicians and professionals with whom they work. Anticipatory socialization has been shown to account for some of the career choices of veterinary medicine students (Kedrowicz, Fish, & Hammond, 2015). A high level of motivation to enter a career in pharmacy has been correlated to a high degree of anticipatory socialization (Keshishian, 2010). The current study may show that the career decisions of medical scribes can be influenced by their interaction with physicians.

Emotional Intelligence

Emotional intelligence has been defined as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1990). A high level of emotional intelligence can help make interpersonal relationships more satisfying, helps manage stress, is a quality of good leaders, and is directly related to success in work that can be emotionally charged, such as medicine (Cherry et al., 2014). Arora et al. (2011) showed that medical students with high emotional intelligence still exhibited stress during a surgical learning experience, but recovered better compared to students with lower emotional intelligence. A high degree of emotional intelligence has been associated with lower risk of burnout and higher job satisfaction among physicians (Weng et al., 2011). While emotional intelligence can be measured by a variety of assessments, it has not shown to be a better

predictor of success in medical school than standardized admission tests (S. E. Carr, 2009; Leddy, Moineau, Puddester, Wood, & Humphrey-Murto, 2011).

I believe the experiences that medical scribes have will help them develop emotional intelligence. One reason is that as the scribes observe highly-emotional and stressful situations, they are able to see how trained professionals handle the situation. Also, they are able to gain a better understanding of their own emotions through reflection and dialogue with peers and professional role models. Because structured experience with simulated patients during the clinical years of medical school has been shown to develop emotional intelligence in medical students (Cherry, Fletcher, O'Sullivan, & Shaw, 2012), it may also be possible that medical scribe experiences will be able to help them develop control of their emotions, as well as the desire to provide empathetic and compassionate care.

Conclusions

In this literature review, I have laid out the primary theoretical frameworks that I will use to develop the research methods and analysis for this study. Based on some of what the medical scribes have told me of their experiences, these theories seem to fit well with their experiences. However, due to the exploratory nature of this study, it is impossible to know precisely which theories will be relevant. It is possible that some of the frameworks will not be relevant, and others that I have not included may become relevant. As I begin to analyze the data, I am prepared to add to the literature background to relate it to what the participants offer.

CHAPTER 3: RESEARCH METHODS

In this study, I sought to discover the experiences of medical students who once worked as medical scribes in a hospital emergency department prior to matriculation. The research questions guiding this study are:

1. What experiences do medical scribes have in the course of their pre-medical work?
2. How do medical students relate experiences from working as a medical scribe to experiences in medical school?

In this section, I will discuss qualitative research methods in general, and thematic analysis in particular. I will identify the specifics of the data collection process, the sample of participants, and the methods of analysis.

The Qualitative Paradigm

The nature of this project is to begin to explore a phenomenon that has not previously been examined in the literature. While there is a theoretical foundation for this study, there is no existing literature about the experiences of medical scribes on which to build. Taking a quantitative approach to assess the experiences of medical scribes would require the research to test a wide range of hypotheses, with no evidence to guide the inquiry. It is likely that even a well-designed survey would not fully capture the perceptions of medical students with the experience of working as a medical scribe. Therefore, the exploratory nature of this study does not lend itself to be explained through quantitative research methods.

Qualitative research offers several methods to explore a topic that may not be as easy to measure with numerical values, or where there may not be a specific hypothesis to test, or when the issue being studied is complex (Creswell, 2012). The topic of how medical scribe experiences affect medical students is a new concept, which needs to be explored in more detail

before specific hypotheses can be developed and tested. Because the literature provides no insight to what this phenomenon is, it is necessary to spend some time with the people who have these experiences to fully learn and appreciate what their experiences mean to them.

With this project, I am taking a social constructivist world view (Creswell, 2009), because I seek to gain understanding of what is going on in the world. With this study, I want to understand the meaning that these medical students have constructed about their experiences. In order to do this, it is necessary to account for the historical and social context in which these experiences have been obtained. This worldview lends to asking broad, open-ended questions that capture a robust set of ideas from individuals.

Participants and Sampling

I used both purposive convenience sampling and snowball sampling to recruit participants for this study. To begin, I recruited participants from the pool of individuals from the SVSU medical scribe program who have worked as a medical scribe in a physician office or hospital and who were currently attending medical school at the time of data collection. I contacted them through e-mail to invite them to arrange an interview with me. At the end of each interview, I asked them to refer eligible individuals to be included. To be eligible for this study, participants must have worked as a scribe in a physician office or hospital for at least 3 months, and be a current medical student as defined in the previous chapter. I began by interviewing 8 individuals from my program who meet these criteria, and two from other programs who met the inclusion criteria. Through referrals, I was able to interview a total of 16 participants, 8 from my program and 8 from other programs.

The table below gives a description of the participants. Of note, there were participants who were attending medical school in Michigan, Minnesota, New York, North Carolina,

Pennsylvania, and the Caribbean. The average length of employment as a medical scribe was 22 months, with employment ranging between 6 months and 5 years. The participants reported seeing over 23 patients on average during each work shift. Both allopathic medical students (7) and osteopathic medical students (9) were included. Most of the participants worked as a medical scribe in an emergency department, with one having worked only in an orthopedic surgery clinic. In addition, several of the scribes had additional medical scribe experiences in either cardiology, a neurosurgery clinic, or internal medicine office.

TABLE 1: Participant Profile

Mean Age:	25.3 ± 2.7
Males:	7
Females:	9
1st years:	6
2nd years:	4
3rd years:	4
4th years:	2
UG states represented:	California, Indiana, Michigan, Minnesota, Washington
Medical school states represented:	Michigan, Minnesota, New York, North Carolina, Pennsylvania, Caribbean
# of MD students	7
# of DO students	9
Average time worked as a medical scribe	22.5 ± 14.5 months Range: 6 months to 60 months
Average # of patients seen per work shift	23.7 ± 11.5 Range 20.6 ± 9.4 to 26.7 ± 12.9
Settings	ED (15); orthopedic surgeon clinic (1); Some experience in cardiology, neurosurgery clinic, internal medicine
Other pre-medical experiences 6 students had significant work or volunteer experiences	Hospice, home health, CNA experience, a medical mission trip, hospital shadowing, patient ambassador, and memory care/assisted living

TABLE 2: Research Participant Summary

Name (alias)	Sex	Months Worked as a Medical Scribe	Year in Medical School	MD or DO Program
Wendy	Female	24	4	MD
Alice	Female	12	1	DO
Bruce	Male	12	4	MD
Carol	Female	15	1	MD
Barbara	Female	39	3	DO
Bob	Male	6	3	DO
Sally	Female	60	3	DO
Dennis	Male	16	2	DO
Paula	Female	24	2	DO
Jim	Male	9	2	MD
Maureen	Female	24	3	DO
Sheila	Female	36	1	DO
Jeff	Male	7	1	MD
Sharon	Female	24	2	DO
Michael	Male	21	1	MD
Derek	Male	27	1	MD

Data Collection

I conducted interviews to gather the data necessary to answer the research questions. This study was approved by the Institutional Review Boards from Michigan State University and Saginaw Valley State University. All participants signed approved consent forms prior to the interview. With the consent of the participants, I recorded the audio from the interviews, which was then transcribed verbatim and then compared to the original audio recordings for accuracy. Each participant was given a copy of their transcribed interview and asked to verify the transcription as part of the member checking process.

I first asked the participants to talk briefly about their past and how they came to be a medical student. Next I asked them to discuss their thoughts on how working as a medical scribe has played a role in their medical education, and to describe experiences they are having (or have had) as medical students that cause them to reflect on their medical scribe experiences. During the interviews, I prompted the participants to discuss their ideas in more detail, when necessary.

The interview protocol can be found in Appendix 1. The interviews lasted between 20-90 minutes in length. All interviews were recorded and then transcribed verbatim.

Thematic Analysis

I used inductive thematic analysis to determine the main ideas reported by the participants in this study. Braun and Clarke (2006) define thematic analysis as "a method for identifying, analyzing, and reporting patterns (themes) within data." Thematic analysis allows for themes to be identified both within a single data item, such as one interview, as well as a large data set incorporating numerous interviews. I used inductive analysis of the interviews, looking for patterns and themes within the data, and not attempting to relate the ideas to outside literature or theories. This particular method fits very well within the goals of this study and my constructivist world view, because I am looking to make an early discovery into the ideas of medical students' experiences as medical scribes without presupposition or attempt to tie into other theoretical frameworks.

Thematic analysis is a tool to develop thematic networks (Attride-Stirling, 2001), which provide ways to understand an issue or significance of an idea. This method has been successfully used to capture the thoughts and ideas of patients experiencing medical treatment (Hudson, Ogden, & Whiteley, 2014), as well as students' perspectives of medical education (de la Croix, Rose, Wildig, & Willson, 2011) and career choices in medicine (Hill & Vaughan, 2013). These latter two instances apply directly to this current study, so I feel thematic analysis is an especially relevant method to use.

I followed the steps of thematic analysis given by Braun and Clarke (2006) in this study, who identify six phases of thematic analysis. In the first phase, I familiarized myself with the data by having it transcribed verbatim, and then reading the transcripts multiple times while

taking note of my first impressions of the data. In the second phase, I coded the data systematically across the interviews. In the third phase I searched for themes by grouping coded data together. In the fourth phase, I reviewed and refined the themes that I found. Once the themes were refined and a map of the themes was developed, I proceeded to phase five, where I defined and named the themes I identified. For each theme, I organized the coded data in a way that supported the narrative, and allowed for the most interesting aspects to be presented. And lastly, I produced the report of the themes that accurately portrays the ideas presented in the data. I used rich examples to illustrate the points I made during this phase.

Braun and Clarke (2006) state that there are two levels of reviewing themes in thematic analysis. The first level requires the researcher to read the individual coded data pieces for each theme to make sure they form a clear pattern. In this level, a thematic map can be created to illustrate the differences and links between the themes that have been identified. The second level requires the researcher to examine the themes with respect to the whole data set. As this is done, I made sure that the themes truly fit within the bigger picture of the data, and I looked for additional data to code that can go along with the themes I have identified. It is worth stating that the coding and theme-development processes are cyclical and reflexive, and that it can take several rounds of these steps to fully develop the themes that are represented in the data.

Role of the Researcher

I am in a unique situation within this project. As the faculty director of the medical scribe program at SVSU, I have been the professor for each of the training courses. Each of the participants from SVSU has been a student in one or more of my classes, including the training courses. Because these courses had less than 20 students, I have been able to get to know these students quite well. During the time of their employment, I had interaction with all of them at

least a few times per year, and with some of them even more frequently than this. Because of the relationship I have with these students, I was able to communicate well during the interviews. Also, because I am very familiar with the kind of experiences the medical scribes have in the hospital, I was able to understand the students as they related to their experiences.

Another unique aspect to my role is that I have interacted with many different physicians who work with the scribes in the hospital. As I converse with them, I have heard many of them comment about what they think this kind of experience is doing for the medical scribes as they prepare for medical school. They make these comments based on their personal experiences preparing for medical school. Because most of the physicians did not have experiences like this prior to medical school, they have speculated about what this experience could do for a pre-medical student.

Quality and Validity

Many qualitative researchers refer to the standards by Lincoln and Guba (1985, p. 290-292). These standards include internal validity, external validity, reliability, and objectivity, and their definitions of them are included here. Internal validity refers to the degree to which the outcome is related to an independent variable. External validity describes how much the results can be generalized in other settings or with other populations. Reliability is used to note how consistent, predictable, or dependable the results are. Objectivity can refer to the absence of subjectivity, but it also means that the results can stand up to scrutiny from multiple external observers.

There are several ways to establish each of these standards for qualitative research. I designed my study to incorporate several of the methods that Hanson et al. (2011) present for medical educators to establish each of these standards of trustworthiness in qualitative research.

On the issue of internal validity, I used a skillful interview technique, asking well-worded questions in an organized fashion that helps the participants probe for deeper insight. I had the interview questions reviewed by an experienced qualitative researcher. To address external validity, I provide a detailed description of the sample, setting, and results, so that those who read the study can make appropriate decisions about the transferability of the results. To maximize reliability, I conducted member checking of the data from the interview. In addition, I identified several colleagues with research experience who were willing to do peer-debriefing with me at different times during the data collection and data analysis. These individuals understand the project, but are not a part of it, and they were able to appropriately discuss and/or challenge the ideas that come from the analysis. Lastly, I made an audit trail, and kept a record of the decisions I make about the data collection and analysis, along with the rationale to support my decisions. This helped support the objectivity of the study.

Ethical Considerations

This study poses no significant ethical problems. In regards to the sample of participants, some were individuals whom I know quite well, and there were others whom I had not met prior to the interviews. None of the participants seemed to have problems speaking freely to me about their experiences. While I have kept in contact with some of them, I was careful to avoid any conversations with them about the phenomenon being studied, for the sake of minimizing any bias in the study. I did not ask them questions that were of a negative or sensitive nature, so there was little risk that they would experience any negative effects from participating in the interviews. Also, because they selected the experiences or ideas they wanted to share, it was unlikely that they would select things of an extremely sensitive nature. The participants

appeared to be comfortable discussing all of the interview questions, and did not have any problems with me asking follow-up questions.

Because many of the participants know me well, they may have been somewhat biased to provide answers that would portray their experiences as medical scribes in the best possible light. This potential for bias was minimized by precise wording of the interview questions. I took care to avoid leading questions, and I will attempt to steer the conversations to focus on the experiences they have had as medical students.

Limitations

There are several limitations to this study. I worked alone on this project, and I did not have a group of researchers with which to share and compare ideas. I relied heavily on my journal entries, peer-debriefing colleagues, and member checking throughout the process. I also asked faculty member with expertise in qualitative research methods to review and give feedback on the methods and interview questions in this study.

Another limitation of this study is that some of the participants were recruited from the same medical scribe program. They worked in the same hospital with the same group of physicians and healthcare providers. This can be a strength in that their experiences were consistent with each other, but it does limit the generalization of the results to a degree, because not all scribe programs and hospitals are similar to each other. However, I was able to recruit more participants through snowball sampling, and their accounts strengthened the data and the generalizability of the conclusions that can be made.

Lastly, my own biases and assumptions about this program may be a limitation of the study. I have been very conscious to not talk with the participants about their experiences related to being a medical scribe. However, when they worked as scribes I would speak with them frequently about their experiences, so I feel like I can reasonably anticipate many of the things

they will choose to discuss. Additionally, because of my role in this program, I will need to carefully check my assumptions so they do not lead me to conclusions that are not supported by the analysis.

CHAPTER 4: RESULTS

This chapter presents the findings from participant interviews as they related to the research questions composed for this study. In this chapter, I will present the results of the analysis, which includes the participant demographics, a presentation of the themes related to the interview questions, and some of the supporting evidence for the themes. I interviewed 16 individuals who were current medical students at the time. All participants had worked as a medical scribe for at least 3 months prior to enrolling in medical school. The primary themes that I drew from the data were that medical scribe experience provided the participants with a rich framework for learning, an informed commitment to the profession, and confidence in their abilities and career decisions.

Becoming a Medical Student

To help me better understand their backgrounds, I asked the participants to tell how they came to be a medical student. The participants in this study had a variety of reasons to choose a career in medicine. Several of the participants had multiple reasons to choose a career in medicine. The common themes in this section were (frequency/number of participants):

- A long-held belief that a career in medicine was right for them (10/16)
- Personal interactions with physicians (6/16)
- Courses in high school or college gave them an interest in medicine (4/16)
- They had experienced a significant medical condition in themselves, their family, or among their friends (3/16)
- Desire to improve their personal or family economic situation (1/16)

Many students had multiple reasons for choosing a career in medicine. Jeff's ideas were similar to many others in this study:

> Well, I entered undergrad sort of having a rough idea of what I wanted to get into. I knew health was the way to go and I went in there with the intention that I would go into optometry school. But at the time, I was a freshman and I was still kind of exploring my options and opportunities. So as I get into more sciences and I learned about, you know, different concepts and diseases, I figured that medical school might have been a better option because there were more possibilities. I could go beyond the eye. I could go into different systems and work with those. So yeah, that's when I actually, during my second and third year of college, is when I actually started seriously considering medical school. And yeah, that's where I actually started preparing my applications for that, thinking about things that I could do to get more involved in I guess specific fields. So from sophomore through senior year of college, I worked in an orthopedics research lab. And this was a great experience. I learned a lot about research and the translational aspect going into the clinics. So it was nice just seeing the work from bench to bedside.

Paula's motivation to go to medical school came from seeing people in her life pass away from different conditions, which led her to study the sciences. She says:

> I actually lost my grandmother, my grandfather and my aunt all in the same year when I was 10-years-old and my mom said I was always kind of interested in math and science from that point on without really any pushing. And then in high school my friend ended up passing away from acute lymphoblastic leukemia, so that kind of set the tone. I knew from that point on I wanted to go to medical school…And then my senior year of high school my aunt actually passed away from ovarian cancer, so all that adding up. And then in college I went in pre-med right away.

Some of the participants offered some additional and important ideas in this area. Part of Sally's decision to become a physician came from her family situation.

> I am a Latina. Growing up... my parents [had a high-school] education. My father has a high school education from Guatemala. He immigrated to the United States when he was 18. My mother passed her AA. Education has been pushed pretty hard in our household since we were young. My father was the main provider. He went through a lot finding jobs, off and on. We didn't have health insurance. Kind of a pivotal moment for me, as far as family goes, is me and my brother had an incident where he was jumped in the neighborhood. We didn't live in the greatest neighborhood. We didn't have health coverage, so seeing my mom persevere through that situation in mobilizing our family to find the proper services in order to get him care in a speedy fashion was empowering for me as a female. Then going through that experience and seeing all the obstacles you have to go through with being uninsured and being part of a population that is both large in Southern California—and for those who don't know how to—have a command of the English language—was very difficult. We'd sit in long lines at the county hospital trying to find specialists. My mom is taking off her work, and that gave us a hit as far as income goes. It really led me to think about medicine a little bit more seriously.

These statements illustrate the diverse reasons the participants had to pursue a career in medicine, and to choose to become a medical student. Knowing their motivation is an important step in learning how they would view the experience of working as a medical scribe.

Becoming a Medical Scribe

The participants expressed a variety of reasons about their desire to become a medical scribe. One common theme was that none of them had heard about medical scribes before

entering college, and understanding how they come to learn about working as a medical scribe is important, because it relates to their perception of the value of the experience.

As I asked participants to talk about why they decided to become a medical scribe, I was interested in learning both how they heard about this type of work, and also if they had any specific motivation for choosing to work as a medical scribe. The most common ways that the participants learned about working as medical scribes were through a friend or classmate (8/16), a professor at their university (5/16), and a university pre-medical advisor (4/16).

Derek shared how he learned about scribes from a classmate:

> I kind of stumbled upon scribing through like a family friend who's a nurse who knew of scribes at a hospital near my hometown. And they happened to also have scribes through that same company…where I was going to school. So I kind of just applied and ended up getting it and started working my junior year of college.

Barbara shared how her pre-medical advisor helped her find out about the chance to work as a medical scribe:

> I think it was our pre-med advisor at [my university] that kind of sent out an e-mail saying that there was this new up and coming concept of working in the emergency room and they were only going to, you know, accept X amount of applications and it was kind of a blessing that our pre-med advisor told us about it because I know that there's a lot of students that were looking forward to doing it and only, you know, a small number got selected, so definitely looking for something better and the opportunity just kind of fell in my arms, so that was pretty nice.

As the professor for the medical scribe training course at my institution, some students indicated that I had an influence on them choosing to take the class and eventually work as a medical scribe. Sheila said:

> I remember you [in another course] bringing up about the scribe [program], so that's actually how I found out about being a scribe. So then I took the class. I was interested. I didn't know that it was going to be in the emergency room but actually I'm thankful that it turned out to be that way.

Understanding how students learn about the idea of working as a medical scribe can be important to several groups of people. There are many companies and hospitals that hire scribes, and they typically recruit college students for these jobs. Universities that have medical scribe programs also want to send information about these opportunities to their students. Many times the positions are marketed with the message of providing good experiences for students entering health professions.

The participants had a variety of reasons for choosing to work as a medical scribe. These included gaining relevant experience, a feeling that it would help their medical school application, getting new perspectives on healthcare, and getting paid experience instead of just volunteering, among others.

Gaining relevant experience was the most common theme in this section. Given that many pre-medical students have little experience observing or working directly with physicians, and that there are very few physician shadowing program (Kitsis and Goldsammler, 2013), it is not surprising that the chance to work directly with physicians is appealing. Carol offered her thoughts about why she decided working as a scribe would give her relevant experiences for medical school and a career in medicine:

> The upside was for me working very closely with a physician, being able to not only shadow them but work with them as a colleague as well, and to also gain knowledge in medicine so learning the terminology, learning all the definitions, looking at CTs and x-rays because we do have to look through them and lab results, something like that, so a lot of hands-on experience with medicine as a premed student was ideal.

Sally saw the potential to enter the professional world of a physician to be a big draw for her.

> I thought this would be the best stepping stone to put me in the environment, in the situation to behave like a physician. The scribes at our site maintain the same hours. They did all of the documentation for the physician. We got to see everything. You shadowed them through everything. There wasn't one moment that you were separated from that physician. That was my inside look as to, one, do I like this, and two, will I thrive in it successfully. It only seems natural, if that opportunity was in front of me, to go for it.

Bob indicated that he felt the experience of working as a medical scribe would be directly applicable to his next step as a medical student:

> I thought it was very interesting that we would get to work one on one with the doctors while they're seeing patients and doing procedures, get to learn more of the health record system, and kind of get a jump on learning how to document. I thought that would be very beneficial to me going to medical school because I know that's something that's difficult to be able to get a good grasp on is charting, how to do it timely, and how to do it well.

Pre-medical students undoubtedly understand that medical school, as well as a career in medicine, are challenging prospects. The participants seemed to seek out the opportunity to work as a medical scribe because the experiences they would have would be directly relatable to them

becoming medical students and practicing physicians. Given that there are very few programs that give pre-medical students the opportunity to do active shadowing with physicians (Kitsis & Goldsammler, 2013), it is natural that aspiring physicians would want to take advantage of this opportunity prior to medical school.

Another theme was that participants would benefit more from this kind of experience than from others. This theme manifested itself in several ways. Participants felt that medical scribe experience would help their medical school application; they wanted to get paid rather than just volunteer; they valued having something to do something in the medical field during a gap year; and they would be able to truly see what a career as a physician is like. Wendy had participated in study abroad, and wanted to have something good to help her application:

> I studied abroad my junior year, which is when everyone typically does the MCAT, so then they can apply during senior year and start medical school right after, so I was real behind on that…I knew that if you're planning to go to medical school at that time, it looks better on your applications if you end up do having the gap year or more than a gap year, to try and fill that time with something medically related.

Bob also wanted something to boost his application and get more experience prior to enrolling:

> Basically I wanted more experience. I figured it would look good on my application as well. I mean, that's what we do a lot of things for, but it was also good way to fill the six months before I started medical school was a job that I could get good experience while making a little bit of cash, so I could save up a bit before med school.

Jim wanted more clinical on his application, and found that many medical schools asked him about his medical scribe experiences during the interview process:

> As I was going through my application, I felt that I was a little bit weaker on the clinical side…Once hearing about how involved the medical scribes are with not only working with the physicians in the clinic but their direct role on the actual medical charting, I really felt like in order for me to become a stronger applicant that was something that I needed to go for. And I found eventually that once I was in the application pool for medical school at my interviews several of the interviewers had asked about the medical scribe position. They were very intrigued that just coming out of undergraduate studies that I was able to have the contact with the patients that I did. I was able to see a large volume of patients and I was really able to have a lot of good discussions with the physician and gain a better idea of how they go through their thought process on seeing the patient, understanding the conditions that they're presenting with, formulating a diagnosis and formulating a plan of treatment for them. That was really made evident to me in the scribe position as I worked alongside the doctors…So that was really good for me to say that and that was something that I had brought up several times in my medical interviews. And they were very impressed that I was able to see that side of medicine.

These statements indicate that the participants felt that having work experience as medical scribes would enhance their application and consideration for admission into medical school. What is interesting is that one of the first ways that this is experience is perceived as an advantage begins with their application. This means that the perceived benefits of medical scribe work experience can be apparent before taking any classes in medical school. This is a contrast to students who enter with other experiences, such as research in a particular field, where their experiences may only be applicable to classes or rotations they experience later in medical school.

Many pre-medical students examine their classwork and work experiences through the lens of how it will influence their application to medical school. With this mindset, they are drawn to any experience that will improve their application. While it is common for medical school applicants to have a year or more between their college graduation and their application, there are different views of what should be done during those years. Many times students are working while taking the required science courses and preparing for the MCAT. Because of the competition to enter medical school, pre-medical students are eager to get any kind of experience that will complement or assist in their application process.

Positive Influences to Medical Students

Participants reported many different ways in which their experiences as medical scribes have benefitted them. Some of the benefits were realized during the application process, and others were not realized until after entering medical school.

Prior to medical school. The participants reported a number of perceived benefits of medical scribe experience that were apparent before entering medical school. The themes in this section were familiarity with various aspects of medical school, and having confidence that is due to their own knowledge as well as a network of mentors and role models. In addition to improving their application as described above, they related a number of perceived benefits from their medical scribe experience that were apparent to them during the application process. These include choice of medical school and choice of allopathic (MD) or osteopathic medicine (DO), career exploration, and specialty choice, building a professional network, and having mentors and role models.

Choice of medical school. A number of participants spoke about how their choice of medical school was influenced by their medical scribe experience. Wendy offered the following quote:

> One of the physicians that I worked with, she was a Ross graduate… she just mentioned about Ross and said, "Something to check out if you're interested in." And that's actually how I found out about Ross and that kind of started the whole journey and how I ended up getting into medical school…where I ended up in medical school was largely in part due to my role as a scribe and my job as a scribe.

Jim said the following:

> And, you know, by being in the emergency room I felt that that was a great place for me to start. And it even expanded to me working with the neurosurgeon in his office. So I think because of the uniqueness of [my medical school] and the fact that they have the students go into the clinic very early, working as a team, and going over clinical cases, it was a perfect transition for me to go from being a scribe at [my hospital] to [my medical school]. And another good positive for me is the fact that the students at [my medical school] go back to [my hospital] for their clinical rotations. So I think being a scribe in this unique instance is going to allow me to already have some networking with the physicians that are already at [my hospital] that I've already worked with. So I think that has been a really big component of the job too.

As physicians speak positively about their medical schools, pre-medical students may gain a respect for their advice, especially if they see the physicians as role models. Working as a medical scribe allows pre-medical students the opportunity to see the inner workings of healthcare and medical student training, and the medical scribes may develop a sense of

familiarity and comfort with the people and the environment. These factors may be able to influence where they choose to apply.

Choice of Allopathic or Osteopathic Medicine. A few participants indicated that their choice to pursue osteopathic medicine (D.O.) was related to their medical scribe experiences. Bob told how his experiences as a medical scribe reinforced his decision to choose an osteopathic medical program: "I worked with a lot of D.O. doctors, but I had applied to medical school prior to getting the job as a scribe; so it made me more happy with my decision."

Sharon described how her decision to apply to an osteopathic medical school was directly influenced by some of her experiences with osteopathic physicians. She relates how one particular patient encounter get her thinking of going into osteopathic medicine.

> I worked with several D.O.'s that were in the emergency room that were in the emergency room versus the MD's and something that really spoke to me was that the D.O.'s were much more about preventative medicine and more about getting to the root cause of the patient's diagnosis…I got to see kind of a unique way of the D.O. philosophy and thinking. This patient comes in. He's 18-years-old. He was coming with all these joint complaints…And she looked at the patient and looked at his legs, [she] does the full exam. Everything for the most part is normal, but she's doing an osteopathic exam and realizes his leg on one side is shorter than the other. So because of that he was having all these joint complaints just because he had a short leg. And so she was able to give him some information to an osteopath in the area and also to an orthopedic. So she realized what the problem was. Okay. Now let's fix it so you don't have this pain anymore. So that was a really defining moment for me that since she had this extra knowledge in her

> toolbox she was able to get to the root of the patients' problem …That was something that really spoke to me as well.

These were the only two participants who spoke about choosing osteopathic medicine due to their medical scribe experience. However, working closely with both allopathic and osteopathic physicians allows medical scribes to see how both practitioners work, and they can start to form their own, informed ideas of them.

Career Exploration and Seeing the Profession

Many of the participants talked about their opportunity to see what a career in medicine was really like. Bruce said:

> I was actually interested in emergency medicine as a scribe, but as I got further into being a scribe, I realized that being an emergency doctor was not my thing, you know? I saw the docs a lot of times were pretty stressed out and the hours were pretty difficult. For me, that was not my choice of life. I liked taking care of patients directly, but that moment of fear when a patient comes in and they need some time of trauma care, I wanted to avoid that situation, so I chose either internal or family medicine as my career goal to sort of look at.

Wendy described the career exploration aspect like this:

> There are a lot of things that you don't realize happen behind the scenes with the doctors. And so as a scribe… we're assigned to one physician for a shift, you're a kind of the right hand man and you help with everything. So, it gave you a good perspective of what your day could potentially be like as a future physician. And I ended up loving it, so that's why I went to medical school.

Participants discussed not only seeing what a career in medicine is like, but also seeing broad aspects of healthcare that are relevant to many different professions. Sally said:

> In addition to just being a scribe, I'm much more well-rounded about what healthcare is and what the healthcare system is like. That definitely does help me going through rotations. I am currently working in an outpatient clinic, and those are things that you now have to think of. How am I going to pay for the clinic, the patient, the insurance the payroll? What EMR do I pull up? All of that comes into play now… It's definitely given me a holistic view of what I'm getting myself into.

Barbara told about how her ability to see emergency medicine before medical school was a big advantage for her, because she may not have seen it in time to choose it as a career:

> And we don't rotate through emergency until fourth year, so some people, you know, are interested in it and haven't even really been exposed to it that much, so it will be interesting to see if those people that maybe made one rotation through it if they're end of changing their mind or if they'll end up sticking through it. I think that, you know, even though we don't rotate through until fourth year I got so much experience when I was younger, before I started school, that I could make an educated decision as to whether it's something I want to do for the rest of my life.

Almost all of the participants commented in a similar fashion. These comments seem to indicate that working in the clinical environment had an effect on the career choice of the participants. At a minimum, it gives them the chance to seriously consider some of the options in medicine, even if they don't personally experience all of them. With others, they are able to see enough of the profession to make informed choices on their choice of specialty, based on working conditions, career goals, lifestyle, etc. This information allows students to enter

medical school with some idea of where their work will lead them, as well as a context to evaluate other professional opportunities.

The fact that this career exploration occurs before entering medical school is significant. As one participant explained, medical students do not get the chance to spend much time in all of the specialties. In fact, rotations in some areas may not occur until medical students are applying for residency positions. Even a rotation lasting a few weeks may not give a medical student the same amount of information about the career as a medical scribe may obtain in working for months or years in a particular specialty. Working in the field allows medical scribes the chance to have a rare, unrestricted access to many of the details of the career, and to engage in informal discussions with hospital staff about the profession. Even though their experiences may be limited to one medical specialty, working as a medical scribe prior to medical school appears to provide a head start with many of the career decisions that medical students make, and it helps to inform them as they choose a specialty.

Mentors and Role Models

Many of the participants spoke about their ability to have a close professional relationship with other medical scribes, as well as some of the physicians, and how some of them developed into mentors. Maureen described some of the ways she reaped the benefits of having a mentor during medical school:

> I think a lot of the physicians down there that I really felt connected with, I would consider them role models. I know I'd call on them every once in a while just to check in or just to see what their thoughts are about something. Like I talked to [Dr. P] about when I was picking a clinical campus. I was asking her what I should be looking for in a clinical campus. And I had asked her specifically if it was good to have residents there or

> not because one of our clinical campuses does not have residents and the other one does and I was kind of debating between the two. And she said you absolutely want a place with residents and I would have never guessed that.

Maureen also told me about how she saw the female physicians as examples of professionals she wanted to emulate, and how their example helped her feel good about her ability to manage her career with her personal goals:

> Yeah, I think that that is really great to see that these ER female physicians can have a family, be there for their kids still. You know, have time for their family, vacations and stuff like that and knowing that I can still have that too.

Sally, a Latina medical student provided the following statement:

> I had great mentors. The physicians were excellent. They took us under their wings…I found a mentor quite rapidly when I started the program. He was half-Latino, which was great because there aren't many Latino physicians out there. He loved to teach. I was very open and very receptive to learning. He put every vote of confidence in me that I was able to execute…It's definitely a positive experience.

Many students do not enter medical school with a long history of working with different professionals, and some do not have medical professionals in their immediate circle from whom they can receive support and encouragement. Having a large number of professionals who have taken the time to teach informally and shown a professional interest in a pre-medical student certainly has the potential to provide a positive aspect to their preparation for medical school.

In Medical School

Some of the positive aspects of medical scribe work experience were not realized until the participant was in medical school. Some of them were apparent in the first two years, which

are primarily spent in the classroom and in simulated clinical experiences. Others were realized during the third and fourth years, where the medical students spend most of their time in clinical rotations.

Experiences as a framework for learning. Many of the participants were able to recount specific instances in medical school when they were able to draw upon a personal experience that was helpful to what they were learning. These rich and vivid experiences seem to create a framework for learning new content, because the participants had already learned some things from their experiences, and the new content fit with what they already knew. Derek offered his perception of what it was like to take classes in medical school after his experiences as a medical scribe:

> All throughout our classes even though it's basic sciences. They put clinical correlations for each thing we're learning. So like every once in a while I'll see like a type of patient and actually oh, I've seen that illness before. You know what I mean? So I've seen lots of like very severe diabetic ketoacidosis patients. And that's something that's been coming up pretty frequently in my biochem classes because we're talking about the blood, glucose and PH equilibrium and how we need to balance everything, and how homeostasis works. So those tie into clinical correlates in terms of what kind of lab values I would expect to see and also in my biochem class. So I can like picture, like I can see a physical patient in my head when we talk about it I guess is one connection.

Sheila described a similar experience, and told me it was very common to learn about things she had seen frequently as a medical scribe:

> Yeah, because we go through everything so everything that we learn about, I have seen. I would say probably 85 to 90 percent of the things that we learned in anatomy I had a relatable story.

Michael shared that his prior experiences had given him a deeper context for learning the material, and that he was able to quickly connect the material to real medical scenarios.

> But with regard to the coursework that I'm doing, being a medical scribe has given me real world context for the [vital] chemistry and anatomy and the physiology that I'm studying. So when I read a little sentence talking about diabetes and diabetics, I know what a diabetic patient looks like in my mind. I have an image and it's a great asset I think to have that connection to the actual practice of medicine.

As participants related these experiences, they were able to provide a lot of details about the patients they saw in the clinical setting. These experiences happened frequently enough, or were significant enough, that the participants were able to remember them as well as make meaning from them. Patients with trauma, cardiac conditions, and diabetes are very common in emergency departments, and they can sometimes be dramatic or memorable for a variety of reasons. These cases seem to provide a compelling framework for learning basic sciences in medical school.

Another interesting aspect of this phenomenon is that many of these memories were triggered when clinical correlations were used in medical school classes. Many medical school classes use clinical correlations to enhance the learning process and make learning basic science more applicable. Because these medical students had experiences with the clinical correlations, they seemed to be able to make sense of and find application for the basic science concepts they were learning.

Easier, less stress. Another theme reported by the participants was that there were times when they felt things were easier for them, or that they were not as stressed as they would otherwise be. Paula stated that she was already familiar with many aspects of medical care, which lowered her stress:

> I know the computer is well. I know the system is well. I'm comfortable with the terminology. I know the abbreviations that are accepted by the boards. So it's really cut out a lot of stress, I think, that for people that had never seen anything like that before. It's very difficult.

Jim told how the format of the curriculum puts students in the clinical environment early in the first year, and how his experience of being in that environment made a big difference for him:

> Specifically going to [my medical school], at their medical school they really focus on introducing the students very early on to the clinics, which I think being a scribe gave me a significant advantage. And it just helped me to feel more comfortable going into those clinics knowing that I had an extensive amount of experience working in that setting. So I wasn't really experiencing a shock factor of being in the clinic because I had already worked there as a scribe.

The work that medical scribes do allows them to see many different doctor-patient interactions, as well as become familiar with what happens outside of the exam room to provide medical care. For medical students who have never seen this before, it can seem overwhelming and intimidating. However, for medical scribes who have years of experience in that environment, there can be much less stress over learning about the environment. It is possible that this could allow the medical student to be more focused on learning the important aspects of medicine, while not being distracted by the myriad of new things in the clinic.

One interesting perspective on this topic came from a quote from Maureen. She described how it felt to already have some of the knowledge that students are expected to learn, and to get some positive feedback on her knowledge or skills:

> That was good. I really liked that class just because it kind of was like a break from not knowing. You know…medical school is basically like…every day you are told…you're basically inadequate…So that was just kind of like to get to that class, have a little bit of relief.

This idea is significant because it illustrates the feelings that students in many programs can have. As they persist in an academic program, they will make mistakes, and they won't always have the right answers. In medical school, each grade can dictate where you stand in a class, or what opportunities may be available to you down the road. For example, residency programs use grades on the United States Medical Licensing Examination (USMLE) Step 2 exam in their decisions for admission. Not only do medical students want to do well, they also want to ensure that they have the opportunity to choose the specialty they want. Scoring poorly on an exam can cause stress because of all of the future possibilities that are tied into it. Conversely, performing well and demonstrating their knowledge can be an uplifting experience for medical students.

Perceived Advantage Over Peers. Many participants expressed the idea that they had some advantages over their peers. This idea fits well with the above discussion about stress. Bruce summarized his perception of an advantage like this:

> And then my third to fourth year, most of the students sort of caught up to me skill-wise, but it was nice to have that advantage going in. And already when I went to working in clinically, I already knew what to expect as working in the ED (emergency department) with the doctor. And it was the same thing going in, so I was already for, I knew how to

> write the notes, you have to interact with the faculty and the other physicians because I already have that great experience of being a part of that, because the doctors that we worked with at [my hospital] were just so open with us. So I thought that gave me an advantage over a ton of medical students.

Maureen added her thought about how her medical scribe experience helped ease her anxiety, and gave her knowledge that many of her peers did not have.

> In our school…we had clinical cases. And they would use the whole lingo there so they would be giving you review of systems, [a medical history], and a physical exam. I just remember sitting there, and I could read everything on there, and all my classmates were like, 'What's P-E-R-R-L?' You know? Like what does that stand for? What does this stand for? And so that, I think, just kind of put me at ease a little bit, knowing I kind of had that one up on everyone else.

Being able to notice a difference between them and their peers in some situations must certainly have been an exciting experience for the participants. Nearly all of them had some experience with this. Not only did they see some differences from their peers, but a few participants told about times when medical school faculty commented on their abilities. A few times, the faculty member could tell that the participant must have worked as a medical scribe.

What is interesting is that the times when the participants perceived an advantage were in situations that were similar to what they had done as medical scribes. These situations involved the use of medical terminology, and familiarity with the people and context of the clinical environment. Working as a medical scribe will certainly give a strong command of medical terms, and working inside a hospital will help the medical scribe understand and become comfortable with the processes that go on there. Interestingly, this perception of an advantage

was limited to these types of situations, and did not carry over to learning the basic sciences and other aspects of medical education.

Confidence. Another major theme was confidence. This related not only to participants being confident in their knowledge, but also with feeling confident heading into medical school and confidence in choosing a career in medicine. Maureen explained how her knowledge helped her be more engaged during classes when she said, "I had seen it for so long and I just think like I was able to speak up more, which I don't normally do in class. So that was kind of a positive." Michael provided a sense of how he had confidence in his career choice, which carried him through the difficult application process, and has made an impact on his outlook on being a medical student:

> I think the confidence that there is a career in medicine that I will fit into. You know, I'm doing all these basic science courses right now but I know and I'm working hard to succeed and to learn the material. But I have a confidence that I'm going to enjoy the career and enjoy the work of a physician because of the experiences I had as a scribe. And those give me confidence because I recognized in the physicians' characteristics that I have and I identified with some of them. Not all of them, but there were enough physicians that I identified with that I thought oh, that could be me. That's the kind of sentiment and so that helps me be comfortable in my role as a medical student and that I know I'm going to enjoy the career…The experiences that I had as a scribe gave me confidence that I would succeed and enjoy a career as a physician. And gave me confidence that going through this frustrating and brutal application process and, you know, putting yourself out there was worth it and spending the money was all worth it. I mean without the scribing, I would not have applied to medical school. I mean I had to

have some kind of experience to let me know that it was right for me so scribing filled that role.

The process of becoming a physician requires a substantial commitment to a difficult journey on the part of pre-medical students. It is natural to feel doubts as to whether all of the work they put into their preparation and medical school application will be worth it in the long term. However, experiences as medical scribes prior to medical school seemed to provide them with the assurance that they were making the right career choice, and they could be successful as a medical student and in their profession.

Knowledge. For the purposes of this study, knowledge refers to several different things, including basic science knowledge, medical terminology, documentation, treatments, and procedures, as well as clinical decision-making. Wendy spoke about how the knowledge she gained as a medical scribe changed her perspective on the first two years of classes, which are usually heavily-rooted in the basic sciences:

> I got my start as a scribe and I think I had done so much in writing notes and seeing patients, and then going through the first and second years of medical school, it was more that I got to fill in the gaps from what I have learned in scribing. Like I said, they tried to use it as a teaching experience, but certainly, I mean, I can't fully understand everything that they were explaining to me when I was a scribe because I hadn't gone through medical school yet. I didn't know the depths of some of the concepts that we were talking about, but I think then, going forward into medical school, I was able to fill in those gaps, when you start to learn what we call the basic sciences in the first and second year of medical school.

Sheila described how her knowledge of medical terminology and medical practice helped her in classes during her first year of medical school.

> Sometimes they would use words in the questions or they would say patient presents with hematuria and if they don't give an explanation to what that is, some of my classmates are going to get it wrong because they don't know what that is…So that was pretty much anatomy. I was just used to the vocabulary, how things were worded, you know, the thought process behind clinicians I think is what it was. Because I mean actual doctors were writing our exams and if we can already sort of think like a doctor because that's what we were trained to do, it just makes it that much easier.

Barbara commented on how her knowledge helped her learn about clinical decision-making in medicine, something that is not easy to learn.

> So you learn these, like, kind of pattern recognition kind of things. You know that when someone comes in for this complaint you go to rule out, you know, the most emergent thing. If it's a headache, you know, rule out a bleed. So it definitely helps with just being familiar with certain tests that they do and what the test is looking for, but connecting the dots and understanding why certain things are ordered and understanding the order of, you know, things. That's definitely something that was acquired with more knowledge.

An interesting phenomenon about the idea of clinical knowledge is that it appears to have an impact at all levels of medical school. Students in the first years of medical school are able to relate clinical knowledge to both classroom experiences as well as working in simulated clinical scenarios. Students in the clinical years of medical school use their clinical knowledge as they interact with physicians and patients in the hospital setting. Whether recalling a unique clinical case, or using their experiences to determine a differential diagnosis, medical students who have

a large body of clinical knowledge feel like they can thrive in the different aspects of medical school.

Documentation. Another aspect of clinical knowledge is medical documentation. By the nature of the work that medical scribes do, it is safe to assume that they would show proficiency in this area. However, many participants reported some distinct benefits from being able to do medical documentation. Bruce talked about his familiarity with an electronic medical record (EMR) helped him during the clinical years of medical school.

> A lot of the programs I hear are using Epic, and even the third year hospital I worked at, they used the Epic system. And I already knew how to do everything, how do [smart phrases] and everything, and I even helped some of the residents do the smart phrases and things like that. That helped me up my clinical grades because they were sort of impressed by that.

Sally related that her extensive experience with documentation helped her in ways that carry over into several aspects of clinical medicine.

> I did all the documentation. That's also another leg up. When we get out of medical school, we have to be able to manipulate the EMR. I know how to work through an EMR. I know what the components are for filling. I know what I'm looking for. That also helps with physical examination—HPI. I walked into medical school already knowing the components of an entire patient interview—what the high points are that I need to know associated signs and symptoms, the chief complaint, what I'm looking for on a physical exam, how to perform the physical exam—because I've seen all of it in repetition for so long.

Jim gave some insight that may explain why the documentation experience was helpful when he said, "Because I play a very important role in the documentation of the patient, I felt that I was more focused on what the doctor was saying to me."

From these statements, there appears to be an educational value to developing medical charts for patients. One way this is helpful is that the scribes become very proficient at creating high-quality medical charts that are accurate and complete. Because there is no requirement or training for pre-medical students in documentation, their experiences as medical scribes give them a distinct advantage in this area. Another way that documentation experience can be helpful is that creating a medical chart teaches the scribe to pay attention to many of the details of patient care, as well as the thought process of the physician. Because a medical chart needs to contain both factual information about the physical exam and the medical procedures done, as well as some of the medical decision-making process, it is natural to believe that medical scribes will pick up on some of the more complex thoughts and decisions that experienced physicians make.

Professional Development

The participants in this study had many things to say about topics related to professional development. The most common themes in this section were doctor-patient interaction, professional behaviors, and building a professional network.

Doctor-patient interaction. A unique aspect of working as a medical scribe is how they work directly with physicians, and they see how physicians interact with their patients. This is what attracts people to the job, and something that is not offered by every kind of volunteer or paid experience in healthcare. Alice told how seeing the physicians interact got her thinking of how she would approach patients as a future physician:

> I definitely learned different patient care principles, and I guess what sort of patients enjoy other doctors—some of the good things and the bad things—not each physician and what they do and what I would then want to do in the future and what I may not want to do.

Carol spoke about how being around professionals helped her learn how to develop herself as an emerging professional:

> When you see not only the physicians interacting with the patients but also physicians interacting with other physicians and other nurses and other staff in the hospital it definitely gives you an idea of how you should be acting. Whenever we are around patients or whenever we are around other physicians I think I put on a more professional persona than I would if I was hanging out with my friends and maybe the other classmates who don't necessarily know how to act around in certain settings, so I think that it definitely gives you a good look on how—it helps me develop my professional persona.

Finally, Dennis related how being in the room with different physicians and seeing them interact with patients taught him a lot the best ways to do that.

> Talking to the doctors, having been exposed to the physician/patient relationship and all that, it helps with the most important part of being a physician I guess. What they don't teach you in med school I learned working as a scribe, and that's the bedside manner and the relationships and all that sort of thing. It was really cool to see how postoperatively the doctors follow up with the patients and they still care about them and they're concerned with their well-being after they're dismissed from their care. It's really cool to see that.

Being able to be observe physicians as they work with patients was a major theme in the responses from the participants. Seeing them work directly with many different patients has helped the medical scribes develop a sense of what a physician should do when they treat patients. This is something that many other pre-medical students may not be able to see. Also, seeing both positive and negative examples of patient interactions may be particularly beneficial, as it provides a contrast to the attributes that make a good physician. These observations were immediately useful to them when engaging in clinical skills activities and simulated patients.

Professional Behavior. Many participants described how their experiences helped them know how to interact with other professionals in the clinical setting, which relieved some stress from the experience.

Bruce told of how his familiarity with professional interaction helped put him at ease and helped him in the clinical years of medical school:

> Yeah, I already knew what to expect. Interacting with the doctors at a social level, I already sort of knew how to do that. While a lot of the medical students were sort of mechanical and didn't really know what to expect, a lot of times they were real nervous. When I first started third year, it really helped me to start because I already knew how to interact with physicians, what I was supposed to do. I was at ease going in the hospital and the hospital work and it made me look better in front of the other residents and attendings, which helped me to get honors clinically in the clinic setting. And that, I think, was a real bonus to me.

Carol spoke about how her experience in the hospital helped her understand the different titles people have, but also to know that she could talk and relate to them:

> So the mentality, definitely, and just being around patients in general. A lot of students don't have any clinical skills. They were never in the hospital setting. And, you know, you could definitely tell that they're a little insecure working around, you know, doctors and PA's and NP's and nurses and people that, you know, have gone to school and have a great education and know a lot of stuff. Some people can be insecure with working around people of such stature. And it definitely made me comfortable to know that physicians are people, too. You don't have to be scared of them. You can be yourself and be open and ask questions and, you know, want to learn.

Participants said that they were able to develop a sense of professional behaviors by modeling themselves after physicians they had seen while working. This led to a greater sense of comfort when they interacted with other professionals in the clinical setting, and gave an advantage over medical students who did not have this same experience.

Patient interaction skills and developing professional behaviors were brought up by many of the participants when asked how they have developed as a result of their medical scribe work experiences. This is significant because these areas cannot be extensively developed or appreciated with a few limited exposures to the professional setting. Being able to gather an extensive amount of information about the profession, and being able to make judgments about the quality of doctor-patient interactions or professional behaviors occurs with numerous and repeated experiences. Being able to make a determination of the professionals who present the best professional demeanor also appears to lead medical scribes to view these individuals as role models, whereby they become the standard by which professionals will be judged.

Professional Network

In many emergency departments, medical scribes work with many, if not all of the physicians in the department. If the scribe worked in the department for several years, it is safe to assume that the physicians and scribes would develop professional relationships, especially given the nature of the work that scribes do for the physicians, having to write about the thoughts the physicians have about each patient. Jim told how he looked forward to networking with many of the physicians he has been working with at the hospital: "So I think being a scribe in this unique instance is going to allow me to already have some networking with the physicians that are already at [my hospital] that I've already worked with."

Some of the participants described how the professional network evolves over time. Barbara related her experience of how the physicians came to include her into their professional network:

> I've come along ways from when I was just scribing because when you work with physicians they treat you like their friend and they treat you like, you know, just like you're another physician. They totally respect you and, you know, make you feel involved and stuff, but they also talk to you like they're your friend.

Michael shared a similar experience, which included how he had to work hard to develop the relationships at work, and how being a contracted employee made him a little different from the other hospital staff.

> It wasn't as if I was an outsider in the hospital. But it's just that I didn't have the same employer so it changes it a little bit. But yeah, it's not like oh, that's a contract scribe. Like they don't matter. I mean, as a scribe, you don't have much status. They acted like oh, there's a scribe. But once you work there for a while, then people get to know you

> and you can have work relationships and stuff like that. But it starts out like oh, you're just one of these scribes who comes in and out. There's a lot of turnover so you have to be persistent. You have to be a little bit bold to be able to make a relationship with the physicians and the hospital staff.

Wendy described how her professional network has lasted for years after her medical scribe experiences, and how it was a support system to her during medical school.

> I think also just in terms of building relationships. I've been, now, through medical school and I haven't been a scribe for almost four years now and I'm still extremely close with the physicians that I used to work with. We often grab coffee when I come home and just kind of update on how everything is going. And I think it's always been, again, just another support system, kind of going through medical school and the more people who are cheerleaders for you.

Pre-medical students can benefit greatly from a strong professional network. Having current professionals who will "show them the ropes" has the potential to offset much of the stress of preparing for medical school and a career in medicine. Participants also shared how the physicians, residents, and medical students would take the time to share their stories about applying to schools, getting through tough times, and other pearls of wisdom. Working directly with these professionals puts the medical scribe in a unique situation to develop the relationship, and many times the professionals are happy to share their experiences with someone following in their footsteps.

Personal Development

Participants were asked to describe ways in which they may have developed that were separate from the medical or professional areas described above. Themes in this section include

leadership and teamwork, dealing with difficult situations, stress and time management, and understanding and empathy.

Leadership and Teamwork.

Perhaps due to the nature of their work, many participants brought up the idea of learning how to work as part of a team. This included having good team relationships, the role of an inter-professional group of physicians, nurses, and administrators, and the continuum of care between physicians of different specialties. Jeff spoke about learning how healthcare teams operate: "I would say it's kind of given me a picture of things I would like to look for in a healthcare setting or in a work setting… things like strong relationships with your team, flexibility."

Michael commented on how physicians and professionals from different specialties work together to provide comprehensive medical care:

> I think those two years as a scribe really taught me a lot about the role of specialists, neurologists and surgeons in the care of people with certain conditions and the role of the ER like I was talking about earlier. So I think that's given me more than a crash course in how all those different parts of the medical system fit together, which is really valuable.

Like many of the participants, Wendy learned about teamwork by working with many different people, both medical scribes and physicians: "Not only did I always work with new scribes, but I also worked with several, I mean, probably over 100 different physicians between these five hospitals, so I think … I learned team work, I learned conflict resolving skills.

Being an integral part of a healthcare team is another aspect of medical scribe work that makes it unique. Medical scribes play an important role in the documentation aspect of healthcare. They work directly with physicians, but they also work around many other

professionals whose jobs relate to patient care. As hospital employees, they go through a hiring process and receive feedback on their performance. They are expected to perform their job in a way that meets the expectations of the individual physicians as well as the hospital.

A few of the participants had experiences as leaders in their scribe programs, training new scribes or having other administrative responsibilities. While not all of the participants had these additional experiences, those who did seemed to indicate that their administrative responsibilities helped give them additional preparation for a career in medicine. They learned many personal and professional attributes that are used in many professions, including medicine.

Difficult Situations.

Participants related a wide range of experiences that relate to the theme of dealing with difficult situations. This is another topic that results from them directly observing physicians in their work environment. Barbara told about her ability to remain calm under pressure because of her prior experiences in similar situations:

> I was definitely able to keep my cool and stay professional in certain situations where, you know, we've have standardized patients and they would be, you know, acting all crazy and, you know trying to get you to like lose your cool and stuff, but just to maintain definitely patience and maintain, you know, your cool and know that you can see terrible things happen before your eyes, but you remain very professional and you never gawk at patients or, you know, respect family members and things like that.

Bruce related an experience he had as a medical scribe that gave him a new perspective about dealing with death maintaining composure:

> My first patient, I remember she had a code and she died in front of me, and I still remember that as a medical student, seeing that for the first time. And I think that took

me a little bit, that first experience. And, as a scribe, I wasn't directly taking care of patients, but I saw what happened and that helped me to learn to just adjust at those times. I saw the doctor, how they kept composure. And I think after I saw that, I'll be able in the future to, if I see death, how do I react to that? And I think I already have sort of an understanding and how to keep composure under pressure.

It is possible that working in an emergency department, as most of the participants did, that the incidence of difficult or traumatic situations was higher than it would be in other medical settings. Regardless, having seen the ways that professionals handle these situations seems to be beneficial to them as medical students.

Stress management and time management.

Participants spoke about developing the ability to manage stress and their time from their work experiences. As most pre-medical students perceive medical school to challenge them in these two areas, they may also perceive managing their stress levels and their time to be beneficial to them. Sharon described what a busy night shift in the emergency department was like, and how working in that environment helped her learn to manage herself under those conditions:

"I would say another thing is, you know, especially working the emergency room shift on a night shift—very busy. You have to manage so many patients at once. You have to keep them straight, so being able to, you know, practicing your multi-tasking skills, your, you know, short-term memory, long-term memory and trying to keep things in order. I think that was another thing that helped because unfortunately in medical school you are given so much information. You have to digest it so quickly and try to keep things organized and figure out, okay, this is, you know, the thing that I need to focus on right

now. This requires more of my attention—I'm going to sacrifice in this other area, so learning how to do time management was a very good preparation for medical school.

Because most of the participants worked in an emergency department, they would have extensive experience in seeing professionals having to manage many different time-sensitive situations. These could be critical illnesses, timely medical tests, or simply trying to move patients through and out of the department to make room for those who are waiting. Sally described how, as a medical scribe, she learned to be organized and multi-task by working in the emergency department:

> You learn very quickly that you have to be extremely organized, know how to prioritize, and know how to multitask, because we're not just handling one patient at a time; we're handling 12-plus patients, depending on how large your emergency room is and how many physicians they have staffed at one time. You get very good at that.

Medical scribes typically go everywhere with the physician. In an emergency department, this can mean literally running from one room to another, and documenting things that are going on in real time, sometimes by a team working very quickly together. As the medical scribe participates as an active member of a dynamic healthcare team, they can certainly see many examples of multitasking and managing complex scenarios that require organization and time management.

Another interesting aspect of time management relates to working as a medical scribe while still being an undergraduate pre-medical student. In many emergency departments, scribes can work shifts lasting between 8 and 12 hours, which is usually the same as what the physicians work. Emergency departments are open 24 hours every day, and medical scribes can work any shift of the day or night, including weekends and holidays. Being able to balance several work

shifts each week, along with everything else that undergraduate students do, can be a real challenge. They may have to put in many hours of studying for their upper-level classes, or they may participate in athletics or other groups that take up their time. Being able to balance this work schedule with everything else would certainly require some time management skills.

Understanding and Empathy

In addition to acquiring knowledge and professional skills, many participants talked about how they were able to develop empathy and a greater understanding of what patients and families go through when they experience medical conditions. They also offered ideas about how they used these new perspectives to prepare to be effective professionals. Alice commented on how seeing various conditions helped her gain a new perspective about what patients go through, and how this new perspective has changed her personal views.

> It made me realize there's certain diseases and issues that are more real than I would have ever imagined… I think I've become much more understanding and I just think that impacted me in a positive way, and to be grateful for everything that I have right now, being a 22-year-old, healthy human being.

Carol had experiences as a medical scribe that helped her understand the needs of many people in her community.

> [My hospital] was a great place to work in the E.R. because you see a lot of underprivileged, a lot of patients that come from very, very—a wide range of backgrounds. I think that it gave me a really good look at working and associating myself with people that come from different backgrounds. One of the reasons why I applied to the early admission program opportunity is because its mission and even the mission of our school is to serve in underserved communities, and so I think that

definitely influenced me in that regard. It motivated me to get out into my community as well and do some community service, so I think that was definitely a big influence on me.

Derek spoke about how his experiences taught him to avoid judging patients and situations.

> And then every once in a while I feel like you might have thoughts of maybe like prejudging a patient based on their initial presentation, which I think is a bad habit to develop in healthcare. Because you never really know how a patient is going to turn out and you shouldn't have these judgments beforehand because you see a high volume of a certain type of patient that usually presents a certain way.

These are interesting responses for several reasons. First, most of the participants were relatively young, with an average age of 25. Not many people in that age group have extensive experience in situations to see many people go through intense circumstances involving pain, uncertainly, poverty, and death. Being able to observe these aspects of life has a strong potential to help people gain new perspectives on the world around them. Secondly, many of the responses focused on how the medical scribe learned by observing patients and families while working in the clinical environment. It is common for patients in the emergency department to have families and friends with them. Medical scribes can see how the families and friends respond to the patients' situations, as well as how factors such as having health insurance and education on health can influence the people around the patients. Because the physicians are frequently interacting with patients and families, they are able to see how experienced professionals handle situations in this area. Lastly, in many instances the participants were able to recall specific cases or situations where they gained new perspectives about understanding and empathy, which indicates that they likely had very personal and powerful experiences that helped them gain this understanding.

Negative Influences

Very few negative experiences were reported by the participants. These included aspects in medical school that deviated what they did as medical scribes, and some experiences that were not as helpful as they had anticipated.

A number of participants shared experiences when the way they had learned to complete the documentation as part of clinical simulations was different from the expectations of the medical school. Wendy related an experience when the documentation she was accustomed to doing was different from what was expected in her medical school class.

> There's only one experience I can think of. When I was in my third year of medical school, we were doing a semester similar where you see patients and you write up like the whole history and physical on them. And I think I was a little bit further ahead of some of the other people in my class and my paper was a little bit more succinct and similar to my style as a scribe. And the person who had been evaluating these papers… thought that I was a little too succinct and to the matter of the fact, to the point of my papers, so she wanted just a little more elaboration. So, that was a little different for me, coming from a scribe background where we try and make things as succinct as possible and on to the next patient and trying to keep up with how fast everything is moving in the ER, so I wasn't exactly used to writing very lengthy H&P's."

Sheila described how a number of things she did as a medical student were different from what she had seen at her hospital as a medical scribe:

> I guess like one of the times when we first started, [the professor] was like, "Okay. Now just go introduce yourself like you would." And I went up to like my peers, because we do it on each other, and I was like, "Hi, I'm student doctor _____ _____. Blah

> blah blah." And then they were like, "Now we don't say student doctor." And I wanted to be like why? That's what we say [at my hospital] because that's how Dr. G introduces her student. So it's like the one or two percent that is not that good is because you're learning from real doctors, which makes it good, but you're also learning. They know what they're doing so they take shortcuts. So you are inadvertently learning the shortcuts, which they're not like taking shortcuts on how to treat someone. For instance, they don't take blood pressure the Bates way, which is like supposedly the correct way. So they're taking shortcuts because they know what is important and what's not important. But like we don't know that yet so to me, that's just how you do it. You know? Like I would do anything Dr. P told me to do but I wouldn't know that it's taking a shortcut.

Michael mentioned how the patient interviewing he had been taught in medical school was not always like what he had seen the physicians do while working with them:

> Knowing that doctors are pressed for time with their patients, and knowing that that's really a strong force in the workplace for physicians, kind of changes my openness to learning all these patient interview strategies that the school's curriculum is taking us through. Like we spend, for example, we're learning how to spend ten minutes or 15 minutes even asking these open-ended patient-centered questions, which I think is really great and I think it's really beneficial for the doctor patient relationship. But then I remember as a scribe that there was no time. The doctors never spent even remotely close to that amount of time asking the patients about their personal life and sort of constructing that relationship. And that could be because it was the ER and it wasn't a long-term, like a continuous care setting.

Another topic was shared by only one participant, so it is not a theme per se, but it seems to rise to a level of importance worth noting. Sharon talked about trying to apply an experience that was not appropriate for the case at hand:

> There have been a couple of times in both clinical case and test questions where I was reverting back to like a case that I had seen in the emergency room and it did not appropriately apply to the case I was seeing right in front of me and I would either lose a point or be wrong on the clinical case. So sometimes, you know, my memory is not helpful in that way.

This example shows how medical students may not always appropriately use the knowledge and experiences they have. Because they have not yet been trained as physicians, they do not understand their experiences in the same ways that experienced professionals do. This also may indicate that the potential exists for them to better understand and learn from their experiences as they progress through medical school.

It is noteworthy that some of the issues mentioned above relate specifically to working in an emergency department. In that fast-paced environment, physicians may need to quickly ask only the most pertinent questions, so they may not demonstrate the same level of patient interviewing as is presented in medical schools. Similarly, while all physicians are taught to create medical charts that contain all of the pertinent information, there is great variability to the amount and type of information that different physicians may include in their charts, and the way they may choose to describe things is just as variable. Lastly, many medical schools are emphasizing primary care principles, with the goal of training more primary care physicians. While asking more in-depth questions and writing more detailed notes may be the focus of many

programs, medical scribes have spent their time documenting in a manner consistent with the physicians with whom they work.

Every chart that is created must represent the discussions, exam findings, and medical decision-making of the physician, and physicians are ultimately responsible for the content of their charts, and it is common for physicians and scribes to review them together as they work. Also, many times medical scribes must undergo reviews of the charts they create, and they are given feedback on how they are doing. Because of these two factors, it is not likely that the medical scribes were doing anything outside of accepted practice with documentation. Because most of the participants had worked in an emergency department, it is natural to assume that their documentation is consistent with what is accepted in that environment.

Becoming Jaded

Several of the participants related experiences about being around "jaded" physicians, or having their perspective influenced by physicians with negative attitudes or demeanors. Interestingly, those who brought this up seemed to recognize this in themselves and others, and seemed to make it a positive experience by trying to avoid becoming jaded themselves. Carol describes how this process can occur, and her struggle to overcome those negative tendencies:

> "I know that a lot of the docs that I worked with could get easily frustrated and jaded and they could be kind of a black-cloud and kind of glass-half-empty kind of people. So when I was a scribe I was definitely pretty jaded. You know, I came into med school being, like, ah, I've seen a bunch of people die and, oh, I've seen that before and all this stuff, but, yeah, it lightened me up a little bit just learning about the duties, processes and even third year taking care of patients on my own and just realizing that my goal in life is to stay unjaded and to staying kind of happy, positive and be a good person, in and out of

> the hospital, and, you know, maintain, you know, some kind of reputation while you're at the hospital and, you know, be a doctor that you want to take care of your family."

Barbara also talked about becoming jaded, and how she learned from that experience:

> I just had the jadedness, just the being around physicians and having them, you know, kind of be pessimistic around you and you become, you know, numb to just being sensitive and, you know, caring for other people as much as you should. You know, you just get a little jaded working in that environment, so that's the only negative impact that it really had.

Sally shared her experiences of learning what not to do by seeing physicians who did not model the ideal bedside manner:

> There are physicians that I worked with that didn't have the best disposition, or I don't totally agree with their bedside manner or their management. It taught you, this is the kind of doctor I do want to be like. This is the kind of doctor I don't want to be. Either way you're learning. It definitely did not pose a negative impact on me whatsoever.

These responses indicate that medical scribes pick up on the ways that physicians approach their patients and many aspects of their profession. What is interesting is that these participants indicate that they not only recognized the ways that the physicians were jaded, but also tried to avoid becoming jaded themselves. While being reported as a negative aspect of their medical scribe experiences, they give reasons to believe that it may actually be beneficial to their professional development.

Comparing to Other Experiences

One of the aims of this study was to learn if work experience as a medical scribe is perceived to be different from other experiences that pre-medical students have. Six of the

participants reported having either work experiences or significant volunteer experience prior to enrolling in medical school. Their experiences include working or volunteering in hospice, home health, certified nursing assistant (CNA), a medical mission trip, and memory care/assisted living.

The participants reported both positive and negative comparisons of these experiences. Some of the positive aspects included having a focused, intimate experience with patient care; developing empathy from working in an environment with death, dying, grieving; creating a professional connection directly with patients; doing clinical procedures; and developing comfort in speaking with patients. Below are some of the positive aspects of these experiences, and, when applicable, a comparison to their medical scribe experiences.

Jeff had worked as a home healthcare aide prior to medical school. He compared this work to being a medical scribe:

> I'd say my home healthcare aide experience was sort of put healthcare through a magnifying glass. It was very intimate. It was more depth than breadth…I was able to dive deeper into the experience. I learned more about the individual because I saw him every weekend. I learned how to remove catheters. I learned how to work with ostomy bags. And so those are things that are specifically for the individual. I knew about them and I would always learn something different from a different perspective for that specific individual. It was more longitudinal. It was a longitudinal experience, you know, because you have one patient and you work with them throughout the whole time.

Bob had a background as a patient ambassador on a surgical unit. His job was to speak with patients and help them with their concerns. Bob said:

> I felt very comfortable doing patient interviews. I still do. It was different on the surgical floor or the pre-surgical rehab floor because there were a lot of them that were more tired and sleepy, and they don't want to talk to you; so it took a little bit of courage to go into the room and like, how you're doing, especially when they don't talk back to you. I had good opportunity with that, talked to a lot of patients. Kind of helped me break out of my shell being nervous about doing that. It's a lot easier doing it now. I don't mind just going into a room and saying, hey, how are you. Seeing how patients are doing, start an interview.

Dennis was a long-term volunteer at a hospice center, and he said the following:

> They're two completely different things, but working at that place definitely was very rewarding and helped me learn how to deal with dying and death and grieving, and it taught me—after that, I was a lot more empathetic for families that came in and we had to tell them that their family member had just died and sometimes I would be talking to somebody and then 10 minutes later they would be dead. It was very—it was a very grounding experience, but it was completely different than the scribing experience, but both of them were amazing.

One participant compared had experiences from a medical mission trip:

> In terms of the medical mission trip essentially my duties were pretty similar to what a medical assistant does. I was administering medicines, I was helping with exams and procedures. That was something that correlated pretty well with being a scribe—understanding, you know, how a physician thinks, how to take an exam, what to look for when you're looking at a patient— those had very good overlaps. The only thing that I liked more about being a medical assistant I got to more involved in the patient care. I

> actually got to, you know, take vitals and touch the patient and ask them questions, whereas being a scribe you're stuck in a corner typing what is going on. You can't ask the patient any questions. You're not involved in their care whatsoever…I guess the only other things is, like, learning how to collaborate with a physician. That was a really good skill to gain - learning how to speak the language, the jargon—learning how to present a patient. I had to do that on both cases and that was also very good, positive experience for me.

From their responses, it is possible to begin to see how these former medical scribes viewed the positive aspects of their other clinical experiences. This is important because many pre-medical students take jobs or look for volunteer opportunities that will be helpful during their application process, and give them some knowledge and skills they can use in medical school. Understanding how medical scribes perceive the value compared to other experiences is an important aspect of this study.

The other experiences that were discussed by the participants had a variety of positive aspects to them. As a home healthcare aid, patient ambassador, and while working on a medical mission trip, it is possible to communicate directly with patients, which appears to help pre-medical students feel comfortable doing this later as a medical student. As medical scribes, there are limited, if any opportunities to engage directly with patients. Similarly, some of these experiences allowed the pre-medical students to do clinical procedures, which is certainly something they will learn in medical school.

It is interesting that the participant who went on the medical mission trip talked about learning how the physicians think, and how to process clinical information. While on the medical mission trip, she acted much like a medical assistant. None of the other participants had

experience from mission trips or as M.A.'s, so it is difficult to do much further comparison about this aspect.

It is also interesting that some of the positive aspects of working as a medical scribe were brought up by participants in this section. For example, the participant who was a long-term volunteer in a hospice facility talked about developing empathy, which was also discussed by many other participants.

Participants also had some negative comparisons of their other volunteer or pre-medical experiences. Some of the negative aspects of volunteer or work experiences included limited exposure to patient care in some settings; very few patients to see compared to being a medical scribe; not working directly with physicians; "red tape," or restrictions on what they are allowed to see or do; and not having a responsibility or commitment.

Not all observation or volunteering provides pre-medical students with access to physicians and patients. Many experiences focus on tasks that are tied into facility management. Sharon had volunteered at an urgent care facility hoping to gain some experience with physicians and patient care. Instead she spent time doing things that had nothing to do with patient care:

> The volunteering at the urgent care was not helpful for me at all. I basically stocked the room, cleaned the rooms. I was not involved with patient care, except for maybe transporting them to radiology, but other than that I was not at all involved in their care, so that for me was very boring and it didn't help me. I didn't learn anything, so that's something I didn't like."

Even when observers can be in the clinic as patients are being seen, they don't always have the same experience as someone who works there. They can sometimes be given other

responsibilities that can take away from the experience. Sally experienced this during her shadowing opportunities:

> My volunteer work at [the hospital] was shadowing. There's a lot of red tape. You weren't allowed to touch the patient most of the time… I mean, it's shadowing. You are running labs. You're doing—watching, for the most part. You're observing. You're not actually—you don't have full responsibility for anything. You're not vested in the position that you are in to take care of a patient. You're not keeping the entire physician's hours. You go and volunteer for four hours.

Several participants talked about not doing or learning the same things in their other experiences. Maureen had a job as a certified nursing assistant (CNA), but she wanted more experience with physicians:

> I would say the scribe was a lot more medically related. [Working as a] CNA was just basically me helping somebody to shower, to go to the bathroom, to eat. Those things are all important to living but I wanted to do more.

Barbara had worked as an aide in a memory care unit, and was responsible for providing basic care to the residents. She described her work, and how it was different from being a medical scribe like this:

> When I was working at the memory care unit…you give meds and you don't know really what they do, but you know the patients are on them and you take care of them…and you know that they have, you know, Parkinson's or Huntington's or Alzheimer's, but…you're not involved in their care plan, so when I was scribing you definitely see what medications someone's on, what their history is and what a role certain things play, like, chronic kidney disease and how that kind of, you know, affects so many different

systems. It affects, like, the meds someone's on, you know, it affects their ability to excrete certain things—you know, just homeostasis in general.

Sally also spoke about why being a medical scribe was different from shadowing, in that the medical scribe has a job with specific duties and expectations:

> The scribing program, you have a job. You're on the clock. You're responsible for something. You're supposed to be good at it and execute well. You're there for the entire shift with this physician. If the physician works 12 hours, you're working 12 hours too. It's just like the doctor. You get to sit next to the doctor. You finish all your documentation. You get into how they're thinking. You see all the behind-the-scenes contemplation. What do I do with this patient? What do I have to think about? Who do I need to consult to get them proper care?

From these responses, it appears that the main things the participants liked about being a medical scribe is the experience of working directly with physicians, and learning about clinical decision-making by seeing how they interact with patients. These aspects are not part of all of the things pre-medical students choose to do in their paid or volunteer work.

It is interesting that several participants discussed the difference between simply observing and having an active role while in the clinic. They seemed to indicate that having more of a responsibility, or being more actively involved was better than being a passive observer. Despite the negative aspects of the other pre-medical experiences, observing and volunteering can still provide some benefits to pre-medical students. While they may not offer the same amount or variety of benefits, there is still value to having experiences in the medical field as a way of preparing for medical school.

Advice to Other Pre-Medical Students

When asked what they would say to another pre-medical student who is considering working as a medical scribe, every one of the participants said they would recommend it. Maureen's quote was, "Do it. Hands down, do it. Don't even think about it. Do it." Wendy added to this endorsement with her thoughts:

> I would say absolutely do it, it pays off in so many aspects…I mean, it's a great way not only to make money while you need to, but it gives you that clinical experience. And whether you do it in an emergency aspect—I know some people are incorporating them into their offices, some of the physicians, whether it's orthopedics—I've had experience with people who have been there—or family physicians, but it just gives you a really good idea of how everyday life is in the hospital. You see so many different people working, especially in the ER. I think that's where I really got a grasp of the teamwork that's involved in patients coming into the emergency department. I mean, it's not just the physician who's taking care of our patient. There are nurses, techs, the ambulance crew, social work, I mean, there's everybody. And so you kind of learn a lot about medicine that they can't teach you out of a book in medical school. And you pick up a lot of skills that your colleagues might be lacking since they didn't have that clinical experience.

Participants gave an overwhelmingly positive response when asked to recommend working as a medical scribe before attending medical school. This gives a good summary of their most salient impressions of their experiences, especially now that they were in medical school. Interestingly, many participants also included the advice to work very hard to make the most of the experience. Alice even recommended taking a year off of school, if necessary, to get enough of the right experience through working:

> Take a year off and be a medical scribe. That would be my advice is to definitely do it even if that means taking a year off to get the experience I think that it definitely helped me in where I'm at. I would recommend no matter what they do at least a year of being a medical scribe.

Sally was very frank about how to make the most of the medical scribe experience:

> Take advantage of everything. Take it all in. Be on top of it 100 percent. Don't just show up and do your work and be a robot. Be inquisitive. Pay attention to cases and what your physician is doing. Ask questions. Try to soak it in, because these are things you can refer back to.

Derek spoke highly of why an emergency department may be the ideal place to work as a medical scribe:

> I would definitely say to do it maybe in your third or fourth year of college just because you want to have a lot of other experiences in terms of like volunteering and extra-curriculars under your belt beforehand. I would say definitely make sure you do it for like a good year just because you want to get the full experience. I would say if you are going to become a scribe, try to become a scribe in the ER because then you can kind of get a feel for the types of medicine you like. You see everything in terms of like cardiac, GI, psych, surgery, ortho. So I would recommend that someone considering scribe, they make it a scribe in the ER.

The responses in this section allow us to see the ways in which former medical scribes truly feel about their experiences in terms of preparing them for medical school. By asking them to give advice to those considering working as a medical scribe, the most important and relevant thoughts on the topic could be given. Knowing that the universal response was to encourage pre-

medical students to get this kind of work experience, it shows how positively it is viewed by the participants in this study.

Thematic Map

Below is a map of the themes I have identified in this study. The major themes are the largest, and the sub-themes are shown as they relate to the major themes and to each other. This is a key component of a thematic analysis, and is part of the fourth step of reviewing the themes. The major themes are that medical scribe experience offers medical students knowledge, the ability to develop an informed commitment to the profession of medicine, and confidence in their abilities and in their career choices.

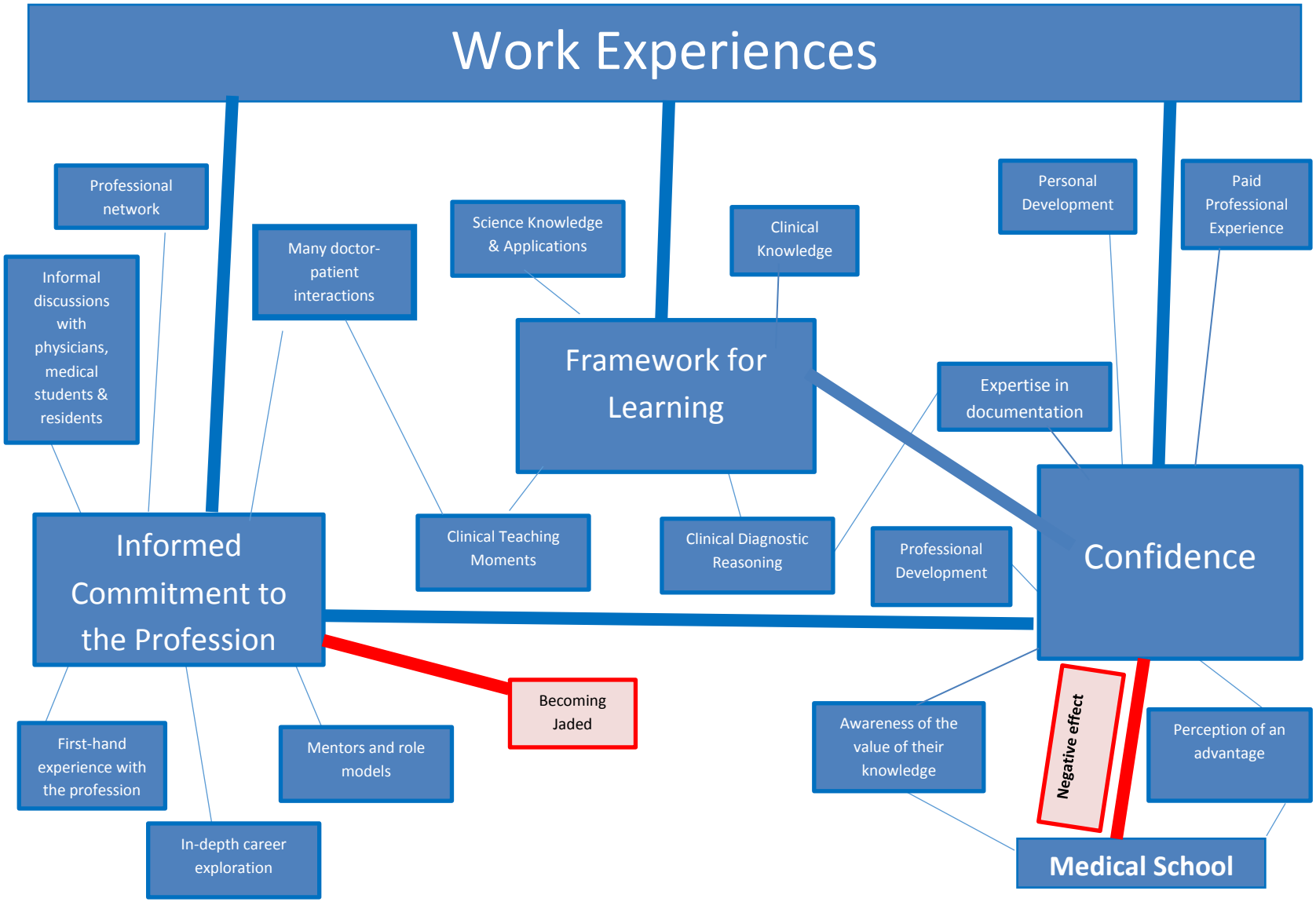
A framework for learning is developed as medical scribes see patient encounters and have formal and informal teaching moments in the clinical setting. They know the important things that the physicians are thinking, because they write about them in the medical charts. They see patients with many different conditions, which provides a broad exposure to medicine. They also see many patients with similar conditions, so they can begin to see patterns in how conditions are treated. Being responsible for documenting the patient encounter provides an additional layer of thought and reflection for each patient they see.

Medical scribes see the profession of medicine first hand. They are very aware of the things that physicians do in their work, as well as the context in which they work. In many instances, the medical scribes are able to have formal and informal conversations with numerous physicians, medical students, and residents, where important questions can be asked, and professional relationships can develop. Medical scribes are able to identify mentors and role models who can play an integral role in professional development.

Confidence comes from several aspects of medical scribe work experiences. Having a job that requires them to use specialized training to create medical charts allows them to become experts in medical terminology and documentation. As a paid professional in the hospital, they are seen as part of the medical staff, and they are comfortable working in a hospital with physicians and other professionals. As they go through medical school, they become aware of their knowledge, and they see a difference between themselves and their peers in certain situations, which adds to their self-confidence.

As expressed by the participants, medical school is a stressful and challenging environment that can put a damper on students' confidence in themselves. However, the knowledge and experiences they have as medical scribes can provide a much-needed boost to their confidence.

FIGURE 4: Thematic Map: How Medical Students Relate Medical Scribe Experience to Medical Education



Conclusions

In this chapter, I have presented the major themes related to how medical students perceive their work experiences as medical scribes. The primary themes of a framework for learning, confidence, and commitment to the profession were presented. The major sub-themes of clinical knowledge, career exploration, mentors and role models, and experiences dealing with difficult situations contribute to the primary themes. These sub-themes are made up of many different aspects of the working environment, such as seeing doctor-patient interactions, first-hand experiences in the field of medicine, and experience in documentation.

Entering medical school with a rich framework for learning, a commitment to the profession, and confidence in their abilities and career choice may dramatically change the undergraduate medical education experience for these individuals. Having a large body of clinical experiences that can serve as a framework for learning would be very helpful to medical students, especially in some of the early science-based courses where a limited number of clinical applications is given. A medical student who has developed a true sense of confidence in his or her abilities and career choice may be more resilient during stressful times of medical school. Many of the themes in this study relate to aspects of medical education that have proven to be difficult to teach, such as instilling a sense of appropriate professional behavior and a commitment to the profession. If work experiences as a medical scribe can have these kinds of impacts on medical students, then students and educators in the medical industry will likely be interested in taking advantage of them.

The body of research on medical scribes is very small, and none of the existing studies to date has looked at the educational experiences of medical scribes. From these themes, we can begin to see the ways that this experience can be perceived as valuable for medical students. I believe this is the first study to directly examine the experiences of medical scribes, and to look

at them through the lens of helping students prepare for medical school. That being said, clearly more research is needed to learn more about the themes reported here, and to find out if it is possible to enhance medical education outcomes through these types of experiences. The following chapter contains a bigger discussion of the implications of this study.

CHAPTER 5: IMPLICATIONS FOR PRACTICE AND RESEARCH

In this chapter I present a summary of the study and conclusions from the previous chapter. I include a summary of the research questions, findings, and implications of the findings. I also relate the conclusions to the framework of workplace learning, as well as some current issues, challenges, and opportunities in medical education in the United States.

In this study, I conducted interviews with current medical students who entered medical school with experience working as a medical scribe. The aims of this study were to learn about the workplace experiences of medical scribes, and also to learn how these experiences are perceived by them after they have entered medical school. In the interviews, I asked them to talk about their work experiences, and to tell how their work experience relates to their experiences in medical school. Overall, I found that the participants had a very positive perception of their medical scribe experiences, and that they saw many ways in which their experiences as medical scribes proved to be beneficial to them as medical students. The primary areas where the participants reported having a benefit are with knowledge, having an informed commitment to the profession, and confidence in their abilities and for success in the path they had chosen. All of the participants indicated they would recommend working as a medical scribe before entering medical school, with many giving an emphatically strong recommendation to it.

Studying the medical scribe experience, which is one of many experiential learning/work options in which students may engage before medical school, provides a window into a workplace learning program in which an increasing number of pre-medical students participate. The program is not compulsory, nor is it a formal aspect of an educational program. However, with more and more people working as medical scribes—the number of medical scribes in the U.S. has risen from 7,000 to almost 17,000 in the past two years (Bailey, 2016)—these programs

provide further insight into workplace learning that may be valuable for students in a number of professional education programs.

Summary of Major Findings

The findings in this study indicate that medical scribes gain work experience that they feel is directly applicable to many of the things they do in medical school. Working in a hospital setting provides some of the experience, but working directly with physicians seems to provide additional layers or enrichment of the work experience, and makes this type of work experience different from other employment in healthcare fields. Even the participants who worked in settings outside of the hospital were able to articulate many positive aspects of working directly with physicians. The primary benefits from this work experience are knowledge, confidence, and an informed commitment to becoming a physician. Some of these aspects are apparent prior to entering medical school, and other manifest themselves once a student has begun medical school.

Response to Research Questions

The research questions in this study were:

1. What experiences do medical scribes have in the course of their pre-medical work?
2. How do medical students relate experiences from working as a medical scribe to experiences in medical school?

In the role of a medical scribe, they see everything the physicians do, and they learn a lot of things along the way. They become experts in documentation, which is useful in itself, but can also help them learn clinical diagnostic reasoning and aspects of medical care. They see physicians provide care for a diverse patient population, which allows them to see a wide range of human conditions like pain, death, poverty, and different levels of understanding.

Through their experiences, they begin to develop a context for their roles as future physicians. Spending time around physicians, residents, and medical students helps them see themselves in that role, and they are able to develop professional networks of people who can answer their questions and impart the wisdom from experience that the medical scribes may otherwise not have. Having knowledge and first-hand experience of the field helps them develop confidence in their career choices and their ability to be successful in medical school.

The participants were able to relate their experiences as medical scribes to all aspects of medical school. Classroom and laboratory experiences during their first two years allowed them to see how much knowledge they had, and to effectively build on what they knew. Simulated and authentic clinical experiences in the first years provided the chance for them to show their knowledge and confidence from having been a part of many different patient encounters. During the clinical years, their medical scribe experiences helped them feel comfortable in the clinical environment, and they were able to draw on their prior patient encounters to help them learn how to practice medicine and manage the documentation and other professional tasks.

Implications for Research

To my knowledge, this is the first study to examine the experiences of medical scribes who matriculate into medical school. I have taken a broad, exploratory approach to this study, with the goal of learning about how medical students perceive their experiences as medical scribes. Certainly there is a need to learn much more about what they learn, how they learn, and how this experience can translate into benefits for medical students.

It is important to learn about the experiences of medical scribes for several reasons. First, more and more aspiring medical students are getting jobs as medical scribes, with the hope of getting some benefits from them. Second, it is important to know if medical scribes have the same experiences, or if different contexts can provide a different set of experiences and benefits.

Some specific recommendations for future research is to examine the difference between working at a teaching hospital compared to a non-teaching facility. It is also necessary to know how working in a private medical office with one physician compares to working in a setting with many different physicians, as well as comparing emergency room experience to that in other medical specialties. And lastly, we need to examine the process of how complex things like professional development and career explorations can occur in a workplace environment.

Applications of workplace learning

The results of the current study fit well within the current body of literature on workplace learning. Specifically, there several major attributes of workplace learning (Billett, 1995) that are relevant. Through work experiences, the participants learned a great deal about medical science and practice, career possibilities, and how to handle difficult professional situations. They learned these things through authentic work experiences that required active participation in increasingly complex activities. They worked directly with expert professionals, including physicians, residents, and medical students, who provided assistance with their tasks, and also served as role models and guides to understand the workplace. These factors led to the participants gaining knowledge and perspectives that they perceived to be valuable while in medical school.

Other theories

Another theory that may relate to the current study is the cognitive load theory, which states that the human mind cannot process an infinite amount of information at a time, but rather that there are limits to what a person is able to recall in a given situation (Young, Van Merrienboer, Durning, & Ten Cate, 2014). If a medical scribe has a rich medical and contextual knowledge, it is possible that they may learn more effectively because they are only learning the bits of information that are new to them, and their cognitive processes do not get overwhelmed in

the same way that a naïve learner would in the same situations. And lastly, there is a great deal of room to examine these experiences through the frameworks of social cognitive theory and self-efficacy. It is possible that what medical scribes learn influences their motivation and their actions related to their pre-medical classes, medical school application process, and career choices. Much more research is needed in these areas to continue to process of examining the educational benefits of medical scribe experiences. There may be additional theoretical frameworks that could apply to studying the experiences of medical scribes. I believe I have provided a logical explanation as to why these theories are relevant to the experiences of medical scribes, and it is my hope that this study will be a catalyst for further research into the applications of these theories.

Implications for Pre-Medical Education

The pre-medical education process is difficult. During the years when students hope to prepare for admission to medical school, they must take many difficult science courses that many see as a way to "weed out" those who don't have a strong ability to learn. The competition is fierce, and there is no guarantee they will be able to enter medical school after doing all of this work. It is understandable that it can be seen as a de-humanizing process (Coombs & Paulson, 1990).

Working as a medical scribe during these years has the potential to offset many of these negative aspects of pre-medical education. The experiences that come from working in this capacity can give purpose and meaning to the other aspects of the pre-medical process. Having a paid position in a hospital working directly with physicians allows pre-medical students to earn money while seeing medicine up close. This career exploration is a unique aspect to working as a medical scribe. Not all of the work experiences available to pre-medical students allow them to see physicians' work to the same extent. Interacting with physicians, residents, and medical

students gives them the chance to develop a professional network, and the informal discussions that take place help them develop a thorough understanding of what to expect. Having a professional role with the healthcare team allows them to begin to develop a professional identity. Given the scope of the benefits of this experience, it is no wonder that pre-medical students and medical scribe companies are quick to promote them. Pre-medical advisors and those involved in the pre-medical curriculum should be aware of the benefits of working as a medical scribe, and help interested students to take advantage of these opportunities. Pre-medical curricula should provide students with opportunities to experience the clinical environment in meaningful ways, where the students are actively participating with professionals. Further research in this area will help to inform the

Years ago when my colleagues and I began the medical scribe program at Saginaw Valley State University, we anticipated that it would be beneficial to the students who chose to be a part of it. We could not have predicted that this program would have the kind of impact I have found in this study. The results of this study, along with what I have seen as I work in this program, have given me a very positive perspective about why they are beneficial for students. For all of these reasons, I am a strong advocate for medical scribe programs, and I would like to see more universities offer this experience to their pre-medical students. Pre-professional students need to have exposure to what the profession is truly like, which this experience offers. They see the people, the medical care, and the settings that they need to begin to inform their career decisions. They need to have a role that is meaningful, especially one that can pay them for their skills and hold them accountable to working in the system, and not just passively observing when they feel up to it. And students need to be around professionals, at least to observe and have some informal dialogue, and at most, they could find very influential mentors that will play a powerful role in preparing them for the long process of becoming a professional.

Higher education and community partnerships.

Many medical scribes are trained by private companies and then hired by hospitals or physician offices. The medical scribe program at SVSU is somewhat unique in that it represents a successful community partnership with a university. By working together, both the university and the community partner are able to create an environment that leads to numerous positive features. One of these is the economic benefit of creating new local jobs. The partner hospital hires between 15-30 medical scribes, who make roughly $10-12 per hour, and there are many other local businesses that hire medical scribes. Working as a medical scribe, a pre-medical student can reasonably expect to make between $20,000-30,000 if he or she works a typical part-time schedule for about two years. The chance to make this kind of money while gaining the rich experiences available must seem very appealing, especially when compared to volunteering with the hope that it is a good experience. Because of the numerous positive aspects of this kind of program, it is my hope that more institutions would actively pursue partnerships that provide opportunities like this for students.

Resilience, Wellness, and Burnout

Pre-medical students experience a lot of stress (Klink, Byars-Winston, & Bakken, 2008), which only grows as they transition to medical students and residents (IsHak et al., 2013). Working as a physician can be a very stressful career (Rosenstein, 2013). Stress is high, and incidence of burnout can be as high as 75% of medical students (Fares et al., 2016), with similar numbers among medical residents (IsHak et al., 2009). In recent years, more and more physicians have experienced burnout and decreased satisfaction with work-life balance (Shanafelt et al., 2015). Whether or not they understand the stresses that lie ahead, college students are faced with at least 11 years (some specialties will require much more) of high-stress

schooling and clinical experiences before they can be practicing physicians, only to enter a demanding profession where they may work for 30-40 more years.

There have been many efforts recently to promote resilience and wellness among medical students, residents, and practicing physicians. The results of this study give some hope that medical scribe work experience may help medical students become more resilient to stress. Burnout and stress can be linked to a lack of understanding and commitment to a career as a physician (O'Connell & Gupta, 2009). Because their experiences allow them to see what a career as a physician is like, medical scribes may understand many of the aspects of a career in medicine that others do not, which may lower the amount of stress they experience. Medical scribes may also have less stress about medical school because of the knowledge they have gained, giving them hope and confidence for success.

Another way in which medical scribe experience can help with resilience is because scribes develop expertise with electronic health records (EHR). Healthcare professionals can experience stress and burnout from excessive EHR use, and issues with navigation, data entry, and others present additional stress to physicians (EHRIntelligence, 2016). Conversely, the nature of their work allows medical scribes to develop extensive proficiency with using EHR's. Becoming comfortable using a complex software system prior to medical school may prevent or relieve the stress of having to learn it as a medical student or later.

The "hidden curriculum" and lack of professional development may also play a role in burnout (Montgomery, 2014). In addition to learning clinical medicine, medical students and residents are put into situations where they must show a high level of communication and professional skills. They give and receive feedback on their performance frequently, and they work in diverse groups. Depending on where students are in their personal and professional development, they may see these as stressful situations. However, if working as a medical scribe

can help medical students establish a professional identity and give them a sense of what to expect in medical school in this regard, it is possible that they would have less stress in these situations. When medical scribes see medical students and residents being taught by clinical faculty, they may be able to anticipate the day when they will be in those situations, which may play a direct role in offsetting this stress.

There may be numerous ways in which medical scribe work experience may contribute to resiliency and wellness. They may have seen both good and poor examples of how to cope with stress, perhaps couples both positive and negative outcomes in coping with stress. Completing clinical experiences after working in hospitals for several years may provide a sense of comfort and familiarity, instead of a new and unfamiliar challenge. Using their medical vocabulary and knowledge may provide a similar sense of the familiar. It is not known if medical scribe experience can contribute to medical student wellness and resilience, but these possibilities warrant a closer examination.

Recommendations for Pre-Medical Students

The results of this study are very encouraging for pre-medical students who desire to gain knowledge that will help them in medical school. All of the participants reported having learned many things as a medical scribe that helped them during medical school. Part of the job of a medical scribe is to "climb inside the head" of a physician to be able to document the exam findings and clinical reasoning associated with the care they provide for their patients. Doing this with each patient encounter will allow the medical scribe to become very familiar with a large amount of information that they will need to learn in medical school. This knowledge can have an immediate impact on their medical education, both in the classroom and in simulated and authentic clinical experiences. Not only do they have knowledge of medical conditions and treatments, but they also have knowledge about healthcare systems, hospital staff and operating

procedures, and the business and ethical issues in healthcare. Their firsthand experiences have provided them the opportunity to see all of these things and more prior to stepping foot in medical school. Once they enter, they find they know more and have experienced more than many of their peers.

This knowledge, along with their experiences in working with and around professionals helps them to develop a number of professional attributes. They know what physicians' work is like because they have worked directly with them for many work shifts. They have witnessed physicians interact with patients, families, medical students and residents, and other professionals, and they have a sense of what is good (and not good) to do in these situations. As they become more assimilated into the healthcare team, medical scribes develop professional relationships that provide a strong foundation for their professional development. These professional relationships can also be a great support to them as they go through medical school.

As stated in the results, every participant recommended that pre-medical students should take the opportunity to work as a medical scribe, if the opportunity is there. Clearly, they feel that the time they put into their jobs was worth it. It is worth noting that many of them also felt strongly that people considering working as a medical scribe should take their work seriously, and not squander the opportunity to take away so many good things from the experience.

While there are many benefits to working as a medical scribe prior to medical school, it is by no means the only way to gain useful knowledge and experiences. In this study, the participants felt that all of their clinical experiences were valuable, even those that were not as a medical scribe. Medical scribes do not provide any patient care, so a medical student may also benefit from working as a CNA, phlebotomist, or other job that allows for direct patient care. Being able to show competency with the interpersonal and psychomotor skills related to healthcare must also be beneficial in medical school. Experience in a specialized area of

healthcare, such as a care facility or laboratory, can have some value to medical students, although the value may only be realized in certain contexts. Any knowledge, skills, or abilities that pre-medical students gain along the way can contribute to their success in medical school, and development as professionals.

Recommendations for Medical Schools

Medical educators need to learn more about how medical scribe work experience can benefit medical students. However, the results of the current study provide some promising avenues to explore. If further research can confirm the same results on a larger scale, medical schools may do well to embrace some changes in some of their traditional processes. For example, it may be advantageous for medical schools to recruit and admit more students with medical scribe work experience, for the reasons I have discussed. Also, many medical schools provide their students with early clinical experiences, such as working as an emergency medical technician (EMT), or as a medical assistant. Given the potential benefits, medical school administrators may want to consider providing their students with medical scribe training and work experience. One primary difference between working as a medical scribe and many other experiences is the fact that medical scribes work directly with physicians. Of course, medical scribes do not typically provide direct patient care like EMT's and medical assistants do, so the experience would need to align with the specific goals of the curriculum in order to meet the right outcomes.

Summary

Medical students who have significant work experience as a medical scribe enjoy a variety of benefits from their experiences. They have a substantial amount of medical knowledge, and expertise in medical documentation. They have started to develop a true

professional identity, and they have started to engage in an informed career exploration process. Because of all of these things, they have confidence in their abilities and career choices.

I firmly believe that this type of experience adds depth and breadth to the pre-medical experience. Pre-medical students use this experience to get perspective and insight that they may not have obtained in any other way. They get paid to work side by side with a group of physicians, in an environment that is diverse enough to show them many aspects of medicine and humanity. The experience is powerful and personal. And when I think of how the traditional pre-medical curriculum emphasizes vastly different priorities, I feel fortunate that many at my institution have the chance to take advantage of this program. By offering programs with a link to powerful and meaningful experiences, I believe higher education institutions can do a great service to their pre-medical students.

APPENDIX

APPENDIX 1:INTERVIEW PROTOCOL

1. How did you come to be a medical student?

2. Why did you decide to become a medical scribe?
    - Where did you hear about it?
    - What was your motivation?

3. How would you describe your experience of working as a medical scribe in terms of preparing you for medical school?

4. Specific instances they remember from their scribe experiences

5. Have your medical scribe experiences had a positive influence on you as a medical student?
    - Knowledge
    - Professional development
    - Career goals
    - Personal development
    - Other

6. Have your medical scribe experiences had a negative influence on you as a medical student?
    - Knowledge
    - Professional development
    - Career goals
    - Personal development
    - Other

7. How do your medical scribe experiences compare to your other pre-clinical work experiences? (If applicable)

8. What is your advice to pre-medical students considering working as a scribe?

APPENDIX 2: MEDICAL SCRIBE TRAINING PROGRAMS

Saginaw Valley State University

The medical scribe training program at SVSU is a 15-week university course, which consists of both classroom training and observation in the hospital. Students have a manual with all of the required medical terminology and documentation information. Students are organized into diverse teams, and a traditional Team Based Learning (TBL) format is used, complete with individual quizzes (iRAT) and team quizzes (tRAT). The application activities have students developing a medical chart for a simulated patient encounter, with several videos used for each system. The instructor, as well as lead scribes from the partner hospital give support and immediate feedback to students as they complete their charts. Classroom activities also include formal instruction and testing about laboratory results and imaging studies, as well as the electronic medical record software.

Outside of class, students complete four observations in the hospital with experienced medical scribes. During the 3rd and 4th observation, students are given opportunities to show their abilities by writing charts alongside the medical scribes, and detailed feedback is given during this process. Students are evaluated on their skills and professional behaviors with each observation. Lead scribes from the partner hospital help to schedule the observations, and ensure that each student is properly evaluated.

Medical Scribe Companies

Many medical scribes are trained and hired through national companies that have contracts with local hospitals. The following information is taken directly from the respective companies' websites.

Scribe America. "The medical scribe training program consists of 3 steps: Step 1 is a 2-week orientation course designed to get the medical scribe "up to speed" for his first day of collaboration with the physician. Step 2 is supervisory period during which a highly experienced medical scribe offers immediate review and feedback of the new medical scribe's work. Step 3 is a periodic re-assessment that allows for indefinite and frequent review of the scribe's role and effectiveness in an effort to enable the medical scribe to always keep up-to-date with a dynamic workplace environment."

PhysAssist. "Free for scribe trainees, I Am Scribe University (Scribe U) includes one-on-one coaching with daily learning modules on proper chart structure, common complaints with associated signs and symptoms, medical terminology and more. High-performing trainees move on to residency shift training. Following a successful interview, onboarding (including Scribe U and then residency shifts) begins. This can take anywhere from one week to two months, depending on facility availability."

Elite Medical Scribes. "The Elite Academy is the nation's leading medical scribe training program offered today. This innovative scribe training program was designed by Elite Medical Scribes, the nation's leading provider of quality medical scribe services, and offers cutting-edge knowledge and training for medical scribes. It utilizes world-class technology to provide an immersive online medical scribe training experience, including real-time feedback and coaching from deeply experienced instructors with real-world scribe experience within the online Elite Academy Virtual Workshop.

"Developed by medical scribe professionals, training professionals and physicians, it stands alone as the finest training method for those starting their medical scribe careers. Quality and complete HPIs, accurate charting, detail-oriented notes, including billing and coding, and true typing speed are all measured and coached to ensure superior results, as well as clinician and administration confidence and satisfaction.

Properly trained medical scribes allow for a more streamlined process for health professionals. The Elite Academy combines 300+ multimedia scenarios through the Elite Academy Virtual Workshop.

"The Elite Academy Virtual Workshop allows the industry's finest medical scribe trainers to teach and educate medical scribe students in real-time from anywhere in the nation. Trainers with years of medical scribing experience lead this interactive virtual classroom. The training is comprehensive and allows for students to create unlimited medical records within the Elite Academy note creation software, EliteSoft. The Elite Academy also requires scribe candidates to complete and pass several rounds of testing to advance."

REFERENCES

REFERENCES

AACOM. (2013, September 24). *Fast facts about osteopathic medical education.* Retrieved from American Association of Colleges of Osteopathic Medicine. Retrieved from www.aacom.org/data/studentenrollment/Documents/prelim%20enroll%20report%202013%20fast%20facts%20103013.pdf

AAMC. (2013, October 14). *Medical school applicants, enrollment reach all-time highs*. Retrieved from Association of American Medical Colleges: https://www.aamc.org/newsroom/newsreleases/358410/20131024.html

AAMC. (2014). *GME Funding: How to fix the doctor shortage*. Retrieved from Association of American Colleges of Medicine. Retrieved from https://www.aamc.org/advocacy/campaigns_and_coalitions/fixdocshortage/#.UtBRM7TDulo

AAMC Compliance Officers' Forum. (2011). *Compliance advisory: Electronic health records in academic health centers.* Washington, DC: AAMC.

Aging statistics. (2013, December). Retrieved February 27, 2014, from U.S. Department of Health and Human Services, Administration on Aging. http://www.aoa.gov/AoAroot/Aging_Statistics/

Almy, T. P., Cohen, R. D., Ham, T. H., Hornig, E. O., & Price, J. (1983). Health-related experimental learning for college undergraduates. Journal of Medical Education, 58(5), 404–410.

Anderson, E. E., & Kiger, A. M. (2008). "I felt like a real nurse"—Student nurses out on their own. Nurse Education Today, 28(4), 443–449. https://doi.org/10.1016/j.nedt.2007.07.013

Arora, S., Russ, S., Petrides, K. V., Sirimanna, P., Aggarwal, R., Darzi, A., & Sevdalis, N. (2011). Emotional intelligence and stress in medical students performing surgical tasks. Academic Medicine, 86(10), 1311–1317. https://doi.org/10.1097/ACM.0b013e31822bd7aa

Artino, A. R., Cleary, T. J., Dong, T., Hemmer, P. A., & Durning, S. J. (2014). Exploring clinical reasoning in novices: A self-regulated learning microanalytic assessment approach. Medical Education, 48(3), 280–291. https://doi.org/10.1111/medu.12303

Arya, R., Salovich, D. M., Ohman-Strickland, P., & Merlin, M. A. (2010). Impact of scribes on performance indicators in the emergency department. Academic Emergency Medicine, 17(5), 490–494. https://doi.org/10.1111/j.1553-2712.2010.00718.x

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for. Qualitative Research, 1(3), 385–405. https://doi.org/10.1177/146879410100100307

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191.

Bandura, A. (1991). Social cognitive theory of self-regulation. Organizational Behavior and Human Decision Processes, 50(2), 248–287. https://doi.org/10.1016/0749-5978(91)90022-L

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117-148.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52(1), 1–26. https://doi.org/10.1146/annurev.psych.52.1.1

Bank, A., Obetz, C., Konrardy, A., Khan, A., Pillai, K., McKinley, B., … Kenney, B. (2013). Impact of scribes on patient interaction, productivity, and revenue in a cardiology clinic: A prospective study. ClinicoEconomics and Outcomes Research, 399. https://doi.org/10.2147/CEOR.S49010

Barr, A. B., Walters, M. A., & Hagan, D. W. (2002). The value of experiential education in dietetics. Journal of the American Dietetic Association, 102(10), 1458–1460.

Billett, S. (1995). Workplace learning: Its potential and limitations. Education + Training, 37(5), 20–27. https://doi.org/10.1108/00400919510089103

Billett, S. (2001). Learning through work: Workplace affordances and individual engagement. Journal of Workplace Learning, 13(5), 209–214. https://doi.org/10.1108/EUM0000000005548

Billett, S. (2004). Workplace participatory practices: Conceptualising workplaces as learning environments. Journal of Workplace Learning, 16(6), 312–324. https://doi.org/10.1108/13665620410550295

Bok, D. C. (2006). *Our underachieving colleges: A candid look at how much students learn and why they should be learning more.* Princeton, NJ: Princeton University Press.

Bowen, J. L. (2006). Educational strategies to promote clinical diagnostic reasoning. New England Journal of Medicine, 355(21), 2217–2225. https://doi.org/10.1056/NEJMra054782

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brondani, M. A., Chen, A., Chiu, A., Gooch, S., Ko, K., Lee, K., … Steed, B. (2012). Undergraduate geriatric education through community service learning. Gerodontology, 29(2), e1222–e1229. https://doi.org/10.1111/j.1741-2358.2010.00444.x

Burford, B. (2012). Group processes in medical education: Learning from social identity theory. Medical Education, 46(2), 143–152. https://doi.org/10.1111/j.1365-2923.2011.04099.x

Carr, S., & Carmody, D. (2006). Experiential learning in women's health: Medical student reflections. Medical Education, 40(8), 768–774. https://doi.org/10.1111/j.1365-2929.2006.02536.x

Carr, S. E. (2009). Emotional intelligence in medical students: Does it correlate with selection measures? Medical Education, 43(11), 1069–1077. https://doi.org/10.1111/j.1365-2923.2009.03496.x

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. Journal of Educational Psychology, 93(1), 55–64. https://doi.org/10.1037/0022-0663.93.1.55

Chuck, J. M. (1996). Do premedical students know what they are getting into? Western Journal of Medicine, 164(3), 228–230.

Conklin, A. M., Dahling, J. J., & Garcia, P. A. (2013). Linking affective commitment, career self-efficacy, and outcome expectations: A test of social cognitive career theory. Journal of Career Development, 40(1), 68–83. https://doi.org/10.1177/0894845311423534

Conrad, P. (1986). The myth of cut-throats among premedical students: On the role of stereotypes in justifying failure and success. Journal of Health and Social Behavior, 27(2), 150–160. https://doi.org/10.2307/2136313

Cooke, M., Irby, D. M., Sullivan, W., & Ludmerer, K. M. (2006). American Medical Education 100 years after the Flexner Report. New England Journal of Medicine, 355(13), 1339–1344. https://doi.org/10.1056/NEJMra055445

Cooke, M., Irby, D. M., & O'Brien, B. C. (2010). *Educating physicians: A call for reform of medical school and residency.* San Francisco: Jossey-Bass.

Coombs, R. H., & Paulson, M. J. (1990). Is premedical education dehumanizing? A literature review. Journal of Medical Humanities, 11(1), 13–22. https://doi.org/10.1007/BF01142235

Cowin, L. S., Johnson, M., Wilson, I., & Borgese, K. (2013). The psychometric properties of five Professional Identity measures in a sample of nursing students. Nurse Education Today, 33(6), 608–613. https://doi.org/10.1016/j.nedt.2012.07.008

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.

Cruess, S. R., Johnston, S., & Cruess, R. L. (2004). "Profession": A working definition for medical educators. Teaching and Learning in Medicine, 16(1), 74–76. https://doi.org/10.1207/s15328015tlm1601_15

Cuyvers, K., Donche, V., & Van den Bossche, P. (2016). Learning beyond graduation: Exploring newly qualified specialists' entrance into daily practice from a learning perspective.

Advances in Health Sciences Education, 21(2), 439–453. https://doi.org/10.1007/s10459-015-9640-y

Davis, J., Anderson, M., & Stankevitz, K. (2013). Providing premedical students with quality clinical and research experience. WMJ : Official Publication of the State Medical Society of Wisconsin, 112(5), 195–198.

de la Croix, A., Rose, C., Wildig, E., & Willson, S. (2011). Arts-based learning in medical education: The students' perspective. Medical Education, 45(11), 1090–1100. https://doi.org/10.1111/j.1365-2923.2011.04060.x

Dewey, J. (1938). Experience and education. Simon & Schuster.

Diemers, A. D., Dolmans, D. H. J. M., Verwijnen, M. G. M., Heineman, E., & Scherpbier, A. J. J. A. (2008). Students' opinions about the effects of preclinical patient contacts on their learning. Advances in Health Sciences Education, 13(5), 633–647. https://doi.org/10.1007/s10459-007-9070-6

Diemers, A. D., van de Wiel, M. W. J., Scherpbier, A. J. J. A., Heineman, E., & Dolmans, D. H. J. M. (2011). Pre-clinical patient contacts and the application of biomedical and clinical knowledge: Patient contact and the application of biomedical knowledge. Medical Education, 45(3), 280–288. https://doi.org/10.1111/j.1365-2923.2010.03861.x

Dornan, T. (2012). Workplace learning. Perspectives on Medical Education, 1(1), 15–23. https://doi.org/10.1007/s40037-012-0005-4

Elstein, A. S. (2009). Thinking about diagnostic thinking: A 30-year perspective. Advances in Health Sciences Education, 14(1), 7–18. https://doi.org/10.1007/s10459-009-9184-0

Erich, J. (2014, May 1). EMT training for medical students. Retrieved September 18, 2016, from http://www.emsworld.com/article/11386677/emt-training-for-medical-students

Eva, K. W. (2005). What every teacher needs to know about clinical reasoning. Medical Education, 39(1), 98–106. https://doi.org/10.1111/j.1365-2929.2004.01972.x

Fares, J., Al Tabosh, H., Saadeddin, Z., El Mouhayyar, C., & Aridi, H. (2016). Stress, burnout and coping strategies in preclinical medical students. North American Journal of Medical Sciences, 8(2), 75. https://doi.org/10.4103/1947-2714.177299

Finn, G., Garner, J., & Sawdon, M. (2010). "You"re judged all the time!' Students' views on professionalism: A multicentre study. Medical Education, 44(8), 814–825. https://doi.org/10.1111/j.1365-2923.2010.03743.x

Flexner, A. (1910). *Medical education in the United States and Canada: A report to the Carnegie Foundation for the Advancement of Teaching. No. 4.* New York: Carnegie Foundation for the Advancement of Teaching.

Gallagher, P. (2007). Preconceptions and learning to be a nurse. Nurse Education Today, 27(8), 878–884. https://doi.org/10.1016/j.nedt.2006.12.004

Gandomkar, R., Mirzazadeh, A., Jalili, M., Yazdani, K., Fata, L., & Sandars, J. (2016). Self-regulated learning processes of medical students during an academic learning task. Medical Education, 50(10), 1065–1074. https://doi.org/10.1111/medu.12975

Ginsburg, S., & Lingard, L. (2011). "Is that normal?" Pre-clerkship students' approaches to professional dilemmas. Medical Education, 45(4), 362–371. https://doi.org/10.1111/j.1365-2923.2010.03903.x

Goldie, J. (2012). The formation of professional identity in medical students: Considerations for educators. Medical Teacher, 34(9), e641–e648. https://doi.org/10.3109/0142159X.2012.687476

Gross, J. P., Mommaerts, C. D., Earl, D., & De Vries, R. G. (2008). Perspective: After a century of criticizing premedical education, are we missing the point?: Academic Medicine, 83(5), 516–520. https://doi.org/10.1097/ACM.0b013e31816bdb58

Gunderman, R. B., & Kanter, S. L. (2008). Perspective: "How to fix the premedical curriculum" revisited: Academic Medicine, 83(12), 1158–1161. https://doi.org/10.1097/ACM.0b013e31818c6515

Guthrie, E. A., Black, D., Shaw, C. M., Hamilton, J., Creed, F. H., & Tomenson, B. (1997). Psychological stress in medical students: A comparison of two very different university courses. Stress Medicine, 13(3), 179–184. https://doi.org/10.1002/(SICI)1099-1700(199707)13:3<179::AID-SMI740>3.0.CO;2-E

Haase, K. K., Smythe, M. A., Orlando, P. L., Resman-Targoff, B. H., & Smith, L. S. (2008). Ensuring quality experiential education. Pharmacotherapy, 28(12), 1548–1551. https://doi.org/10.1592/phco.28.12.1548

Hanson, J. L., Balmer, D. F., & Giardino, A. P. (2011). Qualitative research methods for medical educators. Academic Pediatrics, 11(5), 375–386. https://doi.org/10.1016/j.acap.2011.05.001

Hayward, L. M., Black, L. L., Mostrom, E., Jensen, G. M., Ritzline, P. D., & Perkins, J. (2013). The first two years of practice: A longitudinal perspective on the learning and professional development of promising novice physical therapists. Physical Therapy, 93(3), 369–383. https://doi.org/10.2522/ptj.20120214

Helmich, E., Bolhuis, S., Laan, R., Dornan, T., & Koopmans, R. (2013). Medical students' emotional development in early clinical experience: A model. Advances in Health Sciences Education, 19(3), 347–359. https://doi.org/10.1007/s10459-013-9477-1

Helmich, E., & Dornan, T. (2012). Do you really want to be a doctor? The highs and lows of identity development. Medical Education, 46(2), 132–134. https://doi.org/10.1111/j.1365-2923.2011.04189.x

Heung, Y. Y. J., Wong, K. Y. F., Kwong, W. Y. E., To, S. S. T., & Wong, H. C. D. (2005). Severe acute respiratory syndrome outbreak promotes a strong sense of professional identity among nursing students. Nurse Education Today, 25(2), 112–118. https://doi.org/10.1016/j.nedt.2004.11.003

Hill, E., & Vaughan, S. (2013). The only girl in the room: How paradigmatic trajectories deter female students from surgical careers. Medical Education, 47(6), 547–556. https://doi.org/10.1111/medu.12134

Holden, M., Buck, E., Clark, M., Szauter, K., & Trumble, J. (2012). Professional identity formation in medical education: The convergence of multiple domains. HEC Forum, 24(4), 245–255. https://doi.org/10.1007/s10730-012-9197-6

Howe, A. (2002). Professional development in undergraduate medical curricula—the key to the door of a new culture? Medical Education, 36(4), 353–359. https://doi.org/10.1046/j.1365-2923.2002.01168.x

Hudson, B. F., Ogden, J., & Whiteley, M. S. (2014). A thematic analysis of experiences of varicose veins and minimally invasive surgery under local anaesthesia. Journal of Clinical Nursing, n/a-n/a. https://doi.org/10.1111/jocn.12719

IsHak, W., Nikravesh, R., Lederer, S., Perry, R., Ogunyemi, D., & Bernstein, C. (2013). Burnout in medical students: A systematic review. The Clinical Teacher, 10(4), 242–245. https://doi.org/10.1111/tct.12014

IsHak, W. W., Lederer, S., Mandili, C., Nikravesh, R., Seligman, L., Vasa, M.,…Bernstein, C. A. (2009). Burnout during residency training: A literature review. Journal of Graduate Medical Education, 1(2), 236–242. https://doi.org/10.4300/JGME-D-09-00054.1

Johannsen, A., Bolander-Laksov, K., Bjurshammar, N., Nordgren, B., Fridén, C., & Hagströmer, M. (2012). Enhancing meaningful learning and self-efficacy through collaboration between dental hygienist and physiotherapist students—a scholarship project. International Journal of Dental Hygiene, 10(4), 270–276. https://doi.org/10.1111/j.1601-5037.2011.00539.x

Johnson, M., Cowin, L. s., Wilson, I., & Young, H. (2012). Professional identity and nursing: Contemporary theoretical developments and future research challenges. International Nursing Review, 59(4), 562–569. https://doi.org/10.1111/j.1466-7657.2012.01013.x

Kanter, S. L. (2008). Toward a sound philosophy of premedical education. Academic Medicine, 83(5), 423–424. https://doi.org/10.1097/ACM.0b013e3181734623

Karani, R., Fromme, H. B., Cayea, D., Muller, D., Schwartz, A., & Harris, I. B. (2014). How medical students learn from residents in the workplace: A qualitative study. Academic Medicine: Journal of the Association of American Medical Colleges, 89(3), 490–496. https://doi.org/10.1097/ACM.0000000000000141

Kedrowicz, A. A., Fish, R. E., & Hammond, S. (2015). Relationship between anticipatory socialization experiences and first-year veterinary students' career interests. Journal of Veterinary Medical Education, 42(1), 18–27. https://doi.org/10.3138/jvme.0814-083R

Keshishian, F. (2010). Factors influencing pharmacy students' choice of major and its relationship to anticipatory socialization. American Journal of Pharmaceutical Education, 74(4). Retrieved from https://www-ncbi-nlm-nih-gov.proxy2.cl.msu.edu/pmc/articles/PMC2879127/

Kitsis, E. A., & Goldsammler, M. (2013). Physician shadowing: A review of the literature and proposal for guidelines. Academic Medicine, 88(1), 102–110. https://doi.org/10.1097/ACM.0b013e318277d5b2

Klink, J. L., Byars-Winston, A., & Bakken, L. L. (2008). Coping efficacy and perceived family support: Potential factors for reducing stress in premedical students. Medical Education, 42(6), 572–579. https://doi.org/10.1111/j.1365-2923.2008.03091.x

Knecht-Sabres, L. J. (2010). The use of experiential learning in an occupational therapy program: Can it foster skills for clinical practice? Occupational Therapy in Health Care, 24(4), 320–334. https://doi.org/10.3109/07380577.2010.514382

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Upper Saddle River, New Jersey: Prentice Hall.

Koponen, J., Pyörälä, E., & Isotalus, P. (2012). Comparing three experiential learning methods and their effect on medical students' attitudes to learning communication skills. Medical Teacher, 34(3), e198–e207. https://doi.org/10.3109/0142159X.2012.642828

Koshy, S., Feustel, P. J., Hong, M., & Kogan, B. A. (2010). Scribes in an ambulatory urology practice: Patient and physician satisfaction. The Journal of Urology, 184(1), 258–262. https://doi.org/10.1016/j.juro.2010.03.040

Leddy, J., Moineau, G., Puddester, D., Wood, T., & Humphrey-Murto, S. (2011). Does an emotional intelligence test correlate with traditional measures used to determine medical school admission? [Miscellaneous]. Academic Medicine October 2011, 86(10). https://doi.org/10.1097/ACM.0b013e31822a6df6

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. Journal of Vocational Behavior, 45(1), 79–122. https://doi.org/10.1006/jvbe.1994.1027

Lincoln Y. S., and Guba, E. G. (1985). *Naturalistic Inquiry*. SAGE.

Lynch, T. S. (1974). An emergency department scribe system. Journal of the American College of Emergency Physicians, 3(5), 302–303. https://doi.org/10.1016/S0361-1124(74)80045-6

Lyndon, M. P., Strom, J. M., Alyami, H. M., Yu, T.-C., Wilson, N. C., Singh, P. P., … Hill, A. G. (2014). The relationship between academic assessment and psychological distress among medical students: A systematic review. Perspectives on Medical Education, 3(6), 405–418. https://doi.org/10.1007/s40037-014-0148-6

Maiorova, T., Stevens, F., Scherpbier, A., & van der Zee, J. (2008). The impact of clerkships on students' specialty preferences: What do undergraduates learn for their profession? Medical Education, 42(6), 554–562. https://doi.org/10.1111/j.1365-2923.2008.03008.x

Marshall, J. S., Verdick, C. M., Tanaka, M. S., Frederick, R. C., Hevesy, G. Z., Wang, H., & Hafner, J. W. (2012). 296 Implementation of Medical Scribes in an Academic Emergency Department: Effect on Emergency Department Throughput, Clinical Productivity, and Emergency Physician Professional Fees. Annals of Emergency Medicine, 60(4, Supplement), S105. https://doi.org/10.1016/j.annemergmed.2012.06.274

Maudsley, G., & Strivens, J. (2000). Promoting professional knowledge, experiential learning and critical thinking for medical students. Medical Education, 34(7), 535–544. https://doi.org/10.1046/j.1365-2923.2000.00632.x

Meyer, H. (2010). The doctor (and his scribe) will see you now. Hospitals & Health Networks, 84(12), 41–2, 44.

Monrouxe, L. V., & Rees, C. E. (2009). Picking up the gauntlet: Constructing medical education as a social science. Medical Education, 43(3), 196–198. https://doi.org/10.1111/j.1365-2923.2008.03272.x

Monrouxe, L. V., Rees, C. E., & Hu, W. (2011). Differences in medical students' explicit discourses of professionalism: Acting, representing, becoming. Medical Education, 45(6), 585–602. https://doi.org/10.1111/j.1365-2923.2010.03878.x

Monteiro, S. M., & Norman, G. (2013). Diagnostic reasoning: Where we've been, where we're going. Teaching and Learning in Medicine, 25(sup1), S26–S32. https://doi.org/10.1080/10401334.2013.842911

Montgomery, A. (2014). The inevitability of physician burnout: Implications for interventions. Burnout Research, 1(1), 50–56. https://doi.org/10.1016/j.burn.2014.04.002

Norman, G. (2005). Research in clinical reasoning: Past history and current trends. Medical Education, 39(4), 418–427. https://doi.org/10.1111/j.1365-2929.2005.02127.x

Norman, G. (2006). Building on experience—The development of clinical reasoning. New England Journal of Medicine, 355(21), 2251–2252. https://doi.org/10.1056/NEJMe068134

Norman, G., Young, M., & Brooks, L. (2007). Non-analytical models of clinical reasoning: The role of experience. Medical Education, 41(12), 1140–1145. https://doi.org/10.1111/j.1365-2923.2007.02914.x

Norris, B., Harris, T., & Stringer, S. (2011). Effective use of physician extenders in an outpatient otolaryngology setting. The Laryngoscope, 121(11), 2317–2321. https://doi.org/10.1002/lary.22192

O'Connell, V. A., & Gupta, J. (2009). The premedical student: Training and practice expectations. Medical Education Online, 11. https://doi.org/10.3402/meo.v11i.4590

O'Connor, B. (2004). The workplace learning cycle: A problem-based curriculum model for the preparation of workplace learning professionals. Journal of Workplace Learning, 16(6), 341–349. https://doi.org/10.1108/13665620410550312

Passi, V., Johnson, S., Peile, E., Wright, S., Hafferty, F., & Johnson, N. (2013). Doctor role modelling in medical education: BEME Guide No. 27. Medical Teacher, 35(9), e1422–e1436. https://doi.org/10.3109/0142159X.2013.806982

Piaget, J. (1972). *Development and learning. Reading in child behavior and development.* New York: Hartcourt Brace Janovich.

Pinnock, R., & Welch, P. (2014). Learning clinical reasoning. Journal of Paediatrics and Child Health, n/a–n/a. https://doi.org/10.1111/jpc.12455

Rosenstein, A. H. (2013). Addressing physician stress, burnout, and compassion fatigue: The time has come. Israel Journal of Health Policy Research, 2(1), 32. https://doi.org/10.1186/2045-4015-2-32

Sajjad, M., & Mahboob, U. (2015). Improving workplace-based learning for undergraduate medical students. Pakistan Journal of Medical Sciences, 31(5), 1272–1274. https://doi.org/10.12669/pjms.315.7687

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, cognition and personality, 9*(3), 185-211.

Schaub, M., & Tokar, D. M. (2005). The role of personality and learning experiences in social cognitive career theory. Journal of Vocational Behavior, 66(2), 304–325. https://doi.org/10.1016/j.jvb.2004.09.005

Schmidt, H., Norman, G., & Boshuizen, H. (1990). A cognitive perspective on medical expertise: Theory and implication [published erratum appears in Acad Med 1992 Apr;67(4):287]. Academic Medicine October 1990, 65(10), 611–21.

Shanafelt, T. D., Hasan, O., Dyrbye, L. N., Sinsky, C., Satele, D., Sloan, J., & West, C. P. (2015). Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. Mayo Clinic Proceedings, 90(12), 1600–1613. https://doi.org/10.1016/j.mayocp.2015.08.023

Siddiqui, S. (2014). Of mentors, apprenticeship, and role models: A lesson to relearn? Medical Education Online, 19(0). https://doi.org/10.3402/meo.v19.25428

Sklar, D. P. (2013). Preparation for medical school: Reflections on the MCAT exam, premedical education, and the medical school application process. Academic Medicine, 88(5), 553–554. https://doi.org/10.1097/ACM.0b013e31828b7c8f

Smith, S. E., Tallentire, V. R., Cameron, H. S., & Wood, S. M. (2013). The effects of contributing to patient care on medical students' workplace learning. Medical Education, 47(12), 1184–1196. https://doi.org/10.1111/medu.12217

Stewart, Lam, Betson, & WongWong. (1999). A prospective analysis of stress and academic performance in the first two years of medical school. Medical Education, 33(4), 243–250. https://doi.org/10.1046/j.1365-2923.1999.00294.x

Thomas, L. (1978). How to fix the premedical curriculum. *The New England Journal of Medicine,* 1180-1181.

Thompson, M. N., & Dahling, J. J. (2012). Perceived social status and learning experiences in Social Cognitive Career Theory. Journal of Vocational Behavior, 80(2), 351–361. https://doi.org/10.1016/j.jvb.2011.10.001

Tokar, D. M., Thompson, M. N., Plaufcan, M. R., & Williams, C. M. (2007). Precursors of learning experiences in Social Cognitive Career Theory. Journal of Vocational Behavior, 71(3), 319–339. https://doi.org/10.1016/j.jvb.2007.08.002

Turner, N. M., Van De Leemput, A. J., Draaisma, J. M. T., Oosterveld, P., & Ten Cate, O. T. J. (2008). Validity of the visual analogue scale as an instrument to measure self-efficacy in resuscitation skills. Medical Education, 42(5), 503–511. https://doi.org/10.1111/j.1365-2923.2007.02950.x

Wang, J. Y., Lin, H., Lewis, P. Y., Fetterman, D. M., & Gesundheit, N. (2015). Is a career in medicine the right choice? The impact of a physician shadowing program on undergraduate premedical students. Academic Medicine: Journal of the Association of American Medical Colleges. https://doi.org/10.1097/ACM.0000000000000615

Wear, D., & Castellani, B. (2000, June). The development of professionalism: Curriculum Matters. *Academic Medicine, 75*(6), 602-611.

Weaver, R., Peters, K., Koch, J., & Wilson, I. (2011). "Part of the team": Professional identity and social exclusivity in medical students. *Medical Education, 45*(12), 1220–1229. doi:10.1111/j.1365-2923.2011.04046.x

Weidman, J. C., Twale, D. J., & Stein, E. L. (2001). Socialization of graduate and professional students in higher education: A perilous passage? ASHE-ERIC Higher Education Report, Volume 28, Number 3. Jossey-Bass Higher and Adult Education Series. Jossey-Bass, Publishers, Inc. Retrieved from http://eric.ed.gov/?id=ED457710

Weng, H.-C., Hung, C.-M., Liu, Y.-T., Cheng, Y.-J., Yen, C.-Y., Chang, C.-C., & Huang, C.-K. (2011). Associations between emotional intelligence and doctor burnout, job satisfaction

and patient satisfaction. *Medical Education*, *45*(8), 835–842. doi:10.1111/j.1365-2923.2011.03985.x

Willenbring, B. D., McKee, K. C., Wilson, B. V., & Henry, T. D. (2008). The Minneapolis Heart Institute Foundation summer research internship program: The benefits of preprofessional experience for prospective physicians. *Minnesota Medicine*.

Wilson, I., Cowin, L. S., Johnson, M., & Young, H. (2013). Professional identity in medical students: Pedagogical challenges to medical education. *Teaching and Learning in Medicine*, *25*(4), 369–373. doi:10.1080/10401334.2013.827968

Worthington, M., Salamonson, Y., Weaver, R., & Cleary, M. (2013). Predictive validity of the Macleod Clark Professional Identity Scale for undergraduate nursing students. *Nurse Education Today*, *33*(3), 187–191. doi:10.1016/j.nedt.2012.01.012

Yardley, S., Brosnan, C., & Richardson, J. (2013). The consequences of authentic early experience for medical students: Creation of mētis. *Medical Education*, *47*(1), 109–119. doi:10.1111/j.1365-2923.2012.04287.x

Yardley, S., Brosnan, C., Richardson, J., & Hays, R. (2013). Authentic early experience in Medical Education: A socio-cultural analysis identifying important variables in learning interactions within workplaces. *Advances in Health Sciences Education*, *18*(5), 873–891. doi:10.1007/s10459-012-9428-2

Yardley, S., Littlewood, S., Margolis, S. A., Scherpbier, A., Spencer, J., Ypinazar, V., & Dornan, T. (2010). What has changed in the evidence for early experience? Update of a BEME systematic review. *Medical Teacher*, *32*(9), 740–746. doi:10.3109/0142159X.2010.496007

Yardley, S., Teunissen, P. W., & Dornan, T. (2012a). Experiential learning: AMEE Guide No. 63. *Medical Teacher*, *34*(2), e102–e115. doi:10.3109/0142159X.2012.650741

Yardley, S., Teunissen, P. W., & Dornan, T. (2012b). Experiential learning: Transforming theory into practice. *Medical Teacher*, *34*(2), 161–164. doi:10.3109/0142159X.2012.643264

Young, J. Q., Van Merrienboer, J., Durning, S., & Ten Cate, O. (2014). Cognitive Load Theory: Implications for medical education: AMEE Guide No. 86. Medical Teacher, 36(5), 371–384. https://doi.org/10.3109/0142159X.2014.889290

Yu, J. H., Chae, S. J., & Chang, K. H. (2016). The relationship among self-efficacy, perfectionism and academic burnout in medical school students. Korean Journal of Medical Education, 28(1), 49–55. https://doi.org/10.3946/kjme.2016.9

Zwaan, L., Schiff, G. D., & Singh, H. (2013). Advancing the research agenda for diagnostic error reduction. *BMJ Quality & Safety*, *22*(Suppl 2), ii52–ii57. doi:10.1136/bmjqs-2012-001624