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RELATIONSHIP OF HELP-SEEKING BEHAVIORS AND ACADEMIC
PERFORMANCE IN FIRST YEAR PHYSICIAN ASSISTANT AND DENTAL
STUDENTS

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RELATIONSHIP OF HELP-SEEKING BEHAVIORS AND ACADEMIC
PERFORMANCE IN FIRST YEAR PHYSICAIN ASSISTANT AND DENTAL
STUDENTS

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CURRICULUM

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Abstract

Background: Individual coping and stress management skills influence rates of burnout, substance abuse, and other untoward situations for medical professionals. Ideally, underdeveloped coping mechanisms and at-risk behaviors are identified early in students' professional education. Utilization of support services and coping strategies have been shown to correlate with academic success in undergraduate and graduate education. Data regarding coping strategies, academic performance, and help-seeking behaviors is scant in the Physician Assistant (PA) and Dental student literature.

Purpose: A portion of physician assistant (PA) and Dental students underperform academically. This study is designed to answer questions by the review of the related literature and analysis of coping and support strategies in minimally competent, barely passing students (MCBPs) first year PA and Dental students.

The following research questions are the focus of this study:

1. What are the coping mechanisms and support services used by first year PA and Dental students?
2. What is the relationship between coping mechanisms and academic performance among first year PA and Dental students?

3. What is the relationship between utilization of support services and academic performance among first year PA and Dental students?
4. What are the coping mechanisms of minimally competent, barely passing (MCBP) first year PA and Dental students?

Methods: Brief COPE and support service usage surveys were administered online after each of three exams. An online End of Course Survey was administered online for qualitative data collection. Control group received no intervention. The experimental group received three additional emails containing information about available support services.

Results:

1. The control group Brief COPE responses, academic performance, and poor coping behaviors revealed self-criticism and blaming correlated with poor exam grades. Analysis of the experimental group did not show strong relationships between Brief COPE items and academic performance.
2. The majority of students utilized support from family, peers, and upperclassmen. MCBPs tended to use less tutoring and less formal academic support than their higher performing peers. Both groups have low percentages of students utilizing formal on-campus services.

3. Both experimental and control groups utilized non-academic support services at higher percentages than formal academic supports. MCBPs in the experimental group utilize formal academic supports at much lower percentages than higher performing peers.

4. Self-criticism and self-blaming Brief COPE items are seen in correlation with decreased exam grade performance. Differences in overall exam grades were not observed between the two groups.

Control group MCBPs report significant negative coping strategies of denial, self-blame, and disengagement. MCBPs in the experimental group did not demonstrate no significant trends in coping mechanisms. The small numbers of responses reporting self-blame and anxiety in regard to ineffective study skills somewhat limits the qualitative data.

No significant impact from the intervention of email providing information about support services is seen in exam scores, Brief COPE responses, support service usage, or End of Course Survey responses. This is consistent with the literature.

Future Implications: The Brief COPE may have potential use to identify poor coping strategies in MCBPs. Student support service usage data can evaluate effectiveness of services and aid strategic planning. Qualitative student feedback can be implemented for continued course and program improvement.

Conclusion: Experimental and control groups have similar academic performance, support service usage, and Brief COPE responses. This is consistent with broader public health research which finds that an increase in educational efforts does not translate into behavioral changes. In both groups, students with lower exam scores reported using fewer academic supports and poor coping behaviors.

Key words: Brief COPE, student services, Minimally Competent Barely Passing (MCBP), physician assistant student, dental student, education

Chapter 1

Education research to find predictors of struggling students has focused on the K-12 education systems and undergraduate environment.¹ However, this issue needs to be addressed at all levels of education. Because PA and dental programs require high academic performance and passing marks on final board exams, early identification of struggling students could be advantageous for both faculty and student. Once contributing factors for poor performance are identified, support could be offered to students who struggle academically.

American healthcare continues to rely on Physician Assistants (PA's) and nurse practitioners as ways to extend care and reduce the costs of healthcare. Often these providers serve as the primary providers of medical care to underserved communities and rural areas.² Because the number of PA graduates is not limited by available residency positions, PA education may be a more cost-effective way to increase the overall numbers of healthcare providers to meet growing demand.³

Educational programs for PA's have doubled in the since 1995.⁴ There are now over 200 programs nationwide admitting over 8,000 students annually. These programs can be either extensions of medical schools or stand-alone programs. The programs are based on clinical skill mastery in 2-3-year intensive

programs. Once licensed, although still under some type of M.D. or D.O. supervision, these PA clinicians will be assuming many patient duties in a variety of settings. As the medical knowledge continues to grow and demand scientific understanding, the level of medical education continues to increase academic rigor.⁵ This increases the academic demands of students accepted to graduate level medical programs.

The PA and Dental workforces continue to examine effective education as programs and the workforce rapidly expand.³ Unfortunately, investigation into the causes and predictors of poor academic performance in PA and Dental programs lags behind studies of traditional medical schools in scope and faculty education.⁶ Because PA and dental programs require high academic performance and passing scores on final board exams, early identification of struggling students could be advantageous for both faculty and student.⁴ Once poor performance is identified, contributing factors and support could be addressed for students that struggle.⁷

Ensuring graduates are able to perform under a variety of situations is essential, yet PA and dental students are not required to complete the same residency requirements as physicians. Upon graduation and board exam completion, they are able to practice in a variety of settings. Both a strong academic background and mature coping skills are required to successfully practice in today's healthcare environment.

Individual coping and stress management skills influence rates of burnout, substance abuse, and other untoward situations for medical professionals. Ideally, underdeveloped coping mechanisms and at-risk behaviors are identified early in students' education. Utilization of support services and coping strategies has been shown to correlate with academic success in undergraduate and graduate education. However, little data has been collected on graduate PA students.⁸ Without this data, educators, students, and administrators may find it difficult to identify useful resources, possible academic interventions, future teaching strategies, and support systems that enhance long-term student success.

This study examined the use of support services by Physician Assistant and Dental students and assessed the impact of coping strategies on academic performance. In order to examine these questions in depth, both quantitative and qualitative research techniques were used.

Background

Education research to find predictors of struggling students has focused on the K-12 education systems and undergraduate environment. In regard to medical schools, the literature attempts to correlate and find predictors of board passing versus didactic or clinical course failure. Students come into graduate and professional level education with a variety of academic backgrounds and

personal experiences. These unique backgrounds give each student specific skills to succeed in the new educational environment. Unfortunately, some students come with fewer skills and less preparation than others. Identification of needs and needed areas of support may help ensure all students succeed in their programs. Student support includes academic guidance, skill acquisition, and facilitation of personal support systems that may be beneficial to individual students.

There is a growing body of research in higher education concerned with external factors affecting student performance. Factors include stress, personality traits, socioeconomic background, and educational preparedness. While students are in medical school, these external factors can play a large role in retention, board passing scores, individual course performance, and mental health status.^{9,10}

Over the last two decades, the field of medical education has expanded as an area of research and priority worldwide. This has positively affected the curriculum and student outcomes and, ultimately, the quality of practitioners. However, the same emphasis on teaching practices has lagged behind in physician assistant (PA) and dental programs. In addition, early identification of factors negatively impacting academic performance can predict possible future difficulty functioning as medical professionals. According to Bahramnejad, et al.¹¹ and Mahmood, et al.,¹² poor stress coping skills and

addictive behaviors in medical school are a high predictor of later addictive behaviors and increased risk of medical errors.

Purpose

Recent investigations of remediation reveal a number of factors impacting student performance in medical school.¹¹ In the majority of studies, problems associated with remediation are post hoc studies.^{5,6,12} Thus, few tools have been developed to predict the academic success or failure of PA students, especially in the physician assistant literature. Faculty tend to spend significantly more time with the few struggling students in these programs. Early identification and intervention could both improve student performance and increase teaching efficiency.¹³

Internal factors can deter students from receiving assistance. This project identified strategies utilized by both minimally competent, barely passing students (MCBPs) and higher performing students to gain insight into the behaviors and strategies of lower performing students. While this study does not intend to examine the impact of intervention on changes in personality or experience, it is important to note that students can modify their learning techniques, metacognitive skills, and behaviors with training and guidance.

External factors can limit the use of coping and help-seeking behavior in students in medical training. Limited or inaccessible services and the stigma

associated with “needing help,” are barriers to students utilizing aides already in place. These barriers are both institutional and personal limitations. From an institutional standpoint, faculty and peers have limited training and experience assisting students with needs outside of their academic scope.

Studying behavior is a complex, multifaceted endeavor, a stepwise approach was taken to first understand the current learning environment.^{14,15} This study examined help-seeking behaviors students currently use and how those behaviors correlated with academic performance in their first (Summer) semester of study in the PA and Dental programs. A second portion of the project examined whether increased education about available support services changed either help-seeking behaviors or student performance.

Because this study measured reported behavior simultaneously with academic performance during a course versus relying on post hoc reporting, study results were correlated and examined for possible relationships. The qualitative portion of the study analyzed students’ perceptions and insights not captured by quantitative survey tools. Qualitative data was compared with quantitative data to uncover links. The qualitative portion of the study included student perspectives of classroom experience to give depth and nuance to quantitative data.

Problem Statement:

A portion of PA and Dental students underperform academically.

This study analyzed the coping and support strategies in first year PA and Dental students in an attempt to improve academic performance and subsequent clinic success.

The following research questions were the focus of this study:

1. What are the coping mechanisms and support services used by first year PA and Dental students?
2. What is the relationship between coping mechanisms and academic performance among first year PA and Dental students?
3. What is the relationship between utilization of support services and academic performance among first year PA and Dental students?
4. What are the coping mechanisms of minimally competent, barely passing (MCBP) first year PA and Dental students?

Chapter 2

Education and Contextual Background:

Traditionally, medical courses including Clinical Anatomy are instructed with an emphasis on behaviorist theory. This involves a significant amount of direction by instructors as to what content is presented and, hopefully, learned during the course. Feedback is frequent and designed around correctness of responses.

This approach is usually prevalent when students are novice learners.

Behaviorism lends itself to surface knowledge and fact retrieval, but the behaviorist approach offers students little control or ability to impact the curriculum since it is directly based on test and performance results. This type of curriculum has a long history based on the advancement of industrialized techniques used by B.F. Skinner.¹⁶ Greatly influenced by the mechanization of the twentieth century, Skinner brought hypothesis-based research in controlled environments to education. His emphasis on implementing step-by-step tasks with immediate feedback as a measure of mastery continues to be influential in most medical programs. Skinner's influence in the study of human behavior is well known in the medical literature and easily accessible to instructors looking for guidance when developing curriculum.

Clinical Anatomy courses are considered foundational for all other systems and clinical coursework to follow. It can be argued that, without the vocabulary and knowledge of Clinical Anatomy, students cannot succeed in further coursework requiring advanced cognitive processing. Utilizing behaviorist theories allows instructors to quickly assess recall, performance and need for remediation of concepts. As medical schools have redesigned their curriculum to include increased amounts of material while staying within limits of instructional course hours, behaviorism has remained the dominant theory underlying the method of delivery.¹⁷ As recent as the early 2000s, major medical schools were basing the majority of content, presentation, and evaluation of the four-year curriculum on a behaviorist model.¹⁸

The condensed format of Clinical Anatomy courses is another rationale for the use of a behavioristic approach. Programs nationwide have condensed their Gross Anatomy and Clinical Anatomy courses into shorter time frames. While this has had little effect on board pass rates or overall academic outcomes, compressing curricula into an ever-smaller time frame lends itself to using a more behaviorist approach.¹⁹ Instructors can minimize the cognitive load for novice learners with direct and specific tasks for each learning objective. Surface engagement and memorization of basic facts has been shown to be an effective strategy to manage foundational information in minimal time. The assumption is that information learned can be applied to deeper learning experiences later.²⁰

The ultimate performance test for all medical professional programs is the licensure board exams. These tests are historically rooted in and structured around recollection of memorized information. Introduction to recall-based learning outcomes and expectation can familiarize students with study skills needed to pass their board exams.

In recent years, an attempt to move away from a behaviorist approach in curriculum design towards active learning in medical education has arisen. Cognitive curriculum design is based on the theory that students can discover their own learning needs and can guide curriculum as they master the material. When students are using a cognitive approach, instructors design learning environments that allow students to explore questions and answers within defined parameters. A true cognitive approach is less focused on a correct response to an answer than the ability of the student to identify the knowledge gap and acquire the answer. Cognitive theory views the instructor as more a guide than direct source of information. Cognitive design is defined by containing fewer traditional lectures and more interactive activities such as problem-based learning units and case studies.²¹ The cognitive approach assumes this instructional model will encourage deeper learning and higher locus of control in students as they continue through the program.

While medical programs started utilizing cognitive theory as students moved into clinical instruction, it has traditionally been secondary to behaviorism in foundational courses. In the 1990s, Problem Based Learning was introduced, and a movement to incorporate self-directed learning gained momentum.²² The American Association of Medical Colleges began surveying medical schools about their use of student self-directed learning in 1991.²² Since then, instructors and medical programs have begun to incorporate more cognitive-based curriculum design into foundational classes through formative experiences with technology, problem-based learning, and flipped classrooms.

Another attempt to add self-directed learning modules to medical education curriculum has been the use of online learning modules. Online collaborative learning includes creation and building of knowledge and material by users. This is also generally accepted as a sign of increased student engagement and self-directed learning.²³ Instructors can play a significant role as guides by developing and interacting with online course material.²⁴ Without the involvement of an expert to guide, monitor, or teach critical evaluation skills, students' participation in the online community can result in a false or incomplete body of knowledge.

Transitioning to successful use of these methods requires an epistemic shift, ongoing instructor support, and student readiness.²¹ Program accreditation organizations also continue recognizing the value of student directed learning,

thus, additional pressure exists to implement cognitive-based curricular design for continued accreditation.²⁵

While less often used in current classroom medical curriculum, constructivism as a theory may be useful to consider when looking at internal motivation of students, the transfer of knowledge to long-term memory, and functional knowledge. Constructivism focuses on the premise that learning cannot take place unless there is direct interaction between the learner and the environment. In a dynamic interchange, the student and situation act directly on each other to reach meaning and reality about a construct. Vygotsky described how learning is a product of the meaning learners create from experience. Based on theory and observation, this type of experience stimulates deep learning strategies.²⁶

Constructivism can be difficult to design and implement into a traditional, lecture-based classroom, but it may prove useful in clinical situations with patients and medical faculty. How students are able to transfer classroom knowledge into an individual skill set is a direct application of constructivism. As students progress through a patient intervention, each student must interpret and react to a changing environment as they directly manipulate the variables and receive feedback from the patient, test results, and supervising faculty. The development of effective clinical skills is a highly individualized

process and results from an ongoing interplay of practice, knowledge, and context.²⁷

Successful medical students are able to vary their learning strategies by task but also apply facts to clinical applications. Knowing lab values that could indicate a patient is diabetic requires factual recall. The application of these facts to appropriately prescribe medications and treatments in unique situations requires application of strategies regarding treatment strategies, patient, and clinic environment.

Utilization of behaviorism, a cognitive approach, constructivism, or a combination of theoretical frameworks may be useful in considering the kind of knowledge and skills students will need as medical professionals. Separate aspects of each framework could be present at different moments during a single course. Designing and modifying curriculum and instructional practices so that students can access a large volume of information as clinicians begins with the strategic implementation of curriculum theories. Students with less ability to utilize a variety of learning strategies may find themselves struggling to manage both the volume of information presented and the transition from surface engagement of the lecture hall to the requirements of clinical care.²⁰

This study examined stress, help-seeking behaviors, and academic performance of physician assistant and dental students. While not directly examined, the

design of the Clinical Anatomy course included both a behaviorist curriculum in the form of traditional lectures and a cognitive approach in the form of laboratory and case-based learning experiences. Laboratory sessions were defined by expectations of learning objectives, but students were allowed to participate as they deem necessary to meet learning objectives. Students were required to determine which learning strategies were needed for the components of the course and adjust accordingly. Students with less developed learning and study strategies may have struggled to adapt to changing curricular demands.

Research focusing on student outcomes and behaviors is a long-standing area of study in educational and psychosocial research. In more recent years, academic medicine has begun investigating factors impacting student achievement and academic outcomes.^{19,28} The literature review for this study gathered resources from education, psychology, and health education to address the research questions.

The search for predictors of academic failure has focused on PK-12 schools and the undergraduate environment in higher education.¹ In regards to medical schools, studies have attempted to correlate and find predictors of board passing in variables of instructional delivery.²⁸ For all medical careers, passing board exams is necessary to gain licensure and begin a career. Research regarding the relationships between Physician Assistant (PA) and dental

students' didactic environment and board exam scores lags behind that found in other areas of higher education.

Factors Contributing to Underperformance:

Recent study and investigation of student remediation reveal a number of factors that can impact student performance.¹¹ These include academic background, social issues, professional skills, and personality. In post-hoc studies, some predictors of success in general medical education have been identified.²⁹ These are similar across all fields of practice to include medicine, dentistry, pharmacy, and veterinary science. Hendricson and Kleffner describe six categories of deficiency students bring to medical school: (1) medical problems, (2) cognition, (3) the affective component of learning, (4) study habits, (5) academic environment, and (6) student distraction.¹³ The literature also describes how dental students who lack adequate information about support and resources to address their deficiencies have higher anxiety and depression rates than the general student population.^{29,30,31,32}

Medical Diagnoses, Mental Health and Personality Traits:

In the United States, approximately 15% of higher education students have depressive or anxiety disorders; 68% of students reported drinking at hazardous levels during the past week.³³ Students with these behaviors have reported interaction difficulties with faculty, and peers. If these students have an additional diagnosis, such as depression or anxiety disorders, the risk of

distress and inability to cope increases significantly.³³ These students are also at risk for developing medical problems, such as chronic depression and suicidal thoughts.³⁴ These personality traits can be lifelong and carry poor coping strategies into later life and practice.^{35,36} Barhramejad, et al. and Mahmood et al. followed students identified as having poor coping skills into adulthood and found these individuals had significantly higher rates of later addictive behaviors such as hazardous drinking.^{37,38,39}

Poor coping skills can negatively affect students in every environment. Based on the theories of Sigmund Freud and his daughter Anna Freud, coping strategies are arranged into a hierarchy:

Level I - pathological defenses (psychotic denial, delusional projection)

Level II - immature defenses (fantasy, projection, passive aggression, acting out)

Level III - neurotic defenses (intellectualization, reaction formation, dissociation, rationalization, displacement, repression)

Level IV - mature defenses (humor, sublimation, suppression, altruism, anticipation)⁴⁰

There are a range of behaviors and strategies associated with levels of adult maturity and emotional capacity. Lower level strategies are often seen in conjunction with mental illness as defined by the DSM IV.⁴¹ Coping strategies of denial, distraction, blaming, and acceptance are utilized by all students in

certain situations. However, students with consistently immature coping strategies tend to have lower grades, increased depression, and increased anxiety.⁴¹

Immature coping strategies are also associated with specific personality types such as depression and anxiety disorders. These personality types and mental health issues can also negatively impact academic performance.⁴² Denial, disassociation, rationalization, projection, and displacement are poor long-term coping strategies. Because students have varying maturity levels, personalities, and coping strategies, academic success is unique to the individual. Those with poor long-term coping strategies may require additional support.

Stress management and Coping Abilities:

Stress management and associated metacognitive skills have implications beyond medical school. The ability to manage high-pressure situations associated with anxiety is a crucial skill for physicians' long-term success. Physicians that do not respond well to failure have significantly lower clinical competence and incomes, and higher rates of reported burn out and work dissatisfaction.¹⁰ This relates directly to the ideas of personal maturity previously discussed. The ability to manage failure results in more efficient practice that then cycles into less job and school related stress.

Role of Metacognition:

Just as Freud categorized coping strategies into a hierarchy of maturity, Bloom developed a taxonomy of cognitive development with basic receiving and remembering information at the lowest level. Based on Bloom's Taxonomy of the "Knowledge Domain," metacognition is the highest level of learning and cognition.⁴³ Metacognition is referred to as "thinking about thinking," and describes how students see themselves as learners within their current environment. Students with developed metacognitive skills adapt their behaviors according to the demands of the learning environment.^{44,45} Successful identification of strength and weaknesses guides students with developed metacognition to utilize and develop new behaviors and academic skills.

Decreased metacognition is correlated with procrastination, anxiety, and decreased help-seeking. Students with poor metacognition often display poor self-awareness, judgment, and impaired ability to implement strategies to improve performance.^{46,47} Students with poor metacognition tend to have increased depressive thoughts and addictive behaviors.^{48,37} Poor metacognition can result in students either over- or under-estimating their future performance. Longitudinal studies have examined the impact of poor metacognition in medical practice settings and found that both under and over-confidence can negatively impact accurate clinical decision making and patient care.^{49,50}

Decreased metacognitive skills may be reflected in students' decreased use of resources to reduce stress and/or improve academic performance. By contrast, learners with the ability to self-reflect and utilize deep learning strategies may have improved academic success and higher quality of life measures.^{51,52} Successful students tend to integrate new learning techniques, seek out appropriate academic assistance, and utilize external support systems.⁵¹

Of course, students can acquire metacognitive skills in the classroom. Just like other learning processes, metacognitive skills require feedback and tutoring. Improved metacognition positively impacts study skills and self-evaluation of learning techniques as well as identification of appropriate and helpful support systems. Teaching the skill of self-reflection can be a gateway to introducing students to the empathetic response required in healthcare. Structured, specific feedback over the long-term is not always available in the traditional lecture classroom. Immediate feedback about academic achievement without active training and coaching has no effect on metacognitive skills.⁵³ Without proper feedback students may believe they cannot improve and might not attempt to change detrimental behaviors or seek support.

Academic Preparedness:

Learning strategies and knowledge acquisition have been studied extensively in the educational literature.^{54,55} The behaviorist theory of education presents a set curriculum in a predetermined format. Behaviorist theory assumes students

understand their own learning techniques and needs and can independently engage in building their knowledge.⁵⁶ A strictly behaviorist curriculum focused on discrete information reinforces the use of lower level learning and reduces the need for metacognitive skills.

At some point, successful students and practitioners move beyond the behaviorist approach of superficial retention to deeper learning. Graduate students who have mastered techniques of deep learning report significantly less stress and have correspondingly higher academic achievement than those who report only superficial learning.^{57,58} This is partly due to understanding learning goals and continuous self-monitoring of mastery.⁵⁹ Deep learners also demonstrate intrinsic focus and motivation to learn.⁵² The decrease in perceived stress pertaining to learning translates into the ability to continue learning and adapt to challenges. Students with deep learning skills also tend to accurately evaluate their own competence and skill mastery which decreases anxiety surrounding new tasks.⁵¹

Several researchers have demonstrated that deep learning and adaptability can be modified at various points. Kumar and Chacko demonstrated the implementation of learning skill awareness training that positively impacted student awareness and study skills.⁶⁰ Similarly, Moffat et al. managed to explicitly train students to better manage stress.⁶¹ Studies demonstrating the ability of students to initiate novel metacognitive strategies are not pertinent to

this study. Students may lack the knowledge and skills to seek support or know how to initiate positive change and academic improvement.

Help-seeking:

Help-seeking behaviors can be defined as those times when individuals seek out additional assistance outside of their daily routine.^{62,63,64} For dental and PA students, help-seeking behaviors include: utilizing counseling, student services, extra tutoring, or online learning aides.^{63,65} Unfortunately, research indicates college and medical students are hesitant to display help-seeking behaviors for a variety of reasons.⁶⁶ Struggling students are often burdened with shame, denial, helplessness, and poor self-awareness of their predicament.⁶⁷ Predictive tools to identify these students prior to academic problems could help prevent academic failure as well as mental and medical health issues such as depression, substance abuse, and isolation. Seeking intervention for these more serious problems may require reporting to the supervising Medical Board, a significant potential deterrent for students and new professionals needing mental health services.^{68,69}

One way to measure student stress and external factors affecting their performance is to look at the amount and types of support that students seek for both academic and personal issues. The term “help-seeking behaviors,” was originally developed regarding students with substance abuse problems, but it has expanded to include any request or action that involves asking for

assistance outside of normal daily activity.^{65,67,70} This expansion of definition has increased tracking of service utilization and research into students that need additional support both in and out of the classroom.^{64,71,72}

Underperforming or struggling students often have decreased metacognitive skills and seek help less often than their successful peers.⁷³ They may falsely believe that failing does not apply to their current situation or that they do not differ from their more successful peers. As a result, they may not reach out for support or assistance. Other metacognitive barriers also exist. Students that utilize primarily superficial learning strategies are unable to independently move toward deeper and more effective learning strategies.⁵²

Peer-to-peer interaction has been demonstrated to help these students.⁷⁴ Peer teaching and mentoring can provide both immediate empathy and insights into what academic skills are lacking. Peer or near-peer mentoring may provide a more relaxed environment to address specific gaps in learning. However, peer assistance may not be sufficient for mental health intervention or large academic gaps.⁷⁵ In addition, peers often lack sufficient training and experience to address significant academic unpreparedness.

Types of support available:

Support services available on college campuses are utilized for a variety of reasons.⁷⁶ Support services at the research site include, but are not limited to, a student health clinic, counseling services, a writing center, instructor office hours, deans of students in each college, and assigned peer mentors and study groups. When students seek help and support for academic or personal reasons, there can be obstacles and confounding situations that make successful outcomes difficult. Campus support services are reported by students to be difficult to access and are not utilized.^{65,77} In the United States, less than 20% of students reporting and seeking assistance for suicidal ideation received treatment.⁷⁸ Even when services are available, instructors and help line volunteers may not be skilled or licensed practitioners. In addition, many campuses lack 24-hour support hotlines or after-hours clinics.

Faculty members are not trained in identifying students needing support services or how to refer them to the most appropriate venue.^{14,72} According to Monrouxe et al,⁷⁹ medical educators lack basic language and discourse skills to communicate about students' shortfalls and underperformance. Most instructors are not trained in assisting students through the administrative process of service access.⁸⁰

Classrooms may have other inherent barriers to help-seeking. In classes that have mandatory attendance policies, students can find it difficult to use services

during business hours without the support of faculty members.⁸¹ The impersonal setting of the lecture hall also decreases the likelihood students will seek assistance for academic or personal difficulties. Smaller class sizes offer more personal interaction between students and instructors, yet students may defer assistance if they feel they will be stigmatized or have their academic work scrutinized. Because several states mandate reporting of mental health treatment to their state medical boards prior to receiving state licensure, students view help-seeking from professors as possibly detrimental to a medical career.⁶⁸

Universities are continually developing new programs in an effort to address the emotional and mental health needs of students. Because there is not a standard formula for these, the effectiveness and structure vary widely. Many of the programs in the last 10 years have focused on mindfulness.^{82,83,84} This usually contains a curriculum of relaxation training, self-reflection, and screening for mental illnesses.

These programs typically measure effectiveness pre and post intervention. While these short programs show an immediate positive effect, there is little long-term follow up to investigate retention of benefit or skill utilization. The few studies that have followed students long term showed little benefit in self-reported anxiety or depression scores.⁸⁵

Another limitation of effectiveness may be the voluntary nature of help-seeking behaviors. Students who actively seek help may have more pronounced mental health or academic needs than the general student population. In order to reach all students, the University of Missouri Medical School developed required curricular components addressing metacognition, stress management, and interpersonal interactions.⁸⁶ These seminars were placed throughout the four-year curriculum. Project data found significant decreases in stress and anxiety levels as compared to previous student cohorts without the focused seminars.

Knowledge Versus Action:

Ideally, once a student has sought help, they are given knowledge and resources to address their needs and possible deficiencies. When a student requires help or support, the presumption is that the student will be able to access assistance and positively change his or her behavior. Unfortunately, there is evidence that knowledge of assistance or services does not guarantee positive behavioral change.⁸⁷

Over the last decade, large scale public health initiatives have been rolled out in the United States. These have included initiations for improved nutrition, signs and symptoms of stroke, basic life saving measures in case of cardiac arrest, and addictive behaviors. The primary goal of these initiatives is to change behavior and increase health over the entire U.S. population.⁸⁸ Unfortunately, follow up studies often show little change in behavior.^{89,90} Surveyed individuals have

increased knowledge of what they should do; however, they often do not change their behavior as a result. There is some indication that individuals with higher metacognitive and self-reflection skills are the most likely to change their behavior based on new knowledge.^{91,92} Similar studies in the PA or Dental student literature is scant, but it is worth acknowledging that increased knowledge of benefit is not a predictor of positive behavior changes.

Conclusion:

The interplay of coping mechanisms and help-seeking behaviors is a complicated interplay between many factors internal and external to the student. In order to engage in help-seeking in academic environments, students must have coping skills or must be able to learn and develop mature coping strategies, effective metacognition, and motivation for deep learning and academic success. The interplay between overall performance, ongoing stress, and deficient internal traits may increase academic difficulty and, in addition, decrease performance of students in their academic careers and beyond.

Chapter 3

Web-based surveys are being used with increased frequency. They have several advantages to include cost and accessibility to specific populations.⁹³ While the ease and cost of administration may be tempting, care must be taken to structure surveys properly. Length, presentation, and topic influence response rates significantly.⁹⁴ These principles were used to construct both the qualitative and quantitative surveys.

Study Design Overview:

Utilization of Brief COPE⁹⁵

No appropriately vetted survey instrument to test PA student stress and coping skills was located. However, several instruments have been used and validated for use with college students. The Brief COPE (Appx B. 1) was selected for several reasons. The Brief COPE was free to use with permission from the University of Florida and its author. Unlike most other standardized assessments, the Brief COPE can be administered in a variety of formats. The Brief COPE has also been widely used and validated in a variety of settings. Moffat, et al. utilized the Brief COPE as a measure of stress in first year medical students and found a strong correlation to the much longer, and widely utilized, General Health Questionnaire (GHQ). Their results also showed positive correlations between behavioral strategies, demographics, and reported

stress.⁵⁸ The GHQ was not chosen for this study because of length, inability to administer in Qualtrics format, and cost constraints.

The average time to complete COPE with beta testing was 12 minutes. This falls within the ideal completion time of under fifteen minutes.⁹⁶ Manual question advancement was used to allow participants control of pace for each question.⁹⁷

The Brief COPE is a Likert-type instrument (1-4 respectively) that is easily scored.⁹⁸ The range of responses is 'I have not been doing this at all' to 'I have been doing this a lot.' Because all Brief COPE items have the same response code, less cognitive load was required than with other surveys types. Data coding was also more accurate using this format. There were several items in the instrument that are reverse coded to reduce the likelihood of convenience responses.

For analysis, the Brief COPE questions and responses were assigned to behavioral scales. The scales were then used to identify types of behaviors associated with responses. These are as follows:

Self-distraction, items 1 and 19

Active coping, items 2 and 7

Denial, items 3 and 8

Substance use, items 4 and 11

Use of emotional support, items 5 and 15

Use of instrumental support, items 10 and 23

Behavioral disengagement, items 6 and 16

Venting, items 9 and 21

Positive reframing, items 12 and 17

Planning, items 14 and 25

Humor, items 18 and 28

Acceptance, items 20 and 24

Religion, items 22 and 27

Self-blame, items 13 and 26

Consent/Identification Protection:

The Brief COPE was administered after each exam using the online Qualtrics survey tool.⁹⁹ (Appx B. 2) A link included in a locked-down browser took students to the Qualtrics site after they finished their exams. (Appx B. 3) Consent was given via on-screen click button after each exam. Students could stop the survey at any point. Students entered student ID number on Qualtrics survey, and their survey results were subsequently matched with exam and overall course score. After matching, all information was de-identified prior to analysis. All data was stored on an encrypted hard drive with access only for the researcher and dissertation committee members.

Participant Selection:

Recruitment for participants was based on the social exchange theory and the premise that participants are willing to share knowledge and experiences with the administrator for the good of all.¹⁰⁰ In a social exchange paradigm, members of a population are willing to participate based on possible improvements. This study assumed students would be willing to participate if they believed their efforts might contribute to program improvements.

Participants were entering students taking Clinical Anatomy for six weeks in the summer session. Students were age 22 or older, had a bachelor's degree or higher, and met all PA or dental programs admissions criteria. The sample of students was both convenient and purposeful. All students entering the Physician Assistant and Dental programs during the 2016 and 2017 academic years had the opportunity to participate in the study. Each entering class was 104 students.

National program data indicated student population should be 75% female and 25% male.

Students had the opportunity to take the survey at every administration. However, they were not required and could opt out of any administration or question within the survey. Participants that completed all three Brief COPE

questionnaires could have their responses followed and analyzed longitudinally over the semester.

Study Environment:

The class had daily lectures from faculty in the morning followed by lab sessions. The lab sessions were led by a combination of faculty and medical student teaching assistants. The laboratory was accessible to students 24 hours per day during the course. Students had to achieve an overall score of 70% to pass the course, and grades were a combination of lab practical exams and didactic exams. Exams were given at the end of three units. Units were not cumulative, but students were expected to gain a working knowledge of the material, as it provided a basis for the remainder of the curriculum.

The study took place at a health sciences center in the South-Central United States. Although under the umbrella of the medical school, its program and curriculum were developed and administered by specific PA and Dental School departments. The programs shared teaching faculty with the medical school.

A pilot survey was conducted among second year PA and Dental students to ensure the questionnaire could be easily understood and completed in a reasonable time. Feedback was requested to improve the questionnaire. This data was anonymous and not included in data analysis but was used to validate the instrument.

Survey Design:

	Group 1/Control	Group 2/Experimental
Exam 1	Brief COPE	Support Service Email Brief COPE
Exam 2	Brief COPE	Support Service Email Brief COPE
Exam 3	Brief COPE	Support Service Email Brief COPE
	End of Course Feedback	End of Course Feedback

Figure 1. Survey Design.

Schedule of administration of surveys, intervention emails, and exams. Both groups able to access student support services anytime throughout the course.

Group 1 (2016)/Control:

Group 1 included entering PA and Dental students in the summer semester of 2016. Total course enrollment was 104 students. One graduate student was enrolled in the course, and their data was excluded from the study. Students had access to all on-campus support the university offers if they initiated contact. Education about these support services was given as a standard part of new student orientation. Students could have asked for assistance for academic or any other support service at any time in accordance with the university policies. Group 1 was surveyed 3 times, once at each exam. Surveys were matched with exam and course scores.

Group 2 (2017)/Experimental:

Group 2 included entering PA and Dental students in the summer semester 2017. Total course enrollment was 104 students. Group 2 was surveyed 3 times. Surveys were matched with exam and course scores. Students were offered emails educating them about availability of student support services on campus and in the community. Contact information for all services was provided. These interactions happened four times at the following intervals: new student orientation, after exams 1, 2, and one week prior to exam 3 (Fig 2 and Fig 2). Students were encouraged to ask for assistance for academic or any other support service at any time in accordance with the university policies. Surveys were matched with exam and course scores.

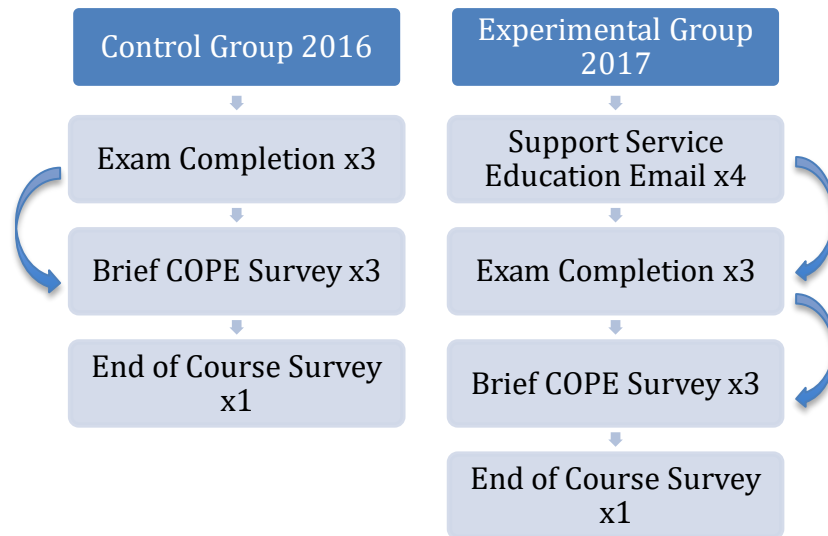


Figure 2. Synopsis of Intervention.

Intervention of Education Email administered prior to each of three exams. Arrows indicating intervention emails and Brief COPE surveys occurring in conjunction with exam administration. Three cycles of exams and Brief COPE surveys were completed. End of Course survey administered after Exam 3 completed and Clinical Anatomy course was concluded.

Qualitative Data Collection:

All students were contacted with a link to a qualitative End of Course Survey following the last exam. Qualitative interview questions were presented

through the Qualtrics system. Interviews were directly entered into data storage from Qualtrics and coded for themes.¹⁰¹

Qualitative methods were used to obtain the following data:

1. Detailed feedback about student perceptions
2. Behavior trends

Data Analysis:¹⁰²

For purposes of this study, the cut point was an overall course grade below 80%.⁵ Students scoring below 80% were considered Minimally Competent/Barely Passing Students(MCBPs).^{103,104,5,105}

Demographic information, Brief COPE score, and academic performance were explored using Chronbach's Alpha and Linear Regression model. Correlation of exam scores and Brief COPE item responses were obtained. Significance was analyzed via a 2-tailed *t*-test. The *p* value was set at 0.05. Brief COPE items that had significant correlation with exam score where then further evaluated.

Between groups:

Brief COPE scores were compared to grades for each exam and overall course grade using mixed ANOVA modeling. ANOVA combines linear relationships and comparisons of means and characteristics across groups. Repeated measures were performed for each group as an examination of variable interactions over

time. Further examinations of Brief COPE items as co-variables were performed using a repeated measure ANCOVA. Tests of sphericity were conducted as verification of variable influence.

Qualitative results were analyzed using manual categorical coding.¹⁰⁶ The investigators using manual coding triangulated thematic evaluation of survey results. All three coders were familiar with the study and had some previous experience with coding and/or coursework that involved manual coding. Three reviewers completed qualitative analysis of survey via coding comparisons of qualitative themes. The reviewers were blinded to others' coding. The principal investigator compiled the coding and thematic differences were resolved between coders meeting together. Discrepancies were resolved through in-person sessions and re-coded as required. Coding terms and procedures were borrowed from current literature cited in this study.

Strengths of Design:

Several aspects of the study design were selected to increase the validity of the project. The Brief COPE instrument has been widely used to measure stress and student self-perception of distress and has been validated with college students in a wide variety of settings. The Brief COPE also has good inter-item reliability and some items are reverse coded allowing for detection of convenience responses. Also, because questions are formatted to be answered in a Likert-

type format, the data can be analyzed numerically. The Brief COPE can be administered by individual researchers and is not restricted to paper format.

The format of the Brief COPE allows for the use of Qualtrics for survey administration which has several advantages to paper administration.¹⁰⁷ One is that students can access the instrument immediately after completing each exam. Computer access also minimizes intrusiveness of administration in the already stressful test environment. Another is the integration with the Qualtrics system that imports the data directly into SPSS and Excel to minimize data entry errors.

The online administration of the qualitative portion of the research question also has significant advantages. The first is ease of administration. Rather than trying to get students to come to face-to-face interviews during a semester break, they can respond to the interview questions at their leisure. Another advantage of the online administration is increased anonymity participants feel online. Individuals can respond without the increased pressure or influence of a live interviewer.^{108,109} As with the Brief COPE survey, responses are entered directly into the database with little chance of error that can occur with hand transcription. This reduction in error and transcription time until the data can be coded is another advantage to online administration.⁵⁷

Potential Design Problems:

One issue was the assignment of cut points as to what qualifies students as MCBP. There is no national data for gross anatomy scores related to board passage for PA students.⁶ Students pass Clinical Anatomy with an overall minimum score of 70%. Cut points have been assigned based on correlation of gross anatomy scores and medical student STEP I pass rates at the same institution. This data indicates students scoring below 80% in Clinical Anatomy have a 30% chance of failing the STEP I exam.

Another issue was the possible amplification of stress associated with functioning in a new environment.⁵⁸ As all participants were entering students, there was an expected amount of stress that may distort responses, especially on the first administration of the survey. However, as the survey was given multiple times, distortion may play out during data analysis.

Any time survey data is used there are potential issues with participation rates, accuracy of responses, and convenience responses. This study also had the potential for creating survey fatigue since the instrument is given multiple times.^{110,111} Several steps were taken to avoid these problems. To maximize participation rates, the instrument was administered immediately after the students completed their exams. The computerized administration was put in place so students accessed the web link directly from their laptops before

leaving the exam room. The survey's ease of completion helped to avoid survey fatigue.

The Brief COPE has several reverse response questions built in to identify convenience responses. However, because the students retook the same instrument multiple times, there was the potential for them to give responses without reflection or thinking. Of course, there was no way to ensure truthfulness of responses. However, multiple administrations of the instrument can help identify inconsistencies of responses for each participant. The Brief COPE has been analyzed for inter-item reliability and abnormal trends can be readily detected.

The End of Course Survey qualitative portion of the study was administered online via Qualtrics software and allowed participants to opt out of the interview. Of course, students could have accidentally opted out by missing the email or notification of the interview.⁹⁹ Just as with survey data, there were issues of accuracy with interview questions. While triangulation of coding helped establish response reliability, there was still the potential for wide variation between interview responses.

To avoid FERPA breeches of privacy, several steps were taken. Each student was assigned a numerical code that identified him or her in the data set. All identifying information such as student ID number were removed from the data

set after it was matched with the exam grade and associated with the code. All data was stored on an encrypted hard drive that is password protected.

However, because students were identified with their grade for a portion of the data collection, the privacy integrity of the study could be called into question.

Chapter 4

Problem Analysis

Individual COPE and exam grades for both the 2016 control and 2017 experimental groups were analyzed across the three exams for each group and then between control and experimental groups. Analysis of both groups individually provided examination of behaviors of each group over time to allow for initial examination of coping mechanisms and support service usage. Comparison across groups examined differences between control and experimental groups and evaluated the effectiveness of intervention (Fig 3).

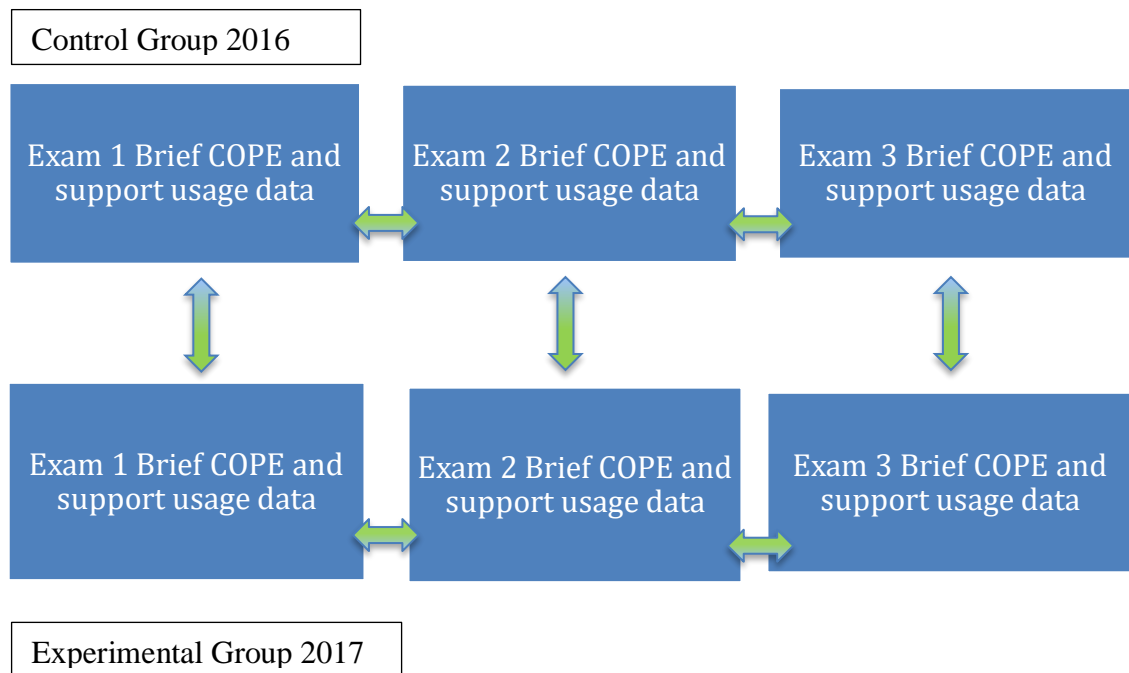


Figure 3. Data analysis process for comparison of Brief COPE and Support Service Usage.

Correlations completed for Brief COPE responses, support service usage, and exam grades for each exam for each group. Time and natural maturation over the course was not a significant factor for either group. Analysis of individual study groups revealed unique trends for each.

Exam scores, Brief COPE responses (grouped by behavioral scales), and support service usage were compared between treatment groups. Comparison between groups examined differences in exam grades, coping behavior scales, and treatment effect of the support service education email.

Brief COPE results were grouped into the behavior scales as per the instrument mentioned on page 28. Analysis of coping mechanisms was performed with behavioral scale grouping. Individual items of note are indicated in the data analysis. At several points in the analysis, only one item of a scale was of statistical significance. These are noted in the calculations.

	Self-Blame	Denial	Disengagement	Exam 1	Exam 2	Exam 3
Control Group						
Exam 1	p=0.01 r=-0.30	p=0.01 r=-0.31	0	**	p=0.01 r=0.69	p=0.01 r=0.66
Exam 2	p=0.01 r=-0.35	p=0.01 r=-0.30	0	p=0.01 r=0.69	**	p=0.01 r=0.68
Exam 3	0	p=0.01 r=-0.50	p=0.01 r=-0.35	p=0.01 r=0.66	p=0.01 r=0.68	**
Group 2						
Exam 1	p=0.05 r=-0.30	0	0	**	p=0.05 r=0.60	p=0.01 r=0.67
Exam 2	0	0	0	p=0.05 r=0.60	**	0
Exam 3	0	0	0	p=0.01 r=0.67	0	**

Figure 4. Brief COPE behavioral scale and exam grade correlations.

For the control group, Self-Blame, items 13 & 26; Denial, items 3 and 8; Behavioral Disengagement, items 6 and 16 all had significant correlations with poor exam performance ($p=.05$). Similar correlations were not seen for positive behaviors or higher exam scores in either group. Items with better than $p=0.05$ are also noted. Negative correlation r -values indicated correlation between decreasing exam grades and use of behaviors ($r>0.30$). Magnitude of behavioral correlations consistent.

Problem Discussion

1. What are the coping mechanisms and support services used by first year PA and Dental students?

Analysis of Brief COPE Responses:

Students in both the control and experimental groups using positive coping strategies as measured by the Brief COPE did not have significant correlations between items or with support service usage. However, the data did reveal the MCBPs from both groups had decreased coping behaviors (Fig. 4). Similar patterns of behavior were not found with items identifying positive coping behaviors.

In order to compare the influence of coping behaviors over the duration of the course, an analysis of variance determined significant differences between individual Brief COPE items and exam grades. This test was also used to determine differences between control and experimental groups. A mixed ANOVA/repeated measures procedure was performed for within-subjects/exam score over time and a factor and a between subject factor (group/treatment/year).

However, the interaction between the groups and exam scores over time was not significant: $F(2, 56) = 0.118, p = 0.889$. The exam scores did not vary as a function of the intervention. The exam score pattern was consistent for both groups. Both groups had a similar increase in exam score over the duration of the course regardless of Brief COPE responses. The use of email to increase student support use and improve coping behaviors was ineffective.

The majority of students utilized support from family, peers, and upperclassmen. Both groups had low percentages of students utilizing formal on-campus services such as student services, student health clinic, and counseling. Both quantitative and qualitative data reflected low usage.

Frequency Data of Support Service Usage:

Students reported what supports they used at each survey point. The raw numbers and percentages are listed in (App A. Fig. 6-13, pp 85-92). Participants were allowed to select multiple items to accurately reflect their behaviors.

Over the span of the entire Clinical Anatomy course, students in the control group used primarily peer support (58%), advice from upperclassmen (51%), and family support (56%). Students reporting no support service use was 15%. The overall percentage of tutor usage was 31%.

Students in the experimental group used primarily peer support (58%), advice from upperclassmen (53%), and family support (57%). Overall students reporting no support service use was 13%. This was similar to the control group of 15%. Overall percentage of tutor usage was 44%.

Both groups reported 4% use for pastoral services and professional counseling. Student health clinic use was similar between groups (13% versus 12%).

Qualitative Data:

Themes of support from family and friends were prominent (App A. Fig. 14, pp 93). These support networks were utilized as both emotional and physical supports. Families and friends provided “someone to talk to,” the ability to “verbalize things,” as well as assistance with household work and family duties. Peers and friends within the class reported commiseration of the situation and positive support. As Human Anatomy was the first course of the program, all students were new to the learning environment and only six weeks long versus a traditional 16-week semester. During this study, students demonstrated the ability to quickly develop peer networks that organized study groups, texting networks, and tutoring. This was seen between Exam 1 and Exam 2 (App A. Fig. 6-13, pp 85-92). In both groups there is an increase in the percentage of all students using support from peer support and tutoring

The majority of students indicated they believed their current support system and strategies were effective. Of the remainder, two students suggested they would seek professional medical help earlier. One student was unsure of the effectiveness of any of their support strategies.

2. What is the relationship between coping mechanisms and academic performance among first year PA and Dental students?

The exam score pattern was consistent for both control and experimental groups with both having similar increase in exam scores over the duration of the course. $F(2, 56)=7.32, p=0.001$.

The test effect of intervention on overall exam scores was performed and revealed exam scores did not vary significantly over time. Exam scores did not vary as a function of the intervention, ignoring all other variables, as verified by between subjects effects ($p=0.901$).

Control Group 2016:

Exam scores from 2016 correlated with Brief COPE items of self-blame, denial, and disengagement at $p=0.01$. A positive response to these items indicated poor coping skills. Correlation of disengagement increased after the first exam.

Exam 1 and Exam 2 scores correlated at the $p=0.01$ level with support service use. Exam 3 correlated with support service use at the $p=0.05$. These

correlations were supported by absolute value of $r=0.30-0.50$. Magnitude of all significant correlations were similar indicating moderate negative relationships between all three behavior scales and exam performance.

Experimental Group 2017:

Experimental group exam scores correlated only with Brief COPE items of self-blame at Exam 1. This correlated with the same magnitude range as the correlations in the control group ($r=-0.30$). Exam 1 and Exam 2 scores correlated at the $p=0.01$ level with support service use. Exam 3 correlated with support service use at the $p=0.05$.

Significance of support service use is equal for both groups. The decrease in significance at Exam 3 was equal.

These results indicate correlation between poor coping skills and negative behaviors with decreased academic performance for MCBPs. Due to the nature of correlational data, it is not possible to determine if coping behaviors are contributing to the decreased exam scores or if the exam grades are a cause for student behaviors. However, as the literature review stated, there is evidence for negative behavioral patterns and coping behaviors to have an impact on academic success.

3. What is the relationship between utilization of support services and academic performance among first year PA and Dental students?

	Support Service Use	Exam 1	Exam 2	Exam 3
Control Group				
Exam 1	p=0.01	**	p=0.01	p=0.01
Exam 2	p=0.01	p=0.01	**	p=0.01
Exam 3	p=0.05	p=0.01	p=0.01	**
Group 2				
Exam 1	p=0.01	**	p=0.05	p=0.01
Exam 2	p=0.01	p=0.05	**	0
Exam 3	p=0.05	p=0.01	0	**

Figure 5. Student support service usage and exam grade correlations

Higher exam grades were correlated with increased student support service use ($p=0.05$). Positive correlation indicates higher rates of help-seeking and support service use. Correlation was performed with yes/no responses regarding use of support services.

As previously stated, support from family, peers, and upperclassmen were reported at higher rates by all students. MCBPs tended to use less tutoring and formal academic support than their higher performing peers (App A. Fig. 6-13, pp 85-92). Both groups had low percentages of students utilizing formal on-campus services.

The control group scoring above 80% on exams used peer support (68%), advice from upperclassmen (52%), and family support (59%). Students with exam scores <80% (MCBP) used less peer support (38%). Seventeen percent of MCBPs used tutoring versus 31% of higher performing students. At Exam 3, total percentage of tutoring was 30%. Higher performing students used tutoring at 45%. The MCBPs percentage of tutoring for Exam 3 was 0%.

Frequency Data of Support Service Usage:

The raw numbers and percentages are listed in (App A. Fig. 6-13, pp 85-92). As noted previously, participants were allowed to select multiple items on each survey to accurately reflect their behaviors.

Students in the experimental group scoring above 80% on exam grades used primarily peer support (55%), advice from upperclassmen (48%), and family support (57%). Students with exam scores below 80% (MCBP) used more peer support (68%). Eighteen percent of MCBPs used tutoring versus 29% of higher performing students. Higher performing students reporting no support services use was 10% versus MCBP use of 21%. At Exam 3, percentage of tutoring for high performing students was 43.3%. MCBP percentage of tutoring was 50%. However, by Exam 3 MCBPs use of peer support and advice from upper classmen remained higher than total group for each exam period. It is of note that only 2 students could be classified as MCBPs at Exam 3.

As previously noted, both total groups reported similar percentages of use for pastoral services, student health clinic use, and professional counseling.

Both groups utilized non-academic support services at higher percentages than formal academic supports. MCBPs in the experimental group were observed utilizing formal academic supports at much lower percentages than higher performing peers. The control group data did not indicate this. MCBPs in the 2017 experimental group did not increase their use of service that may have assisted in improving their performance.

The MCBPs in both groups tended to use advice from upperclassmen more than higher performing peers. At this time, it is not known if upper class students in the studied PA and Dental programs receive training regarding how to guide or give feedback to students entering into the program. The literature review noted that peer support and mentoring can have positive academic and emotional impacts if students have appropriate training. Since a higher percentage of MCBPs utilized support from upperclassmen, it may be assumed that their feedback and support was not monitored for quality.

Qualitative Data:

Students identified academic supports outside of class as a major contributor to their success in the course (App A. Fig. 14, pp 93). Teaching assistants provide a portion of the supplemental material and review sessions. As a result, the

quality and consistency of the presentations may vary year to year. The 2016 control group repeatedly mentioned the knowledge and teaching of the teaching assistants. The 2017 experimental group had fewer positive comments about the teaching assistants. This is part of the availability, accessibility, and positive interactions with faculty that were major themes.

4. What are the coping mechanisms of minimally competent, barely passing (MCBPs) first year PA and Dental students?

Control group (2016) MCBPs reported significant negative coping strategies of denial, self-blame, and disengagement. MCBPs in the experimental group (2017) did not demonstrate any significant trends in coping mechanisms. However, qualitative data did have small numbers of responses reporting self-blame and anxiety in regard to ineffective study skills. "I began to question whether I had the knowledge to be successful and whether I would face an embarrassing failure." "My detailed learning style impeded my learning... I personally struggled to effectively learn the material."

Quantitative Data:

Based on significant correlations found with the linear model, the Brief COPE items that demonstrated significant correlation to exam scores were selected for analysis of variance. These questions all fell within the negative coping

behavior scales of disengagement, self-blame, and denial. ANCOVA was performed as a general linear model to examine the influence of covariates. Exam grades were assigned as dependent variable (DV) with covariates of Brief COPE scale items from self-blame, disengagement, and denial. For both groups Brief COPE question 3, "I've been saying to myself 'this isn't real,'" did vary significantly over time (sphericity assumption violation using Greenhouse-Geisser correction) $F(1.57,58) = 6.27, p = 0.007$. Item 13, "I've been criticizing myself," also varied significantly over time $F = 7.503, p = 0.01$. While not at the cut point of $p = 0.05$ level of significance, item 26, "I've been blaming myself for things that happened," $p = 0.64$ is of note when considering the limited sample size. While it does follow the pattern of correlation, it may also be a Type I error. Further investigation with larger sample size may be indicated in the future.

Additional analysis of variance determined significant differences between control and experimental Brief COPE items and exam grades. This test helps determine differences between control and experimental groups and, thus, an indication of the intervention's effectiveness. A Mixed ANOVA/Repeated Measures procedure was performed to determine significance of increased notification of support services on usage and exam grades. Both groups showed significantly improved exam scores over the semester ($p = .001$). Thus, regardless of support service availability or education about support services, students' academic performance and coping behaviors did not differ significantly. While the intervention effect of email notifications was not

significant in improving students' exam scores, it did not appear to have a negative effect on academic performance either.

Analysis of control group Brief COPE revealed correlations between academic performance and poor coping behaviors. Self-criticism and blaming (Brief COPE items) were seen in correlation with low exam grade performance. Analysis of experimental group students did not show strong relationships between Brief COPE items and academic performance. The small experimental group sample size may have contributed to the results. Significant differences in exam grades were not observed between the two groups.

The majority of students indicated they believed their current support system and strategies were effective (App A. Fig. 14, pp 93). Of the remainder, two stated they would seek professional medical help earlier. One student was unsure of the effectiveness of their support strategies.

Chapter 5

The major themes of the qualitative questionnaire relate to each other in ways that form a loose hierarchy (Fig 15). The physical environment played a part in students' comfort and ability to remain engaged in the classroom. While these are often dismissed as something students should deal with, attending to these needs may immediately improve the course experience. This also includes intervention between students. While it is assumed that graduate students are able to manage dynamics within their group, the high-stakes nature of medical programs may produce situations that hinder students. Being aware of the laboratory layout, students being excluded, and general distractions in the classroom could ensure all students have the ability to participate in lecture and laboratory situations. This type of intervention is up to the discretion of faculty, but awareness may alert them to potential problems in the future.

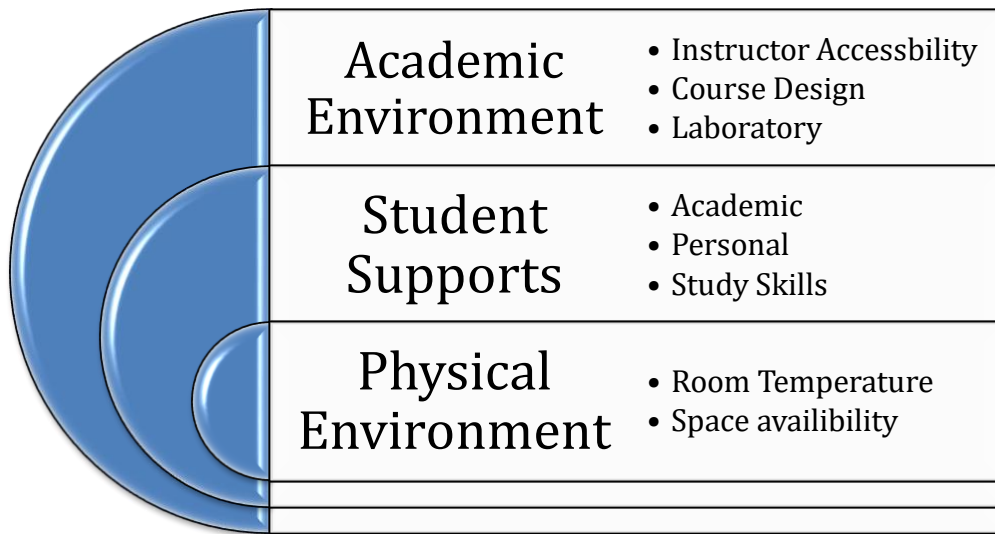


Figure 15. Schematic Relationships of End of Course Survey Responses.

The diagram illustrating the interplay and hierarchy of qualitative feedback was created from the data collected. The diagram illustrates learning experience of the Clinical Anatomy course. Faculty and university understanding how the elements of these themes interrelate can address elements where students lack the resources or skills to manage themselves.

Summation of Qualitative Analysis:

The heart of this study was the investigation of coping and help-seeking behaviors. The qualitative survey was consistent with the quantitative frequency of use data. Students tended to prefer to use the support of friends and family over more formalized academic supports. Follow up questions revealed students relied on friends and family for emotional support and physical help in the home. Only a small number of students reported that they

were using student health services or professional counseling. This was consistent for both groups in 2016 and 2017.

The majority of qualitative respondents discussed how they interacted with external factors during the course. These included friends, family, the physical environment, and faculty. A small number of respondents provided answers about internal factors negatively impacting their performance. These answers revealed significant struggles to master study skills, manage emotional stress, and perform academically. Interestingly, only one student identified new, specific strategies that were successful. "I just needed to adjust and adapt my learning style. This class has a huge psychological and educational transformation component to it." That student reported using academic support from faculty to learn new study techniques to succeed.

Questions related to positive aspects of the class revealed themes of instructor competence, accessibility of teaching faculty and the positive role of teaching assistants. These major themes emphasized the value of out-of-class time with faculty and teaching assistants as effective helps. Instructors were described as "approachable," "caring," and "accessible." These themes indicate that teacher-student relationship played a major role in how students perceived the course.

Human Anatomy was organized so that students were able to have multiple touch points for questions or additional learning opportunities and reviews.

Students reported using face-to-face opportunities, such as review sessions or asking questions during lab more frequently, but students also reported value in supplemental course materials such as PDFs and slide presentations.

However, content discrepancies between in-class and supplemental materials were a reported source of stress and difficulty both in lectures and laboratory. “Conflicting views,” about specimen identification and “inconsistencies between professors,” were examples of these frustrations.

The qualitative questionnaire investigated what specifics made learning more difficult during the course. The majority of qualitative responses regarding learning impediments indicated the cognitive load and shortened time frame of the course most frequently. “The time limit,” was listed and expressed as a problem. Two respondents identified their study habits and skills as factors that impeded their learning.

The survey question asking about prior academic experience attempted to gather data about students’ incoming academic readiness. Over fifty percent of students reported they had some previous exposure to anatomy. However, exposure to anatomy did not equate to a perception that the course was easier for them. Many stated the volume of information and increased rigor of professional level education made the course difficult regardless of any previous anatomy classes. These responses stated that “nothing prepared me for this,” and “I was also over-confident in my innate intellect.” Students that

reported they were prepared, commented on the overall high academic rigor of their undergraduate programs. From this data, learning study skills and coping in a high stakes academic program appears to be more beneficial than taking an actual anatomy course. This may be a factor for consideration in the admissions process. Many professional level health programs use undergraduate GPA as a major selection criterion. At this time, there is not a matrix in use to determine the rigor of different colleges. As shown by this survey data, the development of study skills is an important component of student success and stress management.

Ultimately, the University and faculty determine the academic environment. This environment includes program and course design, in this case laboratory access and experiences, and professional standards for faculty. This Clinical Anatomy course was designed around specific learning objectives with corresponding laboratory activities. Student supports included both internal and external resources of teaching assistants, academic supports such as review sessions, supplemental materials, family supports, and study skills.

Survey results found that a majority of students believed the organization of the course and laboratory helped and enhanced their learning. The other overarching theme students reported as helpful was the availability of professors and teaching assistants outside of classroom hours. The “approachability,” and “accessibility,” of instructors was listed as the most

helpful aspect of the course in both the control and experimental groups. Even students that reported difficulty with the course wrote that they were helped by additional time with instructors. It is clear from these responses that an environment where students are welcome to interact with faculty both in and out of lecture is important.

Effectiveness of Intervention:

The analysis of results from the Brief COPE, support service usage, and End of Course Survey revealed no significant impact from the intervention of educational emails of available support services. Consistent with the literature investigating other educational interventions, the additional education about support services did not increase their use in the experimental group.

Throughout both groups, the MCBPs reported utilizing fewer overall supports and, in addition, used fewer academic support services than peers scoring over 80% on exams. Comparison of Brief COPE responses and behaviors also demonstrated a lack of significant effect of the intervention. Students appeared to have no increase in support service use or an improvement in coping with the additional information given to them. Causational data was not available to determine if accessing additional support services or further intervention would have changed students' academic outcomes.

Confounding Factors:

Studying individuals over time creates possible interference from the design itself. Over time participants can change due to natural maturation. This has the potential to influence survey responses. Despite utilizing the same survey to minimize variation, natural maturation is a possible confounding factor. The inherent differences between groups may impact any project designed to compare two groups of students. Both groups in this study were assumed to be similar because they were selected using program admissions standards and procedures. These standards account for grade point average, test scores and personal interview performance. However, it is unrealistic to assume individuals within the groups are exactly the same. For the purposes of this study, the participant groups were assumed to be similar and were not matched by age or gender.

In relation to this project, the time of the overall project over two years and multiple classes could have allowed the control group to interact with the experimental group regarding the project. It is not clear if this interaction would have been positive or negative. One of the survey items measured support from peers and upper classmen. Participants were not prohibited from discussing the study with peers or upperclassmen. Because they are encouraged to seek support from each other, participant discussion about the surveys is a reasonable expectation. The questions regarding peer support utilization may reflect student discussion of the study itself.

This project attempted to measure coping skills of students in a controlled environment of a single course. Unfortunately, the physician assistant program added an additional biochemistry course during the second year of the project. At the time of inception and design, the biochemistry course was not part of the summer curriculum. This increased the academic load for the experimental group of participants. Presumably, the PA students of 2017 had additional stress and coping difficulties as compared to their 2016 peers. The Brief COPE measures behavioral reactions to overall environmental stress, thus the stress and behaviors related only to the Clinical Anatomy course could not be measured or parsed from the survey questions.

Similarly, the study was not able to control for different lecturers during the two course administrations. It is typical for several lecturers to share the presentation of the materials. The study design did not require individual lectures to be presented by the same person over the two years. Overall, both classes had the same course directors and same lecturers over the course of the semester. This helped minimize possible variation but did not eliminate it.

The online format for the exams was changed by administration just prior to the 2017 summer semester. Both groups were administered exams in the D2L software, but the visual presentation for the 2017 group was markedly different. An additional step was added to submit and exit the exam. This led to

difficulty finding the survey link on the screen. It also was ambiguous that the exam was entered correctly if students did access the survey. This confusion had the potential of decreasing the 2017 experimental group response rate. To minimize this, verbal instructions were given to the students prior to the exam, the instructions to survey access within D2L were posted on an overhead slide during the exam, and an external link was given. Students could access the external link once their exam was submitted. The number of students using the external link could not be extracted from Qualtrics.

When designing any study using survey responses, a thirty percent response rate is expected.⁹⁴ Online surveys are prone to have even lower response rates than print and in-person surveys.⁹⁶ In public health and market research, obtaining more responses is possible by surveying great numbers of a population. In this project, the sample size was limited and fixed by class size. Even with a higher than expected response rate, it was not possible to increase the overall participant numbers.

According to national program data, the gender mix for the students responding to the surveys should have been near 25% male and 75% female. The responses for 2016 were 42% male and 58% female. In the 2017 group, 46% reported as male and 54% as female. All students identified as male or female although an alternative third choice was given. For the purposes of this study, gender was not examined as a co-variate. However, future study into how

gender interacts with help-seeking, coping behaviors, and academic performance may be warranted.

Because of Institutional Review Board guidelines, completion of the Brief COPE and After Course surveys was voluntary. Students were able to complete as many of the survey administrations and questions within each survey as they chose. As a result, the number of participants for each administration varied widely. As a result, the sample size of students completing surveys longitudinally across the entire course was further reduced to approximately 15%. This limited the statistical power and possible tests that could be used for this sub group and made comparisons across groups difficult. Detailed analysis of longitudinal data over the course was not able to be completed using the SPSS software and design models of this study. Future work should include mechanisms to increase participation across all administrations.

The limited number of participants should be considered when evaluating the statistical power of the results. Correlation data increases the likelihood for false positives and Type I errors as sample sizes decrease.¹¹² Future study of larger classes or longitudinal study over an entire program may provide additional data that can increase the power of the results and allow for multivariable analysis. This type of statistical limitation is problematic in educational research when the number of students is often limited.

To help add insight to the quantitative results, this project added qualitative data. The response rate for this survey was lower than the expected rate of 30%. This may have been a result of the timing of the survey presentation, the increased effort of qualitative responses, or survey fatigue.

The qualitative survey was presented after the last exam was given. While this allowed students to reflect on the overall experience of the course, it required students to remain engaged after the conclusion of the coursework. The quantitative survey was the fourth survey administered over a period of eight weeks. This had the potential to create a confounding factor of survey fatigue. Survey research confirms that response rates for qualitative surveys is less than for Likert-type response choices. The response rates of this study reflect this. As with the limitations of sample size in this study, the reduced qualitative response rates created an inability to accurately compare within groups. Future studies should work to expand the sample size and response rates of qualitative questionnaires. This could be done with additional emails, contacting participants by phone, or administering it during classroom time. The additional time and potential costs need to be evaluated when expanding this research.

Future Implications:

1. The Brief COPE questionnaire can be used to identify potential needs for students at the onset of academic underperformance.

On one hand, a predictive measure of personality and stress management strategies would be helpful to know ahead of time. Professors could use identification of at-risk students to proactively monitor them for academic progress and need to refer to support services.

On the opposite side of the debate is that identification prior to poor performance can influence instructors to label students as less capable than their peers. This bias may cause them to overlook possible struggles of “low risk” individuals and discount academic achievements of “at-risk” students. The danger of influencing an “at-risk” group to self-fulfill their role as MCBPs by expecting poor performance is a strong consideration for not using the Brief COPE survey as an identification or screening tool.

Another use of the Brief COPE survey could be identification of specific poor strategies and behaviors of individual MCBPs. Administering the survey after poor exam progress could reveal what type of service referral could most benefit particular students. Students with health or substance use issues may need different interventions than those utilizing blaming and denial strategies.

It was clear that MCBPs had higher reports of blaming and a lack of ownership of their performance. As the literature demonstrated, interventions addressing metacognitive and behavioral stress management strategies can have a positive result, at least in the short term. This type of use would also lend itself to continued monitoring of student improvement after intervention.

2. Provide baseline data for longitudinal study of student support utilization.

Overall, MCPBs reported even lower rates of service utilization than their better performing peers. While significance was limited by sample size, most MCBPs utilized only non-academic support systems such as family and friends. While social support is an important factor in academic success, MCBPs did not take advantage of academic assistance. This may have a direct effect on the continuation of poor exam scores throughout the semester. Better performing students utilized professor office hours and tutoring at higher rates throughout the semester with a significant uptick before the final exam. This behavior may reinforce continued academic success.

The inability of MCBPs to self-identify the need for academic services may be related to metacognition. Students may lack the expertise to seek out services and access them. In spite of possibly knowing about the support services in the experimental group, MCBPs may need direct contact from professors or peers as guides to act initially.

The student support use frequency data reveals students did not increase their use of resources when additional information was given. This is consistent with other studies in the general population. Behavioral changes did not occur when knowledge and education about service and resources were provided.

As universities, especially public institutions, continue to have fiscal pressures imposed upon them, examination of this data indicates certain programs may not be benefiting students. Both groups tended to gravitate towards tutoring and professor office hours for assistance. Larger campus-based programs such as those run through the Student Services office may have limited value. A larger campus-wide survey and study is required to determine the overall value for a campus as a whole. However, there may be value in expanding the service use portion of this study to further examine these questions.

One service that was used by a small, but consistent percentage of students in both groups was the student health clinic. As demonstrated in the literature, students with medical or mental health issues benefit directly from these services. Additionally, the student health clinic provides these services at affordable costs that are included in student health insurance. This decreased cost has the potential to ensure all students have access to medical care when needed. It can be assumed that students who are ill will not be able to perform at their full potential. The sample size in this study was small, and comparisons

of academic performance and students using student health services was not possible. Larger, more robust studies need to be implemented to determine the potential benefits of student health services on academic performance.

As stated in the literature review, there is a stigma and fear of professional repercussions for using student health services, especially for mental health needs. PA and Dental programs need to address these issues when implementing support programs or student outreach. Incorporating student health clinic presence or access points into program planning may increase its use and potential benefits.

3. Program modifications for improved student support to meet the needs of students.

Results of the qualitative survey indicate several key items for consideration in the classroom. First off, students consistently described the classroom as an impediment of learning. While the cadaver laboratory has policy constraints for specimen preservation, the lecture hall environment can be improved.

Awareness of the physical environment, enforcement of course policies, and unprofessional student behavior can be addressed directly by the course director.

Several students commented the compressed nature of anatomy and course requirements were too much. While this course structure is not likely to change, there are several considerations. Programs may need to require some an introductory anatomy course with cadaver lab prior to admission to PA or Dental programs. While these courses may vary in academic rigor, they would ensure some entry-level understanding of the material. Program admission is also heavily weighted on grade point average. There may be a cohort of students that attended less rigorous undergraduate programs in an effort to maintain a high grade point average. Investigation into the rigor of undergraduate education may help programs select students that have the study and metacognitive skills to succeed in demanding medical programs.

Currently, most course evaluations are conducted in class at the end of the semester, this study introduced possible survey structures that may be implemented into curriculums. Survey responses often trend towards both the extreme positive and negative. Follow up qualitative studies can enable programs to prompt more in-depth responses. Online course evaluations that take minimal time to administer may increase response rates. Surveying students during the semester would also inform professors of issues in real time. In the case of this study, inconsistencies of course material could have been addressed throughout the semester to improve the learning environment.

While high performing students in both groups had high praise for the professors and overall semester experience, care needs to be taken in blanket acceptance of these comments. Respondents were self-selected from the class of possible participants. Response bias is likely as the response rate is low. This may have been a result of survey fatigue. Ideally, survey responses would be taken from participants matched to the characteristics of the class as a whole. Future research must develop qualitative investigation that is able to ensure representation of all students.

4. This study revealed student response to challenge and failure may play an important role in academic success. Programs may consider ways to evaluate students' responses to failure during the admissions process. While the Brief COPE is not designed as a screening tool, there may be other survey instruments available to help distinguish individuals that can respond positively to challenge. Program directors may also implement standardized interview or essay questions to probe applicants' responses to stress and academic challenge.

5. Support Service Usage data indicates students utilize upperclassmen as one of their major supports. The program being studied did not have a formalized system to monitor or enhance the communication between students. As cited in the literature review, near-peer and peer-to-peer mentoring can be an effective teaching and support tool for struggling students. Implementation of training

for upperclassmen may be a way to enhance the learning environment for incoming students. In addition, completing training to become a peer mentor could have learning benefits for the upperclassmen as well.

The purpose of this study was to examine the coping mechanisms and student support service usage as they relate to academic performance in first year PA and Dental students. Students were surveyed using the Brief COPE and a qualitative after-course survey during the Clinical Anatomy course in the years 2016 and 2017. The 2017 experimental group was given additional notification of available support services. Analysis was then completed to compare the coping strategies and academic performance between groups.

Both groups had similar academic performance, support service usage, and Brief COPE responses. This is consistent with broader public health research which shows that an increase in the visibility of student support services does not translate into behavioral changes. In both groups, students with lower exam scores reported using fewer academic supports than their better performing peers.

The After Course Survey provided insights into students' experiences during the course. Both the control and experimental group had similar responses.

Qualitative responses primarily revealed the advanced difficulty level of course

material was a major cause of stress to students. Analysis also indicated that previous exposure to anatomy may not be a precursor to academic success in the PA and Dental Clinical Anatomy course. These results should be considered when designing and implementing support services. Designing active avenues between students and support service may be more beneficial than traditional educational program efforts. This, with integrating access and identification of struggling students into the curriculum could possibly increase the use and success of support services.

PA and Dental students in both 2016 and 2017 reported similar levels of stress through the Brief COPE and qualitative questionnaires. While it may be tempting to use behavioral questionnaires as screening tools, the Brief COPE may be suited for faculty to help identify poor coping strategies. Finally, this study demonstrates negative coping strategies correlate with poor academic performance despite increased awareness of available support resources.

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Appendix A: Figures

Control Group Type of Support	Exam 1 n=50		Exam 1 >80% n=30		Exam 1 <80% n=20	
peer support	21	42%	15	50%	6	30%
Advice from upperclassmen	24	48%	15	50%	9	45%
Family support	24	48%	17	57%	7	35%
Tutoring	12	24%	6	50%	5	25%
Student Health clinic	5	10%	3	10%	2	10%
Professional counseling	3	6%	1	3%	2	10%
Online support	6	12%	5	17%	1	5%
Professor office hours	1	2%	1	3%	0	0%
Other: YouTube	1	2%	1	3%	0	0%
Pastoral Services	1	2%	1	3%	0	0%
None	8	16%	4	13%	4	20%
Student Services office	0	0%	0	0%	0	0%

Figure 6. Group 1/Control 2016 Student Support Service Use: Exam 1

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Control Group Type of Support	Exam 2 n=40		Exam 2 >80% n=29		Exam 2 <80% n=11	
peer support	30	75%	25	86%	5	63%
Advice from upperclassmen	25	63%	19	66%	6	38%
Family support	29	73%	21	72%	8	63%
Tutoring	10	25%	8	28%	2	19%
Student Health clinic	7	18%	6	17%	1	9%
Professional counseling	2	5%	2	7%	0	6%
Online support	3	8%	2	7%	1	13%
Professor office hours	5	13%	3	10%	2	13%
Other: YouTube	1	3%	1	3%	0	0%
Pastoral Services	3	8%	3	10%	0	13%
None	5	13%	4	14%	1	19%
Student Services office	1	3%	0	0%	1	9%

Figure 7. Group 1/Control 2016 Student Support Service Use: Exam 2

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Control Group Type of Support	Exam 3 n=33		Exam 3>80% n=22		Exam 3 <80% n=11	
peer support	20	61%	17	77%	5	46%
Advice from upperclassmen	14	42%	8	36%	6	55%
Family support	16	49%	10	45%	6	55%
Tutoring	10	30%	10	45%	0	0%
Student Health clinic	4	12%	1	5%	3	27%
Professional counseling	0	0%	0	0%	0	0%
Online support	5	15%	4	18%	1	9%
Professor office hours	6	18%	7	32%	1	9%
Other: YouTube	0	0%	0	0%	0	0%
Pastoral Services	1	3%	1	5%	0	0%
None	6	18%	5	23%	1	9%
Student Services office	1	3%	1	5%	1	9%

Figure 8. Group 1/Control 2016 Student Support Service Use: Exam 3

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Control Group Type of Support	TOTAL n=123		TOTAL >80% n=81		TOTAL <80% n=42	
peer support	71	58%	55	68%	16	38%
Advice from upperclassmen	63	51%	42	52%	21	50%
Family support	69	56%	48	59%	21	50%
Tutoring	32	26%	25	31%	7	17%
Student Health clinic	16	13%	10	12%	6	14%
Professional counseling	5	4%	2	2%	3	7%
Online support	14	11%	11	14%	3	7%
Professor office hours	12	10%	9	11%	3	7%
Other: YouTube	1	0%	1	0%	0	0%
Pastoral Services	5	4%	5	6%	0	0%
None	19	15%	13	16%	6	14%
Student Services office	2	2%	0	0%	2	5%

Figure 9. Group 1/Control 2016 Student Support Service Use: Totals

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Experimental Group Type of Support	Exam 1 n=51		Exam 1 >80% n=41		Exam 1 <80% n=10	
peer support	23	45%	16	39%	7	70%
advice from upperclassmen	24	47%	15	37%	9	90%
family support	24	47%	18	44%	6	60%
tutoring	10	20%	5	12%	5	50%
student health clinic	5	10%	3	7%	2	20%
professional counseling	3	6%	1	2%	2	20%
online support	6	12%	5	12%	1	10%
professor office hours	1	2%	1	2%	0	0%
other	1	2%	1	2%	0	0%
pastoral services	1	2%	1	2%	0	0%
none	6	12%	3	7%	3	30%
student services office	0	0%	0	0%	0	0%

Figure 10. Group 2/Experimental 2017 Student Support Service Use:

Exam 1

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Experimental Group Type of Support	Exam 2 n=46		Exam 2 >80% n=30		Exam 2 <80% n=16	
peer support	27	59%	17	57%	10	63%
advice from upperclassmen	25	54%	16	53%	9	56%
family support	28	61%	18	60%	10	63%
tutoring	12	26%	8	27%	4	25%
student health clinic	6	13%	6	20%	0	0%
professional counseling	2	4%	1	3%	1	6%
online support	4	9%	2	7%	2	13%
professor office hours	5	11%	3	10%	2	13%
other	0	0%	0	0%	0	0%
pastoral services	3	7%	1	3%	2	13%
none	5	11%	2	7%	3	19%
student services office	1	2%	1	3%	0	0%

Figure 11. Group 2/Experimental 2017 Student Support Service Use:

Exam 2

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Experimental Group Type of Support	Exam 3 n=23		Exam 3 >80% n=21		Exam 3 <80% n=2	
peer support	20	87%	18	86%	2	100%
advice from upperclassmen	14	61%	13	62%	1	50%
family support	16	70%	16	76%	0	0%
tutoring	10	44%	9	43%	1	50%
student health clinic	4	17%	4	19%	0	0%
professional counseling	0	0%	0	0%	0	0%
online support	5	22%	4	19%	1	50%
professor office hours	5	22%	4	19%	1	50%
other	0	0%	0	0%	0	0%
pastoral services	1	4%	1	5%	0	0%
none	5	22%	5	24%	0	0%
student services office	0	0%	0	0%	0	0%

Figure 12. Group 2/Experimental 2017 Student Support Service Use:

Exam 3

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Experimental Group Type of Support	TOTAL n=120	Total %	Total >80% n=92		Total <80% n=28	
peer support	70	58%	51	55%	19	68%
advice from upperclassmen	63	53%	44	48%	19	68%
family support	68	57%	52	57%	16	57%
tutoring	32	27%	27	29%	5	18%
student health clinic	15	13%	13	14%	2	7%
professional counseling	5	4%	2	2%	3	11%
online support	15	13%	11	12%	4	14%
professor office hours	11	9%	8	9%	3	11%
other	1	1%	1	1%	0	0%
pastoral services	5	4%	3	3%	2	7%
none	16	13%	10	11%	6	21%
student services office	1	1%	1	1%	0	0%

Figure 13. Group 2/Experimental 2017 Student Support Service Use:

Totals

Percentage of Support Service Usage for all respondents. MCBPs (<80% exam grade) compared to total group and students with exam grade >80%.

Question	Themes	2016	2017
What were positive aspects of the Clinical Anatomy course?	Teaching assistants	10	3
	professors' knowledge	5	3
	cadaver lab use	7	6
	slides/lecture materials	0	4
	help succeeding	0	4
	supplemental resources	2	5
	caring faculty	0	2
	accessible faculty	3	4
How did these things help your learning?	willingness/availability	6	4
	positive environment/support	6	4
	improved understanding	0	5
	approachable faculty	0	3
	cadaver/lab experience	6	4
	answered questions	4	2
	class was scheduled well	3	0
	supplemental resources	1	6
	facilitated deep learning	0	5
	help from teaching assistants	3	3
	understanding	4	5
	What aspects impeded your learning?	problems with facilities	3
different lecturers		2	1
inconsistent/confusing information		4	4
amount of material in short time		6	5
lack of assistance		0	2
group dynamics in lab		0	4
lack of study skills		1	0
stress		0	4
exam difficulty		0	2
needed outside resources		3	0
cognitive overload		2	3
none		3	0
In what ways?	not enough time	1	2

	classroom/facilities	1	0
	confusion of material	0	1
	amount of		
	material/cognitive load	3	2
	lack of dissection		
	instruction	2	1
Did you receive the final grade in Clinical Anatomy that you expected?			
	yes	16	15
	no	4	5
Why did you not?			
	poor study skills early	1	2
	earned higher grade	1	1
	summative exam		
	performance	0	1
	family emergency	1	0
How did the instructors support your learning the material?			
	caring attitudes	0	3
	supported learning	0	3
	provided outside materials	5	0
	professor accessibility	10	6
	different instructors	2	1
	supplemental lecture		
	aides/reviews	4	4
	willingness to spend time	1	0
What kind of support or strategies did you use to cope with the stress of the summer semester?			
	friends	9	8
	family	13	7
	peers	4	5
	tutoring	1	5
	counseling	0	2
	exercise	2	3
	study groups	2	3
	TA/faculty	2	3
	healthcare	0	0
	church/faith	1	0
	help in the home	2	0
	relaxation/study breaks	5	2
	none	2	2

Will you change the type of support system you have for the next semester?			
	yes	3	1
	no	19	22
What made your support strategy successful?			
	had someone to verbalize to	4	0
	had peers in same situation	3	3
	helped at home	0	2
	had support	2	0
	relaxed/lower stress	0	2
	family support	0	6
	breaks/time away	0	4
	prioritized	0	2
	had friends	1	0
	it's not working	3	0
In what ways?			
	caretaking	0	2
	kept focus/consistent	0	5
	understanding	0	3
	able to depend on	0	3
	new study strategies	0	2
	not feeling alone	1	0
	able to structure study time	2	0
	provided distraction	0	1
	motivation/encouragement	1	0
How did your previous college background effect your readiness for Clinical Anatomy?			
	had anatomy & did not help	6	7
	was not prepared	4	2
	had anatomy & helped	5	2
	more prepared	5	3
	rigor of undergrad	1	2
	similar coursework	5	3
	had professor before	2	0
	study skills/strategies	3	5
	familiar with material	0	7
	had previous anatomy	13	8
How could your experience in Clinical Anatomy be improved to help your learning?			

be a longer course	3	0
organize lecture materials	0	2
improve test/quiz questions	3	4
practice questions	1	1
change study strategies	0	2
facility environment	2	0
dissection/lab policy enforcement	0	2
clarification of learning material	3	0
none	5	2

Figure 14. End of Course Qualitative Questionnaire Responses: Frequency of Themes.

2016 Control group n=22. 2017 Experimental group n=23.

Manually triangulated themes were totaled for each question. Overall results between groups were similar. 2017 experimental group did report terms of “stress” and “exam difficulty” as impediments to learning more than the 2016 control group. The experimental group also reported more help from family and friends in the home than the control group.

Appendix B1

Brief COPE

These items deal with ways you've been coping with the stress in your life since you found out you were going to have to have this operation. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

- 1 = I haven't been doing this at all
- 2 = I've been doing this a little bit
- 3 = I've been doing this a medium amount
- 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

Scales are computed as follows (with no reversals of coding):

Self-distraction, items 1 and 19

Active coping, items 2 and 7

Denial, items 3 and 8

Substance use, items 4 and 11

Use of emotional support, items 5 and 15

Use of instrumental support, items 10 and 23

Behavioral disengagement, items 6 and 16

Venting, items 9 and 21

Positive reframing, items 12 and 17

Planning, items 14 and 25

Humor, items 18 and 28

Acceptance, items 20 and 24

Religion, items 22 and 27

Self-blame, items 13 and 26

Appendix B2. Online Brief COPE Survey

Qualtrics Survey Software

4/19/16, 9:42 PM

Block 2

Online Consent to Participate in Research

Would you like to be involved in research at the University of Oklahoma?

I am **Amy Thiessen** from the **College of Education and Cell Biology** and I invite you to participate in my research project entitled Relationship of Help-Seeking Behaviors and Academic Performance in First Year Physician Assistant and Dental Students Using Quantitative and Qualitative Methods. This research is being conducted at **University of Oklahoma Health Sciences Center**. You were selected as a possible participant as a first year Dental or Physician Assistant Student. You must be at least 18 years of age to participate in this study.

Please read this document and contact me to ask any questions that you may have BEFORE agreeing to take part in my research.

What is the purpose of this research? The purpose of this research is to **investigate student behaviors and their relationships to academic performance. Results of this study will be used to improve the teaching and curriculum of this course in the future.**

How many participants will be in this research? About **300 students** will take part in this research.

What will I be asked to do? If you agree to be in this research, your participation will require approximately 10] minutes and is completed online at your computer. **You will have the opportunity to participate after each of your 4 anatomy exams and at the conclusion of the course.**

How long will this take? Your participation will take **approximately 10 minutes at your computer each time you take the survey.**

What are the risks and/or benefits if I participate? There are no risks and no benefits from being in this research.

Will I be compensated for participating? You **will not** be reimbursed for your time and participation in this research.

Who will see my information? In research reports, there will be no information that will make it possible to identify you. Research records will be stored securely and only approved researchers and the OU Institution Review Board will have access to the records.

In addition, this is an academic not-for-profit research project. Data are collected via Qualtrics, an online survey system that has its own privacy and security policies for keeping your information confidential. Please note no assurance can be made as to the use of the data you provide for purposes other than this research.

Do I have to participate? No. If you do not participate, you will not be penalized or lose benefits or services unrelated to the research. If you decide to participate, you don't have to answer any question and can stop participating at any time.

There are no benefits to you as a result of your participation in this study. Although the risk is minimal, there is always some risk that an unauthorized third party may find a way around security

systems or that transmissions of information over the Internet will be intercepted. Please also be aware that you may decline to answer any item on the questionnaire if you wish to.”

Will my personal records be accessed? If you approve, your confidential records will be used as data for this research. The records that will be used include **your OUHSC student ID number**. These records will be used for the following purpose(s): **to correlate survey responses with academic performance. After initial matching, your data will be deidentified and all analysis will take place with deidentified data.**

I agree for my records to be accessed and used for research purposes.

- Yes
 No

Who do I contact with questions, concerns or complaints? If you have questions, concerns or complaints about the research or have experienced a research-related injury, contact me at Amy Thiessen
University of Oklahoma
College of Education/Cell Biology
Amy-thiessen@omrf.org

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s).

Please print or save this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

- I agree to participate
 I do not wish to participate

Default Question Block

Age

- 20-25
 25-30
 30-35
 over 35

Gender

- Female
- Male
- Prefer not to disclose

Student ID Number

I've been turning to work or other activities to take my mind off things.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been concentrating my efforts on doing something about the situation I'm in.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been saying to myself "This isn't real."

- I haven't been doing this at all
- I've been doing this a little bit
 - I've been doing this a medium amount
 - I've been doing this a lot

I've been using alcohol or other drugs to make myself feel better.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been getting emotional support from others.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been giving up trying to deal with it.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been taking action to try to make the situation better.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been refusing to believe that it has happened.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been saying things to let my unpleasant feelings escape

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been getting help and advice from other people.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been using alcohol or other drugs to help me get through it.



- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been trying to see it in a different light, to make it seem more positive.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been criticizing myself.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been trying to come up with a strategy about what to do.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been getting comfort and understanding from someone.



- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been giving up the attempt to cope.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been looking for something good in what is happening.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been making jokes about it.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been accepting the reality of the fact that it has happened.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been expressing my negative feelings

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been trying to find comfort in my religion or spiritual beliefs.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been trying to get advice or help from other people about what to do.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been learning to live with it.

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been thinking hard about what steps to take

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been blaming myself for things that happened

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been praying or meditating.



- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I've been making fun of the situation

- I haven't been doing this at all
- I've been doing this a little bit
- I've been doing this a medium amount
- I've been doing this a lot

I have used the following services/support systems while enrolled in this degree program:

- Student Health Clinic
- Advice from upperclassmen
- Student Services Office
- Pastoral Services
- Professional Counseling
- Professor Office Hours
- Family Support
- Online support or tutoring
- Tutoring
- Peer support
- Other
- None

What grade do you expect to receive on this exam?

- 59 or below

- 60-69
 - 70-79
 - 80-89
 - 90-100
-

Appendix B3. After Course Online Survey:

Qualtrics Survey Software

5/23/16, 7:18 PM

Default Question Block

Online Consent to Participate in Research

Would you like to be involved in research at the University of Oklahoma?

I am Amy Thiessen from the College of Education and Cell Biology and I invite you to participate in my research project entitled Relationship of Help-Seeking Behaviors and Academic Performance in First Year Physician Assistant and Dental Students Using Quantitative and Qualitative Methods. This research is being conducted at **University of Oklahoma Health Sciences Center**. You were selected as a possible participant as a first year Dental or Physician Assistant Student. You must be at least 18 years of age to participate in this study.

Please read this document and contact me to ask any questions that you may have BEFORE agreeing to take part in my research.

What is the purpose of this research? The purpose of this research is to **investigate** student behaviors and their relationships to academic performance. Results of this study will be used to improve the teaching and curriculum of this course in the future.

How many participants will be in this research? About **300 students** will take part in this research.

What will I be asked to do? If you agree to be in this research, your participation will require approximately 10 minutes and is completed online at your computer. **You will have** the opportunity to participate after each of your 4 anatomy exams and at the conclusion of the course.

How long will this take? Your participation will take **approximately 10 minutes at your** computer each time you take the survey.

What are the risks and/or benefits if I participate? There are no risks and no benefits from being in this research.

Will I be compensated for participating? You **will not** be reimbursed for your time and participation in this research.

<https://ousurvey.qualtrics.com/WRQualtricsControlPanel/Ajax.php?action=GetSurveyPrintPreview>

Page 1 of 7

Who will see my information? In research reports, there will be no information that will make it possible to identify you. Research records will be stored securely and only approved researchers and the OU Institution Review Board will have access to the records.

In addition, this is an academic not-for-profit research project. Data are collected via Qualtrics, an online survey system that has its own privacy and security policies for keeping

your information confidential. Please note no assurance can be made as to the use of the data you provide for purposes other than this research.

Do I have to participate? No. If you do not participate, you will not be penalized or lose benefits or services unrelated to the research. If you decide to participate, you don't have to

answer any question and can stop participating at any time.

There are no benefits to you as a result of your participation in this study. Although the risk is minimal, there is always some risk that an unauthorized third party may find a way around security systems or that transmissions of information over the Internet will be intercepted. Please also be aware that you may decline to answer any item on the questionnaire if you wish to.

Will my personal records be accessed? If you approve, your confidential records will be used as

data for this research. The records that will be used include **your OUHSC student ID number**. These

records will be used for the following purpose(s): **to correlate survey responses with academic**

performance. After initial matching, your data will be deidentified and all analysis will take place

with deidentified data.

I agree for my records to be accessed and used for research purposes.

Yes

No

Who do I contact with questions, concerns or complaints? If you have questions, concerns or complaints about the research or have experienced a research-related injury, contact me at

Amy Thiessen
University of Oklahoma
College of Education/Cell Biology
Amy-thiessen@omrf.org

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your rights

as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s).

Please print or save this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

I agree to participate

I do not wish to participate

Block 1

What were positive aspects of the Human Structures course?

How did these things help your learning?

What aspects impeded your learning?


In what ways?

Did you receive the final grade in Human Structure that you expected?

Yes

No

Why did you not?



How did the instructors support your learning the material?



What kind of support or strategies did you use to cope with the stress of the summer semester? i.e. tutoring, family, friends




Will you change the type of support system you have for the next semester?

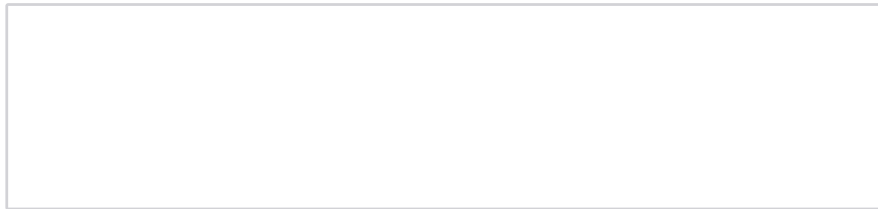
Yes

No

What made your support strategy successful?



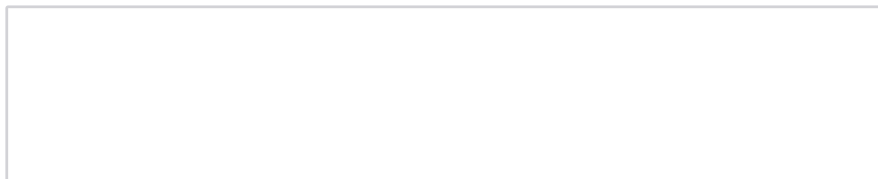
In what ways?



How did your previous college background effect your readiness for Human Structure?



How could the experience in Human Structure be improved to help your learning?



Powered by Qualtrics

Appendix B4: Student Support Service List provided to experimental group

The following is a list of support services available to you as a student. Please do not hesitate to use these at any time.

Student Services on OU Norman and OUHSC campuses

1. **OU Advocates** - Dial 911 (on campus) or (405) 615-0013 (off campus or by cell) and ask for OU Advocates regarding sexual assault issues.
2. **OUHSC counseling services**
Student Counseling Services
David L. Boren Student Union, Suite 300
Phone: (405) 271-7336
Toll-Free: (877) 577-5655
Email: Counselors@ouhsc.edu
3. Please visit the [OUPD website](#) for additional on and off campus emergency numbers.
4. **Department of Disability Concerns**
Chelle' Guttery, Ph.D., Director
730 College Avenue - University Community Center
Norman, OK 73019
(405) 325-3852 (Voice) - (405) 217-3494 (VP)
(405) 325-4491 (Fax)
Email: drc@ou.edu
5. **Sooners Helping Sooner HSC**
Kate Stanton
Executive Director, HSC Student Affairs
(405) 271-2416
kate-stanton@ouhsc.edu
Sarah Bramlett
Coordinator, Leadership Development Programs
(405) 271-2416
sarah-bramlett@ouhsc.edu
6. **National Hopeline Network** - Suicide prevention, awareness, and education. 1-800-SUICIDE (1-800-784-2433) or 1-800-442-HOPE (1-800-442-4673). Available 24 hours a day 7 days a week
7. **National Suicide Prevention Lifeline** - 1-800-273-TALK (1-800-273-8255).
8. **EMERGENCY SERVICES OR HOSPITALIZATION:**
[Red Rock Behavioral Health Crisis Unit](#) (Norman) - 405-573-6466
Norman Regional Behavioral Health - 405-307-5555
9. **Writing Center:**

Mary Carter, Ph.D.
 Coordinator, HSC Writing Center
 David L. Boren Student Union, Room 214
 (405) 271-2416
 mary.carter@ouhsc.edu

10. Student Health Clinics

OUHSC HEALTH IF YOU NEED TO MAKE AN APPOINTMENT:
 Call (405) 271-2577
 Appointments must be made for a visit.
 Same-day appointments are available for illnesses, injuries, etc.
 Remember your student ID and insurance card (must show at each visit!).

11. Information for 211 crisis lines:

Assistance with housing, utilities, mental health, food programs, and family services
<http://www.navigateresources.net/hlok/>

12. HSC Student Affairs

University of Oklahoma Health Sciences Center
 David L. Boren Student Union
 1106 North Stonewall, Suite 300
 Oklahoma City, OK 73117-1200
students@ouhsc.edu
 Phone: (405) 271-2416
 Fax: (405) 271-8817
 Toll-free: 1-877-577-5655

Appendix 5: SPSS Outputs

Tests of Within-Subjects Effects

Measure: item3

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
time	Sphericity Assumed	1.422	2	.711	6.270	.003
	Greenhouse-Geisser	1.422	1.566	.908	6.270	.007
	Huynh-Feldt	1.422	1.640	.867	6.270	.006
	Lower-bound	1.422	1.000	1.422	6.270	.018
Error(time)	Sphericity Assumed	6.578	58	.113		
	Greenhouse-Geisser	6.578	45.424	.145		
	Huynh-Feldt	6.578	47.560	.138		
	Lower-bound	6.578	29.000	.227		

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	.267	5.091 ^b	2.000	28.000	.013
	Wilks' Lambda	.733	5.091 ^b	2.000	28.000	.013
	Hotelling's Trace	.364	5.091 ^b	2.000	28.000	.013
	Roy's Largest Root	.364	5.091 ^b	2.000	28.000	.013

a. Design: Intercept
Within Subjects Design: time

b. Exact statistic

Tests of Within-Subjects Effects

Measure: item13

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
time	Sphericity Assumed	3.289	2	1.644	7.503	.001
	Greenhouse-Geisser	3.289	1.878	1.751	7.503	.002
	Huynh-Feldt	3.289	2.000	1.644	7.503	.001
	Lower-bound	3.289	1.000	3.289	7.503	.010
Error(time)	Sphericity Assumed	12.711	58	.219		
	Greenhouse-Geisser	12.711	54.473	.233		
	Huynh-Feldt	12.711	58.000	.219		
	Lower-bound	12.711	29.000	.438		

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	.309	6.259 ^b	2.000	28.000	.006
	Wilks' Lambda	.691	6.259 ^b	2.000	28.000	.006
	Hotelling's Trace	.447	6.259 ^b	2.000	28.000	.006
	Roy's Largest Root	.447	6.259 ^b	2.000	28.000	.006

a. Design: Intercept
Within Subjects Design: time

b. Exact statistic

Mixed ANOVA:

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
exam	Sphericity Assumed	771.219	2	385.610	7.322	.001
	Greenhouse-Geisser	771.219	1.905	404.935	7.322	.002
	Huynh-Feldt	771.219	2.000	385.610	7.322	.001
	Lower-bound	771.219	1.000	771.219	7.322	.011
exam * Group	Sphericity Assumed	12.463	2	6.232	.118	.889
	Greenhouse-Geisser	12.463	1.905	6.544	.118	.880
	Huynh-Feldt	12.463	2.000	6.232	.118	.889
	Lower-bound	12.463	1.000	12.463	.118	.733
Error(exam)	Sphericity Assumed	2949.048	56	52.662		
	Greenhouse-Geisser	2949.048	53.327	55.301		
	Huynh-Feldt	2949.048	56.000	52.662		
	Lower-bound	2949.048	28.000	105.323		

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.
Contrast	2.096	1	2.096	.016	.901
Error	3754.067	28	134.074		

The F tests the effect of Group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Appendix B6: IRB approval letter



Institutional Review Board for the Protection of Human Subjects
Approval of Continuing Review – Expedited Review – AP0

Date: January 10, 2018 **IRB#:** 6740
Principal Investigator: Ms Amy Susanne Thiessen **Approval Date:** 01/09/2018
Expiration Date: 12/31/2018

Expedited Category: 7

Study Title: Relationship of Help-Seeking Behaviors and Academic Performance in First Year Physician Assistant and Dental Students Using Quantitative and Qualitative Methods

Based on the information submitted, your study is currently: *Active*, closed to enrollment. On behalf the Institutional Review Board (IRB), I have reviewed and approved your continuing review application. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

As principal investigator of this research study, you are responsible to:

- Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- Request approval from the IRB prior to implementing any/all modifications.
- Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- Promptly submit continuing review documents to the IRB upon notification approximately 60 days prior to the expiration date indicated above.
- Submit a final closure report at the completion of the project.

You will receive notification approximately 60 days prior to the expiration date noted above. You are responsible for submitting continuing review documents in a timely fashion in order to maintain continued IRB approval.

If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,

Fred Beard, Ph.D.
Vice Chair, Institutional Review Board

Appendix B7: IRB Final Report—Inactivation



Institutional Review Board for the Protection of Human Subjects Final Report – Inactivation

Date: May 02, 2018

IRB#: 6740

To: Ms Amy Susanne Thiessen

Inactivation Date: 05/02/2018

Study Title: Relationship of Help-Seeking Behaviors and Academic Performance in First Year Physician Assistant and Dental Students Using Quantitative and Qualitative Methods

On behalf of the Institutional Review Board (IRB), I have reviewed the Final Report for the above-referenced research study. You have indicated that this study has been completed and should be inactivated. This letter is to confirm that the IRB has inactivated this research study as of the date indicated above.

Note that this action completely terminates all aspects and arms of this research study. Should you wish to reactivate this study, you will need to submit a new IRB application.

If you have questions about this notification or using iRIS, contact the IRB at (405) 325-8110 or irb@ou.edu.

Cordially,

A handwritten signature in blue ink that reads 'Fred Beard'. The signature is written in a cursive style and is positioned above a horizontal line.

Fred Beard, Ph.D.
Vice Chair, Institutional Review Board