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The Impact of Transfer Shock in a Dental Hygiene Program at a Four-Year Health-Sciences University

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The Impact of Transfer Shock in a Dental Hygiene Program at a Four-Year Health-Sciences University

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by

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Abstract

In order for a student to be successful in dental hygiene education, the student must gain the required knowledge and skills necessary to perform as a hygienist and possess the ability to utilize critical thinking to apply these attributes while in the program and on the National Board of Dental Hygiene Examination (NBDHE) (Alzahrani, Thompson, & Bauman, 2007; Fried, Maxey, Battani, Gurenlian, Byrd, & Brunick, 2017). Dental hygiene students who attend a medical university have the option to take required pre-requisite courses at a community college or a four-year university. All dental hygiene students transfer from another institution and all have the potential to exhibit transfer shock, which may contribute to a drop in GPA following the transfer to another institution. Transfer shock typically occurs for students who transfer from a community college to a university (Hills 1965; Ivins, Copenhaver, & Koclanes, 2016). The study investigated the impact of transfer shock on students who transfer into a dental hygiene program from a two-year community college as opposed to a four-year university. This study examined whether the type of institution, two-year community college versus a four-year university, attended prior to dental hygiene school is a predictor of success in a dental hygiene program in terms of ending program GPA and NBDHE first-attempt pass rates. After data analysis, results suggested that transfer shock did occur with both community college and four-year university students. However, the four-year university group experienced less transfer shock than those who attended a community college during the first semester. Neither group increased their GPAs from the first to second semesters in the program. When comparing the entering GPAs with the end of program GPAs, both groups showed a significant drop. However, the community college group's decrease in GPA was greater. Only five students in the total population (two from the four-year university group and three from the community college group) failed the NBDHE on the first

attempt. Students who were unsuccessful in passing the NBDHE had final program GPAs that ranged from 2.2 to 2.45.

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Chapter I

Introduction

Student success is dependent on a student's ability to perform well academically. In order to achieve at a high level of achievement, a student must obtain the necessary knowledge and skills required, and incorporate critical thinking to apply the knowledge and skills gained. Positive outcomes occur when a student is engaged and persistent throughout an educational program (York, Gibson, & Rankin, 2015). This adage holds true for students enrolled in dental hygiene education. The Commission on Dental Accreditation (CODA), the accrediting body for dental hygiene, stated that dental hygiene programs must present students with appropriate opportunities that will enable them to be deemed competent (CODA, 2017). Therefore, students should graduate equipped with the knowledge and skills to perform as an entry-level hygienist. CODA (2017) also wrote that students from dental hygiene programs should be able to pass the National Board of Dental Hygiene Examination, the national written examination required by state boards to obtain licensure.

A dental hygienist is an oral health care provider who has the potential to increase an individual's overall health by treating their oral health (Bowen, 2013). Continuing to educate and graduate dental hygiene students is necessary to meet the oral healthcare needs of the increasing population (Alzahrani et al., 2007; Fried et al., 2017).

To earn a baccalaureate dental hygiene degree at a medical university, potential students have the ability to transfer two years of prerequisite credits from a two-year community college or a four-year university (CODA, 2017). Studies have suggested that students matriculating from a community college to a four-year university may experience a phenomenon called "transfer shock" (Ivins et al., 2016). According to Hills (1965), this transition occurs after pre-requisite

coursework has been met. Data suggest this phenomenon may contribute to a student's drop in grade point average (GPA) in the first semester after transferring (Hills, 1965; Ivins et al., 2016). Even if students are able to successfully complete dental hygiene program requirements, they still must pass the National Board Dental Hygiene Examination (NBDHE) to obtain a dental hygiene license to practice (Alzahrani et al., 2007).

Although admission criteria may differ among programs, the most common measure utilized in the selection process is pre-requisite grade point average (Alzahrani et al., 2007). Dental hygiene programs consistently have difficulty finding the appropriate criteria for selecting students capable of achieving success in the program as well as being successful on the NBDHE. (Alzahrani et al., 2007; Austin, 2011). There were no studies located for this research that explored how transfer shock impacts students in dental hygiene programs.

Statement of the Problem

In order to continue to prevent and treat oral diseases, it is crucial that faculty in dental hygiene programs are able to educate competent students who graduate the dental hygiene program and pass the NBDHE. Prior to attending a dental hygiene program, students must complete prerequisite courses (CODA, 2017). As of 2016, there were 332 dental hygiene programs in the United States that provide education to a combined total of 9,510 students (Theile, 2017). However, only 7,323 students graduated in 2015. Each program has a number of students they are able to accept on an annual basis. The total capacity of all programs is not met due to students not being successful in program completion (Theile, 2017). At the university where this study was conducted, students who entered the program had GPAs that ranged from a 3.0 to a 4.0. Students were only allowed to fall below a 2.0 GPA and be on probation the first

semester. If students fall below a 2.0 GPA the subsequent semesters, the student is dismissed from the program.

At the dental hygiene school in the study, the number of students close to a 2.0 GPA had increased. At least one-fourth to one-third of the class was close to being on probation after the first semester. The students who were not dismissed from the program tended to struggle to stay above a 2.0 for the remainder of the program. It is imperative to investigate if the type of institution where students took pre-requisite courses impacted a student's GPA in the dental hygiene program so that the institution is aware of what variables might deter student success.

Statement of the Purpose

The purpose for conducting this study was to investigate whether students in a dental hygiene program at a health-sciences university experienced transfer shock by comparing GPAs of students who transferred from two-year community colleges to the GPAs of students who transferred from four-year universities at various points in their educational career. In addition, the researcher examined whether the type of institution, two-year community college versus four-year, where students take their lower-division courses had an impact on program completion GPAs and NBDHE first- attempt pass rates.

Statement of the Research Questions

In order to investigate the impact of transfer shock in a dental hygiene program at a health-sciences university, the following questions were addressed:

1. What was the profile of dental hygiene students upon entering an upper-division program affiliated with a mid-southern health science campus?
2. Was there a difference between entering program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

3. Was there a difference between entering program GPAs and the first semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?
4. Was there a difference between the first and second semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?
5. Was there a difference between then entering program GPAs and the GPAs at the completion of the dental hygiene program between students who attended a two-year community college to take their lower-division courses versus a four-year university?
6. Was there a difference between first-attempt NBDHE pass rates between students who attended a two-year community college to take their lower-division courses versus a four-year university?

Definition of Terms

American Dental Association (ADA). - Established in 1859, the American Dental Association is the largest and oldest dental society today. (www.ada.org). The ADA's mission is to enhance the oral health care of the public through its diverse group of members (www.ada.org).

American Dental Education Association (ADEA). ADEA is the national organization that represents academic dentistry. The American Dental Education Association is comprised of members who include students, faculty, staff, and administrators from all dental educational programs in the United States and Canada. There are also members from corporations that work in oral health education (www.adea.org).

Commission on Dental Accreditation (CODA). CODA is a branch of the ADA and serves as a national accrediting body for dental, advanced dental, and allied dental educational programs in the United States (www.ada.org). As the accrediting body for dental education, CODA has standardized and guided dental and allied dental education for over a century (www.ada.org).

Competency-based education (CBE). A form of education that focuses on the outcomes of learning; addresses what the learners are expected to do rather than on what they are expected to learn (Chambers & Glassman, 1997).

National Board Dental Hygiene Examination (NBDHE). The NBDHE is an examination that a candidate takes at the end of a curriculum to determine if the candidate is equipped with the knowledge to practice as an entry-level hygienist. The exam is required for a candidate to obtain a state license (ADA NBDHE Technical Report, 2017).

Registered Dental Hygienist (RDH). RDH is a licensed oral health provider who has graduated from an accredited dental hygiene program or equivalent to an accredited program (ADA NBDHE Technical Report, 2017). In addition, the graduate must successfully pass national, regional and state credentialing exams in order to apply for a license to practice dental hygiene from the state governing body that regulates dental/dental hygiene practice.

Transfer shock. A decrease in a student's GPA following a transition from a two-year community college to a four-year university. Student GPAs typically rise the second semester following the transfer. (Hills 1965; Ivins et al., 2016).

Delimitations

The delimitation to the study is that only one program was being evaluated. Therefore, the data may not be generalizable to other dental hygiene institutions. In addition, the researcher

did not investigate student factors, including but not limited to family background, individual attributes, and pre-college schooling.

Assumptions

The following assumptions of the study include:

1. Transfer shock can occur for any student transitioning from one institution to another (Ivins et al., 2016).
2. Grade point average is the primary indicator for program acceptance.

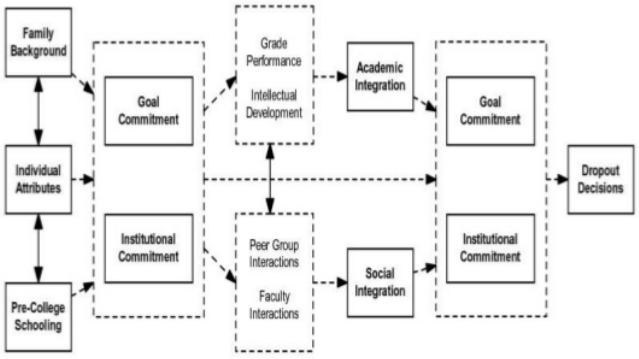
Significance of the Study

It is critical that dental hygiene schools continue producing graduates who must continue treating the oral health demands of the current population. Therefore, the success of dental hygiene students is crucial. In many dental hygiene programs housed in a medical university, students transfer from a two-year community college or another four-year university. Researchers have suggested that students who have transferred from a two-year community college to a university may experience a drop in the GPA. Numerous researchers have investigated predictors to determine success in a dental hygiene program in regards to GPA and NBDHE pass rates (Alzahrani et al., 2007; Austin, 2011). However, there were no studies located for this research that addressed dental hygiene education that also examined transfer shock. The results of this research contributed to the body of literature by determining if transfer shock occurred at a particular dental hygiene school at a health-sciences university. Institutions that have dental hygiene schools need to be cognizant of the potential impact of transfer shock so that they can become equipped to help students who have the potential to experience transfer shock.

Conceptual Framework

Hills coined the phrase "transfer shock" in 1965 after reviewing numerous studies. After examining 46 data sets, Hills concluded that the majority of students who transferred from a two-year community college to a four-year institution exhibited a decrease in their GPAs the first semester following the transition (Hills, 1965). However, Hills also found that students typically adjusted and increased their GPAs the subsequent semesters (Hills, 1965).

In order to further understand transfer shock, Tinto (1975) developed a Student Integration Model. Tinto's model focused on how well a student was able to continue with a program based on prior academic experiences and social integration. Tinto believed that retention in higher education was based on a person's social and intellectual capabilities.



(Tinto, 1975)

Figure 1. *Tinto's Model of Student Integration (1975)*

Researchers continued examining community colleges and how well they prepared students for four-year universities (Cedja 1997; Ivins, 2016). Carlan and Byxbe (2000) found that students who transferred from a community college with a higher GPA were well-prepared for the university setting. In another study, Li (2010) challenged an existing idea that transfer

shock occurs because four-year universities have more difficult courses than community colleges. Li found that four-year university students who transferred to another four-year university can experience transfer shock as well (Li, 2010).

Dental hygiene students who attend a dental hygiene program at a health-sciences university can take their prerequisite courses at either another four-year university or a community college (CODA, 2017). Therefore, all of these students are transfer students and have the potential to experience transfer shock. Tinto's Model of Student Integration (1975) includes many of the aspects that help students transition and deal with transfer shock, including prior academic experience, peer and faculty interactions, and social integration.

Due to the fact that the majority of dental hygiene programs are cohort programs, the students interact with each other five days a week in class, clinic, and at school functions. Faculty members are also actively involved in the students' education as well. Therefore, many of the social variables related to transfer shock may be controlled. The main variable that the researcher examined was GPA at various points in students' progression through the dental hygiene program, evaluated based on the location of the students' prerequisite courses as a predictor of success in a dental hygiene program and on the NBDHE.

Chapter Summary

Transfer shock is a phenomenon that suggest students' GPAs will decline following a transfer from one institution to another. Following a drop in grades, students generally adjust and improve their GPA after the first semester (Hills, 1965). Tinto's Model of Student Integration was developed to explain student retention in higher education, which incorporated previous academic experience and social integration to predict retention (Tinto, 1975).

Student success in dental hygiene education is measured by student GPA, degree completion, and passing the NBDHE. In the United States during 2018, the 332 accredited programs have the ability to take 9,510 students. In 2015, only 7,323 students graduated due to students not completing the program (Theile, 2017). In a dental hygiene program at a health-sciences university, dental hygiene students take pre-requisite courses at another four-year university or a two-year community college. In order to investigate student success in dental hygiene in terms of academic performance, this study analyzed how well students from two institution types adjusted to a dental hygiene program at a health-sciences university. In addition, the study examined how the institution type for completion of lower-division courses impacted the first semester GPA, GPA at the completion of the program, as well as national board pass rates. The study was significant because it examined the role of transfer shock in a dental hygiene program at a health-sciences university in order to determine factors that may impact student success.

Chapter II

Review of Literature

Overview

Dental hygiene programs have an obligation to ensure that they are graduating enough students in order to meet the oral health care needs of the current population and potentially an increasing population (Fried et al., 2017). Dental hygiene researchers have studied predictors of success of the NBDHE such as GPA due to the importance of ensuring that there are an adequate amount of dental hygiene practitioners (Alzahrani et al., 2007; Austin, 2011). According to Bowen (2013), a dental hygienist's role is to prevent oral disease through treatment as well as education. Good oral health prevents other systemic conditions, such as diabetes, cardiovascular disease, bacterial pneumonia, endocarditis, pre-term births, and low-birth weight (Bowen, 2013). As of 2013, the evidence was still pending for the effect of poor oral health on Alzheimer's disease and stroke (Bowen, 2013).

There are numerous factors that contribute to student success in higher education. However, research has suggested that students may struggle and experience transfer shock when moving from a two-year community college to a university that awards baccalaureate degrees. Transfer shock might impact student success in terms of their academics and socialization (Ivins et al., 2016; Laanan, 2007). In order to practice as a dental hygienist, a student must pass a live patient clinical exam and a written test, the NBDHE. Researchers have examined factors that predict success on the NBDHE, including various GPAs and standardized test scores (Alzahrani et al., 2007; Austin, 2011). In some cases, transfer shock is thought to contribute to a student's decrease in GPA following a transfer to a new university from a community college.

Search Strategies and Terms

An extensive review of the literature on this topic resulted in a significant amount of information on predictors of success in dental hygiene education. However, there was a limited amount of literature located for this research regarding the impact of the type of institution where lower-division courses are taken, entering grade point average, and dental hygiene program completion. The libraries utilized were the University of Arkansas for Medical Sciences Library and the University of Arkansas Fayetteville Library. Databases searched include: ProQuest, EBSCO, Ebooks, and PubMed. In addition, searches of the professional websites of ADA, ADEA, and ADHA were performed. A search in *The Journal of Dental Education* and the *Journal of Dental Hygiene* resulted in numerous research articles for the topic. For the study, peer reviewed journals, books, and technical reports were used to complete the literature review. The search terms used were: dental hygiene education, predictors of success in dental hygiene, GPA in dental hygiene, community college education, two-year colleges, four-year universities, health-sciences universities, student success in college, NBDHE, student retention, adjusting to universities, and transfer shock.

Student Success in Higher Education

A large amount of research regarding retention and student success has been based on Tinto's (1975) Student Integration Model. Tinto's model stated that retention in higher education is grounded in social and intellectual abilities. There are numerous variables that enhance student success such as motivation, critical thinking skills, engagement with peers and faculty, perceived academic control, as well as academic emotions (Respondek et al., 2017; van der Zanden et al., 2018).

Based on the data that suggest students typically drop out of college prior to their second year, Van der Zanden et al. (2018) performed a systematic review of student success in first-year college students. Academic achievement, critical thinking skills, and social-emotional well-being were the major themes that arose in the study (van der Zanden et al., 2018). A component of academic achievement involved intrinsic motivation. This type of motivation produces the determination needed to be successful (Arnold & Rowaan, 2014). Students with high motivational levels have the desire to study often. Jansen and Suhre (2010) reported that the number of credit hours earned correlated with the students' contentment in their degree choice. This contentment directly impacted their motivation and willingness to seek additional help if needed. Another aspect of academic achievement was study skills. Students who knew how to study effectively tended to have higher GPAs (Zhou et al., 2015). Critical thinking skills were also a critical component of success in higher education, and students who had the ability to reflect and utilize higher level thinking skills were more likely to be successful in college (van der Zanden et al., 2018). Students benefitted when faculty members provided students the chance to discuss their writings or reflections with an instructor or peer (McMillan & Hearn, 2008; Tonni, et. al., 2016).

According to Gibbison et al. (2011), student success is not only defined in terms of GPA but also in how well students adapt and integrate into their educational program and setting. Those students who clearly integrated into the university and participated in on-campus events were more likely to take pleasure in their academic achievement (Gibbison et al., 2011). Engagement is a factor that has been highly researched in regards to student success in higher education. Engagement not only pertains to student participation in campus activities, but also relates to student interaction with peers and communication with faculty in the educational

setting. Data have suggested that learning increases when peers have the ability to work in small groups on school projects. Students who teach their peers are more likely to understand the material on a deeper level (Lundberg, 2003; Lundberg 2014).

Faculty members play a critical role in student success. When students engage with faculty, students are able to develop their personal and cognitive skills (Lundberg, 2003). In addition, faculty members provide students with feedback. Feedback is more effective if it involves active engagement between the faculty member and the student (Lillis & Turner, 2001). In 2016, Quance stated that faculty feedback should be objective in nature and can be given in written form or verbally. Students also play an important role in faculty feedback. In order for the feedback to be effective, students must be willing to acknowledge that they need the instructor's help. It is important for faculty to present their feedback in a professional manner to allow the student to feel comfortable and display humility during verbal exchanges (Gruppen, 2015). A meta-analysis of 250 research studies discovered that feedback positively influences the learning by students (Stevenson, 2000).

Perceived academic control has been shown to increase student retention and increase achievement. Perceived academic control occurs when students believe that they have control over the academic outcome, whether it is a positive or negative outcome (Respondek et al., 2017). Daniels et al. (2014) found that perceived academic control has also been correlated with self-efficacy and academic success. In addition, perceived academic control has a positive correlation with effective study skills and intrinsic motivation (Perry et al., 2005). Perceived academic control helps with student transition from high school to higher education. This transition can be difficult because students must manage numerous variables such as new environments, social interactions, more responsibilities, and harder academic curricula.

Throughout the transition, students can experience anxiety, an emotion that is often experienced by students with a low perception of academic control. Perceived academic control can vary with first-year college students but typically stabilizes by the second year (Respondek et al., 2017; Stupnisky et al., 2012). In a 2007 study, Stupnisky et al. demonstrated that perceived academic control increased academic achievement regardless of a student's prior academic success, gender, or age.

Transfer Student Success from Community Colleges

Community colleges are critical to higher education because these two-year institutions provide students with opportunities to further their education (Fong et al., 2016). Data suggest that approximately 50% of students who continue to higher education study at community colleges (Fong et al., 2016; Martin et al., 2015). Data also suggest that when compared to a four-year university, community colleges have a higher percentage of minority, lower high school achievement and lower economic status students (Fong et al., 2016). There are various reasons that students attend community colleges, such as enhancing personal skills, training for a specific job, and preparing for transfer to a four-year university. There are a greater number of students who attend part-time in community colleges in comparison to four-year universities, often due to barriers such as balancing work and family.

Based on 2013 data, only 19% of students who begin their higher education in community colleges graduate with a college degree as opposed to 69% of students who begin in a four-year university (Martin et al., 2014). Educational and cultural background, personal characteristics, external hardships, psychosocial variables, and nonacademic support can all contribute to student persistence and success in a community college (Fong et al., 2015; Martin et al., 2014).

Numerous studies have been performed to identify ways to increase student success in community colleges (Fong et al., 2015; Martin et al., 2014). Braxton et al. (2004) found that a portion of Tinto's model depicted what occurs in community colleges. This study revealed that characteristics students possess when they enter college impact their persistence in school. These characteristics that impact persistence included motivation, control, self-efficacy, empathy, and parental education (Braxton et al., 2014). Further research found that characteristics that impact persistence can be categorized into cultural capital, college plans, and academic preparation (Barbatis, 2010; Habley et al., 2012).

Cultural capital is the idea that culture and education are related in that the middle class culture promotes educational success. Researchers suggested that families with a lower income have lower access to educational and cultural materials to prime students for success in college (Martin et al., 2015; Perna, 2006). Therefore, students who have lower cultural capital typically do not have parents to prepare them for college. Additionally, students from a lower economic status may be less aware of how to apply for college and financial aid. Students who have people to encourage them to develop educational goals and prepare for college are more successful in their academics. In addition, they suggested that students who attended high schools where the majority of the students were from a lower economic status are less prepared for college than students who attended a high school in a higher economic status (Martin et al., 2015; Perna, 2006). Braxton et al. (2004) suggested that characteristics students possess at the beginning of their higher education is the dominant factor in persistence in a community college setting.

Martin et al. (2015) performed a qualitative study to investigate what characteristics successful students believed were crucial to persist through a two-year community college. One of the major themes that arose from the study was that the students believed that recognizing and

developing clear goals for their educational career was essential to their success. The ability to have goals and create tasks needed to achieve those goals enables students to be successful. In addition, students aligning their interests and goals are more likely seek out help to grow personally. Another theme that emerged in the study was that all of the graduates were quite motivated to complete their educational goals. Many students stated that motivation was a characteristic that was derived from their inner selves. Contrary to prior research, students in the Martin et al. (2015) study expressed that they had support from family throughout their educational experience. Another characteristic that surfaced was the ability to multi-task in regard to environmental factors such as family, childcare, a full-time job, and the financial stress that can come with attending college. Lastly, self-empowerment was another characteristic that emerged from the research study. Even if students attended a high school that did not prepare them for college, they knew when to seek assistance and were able to utilize critical thinking skills to address any problems that occurred. They were also able to determine what courses they needed every semester to meet their goals (Martin et al., 2015).

Fong et al. (2016) examined how psychosocial categories such as attributions, self-regulation, anxiety, motivation, and self-perceptions, impact student persistence and success in a community college. Attributions would include how students perceive success or failure and their behavior following each outcome. Self-regulation is using methods and tools to maintain good time management and study skills. Feelings of anxiety and stress can potentially decrease students' abilities to perform well in school if they had self-regulation. Fong et al. also stated that in order for students to develop, implement, and continue executing their educational goals, motivation is required. In addition, the manner in which students perceive themselves could impact their performance and persistence. Anxiety can determine how students manage their

stress levels through their educational career. Fong's results demonstrated that attributions, self-regulation, and anxiety did not correlate with persistence. However, self-perceptions and motivations did have an impact on persistence. Fong et al. (2015) reported a positive correlation with each of the psychosocial factors and student achievement.

Along with academic skills and student characteristics, incorporating nonacademic support can aid in student success in community colleges. Nonacademic support can include obtaining guidance from an academic advisor, engaging with faculty members, providing courses that focus on student success, and developing learning communities (Karp & Bork, 2014). Visher et al. (2012) stated that students achieve their goals and improved academic outcomes when the advisors were intentional and truly cared about the students. Data have suggested that courses that focus solely on planning and developing educational goals increase student retention, grades, and graduation rates (Cho & Karp, 2013). Possessing non-cognitive skills allows for an individual to have the ability to relate to others in a social setting and to recognize how to foster learning strategies (Karp et al., 2016).

Meaningful faculty engagement has shown to increase student persistence (Braxton et al., 2004; Lundberg, 2014). Building social relationships with other students enables students in community colleges to feel a sense of belonging. Data have also suggested that students are able to help each other with their academic plans in addition to the socialization aspect (Karp et al., 2010; Lundberg, 2014). Learning communities involve grouping students together who share similar classes, and have been found to increase the students' comfort on the campus as well as improve their achievement because the students are learning from each other (Visher et al., 2012). Other researchers have suggested there is a greater probability that students who connect with other students socially graduate college (Karp et al., 2010; Lundberg, 2016). Community

colleges that take into account the academic and nonacademic variables involved in student education are more likely to have a greater retention and graduation rate (Karp et al., 2016).

Dental Hygiene Education

CODA, a division of the ADA, is the accrediting body for dental educational programs that includes dental, advanced dental, and allied dental educational programs in the United States. As of 2016, there were 332 accredited dental hygiene programs in the United States (Theile, 2017). In order to acquire the skills to be an entry-level hygienist, a student must be deemed competent at the completion of a dental hygiene program (CODA, 2017). In 1975, CODA established six standards for dental hygiene programs that have been reviewed annually and modified as needed. As of 2018, the most recent changes to the six standards occurred in the summer of 2017. In that revision, CODA stated that dental hygiene programs must follow the CODA Accreditation Standards for Dental Hygiene Education Programs in order to be accredited. The standards include: institutional effectiveness; educational program; administration, faculty, and staff; educational support services; health and safety provisions; and patient care services. The six standards provide foundational criteria that guides the development of new dental hygiene programs and the maintenance and enhancement of established programs (CODA, 2018).

In addition to CODA standards, the American Dental Education Association (ADEA) further delineated competencies required for an entry-level practitioner (ADEA, 2016; Theile, 2017). The overall concept of the term “competency” means the ability to perform in various settings, in the classroom and in a clinic. Competency incorporates the needed skills, knowledge, and values required to function as a new dental practitioner (Chambers & Gerrow, 1994; Chuenjitwongsa, et al., 2016; Shahzad et al., 2017). Some educators may use the word

competency in place of "satisfactory" or "sufficient" (Chambers & Gerrow, 1994). In order to achieve competence, an individual is required to have a variety of personal attributes including good communication and social skills (Epstein & Hundert, 2002; Chuenjitwongsa, et al., 2016). Competency can also be depicted as a learning process starting as a beginning learner and proceeding to become an expert in the field (Chambers & Gerrow, 1994; Chuenjitwongsa, et al., 2016).

Prior to attending a dental hygiene program, a student must complete general education pre-requisite courses that include science, math, communication, psychology, and sociology courses (CODA, 2017). Four-year universities may offer an associate's degree or a baccalaureate degree in dental hygiene. To complete a dental hygiene program, students must successfully complete courses that include biomedical sciences, dental sciences, educational and preventive counseling, methods to treat all types of patients, clinical management, and the ethics of the dental hygiene profession (CODA, 2017).

Faculty members play a significant role in dental hygiene education. They are involved in the selection of students and also develop the program's curriculum (Chuenjitwongsa et al., 2016). Educators need to be passionate about teaching in order to support the students, use various methods to evaluate students, and provide students with adequate feedback (Chuenjitwongsa et al., 2016). Another responsibility of an educator is to establish a safe, conducive learning environment that provides students with a sense of security (Chuenjitwongsa et al., 2016). A beneficial educational setting incorporates students' feelings, and gives them a sense that they are valued and their voices are heard (ADEA Commission on Change and Innovation in Dental Education, 2006).

There are several strengths in the dental hygiene education system. For the past century, dental hygienists have served children by attending to their oral health and have expanded this practice to the general population. The current dental hygiene educational system equips students with basic skills such as utilizing instruments effectively, removing biofilm, providing preventive oral hygiene education, performing risk assessments, and placing therapeutics, such as antimicrobial agents in the oral cavity (Theile, 2017). It is inevitable that the need for oral healthcare is going to increase with the population and improving access to care for underserved populations (Fried et al., 2017; Theile, 2017).

Although there are several strengths in the dental hygiene educational system, there are also areas where the dental hygiene educational system could improve. Dental hygiene students need more education on collaborative practice with other professionals as well as how to work in non-traditional settings (Institute of Medicine, 2013). Dental hygiene curriculum does not incorporate skills such as performing diabetes screenings to investigate whether a patient's oral findings could be linked to a systemic condition; it does not include advanced risk assessments needed to work in an interpersonal education setting that merges medicine and dental medicine; and lastly, the dental hygiene curriculum does not provide students with the knowledge needed to engage in telehealth as a means of connecting with other dental providers. Telehealth would be beneficial to serve underserved populations that do not have a dentist (Theile, 2017).

National Board Dental Hygiene Examination

In 1928, the National Board of Dental Examiners was created as a permanent committee of the American Dental Association. The purpose of the National Board of Dental Examiners was to develop and perform written examinations that would allow graduates to receive dental licenses in different states. A National Board Examination for Dental Hygiene was formed in

1962 that was composed of four examinations with 100 questions that focused on three subjects for each of the tests administered. By 1973, there was only one exam comprised of 400 questions that encompassed all subjects (ADA NBDHE Technical Report, 2017).

The exam was altered in 1998 and was converted to a multiple-choice test containing 350 questions. Of the 350 items, 150 were patient case study questions and the remaining questions were discipline-based. As of 2018, the case-based questions focused on various types of patients such as pediatric, geriatric, special needs, and periodontal patients. The cases include patient medical histories, radiographs, and intraoral pictures. Candidates must know how to examine all of the materials correctly and determine the best practice to treat the patients.

The discipline-based items included scientific questions relating to dental hygiene practice, community-based dental hygiene, as well as the practice of clinical dental hygiene (ADA NBDHE Technical Report, 2016). Because states have various legislation on the roles of dental hygienists, the restructured examination tested candidates based on what functions dental hygienists can perform in the majority of states. All test items were developed by test construction committees that included experts in the six areas: basic science, clinical dental hygiene, radiology, community dental health, periodontics, and dental hygiene curriculum. The examination met all three cognitive levels: understanding, application, and reasoning. The Joint Commission on National Dental Examinations (JCNDE) is the agency that is responsible for constructing, scoring, and reporting the exam. The JCNDE ensures that the test items are reliable by utilizing the Kuder-Richardson Formula 20 (i.e., KR20). The 2016 American Dental Association NBDHE Technical Report detailed the significance of conducting a high stakes test that is a valid examination in order to determine if a candidate passes or fails. Prior to 2012, the candidates received a numeric score (ADA NBDHE Technical Report, 2017).

In 2016, the JCNDE reported that there was a 5.1% first-attempt failure rate as well as a 46% repeating failure rate (ADA NBDHE Technical Report, 2017).

In CODA, Standard 1 included that programs demonstrate their effectiveness by national board pass rates (CODA, 2018). Numerous studies have been conducted to determine predictors of success on the national board. Researchers have examined the student's GPA including high school GPA, entering science GPA, entering program overall GPA, and the dental hygiene program GPA (DeWald et al., 2004; Edenfield & Hansen, 2000; Shannon, 1989).

In a study conducted at the University of Maryland, Metzger et al. (1981) found that the predictor that had the strongest correlation with performance on the NBDHE was the science GPA earned prior to student entering the dental hygiene program. There are data that suggest entering GPA and scores on the NBDHE are positively correlated (DeWald et al. 2004; Edenfield & Hansen, 2000). However other data have suggested that GPA is not a valid predictor of success on the NBDHE (Alzahrani et al., 2007; Austin, 2011).

In addition to GPA, researchers have examined American College Testing (ACT) and Scholastic Assessment Test (SAT) scores, the Dental Hygiene Aptitude Test (DHAT), age, marital status, and dental assisting experience (DeAngelis & Goral, 1995; DeWald et al., 2004; Shannon, 1989). Edenfield and Hansen (2000) suggested a positive relationship between ACT and SAT with higher success on the NBDHE. The DHAT is a standardized test that was utilized to test a candidate's numerical ability, verbal understanding, knowledge of science, and ability to read and comprehend scientific material. Sanderson and Lorentzen (2015) and Longenbecker and Wood (1984) found that the DHAT was a greater predictor of success on the NBDHE than the ACT.

Transfer Shock

Students who transfer from a community college to a four-year institution encounter transition periods and often feel culture shock, which could inhibit their progression to complete their degree (Ivins et al., 2016). Transfer shock was first defined by Hills in 1965 as a drop in a student's GPA when transitioning from a community college to a four-year university. Although the majority of transfer students have an initial drop in GPA, students are typically able to increase their grades after one or two semesters (Hills, 1965; Ivins et al., 2016). Cejda et al. (1997) found that transfer shock was mainly found in students who majored in mathematics and science. Another study found that after students were able to adjust from the transfer shock, community college students performed similarly to the non-transfer students (Glass & Harrington, 2002). Zhai and Newcomb (2000) discovered that students who transferred to and/or from a university that offered baccalaureate degrees had better outcomes in terms of GPA than students who transferred from a two-year community college.

In 2013, Schmidt and Wartick investigated the timing of transfer and the sequential order of prerequisite courses taken by the student and how these factors impacted transfer shock. Although the researchers did identify grade inflation in community colleges as an issue, they were able to account for critical demographics (i.e., age, gender, socioeconomic status). The results suggested that native students had significantly better outcomes than transfer students from community colleges. The researchers found that one of the reasons for transfer shock was the different types of curricula the students were taking when they reached the four-year university. Additionally, Schmidt and Wartick found that the gap in time between the lower-level courses and the higher-level courses also impacted transfer shock. The longer time in between taking lower-level courses and higher-level courses increased transfer shock.

In addition to the academic aspect of transfer shock, Rhine et al. (2000) found that the social aspect of college plays a significant role in transfer shock. These factors include age, financial demands, employment, marital status, and financial aid.

Researchers suggested that the number of hours the student could transfer played a role in the shock of the transition from a community college to a four-year university. Thurmond (2007) also found that demographics played a role in the extent of transfer shock. Thurmond's research demonstrated that age, gender, and race were all factors in a decrease in academic outcomes following a transfer (Thurmond, 2007).

Laanan (2007) investigated variables that impact academic and social adjustment for community college students. Laanan suggested that students struggled academically if they had negative ideas of the environment at a four-year university. Also, poor exchanges with community college counselors negatively impacted students' academic adjustment. Laanan (2007) also found that students who lacked self-confidence had lower GPAs and were intimidated by the university atmosphere. In regard to social adjustment, students who participated in clubs or cultural events were able to transition more easily from a community college to a four-year university (Laanan, 2007).

Townsend and Wilson (2006) using qualitative research suggested that transfer students had a hard time building relationships with faculty members, which impacted their academic integration. A large number of the participants also stated that they struggled with meeting new people and developing new friendships, which affected their social integration. Ishitani and McKitrick (2010) studied the difference between social engagement of community college and native university students. The researchers found that transfers from community colleges were less involved in social settings than the native university students. However, community college

students who attended school full time and/or transferred early in their educational career were more engaged socially than students who were part-time and/or transferred later (Ishitani & McKitrick, 2010). Lester et al.'s (2013) qualitative study found that community college transfers engaged socially in a university for academics; however, socialization just for enjoyment was typically found outside the university setting (Lester et al., 2013). D'Amico et al. (2014) also found that transfer students became more integrated with the university academically rather than socially. Multiple studies revealed that transfer students with a higher incoming GPA were more likely to continue and persist after the second semester (D'Amico et al., 2014; Ivins et al., 2016).

As a result of the research performed on transfer shock, many studies emerged that suggested ways to offset the shock transfer students experience (Ivins et al., 2014). Thurmond (2007) addressed the value of bringing awareness to the issue of transfer shock to community college students to better prepare them for their future educational endeavors. Also, Thurmond suggested that transfer students enroll in a mentoring program and engage in social events following their transfer (Thurmond, 2007). Schmidt and Wartick (2013) recommended that transfer students be provided remediation opportunities to increase their chances of success.

Transfer Student Retention

There has been a decline in the number of students enrolling in higher education institutions, decreasing the number of student graduating on an annual basis (Jacobson et al., 2017). With this decline in enrollment and the financial investment from institutions and students, student retention has become a concern in higher education (Borgen & Borgen, 2016; Jacobson et al., 2017). Data suggest that community college transfers have a lower graduation rate following the transfer to a four-year university in comparison to students who begin their education in a four-year university (Martin et al., 2015). There has been a large amount of

research focused on the academic success of transfer students and developed programs to increase retention rates of this group of students.

The College of Science at Texas A&M University created a transfer learning community where transfer students were given a mentor and attended an Academic Boot Camp that focused on the various areas: transitioning to a four-year university, goal setting, time management, structuring study time, class attendance, active engagement, campus resources, reading syllabi, and preparing for exams (Scott, Thigpin, & Bentz, 2017). The Academic Boot Camp was a three hour session prior to the beginning of their first semester (Scott et al., 2017). Following this camp, transfer students were placed in focus groups which met on a monthly basis where students were able to share their hardships and gain insight from their peers. Once this program was implemented, transfer student retention rates increased from 87% to 89% (Scott et al., 2017).

The University of Albany utilized several approaches to increase retention rates of transfer students (Jacobson et al., 2017). They developed living-learning communities in which transfer students were housed together based on their academic interests (Jacobson et al., 2017). Each community had an assistant that was an upper-class or graduate student to serve as a mentor as well as a faculty member who met with students weekly at lunch or dinner (Jacobson et al., 2017). A Transfer Transition Leader Program was created to help guide transfer students in their transition by pairing each new student with a current student who acts as a mentor by providing assistance with getting connected to social events and offering academic support with the library (Jacobson et al., 2017). Transfer students also attended a transfer orientation that provided students campus tours and additional information regarding campus operations (Jacobson et al., 2017). Leaders at the University of Albany believed that their model supported transfer student and has the ability to increase their retention rates (Jacobson et al., 2017).

Chapter Summary

A variety of factors can influence student success in post-secondary education, including demographics, prior academic experience, and environmental factors (Ivins et al., 2014). CODA is responsible for determining the courses needed to enter a dental hygiene program and which can be taken at a community college or four-year university. CODA developed standards to ensure that programs cultivate competent dental hygienists who are able to graduate from a dental hygiene program and pass the NBDHE (CODA, 2018).

Dental hygiene schools have the responsibility to produce competent dental hygienists who are able to care for the populations' oral health care needs. In order to be successful, it is important to examine factors that could impact student success in terms of GPA and first-attempt NBDHE pass rates in dental hygiene education. Students who transfer to a university from a community college are likely to experience transfer shock and a decline in their GPA immediately following the transition to a university; however, GPAs generally rise within a semester (Hills, 1965; Ivins et al., 2014). Transfer shock is a term used to describe a decrease in academic performance following a transfer (Ivins et al., 2014). However, no research was located for this study that addressed transfer shock in dental hygiene programs.

Several universities have designed programs to decrease the impact of transfer shock in order to increase retention rates (Jacobson et al., 2017; Scott et al., 2017). It is critical to examine if transfer shock impacts dental hygiene students at a medical university so that the institution is aware of ways to aid in student academic success to maintain or improve retention rates.

Chapter III

Methodology

The study was designed to investigate the impact of transfer shock in a dental hygiene program by comparing students' entering GPA to their GPAs at various points in the program. The researcher sought to determine if there was a difference between the type of institution and the success of the student in the program in terms of GPA as well as NBDHE first-attempt pass rates.

Population

The population for this research included dental hygiene students who have attended an upper-division dental hygiene program affiliated with a mid-southern health-sciences university. The population included approximately 33 students per graduating class between 2014 and 2018, approximately n=166. The study did not include three students who were dismissed from the program due to academic failure.

The population was categorized in groups based on the institution type where students took their lower-division courses, either at a community college or four-year university. Students who completed more than 75% of lower-division courses at a community college were placed in the community college group. The remaining students were placed in the four-year university group. The population included 67 community college students and 99 four-year university students.

Research Design

An ex post facto design was employed to determine if community college and four-year university students experienced transfer shock in a dental hygiene program. This type of design is used to describe data the difference between two groups of data after the fact. Therefore, an ex

post facto design does not involve manipulation of variables. Descriptive statistics utilized in the study included the measures of frequency, the measures of central tendency, the measures of dispersion or variance, and the measures of position (Creswell, 2005). Addressing the measures of frequency involved gathering a count or a percentage of what was being examined. Determining the measures of central tendency involved calculating the mean, median, and mode of the data, whereas, the measures of dispersion included the variance, range, and standard deviation (Creswell, 2005). The study investigated if transfer shock occurred by analyzing which institution the student attended prior to the dental hygiene program and their GPAs when they entered the program, the first semester program GPAs, the second semester program GPAs, the GPAs at the completion of the dental hygiene program, and NBDHE first-attempt pass rates.

Data Collection Instrumentation

Since the researcher used archival data for this study, the researcher's data collection instrument was SPSS where the existing data could be entered and reviewed. Once the data were retrieved, they were entered into the SPSS file for analysis.

Data Collection Methodology

An application to Institution Review Board (IRB) was submitted and determined exempt because the study did not incorporate human subject research at the health-sciences university. The researcher submitted an application at the University of Arkansas IRB and received approval for the study. Prior to data collection, the protocol 1807134490 was submitted and approved with exempt status by the University of Arkansas at Fayetteville's Institutional Review Board. Following approval from the IRB, the researcher obtained demographic information from the Department of Dental Hygiene at university hygiene program affiliated with a mid-southern medical school. A transcript analysis for every student who graduated from an upper-division

dental hygiene program affiliated with a mid-southern medical school from 2014-2018 was performed to obtain information to include the type of institution the student attended for the lower-division courses, entering program GPA, first and second semester GPAs, and the exiting program GPAs. The researcher also utilized archival data from the dental hygiene program to acquire first-attempt NBDHE scores (pass/fail).

The researcher collected de-identified retrospective data from transcripts and NBDHE first-attempt pass rates for the population. Because archival data were used, the subjects were not contacted. A de-identified retrospective dataset included demographic and transcript information and NBDHE first-attempt pass rates from 160 students who graduated over a five-year period. The researcher gathered demographics such as gender, age, race/ethnicities, the type of institution previously attended by the students, and the number of miles the university was from the students' hometown. A transcript analysis incorporated data such as the type of institution the student attended prior to the dental hygiene program, the number of hours previously acquired, the entering program GPA, the first semester GPA, the second semester GPA, and the end of program GPA. The NBDHE first-attempt pass/fail status was collected from dental hygiene archived data files. Following data collection, data were coded and entered into the Statistical Package for the Social Sciences (SPSS) software for data analysis.

Data Analysis

To investigate the impact of transfer shock in a dental hygiene program at a health-sciences university, archived data from the dental hygiene program's files as well as the archived transcripts were coded and entered into SPSS software. The following questions were addressed:

1. What was the profile of dental hygiene students upon entering an upper-division program affiliated with a mid-southern health-science campus?

In order to determine the profile of the students, archived data from the dental hygiene program were utilized. Descriptive statistics were utilized to determine the profile of the population. Frequencies were conducted for race, gender, and the type of previous institution, two-year community college or four-year university. The researcher determined the mean of the ages of students and the distance (number of miles) the university was from the hometown of the students.

2. Was there a difference between entering program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

In order to determine if there was a difference in entering program GPAs, a comparison of means of GPAs was performed between students who attended a community college and students who attended a four-year university prior to entering the dental hygiene program. In addition, a one-way analysis of variance (ANOVA) was used to determine if there was a significant difference between the means of the two groups. One-way ANOVAs are utilized when a researcher is attempting to determine if there is a statistical significant difference in means between populations of two or more independent groups (Fields, 2014).

3. Was there a difference between entering program GPAs and the first semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

In order to determine if there was a difference between entering program GPAs and first semester GPAs of students who completed lower-division classes at a two-year community college versus a four-year university, two paired samples *t*-tests were performed, one group being two-year community college students and the other being the four-year university students. The entering program GPAs and the first semester program GPAs were the two means assessed

in order to determine if there was a significant difference in means. A paired samples *t*-test is employed when a researcher is comparing means from the same group to see if there was a difference between two variables, in this case the entering and first semester GPAs (Field, 2014). If the *p*-value was less than the *a priori* level of $\alpha = .05$, the difference would be statistically significant. The difference in means for the community college group and the four-year university group were compared to determine which group had a greater difference in means between the entering GPAs and the first semester GPAs.

4. Was there a difference between the first and second semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

In order to determine if there was a difference between first semester GPA and second semester GPA of students who completed lower-division classes at a two-year community college versus a four-year university, the researcher performed two paired samples *t*-tests for each group of students to determine if there was a statistical significant difference in means in GPAs for the first and second semester. The *p*-value was observed to determine if the difference in means was statistically significant. If the *p*-value was less than the *a priori* level of $\alpha = 05$, the difference in means was statistically significant. The difference in means for the community college group and the four-year university group were compared to determine which group had a greater difference in means between the first and second semester program GPAs.

5. Was there a difference between entering program GPAs and GPAs at the completion of the dental hygiene program between students who attended a two-year community college to take their lower-division courses versus a four-year university?

In order to determine if there was a difference between entering program GPAs and GPAs at the completion of the dental hygiene program of students who completed lower-division classes at a two-year community college versus a four-year university, the researcher performed two paired samples *t*-tests to determine if there was a statistical significant difference in means between entering program GPAs and GPAs at the completion of the dental hygiene program, one for each group. The researcher examined the *p*-value to determine if the difference in means was statistically significant. If the *p*-value was less than the *a priori* level of $\alpha = .05$, the difference was statistically significant. The difference in means for the community college group and the four-year university group were compared to determine which group had a greater difference in means between the entering GPAs and the GPAs at the completion of the dental hygiene program.

6. Was there a difference between first-attempt NBDHE pass rates between students who attended a two-year community college to take their lower-division courses versus a four-year university?

In order to determine the difference between first-attempt NBDHE pass rates between students who attended a two-year community college versus a four-year university to take their lower-division courses, descriptive statistics were utilized such as the frequency and percentage rates of the pass rates for the total population as well for each group. In addition, the means of the GPAs at the completion of the program were calculated for the students that passed and failed the NBDHE for each group.

Chapter Summary

The purpose of the study was to investigate if and how transfer shock impacted students in a dental hygiene program at a health-sciences university. In addition, the researcher explored

how well students were able to perform academically in the program in terms of GPA and first-attempt NBDHE pass rates. In the study, the population included 166 students who graduated from an upper-division dental hygiene program affiliated with a mid-southern health-sciences university from 2014-2018. The subjects were placed into two groups by the location of their lower division courses: community college or four-year university. All subjects transferred from either a community college or a four-year university. Therefore, all students represented in this research had the potential to experience transfer shock. Archival data were collected, such as student demographics, the number of miles the university was from their hometowns, prior institutions students attended, GPAs at different points in students' educational careers, and NBDHE pass rates. The data were then coded into SPSS. A variety of descriptive statistical methods were utilized such determining frequencies, means, and inferential statistics to determine if transfer shock occurred and which group was more affected.

Chapter IV

Results

This chapter presents the both the descriptive and inferential statistical analyses of archival data that were coded and entered into SPSS to compare the transfer shock experienced by students who transferred from community college and those from a four-year. Transfer shock is a phenomenon which can occur when students transfer from one institution to another. Transfer shock typically results having an initial decrease in their GPAs with a subsequent leveling of their GPAs (Ivins et al., 2016). All students take prerequisite courses prior to entering the dental hygiene program. Therefore, they all are transfer students and are at risk to have a decline in GPAs following the transfer to a professional program at a health-sciences university. The target population included 166 students graduating from a mid-southern dental hygiene program at a health-sciences university during the years of 2014-2018.

Data Results

Various statistical methods were undertaken to answer the research questions posed in this study. These methods varied by research question and are presented in the sections below.

Question 1. What was the profile of dental hygiene students upon entering an upper-division program affiliated with a mid-southern health-science campus?

Descriptive statistics were utilized to determine the overall profile of the target population, including frequencies of race, age, gender, and type of institution the student attended demonstrating that the populations from each group were similar to each other. The population included 40% (n=67) community college transfers and 60% (n=99) four-year university transfers. In the community college group, 94% (n=63) were females and 6% (n=4) were males. In the four-year university group, 99% (n=98) were females and 1% (n=1) male. In

the community college group, 85.1% (n=57) were Caucasian, 3% (n=2) were African American, and 11.9% (n=8) were Hispanic. In the four-year university group, 97% (n=96) were Caucasian, 2% (n=2) were African American, 1% (n=1) Asian, and 1% (n=1) fell into the Other category (see Table 1).

The average age of the overall population was 24 years old, with community college students averaging 25 years of age and four-year university transfer students 23 years of age. The average miles from the health-sciences university to the hometown of students was 74.5 miles for both groups.

Table 1. *Profile of the Groups*

Variable	*n*	%
Community College		
Gender		
Male	4	6
Female	63	94
Race		
Caucasian	57	85.1
African American	2	2
Hispanic	8	11.9
Four-year University		
Gender		
Male	1	1
Female	98	99
Race		
Caucasian	96	97
African American	2	2
Asian	1	1

Question 2. Was there a difference between entering program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

Data indicated that there was not a significant difference between entering program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university. Entering program GPAs were calculated yielding an average entering program GPA for the community college group of 3.62 and 3.57 for the four-year university group. A one-way ANOVA was then performed to determine any statistical significance difference between the groups. A Levene's test was not significant ($p = .724$) indicating that the two groups possessed equal variances. The ANOVA test also revealed that the groups were not significantly different ($p = .218$), in terms of their entering GPA. Therefore, there was no significant difference in entering GPAs between the community college and four-year university group.

Question 3: Was there a difference between entering program GPAs and the first semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

Paired samples *t*-tests were performed to investigate the difference in means between the entering program GPAs and the first semester program GPAs for both groups. Although the one-way ANOVA demonstrated equal variances between groups, the researcher did not combine the groups to determine if there was a difference in GPA following entry into the program. The results showed a difference between entering GPAs and first semester program GPAs for both groups. The community college group had an average entering GPA of 3.62 and an average first semester GPA of 3.18. The results displayed a -.43701 lower mean in their first semester of dental hygiene school compared with the entering GPA, $t(66) = -7.219$, $p < .0001$ (see Table 2).

Table 2. *Paired Samples t-Tests for Community College Group*

First semester GPA-entering GPA	Mean	SD	SE	t	df	Sig.
	-.43701	.56626	.06918	-7.219	66	<.0001

The four-year university group had an average entering GPA of 3.57 and an average first semester GPA of 3.36. The results demonstrated a significant difference in mean, -.21152, from the entering GPAs to the first semester program GPAs, $t(98) = -5.150$, $p < .0001$ (see Table 3). However, the decrease in GPAs from the four-year university group was less than the community college group. Therefore, there was a difference of entering GPAs and first semester program GPAs between the community college and four-year university group.

Table 3. *Paired Samples Tests for Four-year University Group*

First semester GPA-entering GPA	Mean	SD	SE	t	df	Sig.
	-.21152	.40864	.04107	-5.150	98	<.0001

Question 4: Was there a difference between the first and second semester program GPAs of students who completed lower-division classes at a two-year community college versus a four-year university?

Paired sample *t*-tests were performed to investigate the difference in means between the

first semester program GPAs and the second semester program GPAs for both the community college group and four-year university group. The results demonstrated a difference in first and semester program GPAs for both groups. The community college group had an average first semester GPA of 3.18 and an average second semester GPA of 2.87. There was a difference in mean, -.30985 in the community college group. The difference in means was significant $t(66) = -7.219$, $p = .000$ (see Table 4).

Table 4. *Paired Samples Tests for Community College Group*

Second semester GPA - first semester GPA	Mean	SD	SE	t	df	Sig.
	-.30985	.35132	.06918	-7.219	66	.000

The four-year university group had an average first semester GPA of 3.36 and an average second semester GPA of 3.02. The results demonstrated a difference in mean, -.33242. The difference in means was significant $t(98) = -9.406$, $p = .000$ (see Table 5). Therefore, there was a difference between first semester and second semester program GPAs between the community college and four-year university group.

Question 5: Was there a difference between entering program GPAs and GPAs at the completion of the dental hygiene program between students who attended a two-year community college to take their lower-division courses versus a four-year university?

Paired sample *t*-tests were performed to determine the difference in means between entering program GPAs and the GPAs at the completion of the program for both the community college group and four-year university group. The community college group had an average

entering GPA of 3.62 and an average ending program GPA of 3.09. The results indicated a difference in mean, -.52896 in the community college group (see Table 6). The difference in means was significant, $t(66) = -8.911$, $p = .000$ (Table 6).

Table 5. *Paired Samples Tests for Four-year University Group*

Second semester GPA - first semester GPA	Mean	SD	SE	t	df	Sig.
	-.33242	.35165	. .03534	-9.406	98	.000

Table 6. *Paired Samples Tests for Community College Group*

End of program GPA - entering GPA	Mean	SD	SE	t	df	Sig.
	-.52896	.48586	.05936	-8.911	66	.000

The four-year university group had an average entering GPA of 3.57 and an average ending program GPA of 3.26. The results indicated a difference in mean, -.31253. Therefore, the four-year community had a decrease in GPAs from the entering GPAs to the first semester program GPAs as well. The difference in means was significant $t(98) = -7.695$, $p = .000$ (see Table 7). The community college group had a larger decrease than the 4-year university students

in GPAs at the completion of the program from the entering GPAs. Therefore, there was a difference between first semester program GPAs and end of program GPAs between the community college and four-year university group.

Table 7. *Paired Samples Tests for Four-year University Group*

End of program GPA - entering GPA	Mean	SD	SE	t	df	Sig.
	-.31253	.40413	.04058	-7.695	98	.000

Question 6: Was there a difference between first-attempt National Board of Dental Hygiene Examination pass rates between students who attended a two-year community college to take their lower-division courses versus a four-year university?

Descriptive statistics were employed to determine the difference between first-attempt NBDHE pass rates between students who completed their lower division courses while attending a two-year community college versus a four-year university. In the community college group, 95% (n=64) passed and 3% (n=3) failed the NBDHE on the first attempt. In the four-year university group, 98% (n=97) passed and 2% failed the first attempt. The average GPA at the completion of the program for the community college group was 3.12 and 3.27 for the four-year university students. The average GPA for the students in the community college group who failed the NBDHE was 2.42 and 2.33 for the four-year university group (see Table 8). Therefore, there did not appear to be a difference in first-time pass rates on the NBDHE between the two groups.

Table 8. *NBDHE First-time Pass Rates and Average GPA*

Variable	*n*	%	GPA
Community College			
NBDHE First-time Pass Rate			
Pass	64	95.5	3.12
Fail	3	3.5	2.33
Four-year University			
NBDHE First-time Pass Rate			
Pass	97	98	3.37
Fail	2	2	2.42

Chapter Summary

The results of the data analysis suggested that the majority of students who entered the dental hygiene program included Caucasian females with the average age of 24. Both the community college and four-year university student groups come from approximately the same distance from their homes (75 miles). A one-way ANOVA demonstrated no significant difference between the entering GPAs of the two groups. After paired *t*-tests were performed, the results suggest that both groups had a decrease in means from the entering GPAs and the first semester program GPAs, suggesting the presence of transfer shock. However, the community college group had a slightly higher drop in GPA. Neither group increased their GPAs from the first semester of the program to the second semester. When analyzing the difference between entering GPAs and end of the program GPAs, both groups experienced a decrease in GPAs.

When analyzing the NBDHE first-time pass rates, both groups had high first-attempt pass rates: 95.5% for the community college group and 98% for the four-year university group.

Students who passed the exam on their initial attempt and were in the community college group had an average GPA of 3.12 while those in the four-year university group had an average GPA of 3.27. Students from both groups who failed the NBDHE on the first-attempt had GPAs in the lower 2.0 range.

Chapter V

Conclusion

Summary of the Study

The purpose for conducting the study was to examine the role of transfer shock in a dental hygiene program at a health-sciences university by investigating GPAs of students who transferred from two-year community colleges and those who transferred from four-year universities. In addition, the researcher examined the possible impact on program completion and NBDHE first-attempt pass rates by the type of previous institution attended by students, two-year community college versus four-year university.

Prior researchers have suggested that various factors can impact student outcomes in higher education such as demographics, previous educational experiences, and environmental factors (Ivins et al., 2014). Students who transfer to a university from a community college have the potential to experience transfer shock, which may be indicated by a drop in their GPA immediately following the transition to a university (Hills, 1965; Ivins et al., 2014). In order to decrease the possibility of transfer shock and increase retention, several universities have developed programs to help prevent transfer shock for the purpose of improving retention rates (Jacobson et al., 2017; Scott et al., 2017).

In the realm of dental hygiene, programs are obligated to graduate competent dental hygienists in order to provide oral care services to the general population (CODA, 2017). The dental hygiene program in this study is a 22-month closed cohort program in which all students are considered transfer students. The students must engage with their peers and faculty members at least 35 hours a week in various activities including class, clinic, a student professional

association, as well as community service events. Therefore, the social aspect at school that may contribute to transfer shock was potentially controlled in the study.

Due to the accessibility of data, the only variable represented in Tinto's model that was investigated was students' previous education experience, which includes the type of institution the student previously attended and the entering program GPA. Currently, there was no research located for this study that examined the impact of transfer shock on a dental hygiene program students. It is crucial to investigate if transfer shock occurs in a dental hygiene program at a medical university so that the institution can better prepare for entering students and find ways to support these students.

In order to determine the impact of transfer shock in a dental hygiene program, a transcript analysis was performed on 166 graduates of the dental hygiene program over the span of five years, 2014-2018. Of the 166 graduates, 67 attended community colleges and 99 attended four-year universities prior to entering the program. Data, including student demographics, entering GPAs, GPAs following the first semester, GPAs following second semester, and the final program GPAs were gathered through transcript analyses. NBDHE scores were collected from the dental hygiene program files. Descriptive and inferential analyses were performed on the coded data using SPSS.

Conclusions

The following conclusions are presented for this research.

1. Demographic data indicated student were primarily Caucasian, averaged 24 years old, and took classes approximately 75 miles from their hometowns. The population for the study included 60% four-year university students and 40% community college students. The majority of the population indicated they were Caucasian (91.6%) with other students reporting ethnicities

of African American, Asian, Hispanic, or a combination of two or more. The age of students ranged from 19 to 46 years with an average age of 24 years. The average distance from their hometowns was 74.5 miles.

2. There was no statistically-significant difference between entering GPAs of transfer students from community colleges and four-year universities. In terms of entering program GPAs, a one-way ANOVA including the Levene's test showed that there was not a significant difference between groups (p = .218). When the entering GPAs were compared to the first semester GPAs, the paired samples t-tests indicated a significant difference in the two groups (p = .000). Students from community colleges dropped in GPA in comparison to the four-year university students.

3. Both community college transfer students and four-year transfer students experienced transfer shock during their first semester. After examining the entering GPAs with the first semester GPAs, the results showed that both groups had a significant drop in their GPAs (p = .000). However, the community college group dropped by .43701 and the four-year university group dropped by .21152. This suggests that both groups experienced some transfer shock following their transfer into a dental hygiene program.

4. Both community college transfer students and four-year transfer students had a similar, but significant drop in their GPAs from the first semester to the second semester (p = .000). Community college students' GPA dropped by .30985 and four-year students' GPA dropped by .33242. The results are significant because they suggest that students did not improve their GPAs after the second semester of the program. The students' second semester GPAs were lower than their first semester GPAs

5. Both community college transfer students and four-year transfer students experienced a significant drop in GPA, $p = .001$ from the beginning to the end of the program. However, the community college group dropped by .52896 and the four-year university group dropped by .31252.

6. NBDHE scores were examined and the data suggested that 95.5% of students in the community college group passed their first-attempt and 3.5% of students failed. The average GPA for passing students in the community college group was 3.12 and 2.33 for the students who failed. In the four-year university group, 98% passed and 2% failed the first-attempt. The average GPA for passing students in the four-year university group was 3.27 and 2.42 for the students who failed.

Recommendations for Further Study

Based on the successful completion of this research, the following recommendations for additional research are presented.

1. The population in the study included all students who graduated over a span of five years from only one dental hygiene program. Therefore, the results from the study may not be generalizable to other institutions. Additional research could include the same parameters in populations from multiple dental hygiene programs and how their results compare.

2. It may be beneficial for other dental hygiene programs housed in a medical university to investigate the impact of transfer shock with their students based on research and the results of this study.

3. In addition to dental hygiene programs, other baccalaureate health professional programs that accept transfer students could also study transfer shock within their programs. Future research could also incorporate aspects of Tinto's model in addition to student GPA,

including information such as the number of credit hours previously taken by the students, family background, and attributes such as intrinsic and extrinsic motivations. The majority of research on transfer shock located for the research did not pertain to health related professional programs so it may be valuable for other programs to investigate the impact of transfer shock on their programs.

4. Additional research could also include qualitative studies that investigate baccalaureate graduates who experienced transfer shock after transferring from community colleges versus four-year universities. These studies could focus on 'why' the students believed transfer shock occurred and how they were able to overcome their hardships following the transfer. Other qualitative studies could investigate students coming from community colleges versus four-year universities that experienced transfer shock and were unsuccessful in completing their baccalaureate degrees to determine why they were unable to overcome the impact of transfer shock.

Recommendations for Practice

Based on the successful completion of this research, the following recommendations for practice are presented.

1. In addition to studying the role of transfer shock, it is recommended that all universities investigate transfer shock and develop a new student initiative for transfer students to decrease the potential of transfer shock. Topics for a new student program could include improving time-management skills, learning proper study skills, as well as improving test-taking abilities. Incorporating peer tutoring for transfer students could be an added asset to the program.

2. It is also recommended that student advisors actively and purposively invest in students to ensure that they are actively engaging and succeeding in their courses as well as

adjusting socially to the university. In addition to decreasing the risk of transfer shock, a new student program has the ability to increase student retention.

3. The dental hygiene program addressed in this research could also develop, implement, and evaluate a new student program to help offset the impact of transfer shock and perform a study to determine its efficacy. The new student program would be able to continue to track students and a longitudinal study could be performed in order to determine if the new student orientation had an impact in reducing transfer shock in the dental hygiene program.

Discussion

The study investigated the conceptual idea of "transfer shock" and was based on Hills' (1965) research on students who transferred from two-year community colleges to four-year universities. After analyzing numerous studies, Hills noticed that community college transfer students experienced a drop in GPA immediately following the transfer. Hills also concluded that the majority of students were able to adjust to the new environment and increase their GPA the following semester (Hills, 1965). Tinto (1975) created a model that encompasses various factors that impact how well the student integrates to the new educational setting such as social factors and previous educational experience.

Dental hygiene programs are closed cohort programs. Students must keep their GPAs above a 2.0 every semester to remain in the program. Therefore, the occurrence of transfer shock has the ability to impact a dental hygiene program. In order to investigate if transfer shock exists in a dental hygiene program located in a health-sciences medical university, the research grouped students by institution type prior to attending the program. Following a comparison of students who attended community colleges versus four-year universities, the results indicated that both groups experienced transfer shock following the transfer into a dental hygiene program. The

students were not able to increase and stabilize their GPAs in their second semester. GPAs in the second semester were lower than those in the first semester. Therefore, the results of this research did not concur with the literature which suggested that the majority of students are able to increase their GPAs following their GPA drop in their first semester. In addition, students from community colleges experienced the effects of transfer shock more often than their four-year university counterparts. The study showed that the students who were unsuccessful on the NBDHE at the first-attempt had low GPAs, ranging from 2.2 to 2.44.

After reflecting on the results, the researcher plans on developing a program to help students acclimate to the new environment of a health professional program as a means to close the gap with the intentions of decreasing the impact of transfer shock. This program could include, but not be limited to, sessions performed by experts from student success centers on time-management, developing study schedules, building study skills, and learning how to study for an exam based on objectives. Since students must have earned at least a 2.0 GPA to graduate and pass a written board to practice as a licensed hygienist, it is important to ensure that students are understanding and retaining the material to pass their courses and the NBDHE.

Chapter Summary

The purpose for conducting the study was to determine if and how transfer shock impacted students attending community colleges versus four-year universities in a dental hygiene program at a health-sciences university. In order to investigate transfer shock, data were collected such as demographics, GPAs at different points in the students' educational careers, as well as NBDHE first-time pass rates. The researcher also examined how the institution type impacted the GPA at the end of the program as well as NBDHE first-time pass rates. After descriptive analyses, the results demonstrated that transfer shock impacted dental hygiene

students from both community college and four-year universities. Moreover, students were not able to improve and stabilize their GPAs during the following semester. Community college students were impacted by their transfer slightly more than four-year university students. The end of program GPAs and NBDHE first-attempt pass rates showed that students who were unsuccessful on written boards had GPAs in the lower 2.0 range. Additional studies are recommended, investigating the impact of transfer shock in other dental hygiene and health professional programs to add to the body of knowledge in this area. Due to the outcome of the study, the researcher intends on developing a program to aid in transfer student success and retention.

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Appendix A
University of Arkansas Internal Review Board (IRB) Approval

UNIVERSITY OF ARKANSAS

To:	Claire S. Tucker
From:	Douglas James Adams, Chair IRB Committee
Date:	09/17/2018
Action:	**Exemption Granted**
Action Date:	09/17/2018
Protocol #:	1807134490
Study Title:	The Impact of Transfer Shock in a Dental Hygiene Program at a Four-year Health Sciences University

The above-referenced protocol has been determined to be exempt.
If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.
If you have any questions or need any assistance from the IRB, please contact the IRB

Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu. cc: Kit Kacirek,

Investigator