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Tabitha Nicole Fair
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Faculty and Staff Perceptions of Interprofessional Education:

A Comparative Survey of Dental and Health Science/Nursing Faculty and Staff

by

Tabitha Fair

A dissertation presented to the College of Health Care Sciences

Nova Southeastern University

in partial fulfillment of the requirements for the

degree Doctor of Philosophy in Health Science

December, 2017

Approval/Signature Page

Nova Southeastern University
College of Health Care Sciences

We hereby certify that this dissertation, submitted by Tabitha Fair, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirement for the degree of Doctor of Philosophy in Health Science.

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Abstract

Research has shown a strong correlation between oral and systemic disease; therefore, there is an increased need for collaboration between dental and medical professionals. The purpose of this study was to examine the current opportunities that exist for interprofessional education (IPE) at Nova Southeastern University (NSU), the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased interprofessional activities.

This study surveyed graduate faculty and staff from NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing regarding their views on IPE. The study used the Health Professions IPE Survey. Responses were factor analyzed, which revealed two dimensions: Positive IPE Perception and NSU IPE. There was an overwhelmingly positive response to IPE for dental, health science, and nursing students as evidenced by component one (Positive IPE Perception); however, there was a more negative perception about IPE at NSU as evidenced by component two (NSU IPE), possibly due to financial and administrative considerations. Factor analysis of this data legitimizes the need for future survey development.

Future research should examine enablers for IPE by eliciting faculty feedback. Faculty reluctance to engage in IPE activities can be addressed by designing faculty development programs based on Adult Learning Theory (ALT) concepts. Future IPE program development will need to include adequate institutional support, funding, faculty development, and faculty involvement in planning.

Acknowledgments

It is with sincere gratitude that I acknowledge and thank my committee chair, Dr. Ransdell, and my committee members, Dr. Clark and Dr. Dotson, for all of their guidance during this journey. I would also like to thank my family, friends, colleagues, and students who have been so supportive during this process.

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Chapter 1

Introduction

Interprofessional education (IPE) is defined as two or more professions or student programs learning about, from, and with each other to enable effective collaboration and improved health outcomes (Dolce, Aghazadeh-Sanai, Mohammed, & Fulmer, 2014). Research has demonstrated strong correlations between oral and systemic diseases; therefore, it is important that dental and medical professionals feel comfortable collaborating to provide the most effective treatment for their patients (Cullinan, Ford, & Seymour, 2009; Kidambi & Patel, 2008; Chaudari, Kohad, Mhaske, & Rajhans, 2011; Novak, Potter, Blodgett, & Ebersole, 2008; Jaecks, 2009; Wilder, Thomas, & Jared, 2008; Wilder et al., 2009; Anderson, Smith, & Maseman, 2011). For dental and medical professionals to gain confidence in working collaboratively, they need to learn to work together during their educational experiences. To work toward this goal, the Commission on Dental Accreditation (CODA) developed two new standards that were implemented in 2013 relating to IPE and team-based education; these standards aimed to increase dental students' experiences with students from other disciplines (Formicola et al., 2012). A recent team study group formed by the American Dental Education Association (ADEA) found that dental school deans already recognize the importance of IPE and that there is sufficient interest in developing IPE programs; however, there are significant challenges that exist to developing and implementing them (Formicola et al., 2012). Some of these challenges include lack of funding, lack of time in the curriculum, lack of cooperation among different departments and disciplines, and the fact that people typically do not like change.

This study examined graduate faculty and staff perceptions regarding IPE programs, and

sought information on what barriers may be present to implementing these programs. The majority of dental and dental hygiene programs teach their students about the associations between oral health and systemic health; however, few use an interdisciplinary approach to educate their students about the importance of working as part of a health-care team (Jaecks, 2009; Wilder et al., 2008; Wilder et al., 2009; Anderson et al., 2011). The literature indicates a significant link between periodontal disease and several systemic diseases, including diabetes, cardiovascular/cerebrovascular disease, and an increased risk of preterm/low-birth weight babies (Young, Lyon, & Azevedo, 2010; Marshall, 2009; Nunn et al., 2009; Hong, Ahmed, McCunniff, Overman, & Matthew, 2008; Cullinan et al., 2009; Kidambi & Patel, 2008; Chaudari et al., 2011; Novak et al., 2008; Wilder, Bell, Phillips, Paquette, & Offenbacher, 2014; Crafton & Donley, 2002). Therefore, patients could benefit from collaboration between dental professionals and health professionals who can work together to provide optimal patient education regarding the interaction of oral and systemic health (Jaecks, 2009; Wilder et al., 2008; Wilder et al., 2009). Dental and medical professionals need to be aware of the roles and responsibilities of other disciplines so that they will be well equipped to appropriately refer patients when necessary. They also should be able to work collaboratively to develop treatment plans that address both oral and systemic concerns. Patient outcomes can be improved if patients understand the impact that good oral health can have on their overall health. This can be achieved by ensuring that dental and medical professionals understand the roles and responsibilities of other disciplines so that they feel confident and comfortable in seeking assistance from other professionals and referring when appropriate. This will be best achieved by ensuring that dental and health science/nursing students have collaborative educational experiences during their training. This study examined the current opportunities that exist for IPE at Nova Southeastern University

(NSU), the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that faculty and staff feel should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities.

Statement of the Problem

Collaborative projects have the potential to bring together members from multiple disciplines; through these interactions individuals with different skills and knowledge can create outcomes that no individual can create alone (Jaecks, 2009; Dufrene, 2012; Lapkin, Levett-Jones, & Gilligan, 2012; Spath, Godfrey, Taylor, & Bell, 2011; Buckley et al., 2012; Rice et al., 2010). IPE is a way to encourage collaboration, and students involved in these types of programs report having improved attitudes toward teamwork and a better understanding of what other professions have to offer (Jaecks, 2009). These positive student experiences and outcomes provide evidence of the importance of developing IPE programs for dental and health science/nursing students. However, there are barriers that exist, such as scheduling issues, turf battles, lack of perceived value, lack of financial resources and administrative support, and rigid curricula (Dufrene, 2012). This study sought to determine what faculty/staff view as the most significant barriers to implementing IPE programs. Questions 18 and 19 on the survey sought to determine specific financial and administrative considerations that may exist to the implementation of increased IPE activities. These questions allowed faculty/staff to identify barriers that are specific to their departments and disciplines. Faculty/staff may view the concept of IPE favorably; however, there may be specific barriers in each college, department, or program that make implementation difficult. These survey questions relate to the fifth research question.

There is a unique opportunity for IPE between dental students and health science/nursing

students because there is a significant link between oral and systemic disease (Cullinan et al., 2009; Kidambi & Patel, 2008; Chaudari et al., 2011; Novak et al., 2008). An IPE program could allow dental students to become more knowledgeable about systemic disease and more comfortable in referring patients to the appropriate medical professionals, which could lead to improved patient outcomes. It could also allow health science students to learn about periodontal disease and how it affects systemic health. Health professionals can improve the health of their patients by recommending a dental exam and dental hygiene treatment if the patient has not had a dental and periodontal evaluation in the past six months. This study examined current opportunities for IPE among dental and health science students and whether faculty/staff perceived a need for increased IPE activities. Survey questions four, five, six, seven, 12, and 13 sought information regarding faculty perceptions regarding IPE. These questions asked information about whether faculty felt that dental, health science, and nursing students should understand each other's skills and roles, participate in educational experiences together, and what benefits IPE could have for their students and future patients. These survey questions relate to the second research question.

This study surveyed graduate faculty and staff from NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing, regarding their views on IPE. This study provides information that will be beneficial in implementing new IPE programs in the future. The study utilized a mixed-methods survey, in which quantitative and qualitative data were collected. The survey was administered via an anonymous online survey.

A Priori Research Questions

Research Question One: What current opportunities exist at NSU for IPE among dental students and health science/nursing students? This relates to survey question number 17.

Research Question Two: Is there is a perceived need for IPE activities for dental students and health science students? This relates to survey questions 4, 5, 6, 7, 12, and 13.

Research Question Three: Are there perceived advantages of an IPE program for dental students and health science/nursing students? This relates to survey questions 10 and 11.

Research Question Four: What features do faculty/staff believe should be included in an IPE program for dental students and health science/nursing students? This relates to survey questions 8, 9, 14, and 15.

Research Question Five: Are there barriers that exist to the implementation of increased IPE activities for dental students and health science/nursing students? This relates to survey questions 18 and 19.

Post Hoc Research Questions

The survey instrument (The Health Professions IPE Survey) was developed by the researcher because there was not an available instrument to measure the appropriate information. With a new survey, it was impossible to anticipate the psychometric properties of the instrument. The respondents were all positive in their responses regarding IPE, thus leading to a truncated range with negative skew. Therefore, utilizing correlation and regression to analyze the a priori research questions did not allow the researcher to draw strong conclusions. For these reasons, factor analysis was used to examine the following post hoc research questions.

Research Question One: What factors account for the variance in items on the survey instrument relating to pro-interprofessional perceptions?

Research Question Two: What factors account for the variance in items on the survey instrument relating to NSU items?

Relevance and Significance of Study

The American Dental Education Association (ADEA) approved Policy Statements in 2010 which identified the importance of teaching dental and dental hygiene students to work within an integrated health-system. ADEA states that new models of oral health care should be developed that involve other health professionals as team members and that interdisciplinary educational opportunities should be pursued. IPE can be used to promote mutual respect and trust in the competence of other health care professionals (Jaecks, 2009; Dufrene, 2012; Shiyanbola, Lammers, Randall, & Richards, 2012).

The Commission on Dental Accreditation (CODA) recently developed two new standards related to IPE that were implemented on July 1, 2013 (Formicola et al., 2012). CODA Standard 1-9 states that dental schools are required to show evidence of interaction with other components of higher education, health care education, and/or health care delivery systems (Formicola et al., 2012). Standard 2-19 states that dental schools should teach their students to communicate and collaborate with other members of the health care team to facilitate the provision of health care (Formicola et al., 2012). The implementation of these two new standards emphasizes the importance of developing IPE/team-based learning experiences for dental students. This study sought information from graduate faculty and staff regarding current IPE practices and opportunities at NSU. Question number 17 on the survey asked faculty/staff to describe any current IPE activities for dental, health care science, and nursing students. This provided information from the different colleges and departments about current activities. This survey question relates to the first a priori research question.

There is the potential for improved patient education relating to several health conditions if collaboration between dental and health professionals was improved. It is evident that many

diabetic patients are not receiving adequate information about the oral effects of diabetes from their regular health care providers. Allen, Ziada, O'Halloran, Clerehugh, & Allen (2008) assessed the knowledge of diabetic patients about their risk for periodontal disease and found that only 33% of participants were aware that they were at increased risk for periodontal disease. According to Allen et al., participants were more aware of other potential consequences of diabetes. Of the 33% who were aware of the increased risk of periodontal disease, 51% had received the information from their dentist (Allen et al., 2008). The remaining participants learned of the information from the diabetic team (32%), a dental hygienist (7%), and from other sources (10%) (Allen et al., 2008). Allen et al. stated that dental practitioners should play a role in educating diabetic patients about this link, because closer integration is needed between dental and diabetes professionals. Dental professionals are in a unique position to work with other health care providers to educate patients about the risk factors and symptoms of diabetes, as well as how to improve glycemic control in diabetic patients. Questions 10 and 11 on the survey asked faculty/staff about the benefits that IPE could have in regard to patient health outcomes and quality of patient education. It was anticipated that faculty and staff would answer these questions positively. If faculty and staff answered positively to these questions but not to question number 5 (that students should participate in classroom and clinical experiences with one another), there may be barriers that exist to the implementation of increased IPE activities.

Several studies also examined the oral health knowledge of various medical professions, and found the need for inclusion of more education on oral health in their programs. Hein, Schonwetter, and Iacopino (2011) reported that the majority of pre-doctoral students in pharmacy nursing and medical schools are not being taught to perform an oral exam. Therefore, they recommend developing models of IPE among students from different health care disciplines

(Hein et al., 2011). A study by Yuen, Onicescu, Hill, and Jenkins, (2010b) conducted in South Carolina found that 93.8% of certified diabetes educators felt that oral health should be part of the curriculum. However, 76.9% of these educators reported that their curricula did not include oral health information (Yuen et al., 2010b). Question number 13 on the survey asked faculty/staff whether they feel that health care professionals and nurses should be able to provide information to patients regarding oral diseases. This question sought to determine whether faculty/staff feel that health professionals and nurses should be educated about oral diseases and also whether they have any objection to them providing this information to patients.

A survey conducted by ADEA found that dental school deans believe that IPE is an important topic that must be addressed, and that many opportunities exist for IPE collaborations with medical and nursing schools as well as programs such as dental hygiene, optometry, public health, pharmacy, and social work (Formicola et al., 2012). Currently, the most commonly reported IPE collaborations were among dental and medical schools (Formicola et al., 2012). Wilder, Thomas, and Jared (2008) surveyed dental hygiene program directors to determine what topics are included in the curricula, whether interdisciplinary methods are used, and to ascertain the opinions of the program directors regarding IPE. Only six programs reported teaching information on the periodontal/systemic link to interdisciplinary student groups, and only two programs reported that their dental hygiene students conduct a project or patient education with other health professions students (Wilder et al., 2008). Question number 12 on the survey asked whether dentists should be able to provide information to their patients regarding systemic conditions. This will determine whether faculty/staff believe that dental students need this information and whether they believe that it is appropriate for dentists to provide this information to their patients. This is an important topic because some practitioners may feel defensive about

scope of practice and allowing dentists to provide this information.

It would appear that both dental students and health science students could benefit from working in an interdisciplinary clinical setting because they could learn to work collaboratively to develop treatment plans that may lead to improved patient outcomes. By working collaboratively, they could learn about each discipline while also gaining respect for the other professions. This could lead to improved referral and collaboration after graduation. Future research could focus on examining how IPE during student education relates to referral and collaboration among licensed practitioners.

Definition of Terms

Interprofessional Education Program: Program that will allow dental and health science/nursing students to attend courses together, as well as provide patient care as a team in a clinical setting. Interprofessional education: "Occurs when students or members of two or more professions learn with, from and about each other to improve collaboration and the quality of care" (Centre for the Advancement of Interprofessional Education [CAIPE], 2013, p. 4).

Summary

Chapter One provided a brief overview of the potential benefits of an IPE program between dental students and health science students. Chapter Two will provide a literature review and discussion of relevant theory. The literature demonstrates that IPE programs lead to improved student knowledge and better understanding of the roles that other disciplines play in patient care. Adult learning theory (ALT) and social cognitive theory (SCT) will be examined in relation to motivation for implementation of IPE activities.

Chapter 2

Review of the Literature

Introduction

The purpose of this study was to examine the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities. Information gathered from this exploratory survey can be used in future survey development to further understand faculty/staff perceptions which may be beneficial in designing and implementing future programs, as well as designing faculty development for IPE. This chapter will provide a review of the pertinent literature on the association between oral and systemic disease, the current status of education for dental students, and the current status of IPE in dental and health science programs.

Interprofessional Educational Programs

"Interprofessional education occurs when students or members of two or more professions learn with, from, and about each other to improve collaboration and quality of care" (CAIPE, 2013, p. 4). IPE is suitable for training students in many health care professions (Dufrene, 2012). The majority of research available on IPE focuses on programs that were implemented with medical, nursing, and pharmacy students (Lapkin et al., 2012; Spath et al., 2011; Buckley et al., 2012; Rice et al., 2010). A survey of sixteen medical schools in the United States revealed that fourteen have IPE activities underway; the majority were collaborations between medicine and nursing, with pharmacy included in 57% of schools (West et al., 2016). Dentistry was included in only 29% of the schools (West et al., 2016).

Most previous studies on IPE focused on student perceptions and feelings regarding IPE; methods used in the studies included classroom teaching, seminars, simulation and laboratory activities, and clinical experience (Dufrene, 2012). Each method resulted in greater understanding or appreciation of the roles of other disciplines (Dufrene, 2012). These studies also indicated that IPE increased understanding and practice of collaboration and teamwork (Dufrene, 2012). In his review of IPE literature, Dufrene (2012) discussed the barriers to IPE which include school schedules, turf battles, lack of perceived value, lack of financial resources and administrative support, and rigid curricula. Despite these barriers, IPE is a beneficial part of health professions education (Dufrene, 2012).

Anderson et al. (2011) studied the implementation of an oral health curriculum to physician assistant students. In this study, dental hygiene faculty taught the curriculum using classroom presentations; however, there was not interaction between the two student groups (Anderson et al., 2011). Physician assistant students in the study reported improved understanding on all topics, particularly the ability to monitor the impact of medications on oral tissues, the ability to recognize caries and oral lesions requiring referral, and the ability to recognize signs/symptoms of gingivitis and periodontal disease (Anderson et al., 2011).

Shiyanbola et al. (2012) evaluated an interprofessional project that involved five health professions: medicine, pharmacy, nursing, nutrition, and dental hygiene. Students from each group led workshops for diabetic patients on their areas of expertise; all professions attended each session (Shiyanbola et al., 2012). Patients and students engaged in activities throughout the sessions. Participants reported significant improvements in understanding of the roles of healthcare professionals, diabetes care knowledge, comfort working with the underserved, ability to work with other healthcare professionals, and ability to educate patients about meeting their

goals and to work with a patient to change their health behaviors (Shiyanbola et al., 2012). This interprofessional program improved students' ability to work with patients to achieve clinical goals such as blood pressure, cholesterol, blood sugar, dental care, foot care, eye care, and health behavior changes (Shiyanbola et al., 2012). This study demonstrated that students had improved knowledge following an interprofessional program, and they also reported having a better understanding of the models of care for their patients (Shiyanbola et al., 2012).

Theoretical Overview

Many professional organizations are recognizing the importance of IPE and calling for expanded teamwork and collaboration in health professions education; however, much of the IPE literature is not theory-driven (Clark, 2009). Systematic reviews show that few studies of IPE refer to a specific theoretical framework; most that did referred to adult learning theory (ALT), psychological theories of group behavior, and teamwork approaches (Hean, Craddock, & Hammick, 2012). ALT has been the theory most often associated with IPE (Hean et al., 2012). ALT is beneficial during curriculum development; one of the underlying assumptions of ALT is that students and faculty can work together demonstrating mutual trust and respect to shape and deepen understanding (Hean et al., 2012). This is applicable to IPE because one of the main goals of IPE is to encourage professionals to work together by providing the knowledge, skills and attitudes required to collaborate (Sargeant, 2009). To collaborate effectively, practitioners must demonstrate respect for other professions, understand the roles of others, communicate effectively, resolve conflict effectively, and share common goals (Sargeant, 2009). Traditionally, healthcare providers from different disciplines and backgrounds have been trained in isolated, discipline-specific programs, with little interaction with other programs; therefore, faculty often lack firsthand IPE experience which limits pedagogical reform (Pardue, 2015). IPE

programs involve more student dialogue and problem solving that emphasizes teamwork, communication, and discovery than traditional health science curriculums; health professions faculty may be less familiar with this type of teaching approach (Pardue, 2015). This knowledge makes it imperative to explore faculty perceptions of IPE and to seek insight into what faculty perceive as barriers to increased IPE activities. Involving faculty stakeholders is important in the development of such programs (Anderson, Smith, & Hammick, 2015). IPE curriculum development can be difficult, because there is little-evidence based literature available and the structural and attitudinal barriers can be considerable (Craddock, O'Halloran, McPherson, Hean, & Hammick, 2013).

Since students are often trained in isolation from other disciplines, there is little opportunity for interaction with and observation of other medical professionals. The SCT is a theory of observational learning that focuses on the idea that human learning occurs in a social environment (Schunk, 2016). SCT states that people acquire knowledge, rules, skills, strategies, beliefs, and attitudes by observing others (Schunk, 2016). IPE allows different health professionals to interact with and observe the behaviors of other disciplines, which is beneficial since much human learning occurs vicariously by observing the behavior of others (Schunk, 2016). Another important concept in SCT is perceived self-efficacy, because people desire to control events that affect their lives (Schunk, 2016). For IPE programs to be effective, faculty and staff need to feel that they are capable of leading their students in IPE activities.

Observational learning through modeling occurs when individuals display new patterns of behavior after observing the modeled behaviors; there are four processes of observational learning: attention, retention, production and motivation (Schunk, 2016). Observer attention is required so that relevant events are meaningfully perceived (Schunk, 2016). Retention occurs

when the individual cognitively organizes, rehearses, codes, and transforms modeled information for memory, while production involves translating those memories of modeled events into actual behaviors (Schunk, 2016). Motivation is important to observational learning because individuals are more likely to engage in the previous three processes if they believe that the modeled behavior is important (Schunk, 2016). Faculty must value IPE in order for them to feel motivated to participate effectively in IPE programs and to model that behavior for students. Motivation is affected by many variables; there may be contextual variables that interfere with faculty/staff motivation to participate in IPE programs (Schunk, 2016).

Association Between Periodontal Disease and Systemic Health

It is important for dental professionals and medical professionals to collaborate during patient treatment, because of the association between oral and systemic health. Periodontal disease does have significant effects on a patient's overall health, and dental and health care providers can provide more comprehensive care when they understand this association.

When periodontal infection occurs, there are bacteria, bacterial byproducts, and inflammatory mediators that can gain entrance into the circulatory system; this can lead to increased risk for poor blood glucose control in diabetic patients, cardiovascular/cerebrovascular disease, and an increased risk of preterm/low-birth weight babies (Crafton & Donley, 2002). Therefore, it is important that dental and medical professionals are comfortable collaborating to provide the most effective treatment for their patients (Jaecks, 2009; Wilder et al., 2008; Wilder et al., 2009; Anderson et al., 2011).

Diabetes is a metabolic disorder in which there is either impaired action of insulin or impaired secretion of insulin which results in hyperglycemia (Kidambi & Patel, 2008). The Centers for Disease Control and Prevention (CDC, 2011) estimated that 25.8 million people in

the United States have diabetes; seven million of these individuals are undiagnosed. Research has demonstrated an association between diabetes and periodontal disease; periodontal disease is now called the sixth complication of diabetes, following retinopathy, nephropathy, neuropathy, macrovascular disease, and poor wound healing (Cullinan et al., 2009; Kidambi & Patel, 2008; Chaudari et al., 2011; Novak et al., 2008). The CDC (2011) reported that adults 45 years of age or older with poorly controlled diabetes (defined as HbA1c > 9%) were 2.9 times more likely to experience severe periodontitis than adults without diabetes. Diabetic patients with poor metabolic control have a higher prevalence and severity of gingival inflammation and periodontal destruction, while individuals with well-controlled diabetes do not have a significantly higher risk of periodontal destruction (Roy et al., 2010).

The association between diabetes and periodontal disease is bi-directional, meaning that periodontal disease also contributes to poor metabolic control (Cullinan et al., 2009, Kidambi & Patel, 2008; Chaudari et al., 2011; Lamster, Lalla, Borgnakke, & Taylor, 2008; Morita et al., 2012; Taylor & Borgnakke, 2008; Acharya, Satyanarayan, & Thakur, 2010). Researchers theorize that the association between the two diseases is due to the advanced glycation end products (AGEs) that result from hyperglycemia (Acharya et al., 2010). These AGEs can bind to receptors and transform macrophages into cells that are more destructive with the release of higher levels of interleukin-1 (IL-1), interleukin-6 (IL-6), interleukin-8 (IL-8),and tumor necrosis factor-α (TNF-α) (Nield-Gehrig & Willman, 2008; Acharya et al., 2010; Kaur et al., 2009; Gomes et al., 2006). The formation of AGEs also leads to increased collagen accumulation in periodontal tissues. This leads to thickening of the vessel walls and decreased tissue perfusion and oxygenation, which may be responsible for diabetic patients being more prone to periodontal

infection and impaired healing (Acharya et al., 2010). Therefore, patients with good glycemic control are less susceptible to periodontal disease.

Maternal infections are a risk factor for adverse pregnancy outcomes. In fact, 30% to 50% of preterm births are possibly caused by maternal infection (Crowther, Thomas, Middleton, Chua, & Esposita, 2005). Most commonly implicated are intrauterine infection and bacterial vaginosis; however, maternal periodontal disease has been implicated as a risk factor for preterm birth and delivery of low-birth weight babies (Boggess, 2005). When maternal infection is present, bacteria activate cell-mediated immunological responses, leading to the production of inflammatory mediators which may lead to preterm labor if they reach the feto-placental unit (Crowther et al., 2005). Approximately 23% of women aged 30 to 54 have been found to have periodontal disease, and gingival inflammation tends to be more severe in pregnant women due to an exaggerated response to bacterial biofilm (Albandar & Kingman, 1999; Nield-Gehrig & Willmann, 2008). Many women never see a dentist during pregnancy; research shows that only 35% to 50% of women seek dental treatment when they are pregnant (Habashneh et al., 2005). Wilder, Robinson, Hared, Lieff, & Boggess (2007) found that 84% of obstetricians considered periodontal disease to be an important risk factor for preterm/low-birth-weight babies; however only 51% recommended a dental examination for their pregnant patients. It is important that medical professionals understand the benefit that a dental examination and nonsurgical periodontal therapy can have for their patients (Price, 2010

There is strong evidence to support oropharyngeal aspiration of oral microorganisms as a contributing factor in pneumonia in care-dependent adults; proper oral hygiene care is important in the prevention of aspiration pneumonia (Nguh, 2016). Unfortunately, nurses often lack the knowledge required to perform adequate oral hygiene procedures, and an estimated 44%-65% of

hospitalized care-dependent adults do not receive proper oral hygiene care (Nguh, 2016). This not only puts the patients at risk but also increases health care costs by requiring extended hospital stays (Nguh, 2016). Nguh used interdisciplinary teams to address a potential gap in care; these teams included the following disciplines: registered nurses, certified nursing assistants, speech language therapists, neuro-stroke unit directors, health educators, and dentists (2016).

Research has also demonstrated that periodontal disease is a risk factor for coronary heart disease (CHD), and periodontal therapy has been shown to reduce systemic markers of CHD (Hada, Garg, Ramteke, & Ratre, 2015). Inflammation plays a role in the pathogenesis of CHD and periodontal disease which is demonstrated by elevated levels of various systemic risk markers including C-reactive protein, fibrinogen, cytokines, interleukins, tumor necrosis factor-alpha, matrix metalloproteinase, oxidative stress, lipid profile, and white blood cells (Hada et al., 2015). The correlations between these markers and both diseases suggest periodontal disease as a risk factor for CHD, and nonsurgical periodontal therapy has been shown to improve cardiovascular risk markers and outcomes (Hada et al., 2015). Therefore, medical providers should be referring patients to receive dental and periodontal examination and nonsurgical periodontal therapy if indicated. A recent study involving cardiologists in North Carolina revealed that the majority of the physicians in the sample were unclear about the etiology of periodontal disease and would like more information on the link between periodontal disease and cardiovascular disease (Mosley, Offenbacher, Phillips, Granger, & Wilder, 2015). The authors suggested that educators and administrators in higher education examine the need for IPE and collaboration between the professions of medicine and dentistry (Mosley et al., 2015).

Association Between Nutrition and Dental Caries

Nutritional factors play a significant role in the development and progression of dental caries, or cavities (Young et al., 2010; Marshall, 2009; Nunn et al., 2009; Hong et al., 2008). The frequent consumption of fermentable carbohydrates is one of the most important factors in caries development; therefore, dental professionals are responsible for incorporating dietary counseling into their treatment plans (Young et al., 2010; Marshall, 2009). Many patients can benefit from nutritional counseling regarding carbohydrate intake. According to Young et al. (2010) in 2007 the average American consumed 100.6 pounds of sugar per year, or 1.9 pounds per week. The key areas that dental professionals focus on in dietary assessment are the number of dietary exposures to fermentable carbohydrates, the structure of meals and snacks, and the consumption of sugary beverages (Marshall, 2009). Marshall (2009) recommends that patients should complete a 24-hour dietary log, so that the dental team could determine what dietary modifications are necessary.

Current Education for Dental Professionals

Currently, dental and dental hygiene programs teach their students about the association between oral and systemic diseases. Wilder, Thomas, and Jared (2008) reported that the three systemic diseases that dental hygiene programs emphasized the most were diabetes, tobacco use, and cardiovascular disease; the majority of this information was taught in a periodontology course. Only 4% of respondents indicated teaching this information to interdisciplinary student groups; when interdisciplinary education was reported, it involved combining dental hygiene students with nursing or allied health students (Wilder et al., 2008). Nearly half of the program directors who responded indicated that their program needed to provide more content on the associations between oral and systemic health (Wilder et al., 2008). This study demonstrated

that dental hygiene education is isolated from that of other health professionals. Wilder et al. stated that there is an opportunity for dental hygiene to develop alliances with other medical professionals to assist in assessing and referring patients who have risk factors for oral-systemic disease. A study of dental schools in the United States and Canada resulted in similar findings (Wilder et al., 2009). Only seven dental schools (16% of respondents) reported teaching didactic courses to dental students along with other health professions students, and only two schools reported conducting interdisciplinary projects (Wilder et al., 2009).

Knowledge of Dental Professionals Regarding Systemic Disease

Dental professionals have an opportunity to work with other health care providers to educate their patients about the risk factors and symptoms of several systemic diseases; however, research demonstrates that dental professionals are not always comfortable in translating this information to patients (Paquette, Bell, Phillips, Offenbacher, & Wilder, 2015). Paquette et al. found that over 90% of the dentists they surveyed agreed that medical and dental professionals should be trained to practice collaboratively (2015). The dentists surveyed were knowledgeable about the link between periodontal disease and various systemic diseases; however, they reported that they did not necessarily feel comfortable incorporating that information into treatment planning and patient care (Paquette et al., 2015). They also supported IPE as a way to improve their readiness to work collaboratively with medical professionals (Paquette et al., 2015).

A study regarding dental hygienists' knowledge of diabetes included similar results; the authors concluded that dental hygienists would benefit from enhanced knowledge about diabetes (Boyd & Hartman-Cunningham, 2008). Boyd and Hartman-Cunningham (2008) found that dental hygienists appeared to have general knowledge about diabetes and its relationship to oral health. However, they noted that the participants in their study were deficient in knowledge of

the significance of the patient's glycated hemoglobin (HbA1c) value. The participants also demonstrated the need for further education on the risk factors for diabetes, the current classifications for diabetes, and clinical recommendations for prevention and management (Boyd & Harman-Cunningham, 2008).

Knowledge of Medical Professionals Regarding Oral Health

While dental professionals demonstrate a need for enhanced knowledge regarding systemic disease, medical professionals would also benefit from increased knowledge regarding oral health (Yuen et al., 2010a; Yuen et al., 2010b; Hein et al., 2011; Faine & Oberg, 1995; Owens, Wilder, Southerland, Buse, & Malone, 2011; Gur & Majra, 2009; Blue, Isringhausen, & Dils, 2011). In 1995, Faine and Oberg surveyed nutritionists and public health dental hygienists to assess their knowledge of dietary factors that contribute to the development of dental caries and found that a better understanding of the infectious nature of dental caries and dietary recommendations would help nutritionists and dental hygienists counsel patients. They also recommended that dental nutrition science should be incorporated into the undergraduate dietetics and dental hygiene curriculums (Faine & Oberg, 1995).

Yuen et al. (2010b) surveyed certified diabetes educators in the state of South Carolina to determine their perceptions of the adequacy of their diabetes education curricula in providing oral health information. Almost all of the participants (93.8%) responded that oral health should be a part of the curriculum; however the majority (76.9%) reported that their curricula did not include an oral health module (Yuen et al., 2010b). The two main reasons reported for not including an oral health module were that they did not have time (61%) and that they did not know enough about oral health and its relationship to diabetes (37%) (Yuen et al., 2010b). Adults with diabetes were more likely to have seen a health care provider for diabetes in the

preceding year than to have seen a dentist, so diabetes educators can be a potential source for diabetes-related oral health information (Yuen et al., 2010b). The respondents who reported that they did not know enough about oral health were less likely to provide oral health information to their patients (Yuen et al., 2010b). Yuen et al. (2010b) recommended partnership of diabetes educators and dental health professionals to educate patients on diabetes and oral health.

In response to these findings, Yuen et al. (2010a) surveyed diabetes self-management education programs (DSMEP) to determine whether there were differences in oral health information provided by programs in states with a high prevalence of diabetes versus states with a low prevalence of diabetes. Yuen et al. (2010a) found that management of dry mouth, demonstrations of proper brushing and flossing techniques, and return demonstrations of recommended proper oral hygiene techniques by patients were major deficiencies in the programs. DSMEP in the high prevalence states were more likely to include information on these three topics than the programs in low prevalence states (Yuen et al., 2010a).

Other medical professionals, such as physicians and nurses, also have a need for increased oral health knowledge (Hein et al., 2011; Owens et al., 2011; Gur & Majra, 2009; Blue et al., 2011). Owens et al. (2011) surveyed internists and endocrinologists in North Carolina to determine their knowledge and practice behavior when treating patients with diabetes. The majority of the physicians (88%) agreed that physicians should be taught about periodontal disease, and 78% agreed that they should be trained to screen their patients for periodontal disease (Owens et al., 2011). However, when asked if they were confident in providing an oral health screening, the responses were evenly distributed from strongly agree to strongly disagree. Only 24% reported having any oral health information in their curriculum (Owens et al., 2011).

The physicians in this study recognized a need for collaboration with dental professionals (Owens et al., 2011).

Blue et al. (2011) also recommended interdisciplinary education after studying the oral health knowledge of nephrology nurses. Chronic kidney disease and its treatments have oral effects that can be significant, and periodontal disease and other oral infections can compromise organ transplant (Blue et al., 2011). This study supported that an educational intervention increased nurses' knowledge of oral health and chronic kidney disease, and the authors recommended an interprofessional approach (Blue et al., 2011).

Hein et al. (2011) examined the curriculum of pre-doctoral/undergraduate programs in pharmacy, nursing, and medical schools for content on the relationship between oral health and systemic health and found that that majority of pre-doctoral students in these disciplines are not being taught to perform an oral exam. They discussed the need for developing models of IPE among students from different health care disciplines.

Summary

This literature review examined the need for exploring faculty perceptions about IPE between dental and health science/nursing students. The growing evidence of the association between oral and systemic health makes it more important than ever for dental professionals to work collaboratively with other health professionals. Research demonstrates that IPE is effective in increasing student understanding and appreciation of other disciplines as well as increasing collaboration and teamwork in healthcare disciplines, such as medicine, nursing, and pharmacy (Anderson et al., 2011; Shiyanbola et al., 2012). However, more research is needed on IPE involving dental professionals. Previous research demonstrates that dental professionals and medical professionals believe that IPE programs would be beneficial; however, many students

are not participating in IPE programs. Opportunities exist for dental and medical professionals to work together in developing treatment plans and providing patient education, which could lead to improved patient outcomes.

Chapter 3

Methodology

Introduction

The research design and methods used for this study will be discussed in this chapter. The purpose of this study was to examine the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities. This study surveyed graduate faculty and staff from NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing, regarding their views on IPE. The study used the Health Professions IPE Survey, a mixed-methods survey, in which both quantitative and qualitative data were collected. The quantitative survey questions used a 5-point Likert-type scale, and there were three qualitative questions that allowed respondents to describe current IPE activities at the university, identify financial considerations to the implementation of increased IPE activities, and identify administrative considerations to the implementation of increased IPE activities. The survey was administered via an anonymous online survey.

Participants

The population for this study included graduate faculty and staff members in dental, health science, and nursing programs. The sample for this study included graduate faculty and staff in NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing. The College of Health Care Sciences offers programs for health professionals including physician assistants, occupational therapists, physical therapists, audiologists, anesthesiologist assistants, and speech language pathologists. After discussions with faculty and

administrators from each of the three colleges, it was determined that the most comparable samples from each college would contain only graduate faculty and staff who work with graduate students because the College of Dental Medicine only has graduate faculty. At the time of the survey, there were 459 graduate faculty and staff members in these colleges who were potential participants. The link to the survey was sent to these 459 potential participants on November 9, 2016. There were 54 completed surveys, for a response rate of 11.76%.

Eligibility Criteria

Nonprobability purposive sampling was used to survey graduate faculty and staff in the College of Dental Medicine, College of Nursing, and College of Health Care Sciences.

Inclusion Criteria

Graduate faculty and staff in the College of Dental Medicine, College of Nursing, and College of Health Care Sciences.

Exclusion Criteria

Faculty and staff who work exclusively with undergraduate students were excluded, because the College of Dental Medicine only has graduate students.

Instrument

This survey instrument (The Health Professions IPE Survey) (Appendix A) was designed by the researcher because no existing survey addressed the research questions. The instrument was used as an exploratory survey to determine how graduate faculty and staff at NSU perceive IPE and the potential for increased IPE activities between dental, health science, and nursing students. The anonymous web-based mixed methods survey included nineteen questions; three of the questions also sought qualitative information.

The first three questions sought demographic information regarding the respondent's primary responsibility at NSU (faculty, staff, or administrator) and what college and department they are affiliated with.

The remaining questions used a 5-point Likert-type scale with 1 representing *strongly disagree*, 2 representing *disagree*, 3 representing *neither agree or disagree*, 4 *representing agree*, and 5 representing *strongly agree*. Questions 4, 5, 6, 7, 12, and 13 were related to faculty/staff perception of the need for IPE activities for dental students and health science/nursing students. These questions asked whether faculty/staff thought that their students should participate in classroom and clinical IPE activities together, and whether IPE activities will lead their student to be more effective health care providers.

Questions 10 and 11 asked for faculty/staff perceptions of the advantages of IPE activities and whether IPE activities might improve patient health outcomes and patient education. Questions 8, 9, 14, and 15 asked what features should be included in an IPE program for their students.

Question 17 asked about current opportunities for IPE activities between dental, health care science, and nursing students and included a comment section in which respondents could describe the current activities taking place in their department or college.

Questions 18 and 19 asked whether there are financial or administrative considerations to the implementation of increased IPE activities and included a comment section in which respondents were asked to identify any financial or administrative considerations.

The survey instrument was pilot tested with ten faculty members at another university.

Data Collection Procedures

Data collection began upon approval from the NSU Research Survey Committee and the Institutional Review Board. See Appendix B for a copy of the Institutional Review Board approval letter. Surveys were administered via the website, www.surveymonkey.com. An initial recruitment email with a link to the anonymous survey was sent to all graduate faculty and staff in the College of Health Care Sciences, College of Dental Medicine, and College of Nursing on November 9, 2016. This initial email (see Appendix C) also included an attached participation letter (see Appendix D). Participants could complete the survey at their convenience at any computer they chose. The survey was designed to take approximately 10-15 minutes to complete. One reminder email (see Appendix E) was sent on November 16, 2016. The survey closed on December 7, 2016 after four weeks of data collection. Informed consent was implied by completion of the survey. At the time of the survey, there were 459 graduate faculty and staff members in these colleges who were potential participants. The College of Health Care Sciences sent the survey to 246 potential participants, the College of Dental Medicine to 200 potential participants, and the College of Nursing to 13 potential participants. There were 54 completed surveys, for a response rate of 11.76%.

Web-based surveys typically generate low response rates when compared to regular mail and regular mail plus incentives (Reinisch, Yu, & Li, 2015). Web-based surveys have been found to have a 10-11% lower response rate compared to other modes (Scott et al., 2011). Scott et al. conducted a survey of physicians to examine response rates for three different modes of survey administration (2011). The online mode had a response rate of 12.95%, while the simultaneous mixed mode had a response rate of 19.7% and 20.7% for the sequential mixed mode (Scott et al., 2011). The online mode was the least expensive of the three strategies (Scott

et al., 2011). The online mode also showed the lowest average percentage of questions answered: 89% compared to 92% for the other two modes (Scott et al., 2011). However, web-based survey was the most appropriate method for contacting the proposed sample due to the ability to send the survey via email from the dean's office of each college. A reminder email was sent to all potential participants one week after the initial email, on November 16, 2016, to attempt to increase the response rate. The survey closed on December 7, 2016.

Nulty (2008) recommends several strategies for increasing student completion of online course evaluations that may be applicable to other surveys, as well; these include: making it easier to access the survey by sending the URL directly to potential participants, providing frequent reminders, persuading respondents that their responses will be used effectively, providing rewards, creating surveys that seek constructive criticism, extending the duration of the survey's availability, involving students in the choice of optional questions, assuring anonymity of responses, familiarizing the students with the online survey environment, and keeping questionnaires brief (2008). Researchers in Australia found that internet-based surveys were not an effective way to obtain a high rate of response from Australian medical practitioners, despite being easy to conduct and cost-effective (Aitken, Power, & Dwyer, 2008). Anonymous survey methods have been found to promote greater disclosure of information compared to non-anonymous methods (Murdoch et al., 2016). Murdoch et al. performed their research with mailed surveys; however, online surveys should seek to allow anonymous responses to improve response rate (2014).

Online surveys have many advantages over other methods, including: ease of access for respondents, speed of data collection, low cost, and ability to access populations via email lists (Aerny-Perreten, Dominguez-Berjon, Esteban-Vasallo, & Garcia-Riolobos, 2015). Aerny-

Perreten et al. found that the response rate increased after electronic reminders, especially for professionals with the highest workloads and a minor interest in the survey topic (2015). It has been found that just one or two follow-up attempts can increase survey response rates among health care professionals (Aerny-Perreten et al., 2015). Future research could utilize methodology that allows the survey to remain available for a longer period of time and includes more than one reminder email to encourage a higher response rate.

A Priori Research Questions

The following questions guided this study:

1: What current opportunities exist at NSU for IPE among dental students and health science/nursing students? Survey question 17 addresses this research question.

2: Is there is a perceived need for IPE activities for dental students and health science students? Survey questions 4, 5, 6, 7, 12, and 13 address this research question.

3: Are there perceived advantages of an IPE program for dental students and health science/nursing students? Survey questions 10 and 11 address this research question.

4: What features do faculty/staff believe should be included in an IPE program for dental students and health science/nursing students? Survey questions 8, 9, 14, and 15 address this research question.

5: Are there barriers that exist to the implementation of increased IPE activities for dental students and health science/nursing students? Survey questions 18 and 19 address this research question.

Post Hoc Research Questions

Because of the positive responses on the survey and truncated a range the following post hoc questions were addressed:

1: What factors accounted for the variance in items on the survey instrument relating to pro-interprofessional perceptions?

2: What factors accounted for the variance in items on the survey instrument relating to NSU items?

Quantitative Data Analysis

Data analysis for the quantitative Likert-type scale questions was conducted using SPSS version 24. The researcher conducted item analysis and frequency distributions for responses to each question from each participant. Descriptive statistics were used to examine the scores of the variables. Correlation and regression were used to examine the responses from the different faculty/staff groups. The Pearson product moment correlation coefficient (*r*) was used to quantify the relationship between two variables, whether in a positive or negative direction (Munro, 2005). The correlation coefficient was used to examine faculty/staff perceptions based on department and college affiliation, as well as their primary role at the university (faculty, staff, or administrator). Regression was used to determine the effect that each survey question had on the main variable addressed in survey question number five.

The survey instrument (the Health Professions IPE Survey) was developed by the researcher, because there was not an available instrument to measure the appropriate information. With a new survey, it was impossible to anticipate the psychometric properties of the instrument. The respondents were all very positive in their responses to the survey instrument, thus leading to a truncated range with negative skew. Therefore, utilizing correlation and regression to analyze the a priori research questions did not allow the researcher to draw strong conclusions. For these reasons, factor analysis was utilized to examine post hoc research questions.

Qualitative Data Analysis

Qualitative data analysis was conducted using ATLAS.ti.software. Topic coding was used to examine themes related to current IPE activities, financial barriers, and administrative barriers.

Resource Requirements

The resources required for the study were minimal. The only cost associated with the research was the cost of the subscription to www.surveymonkey.com. Equipment required was also minimal; a computer with SPSS was required to complete data analysis. The researcher analyzed the data.

Data Storage

All study data was stored on a password protected computer. All information was collected anonymously and will be stored for three years after the completion of the study.

Reliability and Validity

Construct validity is the degree to which inference can be made from the operationalizations in a study to the theoretical constructs on which they are based (Trochim & Donnelly, 2008). Construct validity involves generalizing from a program or measures to the concept or idea of the program or measures (Trochim & Donnelly, 2008). External validity is the degree to which conclusions are generalizable to other persons in other places and at other times (Trochim & Donnelly, 2008). There are potential threats to external validity if the sample is not representative of the population of dental, health science, and nursing faculty. Reliability is the degree to which a measure is dependable, meaning that it would give the same results when repeated (Trochim & Donnelly, 2008). The survey instrument was pilot tested with ten faculty members at another university.

Since the survey instrument was developed by the researcher, the psychometric properties of the instrument were not known. The researcher did not expect such positive responses (agree and strongly agree) to most of the survey items. Due to most of the survey responses being so positive, correlation and regression could not be used to address the a priori research questions as planned. Therefore, factor analysis was utilized to examine the interrelationships among survey components.

Summary

This chapter has included the methodology of the research study. A web-based mixed-methods survey was used to survey a sample of graduate faculty and staff at NSU to examine the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities. Understanding graduate faculty and staff perceptions may be beneficial in designing and implementing future IPE programs.

Chapter 4

Results

Introduction

There is little research regarding faculty perceptions of IPE for dental and health science/nursing students. Research involving other health care disciplines has shown that IPE programs lead to improved attitudes toward teamwork and better understanding of other professions (Jaecks, 2009). Therefore, it is useful to examine faculty perceptions of these programs. This research study was designed to measure the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities.

An initial recruitment email (Appendix C) and participation letter (Appendix D) were sent to 459 graduate faculty and staff in the College of Dental Medicine, the College of Health Care Sciences, and the College of Nursing on November 9, 2016. A reminder email (Appendix E) was sent one week later on November 16, 2016. The survey was open for four weeks and closed on December 7, 2016. There were a total of 54 completed surveys.

Data Cleaning

Each completed survey was checked for completeness. Of the 54 surveys, 12 were missing data. Ten of the surveys were missing responses to one question; two of the surveys were missing responses to two questions.

Data Analysis

The quantitative questions on the survey used a 5-point Likert-type scale with 1 representing *strongly disagree*, 2 representing *disagree*, 3 representing *neither agree or disagree*,

4 *representing agree*, and 5 representing *strongly agree*. Descriptive statistics were examined using item analysis and frequency distribution for each response and each question from each participant.

For the qualitative data obtained from questions 17, 18, and 19, topic coding was used to examine themes regarding current IPE activities, financial barriers and administrative barriers that are reported by participants.

Descriptive Statistics

Demographics

The participants include 54 graduate faculty and staff from NSU's College of Dental Medicine, College of Health Care Sciences, and College of Nursing. Almost 65 percent (64.8%) of respondents were faculty, 22.2% were administrators, and 11.1% were staff. Almost 67 percent (66.7%) of the respondents were from the College of Health Care Sciences, 29.6% were from the College of Dental Medicine, and 3.7% were from the College of Nursing.

When examining the responses by department, 29.6% of respondents were from dental medicine; 11.1% from health sciences; 11.1% from the physician assistant program; 11.1% from speech language pathology; 9.3% from occupational therapy; 7.4% from physical therapy; 5.6% from anesthesia; 5.6% from audiology; and 5.6% from nursing.

Likert Survey Responses

Responses to the Likert survey items are listed in this section.

Question 4: It is important for dental, health care science, and nursing students to understand each other's skills and roles in patient care.

70.4% strongly agree

20.4% agree

3.7% neither agree or disagree

1.9% strongly disagree

Question 5: Dental, health care science, and nursing students should participate in classroom and clinical experiences with one another.

40.7% strongly agree

40.7% agree

11.1% neither agree or disagree

3.7% disagree

3.7% strongly disagree

Question 6: Interprofessional education prepares dental, health care science, and nursing students for real-world clinical practice.

46.3% strongly agree

29.6% agree

11.1% neither agree or disagree

7.4% disagree

5.6% strongly disagree

Question 7: Interprofessional education would improve dental, health care science, and nursing students' ability to communicate effectively with other disciplines.

51.9% strongly agree

37% agree

1.9% neither agree or disagree

3.7% disagree

3.7% strongly disagree

Question 8: Dental, health care science, and nursing students should participate in **classes** with students from other disciplines.

24.1% strongly agree

33.3% agree

29.6% neither agree or disagree

3.7% disagree

9.3% strongly disagree

Question 9: Dental, health care science, and nursing students should participate in interprofessional **clinical** experiences.

40.7% strongly agree

48.1% agree

3.7% neither agree or disagree

1.9% disagree

3.7% strongly disagree

Question 10: Patients' health outcomes (examples: blood glucose control, periodontal conditions, nutritional status, etc.) might improve if dentists, health care professionals, and nurses work collaboratively to develop treatment plans.

44.4% strongly agree

40.7% agree

5.6% neither agree or disagree

3.7% disagree

3.7% strongly disagree

Question 11: Quality of patient education will improve if dentists, health care professionals, and nurses work cooperatively.

55.6% strongly agree

33.3% agree

5.6% neither agree or disagree

3.7% strongly disagree

Question 12: Dentists should be able to provide information to their patients regarding systemic health conditions such as diabetes and cardiovascular disease and how they relate to oral health.

57.4% strongly agree

33.3% agree

5.6% neither agree or disagree

3.7% strongly disagree

Question 13: Health care professionals and nurses should be able to provide information to patients regarding oral diseases, such as periodontal disease and dental cavities.

40.7% strongly agree

48.1% agree

5.6% neither agree or disagree

1.9% disagree

3.7% strongly disagree

Question 14: Dental students should receive training from faculty in health care sciences/nursing.

33.3% strongly agree

33.3% agree

25.9% neither agree or disagree

5.6% strongly disagree

Question 15: Health care science/nursing students should receive training from dental school faculty.

31.5% strongly agree

35.2% agree

24.1% neither agree or disagree

1.9% disagree

7.4% strongly disagree

Question 16: I feel confident in my ability to lead my students in an interprofessional activity with other health care professions.

31.5% strongly agree

46.3% agree

9.3% neither agree or disagree

3.7% disagree

3.7% strongly disagree

Question 17: NSU currently provides opportunities for interprofessional collaboration between dental, health care science, and nursing students (i.e. didactic courses involving more than one discipline, clinical experiences with other disciplines, etc.)

9.3% strongly agree

33.3% agree

20.4% neither agree or disagree

31.5% disagree

5.6% strongly disagree

Question 18: There are financial considerations to the implementation of increased interprofessional activities at NSU for dental, health care science, and nursing students.

9.3% strongly agree

46.3% agree

37% neither agree or disagree

1.9% disagree

3.7% strongly disagree

Question 19: There are administrative considerations to the implementation of increased interprofessional activities at NSU for dental, health care science, and nursing students.

29.6% strongly agree

55.6% agree

9.3% neither agree or disagree

1.9% disagree

3.7% strongly disagree

The researcher originally planned for survey question 5, whether dental, health care science, and nursing students should participate in classroom and clinical experiences with one another, to be the main criterion variable. For this question 40.7% of respondents strongly agreed that these students should be participating in classroom and clinical experiences, 40.7% agreed, 11.1% neither agreed or disagreed, 3.7% disagreed, and 3.7% strongly disagreed. Therefore, the majority of respondents agreed that IPE should be implemented for dental, health science and nursing students. The other questions on the survey should have an effect on this main variable because these questions relate to the benefits to students and patients that would

lead faculty/staff to believe that they should participate in IPE, and also to the barriers that may prevent them from believing they should participate.

Faculty and staff reported positive perceptions regarding the outcomes of IPE, as evidenced by their overall positive responses to the survey items. Almost 91 percent (90.8%) of respondents either strongly agreed or agreed that it is important for dental, health care science, and nursing students to understand each other's skills and roles in patient care (Question #4). Almost 82 percent (81.4%) of respondents strongly agreed or agreed that dental, health care science, and nursing students should participate in classroom and clinical experiences with one another (Question #5). Almost 76 percent (75.9%) of respondents strongly agreed or agreed that IPE prepares dental, health care science, and nursing students for real-world clinical practice (Question #6). Almost 89 percent (88.9%) of respondents strongly agreed or agreed that IPE would improve dental, health care science, and nursing students' ability to communicate effectively with other disciplines (Question #7). Almost 58 percent (57.4%) of respondents strongly agreed or agreed that dental, health care science, and nursing students should participate in classes with students from other disciplines (Question #8). Almost 89 percent (88.8%) of respondents strongly agreed or agreed that dental, health care science, and nursing students should participate in interprofessional clinical experiences (Question #9). Approximately 85 percent (85.1%) of respondents strongly agreed or agreed that patients' health outcomes (examples: blood glucose control, periodontal conditions, nutritional status, etc.) might improve if dentists, health care professionals, and nurses work collaboratively to develop treatment plans (Question #10). Almost 89 percent (88.9%) of respondents strongly agreed or agreed that quality of patient education will improve if dentists, health care professionals, and nurses work cooperatively (Question #11). Almost 91 percent (90.7%) of respondents strongly agreed or

agreed that dentists should be able to provide information to their patients regarding systemic health conditions such as diabetes and cardiovascular disease and how they relate to oral health (Question #12). Almost 89 percent (88.8%) of respondents strongly agreed or agreed that health care professionals and nurses should be able to provide information to patients regarding oral diseases, such as periodontal disease and dental cavities (Question #13). Almost 67 percent (66.6%) of respondents strongly agreed or agreed that dental students should receive training from faculty in health care sciences/nursing (Question #14). Almost 67 percent (66.7%) of respondents strongly agreed or agreed that health care science/nursing students should receive training from dental school faculty (Question #15).

The responses to these questions indicate that faculty and staff believe that IPE is beneficial in increasing the ability of students to understand the roles of other disciplines, to work collaboratively in real-world clinical practice, to communicate effectively with other disciplines, to improve patient health care outcomes and patient education. However, the questions that related to implementation had more responses from faculty and staff who were neutral on the topic. On question 8, 29.6% of respondents were neutral regarding whether dental, health science, and nursing students should participate in classes with students from other disciplines. Only 3.7% were neutral when asked if students should participate in interprofessional clinical experiences (Question 9).

The responses to Question 14 show that 25.9% of the respondents were neutral on the topic of dental students receiving training from faculty in health care science/nursing. On Question 15, 24.1% were neutral about whether health care science/nursing student should receive training from dental school faculty. This is also demonstrated by their responses to Questions 18 and 19 in which many report that there are financial and administrative

considerations to the implementation of increased IPE activities. Almost 56 percent (55.6%) of participants either agreed or strongly agreed that there are financial considerations to the implementation of increased IPE activities (Question 18). Approximately 85 percent (85.2%) of participants agreed or strongly agreed that there are administrative considerations to the implementation of increased IPE activities (Question #19).

Inferential Statistics

Correlation was used to examine the effect of survey items on the main criterion variable, whether dental, health care science, and nursing students should participate in classroom and clinical experiences with one another. There were positive responses (4s and 5s) to most questions; therefore, there is a truncated range with a negative skew. The correlation coefficient *r* shows a positive correlation between this main criterion variable and responses to survey questions 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17. Respondents reported positive perceptions of IPE in regards to increasing understanding, communication, patient health outcomes, patient education, and preparation for clinical practice in these questions. They also indicated that dental, health science, and nursing students should participate in classroom and clinical experiences with one another (Question 5; main criterion variable).

The correlation coefficient was also used to examine faculty/staff perceptions based on college affiliation to determine whether a relationship existed between the respondent's department and their responses to survey items. There were positive responses (4s and 5s) to all questions; therefore, there is a truncated range with a negative skew. There was a positive correlation between the respondents' primary department and their responses to question 11 (Quality of patient education will improve if dentists, health care professionals, and nurses work

cooperatively.) and question 16 (I feel confident in my ability to lead my students in an interprofessional activity with other health care professionals).

Regression was used to examine the effect that each survey item had on the main variable addressed in question 5. However, there is multi-collinearity which occurs when predictor variables are too highly inter-correlated (Polit & Beck, 2008). This is due to the fact that there were so many positive responses to the survey items (agree and strongly agree or 4s and 5s). When multi-collinearity is present, the computations required for the regression coefficients are compromised and results are not reliable (Polit & Beck, 2008). The regression analyses show an R of .9, because of this multi-collinearity; therefore, this prevents the researcher from using single survey questions as predictors quantitatively. Since there was high multi-collinearity, dimension reduction or factor analysis was required to examine factors instead of individual survey questions since they will not have the power to uniquely predict the desired outcomes.

Factor Analysis

Factor analysis was used to determine reliability of the survey components and to examine what subsets of questions were related to one another. Factor analysis is used to identify clusters of related variables or dimensions underlying a central construct (Polit & Beck, 2008). Factor analysis is also used to identify and group together different survey items that measure a specific attribute (Polit & Beck, 2008). Factor analysis is another means of hypothesis testing regarding the interrelationships among variables, and for looking at the validity of survey items (Polit & Beck, 2008). Factor analysis of the Health Professions IPE Survey can be used to assess the survey's psychometric properties to assist in future development of a survey instrument with improved validity. Advancing the science of IPE and its impact on clinical collaborative practice requires measures with robust psychometric properties that measure

constructs of interest (Schwindt, Agley, McNelis, Hudmon, Lay, & Bentley, 2017). Currently, there is not a measurement instrument that is recognized as the "gold standard" for assessing IPE and its impact on collaboration and patient outcomes (Schwindt et al., 2017, p. 24). For this reason, Schwindt et al. recently used factor analysis to assess the construct validity and reliability of a survey for assessing attitudes about IPE and perceived ability to engage in IPE (2017). Their study provided preliminary evidence that the instrument was appropriate for assessing perceptions of students regarding IPE (Schwindt et al., 2017). The current research study seeks to evaluate the appropriateness of The Health Professions IPE Survey for assessing faculty perceptions of IPE.

Exploratory factor analysis is utilized to perform data reduction; it "disentangles complex interrelationships among items and identifies items that 'go together' as unified concepts" (Polit & Beck, 2008, p. 487). The goal of factor analysis is to extract groups of highly interrelated items from a correlation matrix (Polit & Beck, 2008). Factor analysis allows the researcher to clarify the underlying dimensions of a large set of constructs; these underlying dimensions are termed factors (Polit & Beck, 2008).

The first step in factor analysis is factor extraction, which "condenses items in the data matrix into a smaller number of factors and thus is used to define the number of underlying dimensions. The general goal is to extract clusters of highly interrelated items from the correlation matrix" (Polit & Beck, 2008, p. 487). In factor analysis, eigenvalues are percentages of variance accounted for by each factor (Polit & Beck, 2008). An eigenvalue over 1.00 is generally considered significant (Polit & Beck, 2008). Another guideline is that at least 60% of the total variance should be accounted for by the factors extracted, and that for any factor to be meaningful, it must account for at least 5% of the variance (Polit & Beck, 2008).

Factor loadings can range from -1.00 to +1.00, expressing the correlation between individual items and factors (Polit & Beck, 2008). Examining the factor loadings allows the researcher to determine which items belong to a factor; loadings with a value of at least .40 are often used as the cut-off value (Polit & Beck, 2008). Interpretation of the underlying dimensions can be performed by inspecting the common themes of those survey items; this allows the researcher to name the factors (Polit & Beck, 2008). Results of factor analysis can be used in future instrument development regarding item retention and deletion (Polit & Beck, 2008).

The researcher developed the Health Professions IPE Survey to assess graduate faculty and staff perceptions regarding IPE for dental, health science, and nursing students. Responses were factor analyzed, which revealed two dimensions: Positive IPE Perception and NSU IPE. Principal components factor analysis, which is the most widely used factor extraction method, shows that two factors account for approximately 72% of the variance in the overall total score of Likert items on the survey instrument (See Table 1). The first two components have eigen values over 1 (9.911 and 1.561). The first component accounts for a reliable 62% (61.946%) of the variance in the total score. This component has been named Positive IPE Perception. The second component accounts for another 9.8% (9.755%) of the variance in the total score. The second component has been named NSU IPE. Factor analysis is an important step when evaluating any new survey instrument, and this factor analysis demonstrates that one component accounts for 62% of the variance in the 16 Likert (non-demographic) survey items. Other components could have possibly become evident if there was a larger sample size or fewer 4 and 5 (agree, strongly agree) responses.

The factor loadings for each component are reported in Table 2. Component one (Positive IPE Perception) is correlated with numerous survey items. The following survey

questions are correlated to component one: question 4 (.645), question 5 (.923), question 6 (.827), question 7 (.919), question 8 (.794), question 9 (.905), question 10 (.930), question 11 (.869), question 12 (.805), question 13 (.795), question 14 (.875), question 15 (.846), question 16 (.776). The following survey questions are correlated to component two (NSU IPE): question 18 (.739) and question 19 (.662). There was an overwhelmingly positive response to IPE for dental, health science, and nursing students as evidenced by component one (Positive IPE Perception); however, there was a more negative perception about IPE at NSU as evidenced by component two (NSU IPE), possibly due to financial and administrative considerations. Question 5, which was originally the main criterion variable, correlated .92 with component number one (Positive IPE Perception). Factor analysis of this data legitimizes the need for future survey development.

Table 1

Factor Analysis Total Variance Explained

Component	Initial Eigenvalues	% of Variance	Cumulative %
1	9.911	61.946	61.946
2	1.561	9.755	71.702
3	.945	5.908	77.610
4	.834	5.215	82.826
5	.616	3.848	86.674
6	.524	3.275	89.949
7	.445	2.779	92.727
8	.312	1.952	94.680
9	.235	1.467	96.147
10	.176	1.101	97.248
11	.113	.706	97.954
12	.099	.620	98.574
13	.076	.474	99.048
14	.061	.382	99.430
15	.054	.337	99.767
16	.037	.233	100.000

Table 2

Factor Analysis Component Matrix

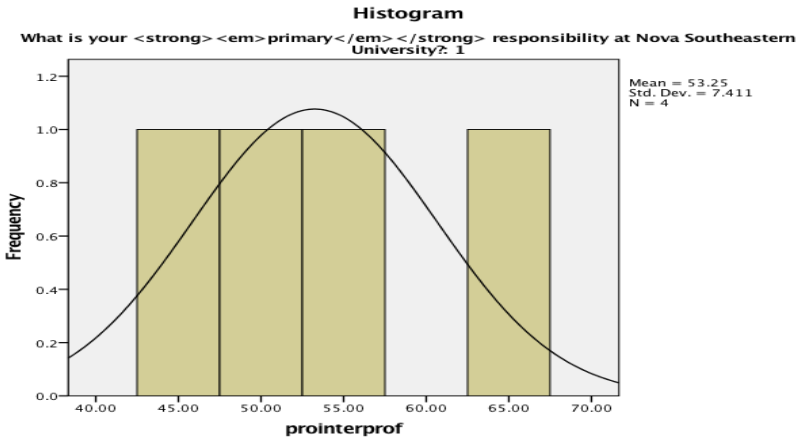
Survey Question	Component 1	Component 2
4. It is important for dental, health science, and nursing students to understand each other's skills and roles in patient care.	.645	-.092
5. Dental, health care science, and nursing students should participate in classroom and clinical experiences with one another.	.923	-.239
6. Interprofessional education prepares dental, health care science, and nursing students for real-world clinical practice.	.827	-.292
7. Interprofessional education would improve dental, health care science, and nursing students' ability to communicate effectively with other disciplines.	.919	-.168
8. Dental, health care science, and nursing students should participate in classes with students from other disciplines.	.794	-.207
9. Dental, health care science, and nursing students should participate in interprofessional clinical experiences.	.905	.061
10. Patients' health outcomes (examples: blood glucose control, periodontal conditions, nutritional status, etc.) might improve if dentists, health care professionals and nurses work collaboratively to develop treatment plans.	.930	-.100
11. Quality of patient education will improve if dentists, health care professionals, and nurses work cooperatively.	.869	-.016
12. Dentists should be able to provide information to their patients regarding systemic health conditions, such as diabetes and cardiovascular disease and how they relate to	.805	.177

oral health.		
13. Health care professionals and nurses should be able to provide information to patients regarding oral diseases, such as periodontal disease and dental cavities.	.795	.148
14. Dental students should receive training from faculty in health care sciences/nursing.	.875	-.166
15. Health care science/nursing students should receive training from dental school faculty.	.846	-.276
16. I feel confident in my ability to lead my students in an interprofessional activity with other health care professions.	.776	.178
17. NSU currently provides opportunities for interprofessional collaboration between dental, health care science, and nursing students (i.e. didactic courses involving more than one discipline, clinical experiences with other disciplines, etc.)	.398	.390
18. There are financial considerations to the implementation of increased interprofessional activities at NSU for dental, health care science, and nursing students.	.499	.739
19. There are administrative considerations to the implementation of increased interprofessional activities at NSU for dental, health care science, and nursing students.	.525	.662

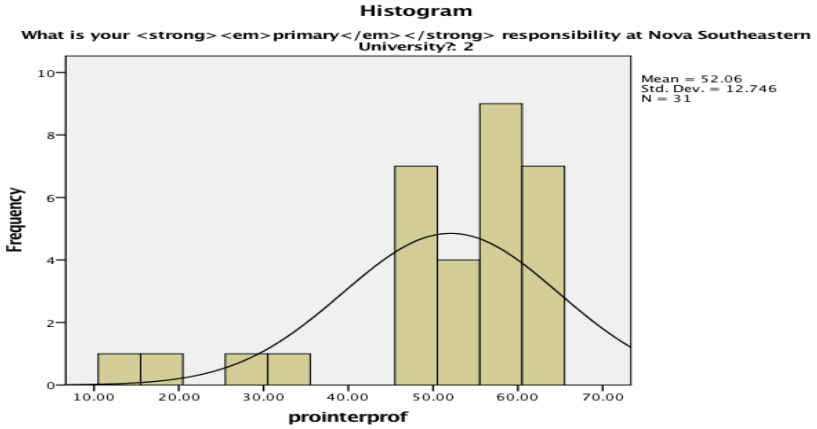
The data were used to examine primary responsibility, college, and department by the new factor variable Positive IPE Perception. When examining primary responsibility (faculty, staff, administrator), the 31 faculty had an average positive score of 52 for Positive IPE Perception. Staff had an average positive score of 53, but there are only four staff responses. Administrators had an average positive score of 58, but there are only nine administrator responses. The 31 faculty show a negative skew, so they are more positive about IPE than not.

With only nine administrators and four staff, the researcher cannot say that any one group is more positive regarding IPE than the other groups; however, it is evident that faculty have positive perceptions of IPE. See Figure 1.

Staff



Faculty



Administrator

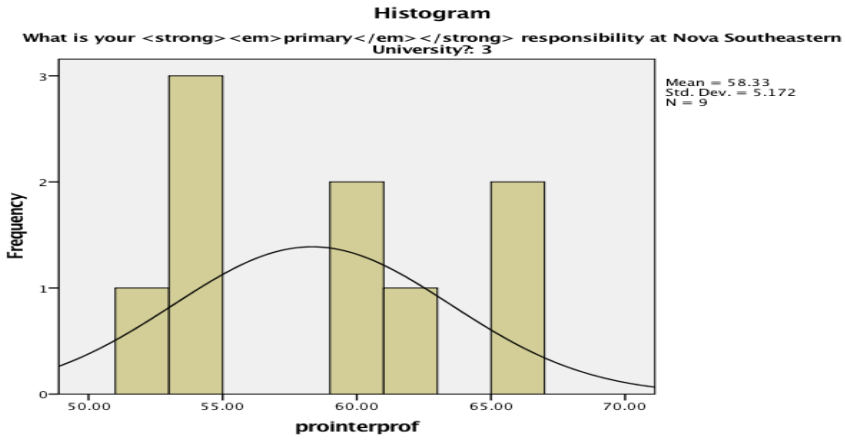
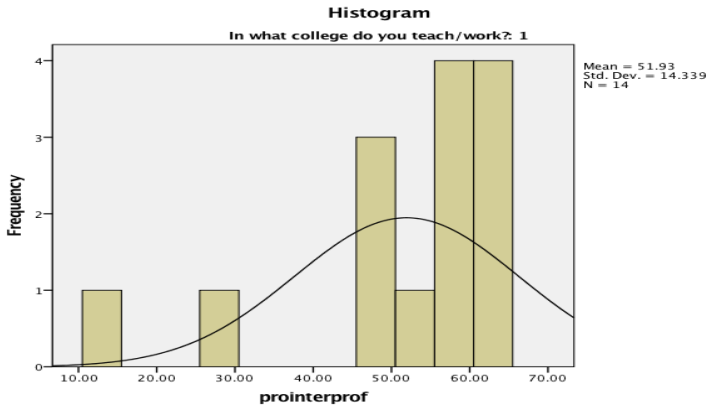


Figure 1. Primary responsibility and positive IPE perception (staff, faculty, administrator)

The data were also used to examine the college in which respondents teach by the factor variable Positive IPE Perception. When examining the college in which the respondents teach (Dental Medicine, Health Care Sciences and Nursing), the 14 respondents from the College of Dental Medicine had an average positive score of 52 for Positive IPE Perception. The 31 respondents from the College of Health Care Sciences had an average positive score of 54 for Positive IPE Perception. There were not enough valid responses from the College of Nursing to determine the score for Positive IPE Perception. See Figure 2.

College of Dental Medicine



College of Health Care Sciences

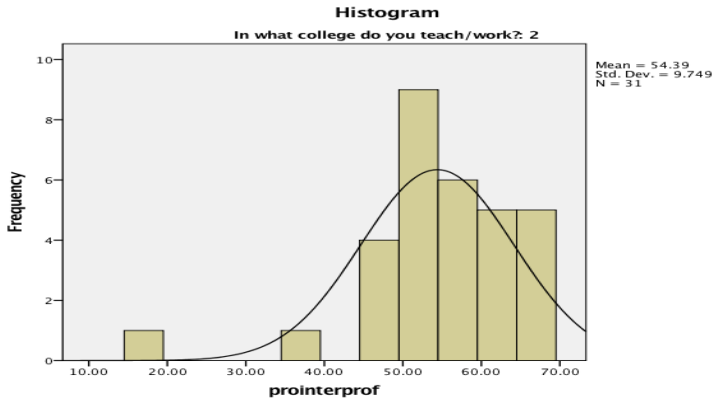


Figure 2. College and positive IPE perception (College of Dental Medicine and College of Health Care Sciences)

The data were also used to examine the department in which respondents teach by the factor variable Positive IPE Perception. When examining the department in which the respondents teach, the average positive scores for Positive IPE Perception were as follows:

Anesthesia (two respondents): 53.5

Audiology (three respondents): 45.7

Dental Medicine (14 respondents): 51.9

Health Sciences (six respondents): 49.5

Nursing (one respondent): 65

Occupational Therapy (five respondents): 57.4

Physical Therapy (four respondents): 53.3

Physician Assistant (five respondents): 55.6

Speech Language Pathology (four respondents): 60.0

Qualitative Results

The survey included three questions that asked respondents to include comments on current opportunities for IPE at NSU, as well as financial and administrative considerations to

the implementation of increased IPE activities at NSU. Qualitative data were analyzed using ATLAS.ti software. Responses grouped by codes are found in Appendix F. Appendix G includes responses grouped by question.

When asked whether NSU currently provides opportunities for interprofessional collaboration between dental, health care science, and nursing students (Question 17), only 9.3% of participants strongly agreed with this statement. 33.3% agreed, 20.4% neither agreed or disagreed, 31.5% disagreed, and 5.6% strongly disagreed. This demonstrates that the majority of faculty and staff responding to this survey do not feel or are not sure that IPE activities are being conducted including these specific groups.

The following activities were identified when examining the qualitative data for question 17 clinical IPE, general IPE, one day IPE events, unsure about IPE activities, IPE activities not including dental, and IPE including dental. One respondent reports that IPE opportunities exist in the form of clinical rotations. Four respondents mention general IPE opportunities among various different student groups. One respondent reported that there is a one day "IPE day" at NSU, but they did not specify which student groups or programs are involved. One respondent was unsure about courses where IPE activities may be occurring. Four respondents report that IPE opportunities are available to health professions student groups, but they do not include dental students. Only one respondent specifically stated that dental students are participating an IPE activity; this is the Interprofessional Diabetes Education and Awareness Initiative.

Based on the qualitative data from this question, it appears that some IPE activities are taking place at NSU; however, many respondents were unable to name specific student programs involved in these activities. It also appears that dental students are not involved in many of these activities. Only one respondent specifically mentioned an activity that included dental students.

It is possible that dental students are involved in more IPE activities than these particular faculty and staff are aware of. It is also possible that dental students are being included in IPE activities with students from other programs that were not included in this research project. Potentially they may be involved in IPE activities with medical students, for example.

Based on the responses to question 18, 55.6% of participants either agree or strongly agree that there are financial considerations to the implementation of increased IPE activities. The following financial concerns regarding IPE were identified: billing for clinical patients, class sizes, compensation, facilities, financial savings, time, unsure, and determining which department funds the program/event. Two respondents reported that billing for clinical patients would be difficult because of coding issues and reimbursement for different departments. One respondent reported that increasing class sizes would be logistically and financially difficult. Two respondents reported that faculty compensation and compensation for each department involved in IPE activities is an issue. Three respondents reported that facilities could be an issue with increased IPE activities; they reported time, access, location and limited space as impacting facility issues. One respondent reported that there could actually be financial savings if colleges could share faculty. One respondent indicated that time was a financial consideration. One respondent was unsure of the financial considerations. Three respondents stated that determining which department should fund IPE programs and events was an important financial consideration, and one of these stated that it is an issue that has been discussed on the IPE committee at NSU. There appear to be many financial considerations that faculty and staff are aware of; availability of facilities and determining which department should pay for the programs are the most frequent concerns.

Based on responses to question 19, 85.2% of participants agreed or strongly agreed that there are administrative considerations to the implementation of increased IPE activities. The following administrative concerns regarding IPE were identified: lack of evidence for the benefit of IPE, coordination of providers, curriculum development issues, equipment, facilities, faculty buy-in, faculty training, faculty workload, institutional issues, location issues, relevance to dental, scheduling, time, and which department should fund the program/event. One respondent expressed concern about whether there are any studies that show improved patient outcomes from IPE. Two respondents reported that coordination of providers is an issue; this includes coordination of faculty and students, as well as clinical providers. Three respondents reported that there are curriculum development issues, such as meeting the requirement of professional boards and coordination among program administrators to design program curricula. One respondent shared concerns about sharing of equipment. Six respondents listed facilities as a concern; they listed inadequate space and ability to schedule rooms as a major concern, as well as, the fact that some programs are not on the same campus to schedule and set up activities. One person was concerned about faculty buy-in, while one was concerned about faculty training for IPE. Faculty workload was a concern to one respondent. One respondent mentioned institutional issues, specifically that any change requires "a lot of time, red tape, and frustration." Two respondents mentioned location issues, mainly due to the fact that many different programs are located at different campuses; therefore, planning would be difficult. One respondent stated that it would be challenging to develop relevant cases for his/her discipline (audiology) to benefit from IPE, especially with dental students. The most frequent concern regarding IPE activities, with eight respondents noting it, was scheduling which included scheduling of space, scheduling of students, scheduling of faculty, and scheduling activities within the curriculum. Three

respondents stated that time was a consideration which also related to scheduling. One respondent was concerned about which department would fund the IPE program/event, relating to which department would receive the tuition dollar allocation for the particular courses.

The most common themes identified for question 17 indicate that there are general IPE activities being conducted at NSU; however, it is reported that dental students are not involved in most of those activities. Only one respondent specifically reported an activity that included dental students.

The most common themes identified for question 18 indicate that the most common financial concerns or considerations are access to facilities and determining which college or department will be responsible for funding specific IPE activities or experiences.

The most common themes identified for question 19 indicate that the most common administrative concerns or considerations are access to facilities and difficulty with scheduling. Eight of the sixteen comments on question 19 discuss scheduling as an administrative concern, and six of the 18 comments mention facilities.

These financial and administrative considerations may play a role in faculty/staff reluctance to agree that students should participate in didactic IPE courses with faculty from other departments or colleges, despite the fact that they acknowledge that IPE is beneficial for students

Summary of Results

This research study was designed to investigate the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities. There were 54

participants from NSU's College of Dental Medicine, College of Health Care Sciences, and College of Nursing. The responses to the survey items indicated that faculty and staff believe that IPE is beneficial in increasing the ability of students to understand the roles of other disciplines, to work collaboratively in real-world clinical practice, to communicate effectively with other disciplines, to improve patient health care outcomes and patient education. However, the responses to questions related to implementation were neutral on the topic.

Participants reported that some IPE activities are taking place at NSU; however, many respondents did not name specific student programs involved in these activities. Dental students were only specifically mentioned in one activity. The availability of facilities and determining which department should pay for the programs were the most frequently named financial concerns while scheduling related issues were an administrative concern.

Responses were factor analyzed, which revealed two dimensions: Positive IPE Perception and NSU IPE. Principal components factor analysis shows that two factors account for approximately 72% of the variance in the overall total score of Likert items on the survey instrument. There is an overwhelmingly positive response to IPE for dental, health science, and nursing students as evidenced by component one (Positive IPE Perception); however, there seems to be a more negative perception about IPE at NSU as evidenced by component two (NSU IPE), possibly due to financial and administrative considerations. Factor analysis of this data, legitimizes the need for future survey development.

Chapter 5

Discussion

Introduction

IPE experiences have the potential to encourage collaboration among students from different disciplines, and students involved in these types of programs report improved attitudes toward teamwork and a better understanding of what other professions have to offer (Jaecks, 2009). Dental and medical professionals have many opportunities to work together to improve patient outcomes; however, there is little interaction between dental students and other medical professionals during their education. As a result, dental and medical professionals often do not collaborate because they know little about each other's roles. Research has demonstrated a significant link between periodontal disease and several systemic diseases, including diabetes, cardiovascular/cerebrovascular disease, and an increased risk of preterm/low-birth weight babies (Young et al., 2010; Marshall, 2009; Nunn et al., 2009; Hong et al., 2008; Cullinan et al., 2009; Kidambi & Patel, 2008; Chaudari et al., 2011; Novak et al., 2008; Wilder et al., 2014). This link between oral and systemic health highlights the significance of dental and medical professionals learning about the roles and responsibilities of other disciplines so that they are well equipped to appropriately refer patients when necessary. They also need to be able to work collaboratively to develop treatment plans that address both oral and systemic conditions. Both the Commission on Dental Accreditation (CODA) and the American Dental Education Association (ADEA) have recognized the importance of increasing IPE activities between dental students and other health care professionals (Formicola et al., 2012). However, dental school deans have reported that there are significant challenges to developing and implementing IPE programs (Formicola et al., 2012). Most previous studies on IPE have focused on student perception of participation in IPE

activities, and the majority of these studies have focused on programs that were implemented with medical, nursing, and pharmacy students (Lapkin et al., 2012; Spath et al., 2011; Buckley et al., 2012; Rice et al., 2010). These studies demonstrated that students generally feel positively toward IPE experiences and that IPE resulted in greater understanding and appreciation of the roles of other disciplines (Dufrene, 2012). Examining faculty and staff perceptions of IPE programs regarding benefits of IPE and perceived barriers can be significant in development of IPE programs.

The purpose of this study was to examine the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities.

This study surveyed graduate faculty and staff from NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing to determine how graduate faculty and staff at NSU perceive IPE and the potential for increased IPE activities between dental, health science, and nursing students. The results of this study can be used in future development of a needs assessment survey.

The following a priori research questions were addressed:

1. What current opportunities exist at NSU for IPE among dental students and health science/nursing students?
2. Is there is a perceived need for IPE activities for dental students and health science students?
3. Are there perceived advantages of an IPE program for dental students and health science/nursing students?

4. What features do faculty/staff believe should be included in an IPE program for dental students and health science/nursing students?

5. Are there barriers that exist to the implementation of increased IPE activities for dental students and health science/nursing students?

The survey instrument (The Health Professions IPE Survey) was developed by the researcher because there was not an available instrument to measure the appropriate information. With a new survey, it was impossible to anticipate the psychometric properties of the instrument. The respondents were all positive in their responses to the survey instrument, thus leading to a truncated range with negative skew. Therefore, using correlation and regression to analyze the a priori research questions did not allow the researcher to draw strong conclusions. For these reasons, factor analysis was used to examine the following post hoc research questions:

1. What factors account for the variance in items on the survey instrument relating to pro-interprofessional perceptions?

2. What factors account for the variance in items on the survey instrument relating to NSU items?

Discussion of Results

The 54 participants in this study included 35 (64.8%) faculty, 12 (22.2%) administrators, and six (11.1%) staff from NSU's College of Dental Medicine, College of Health Care Sciences, and College of Nursing. Of the respondents, 36 (66.7%) of the respondents were from the College of Health Care Sciences, 16 (29.6%) were from the College of Dental Medicine, and 2 (3.7%) were from the College of Nursing.

The responses to the survey items were overall very positive toward IPE. There were so many positive responses (agree and strongly agree or 4s and 5s) to survey items that multi-

collinearity occurred because the predictor variables were too highly inter-correlated. Since there was high multi-collinearity, dimension reduction or factor analysis was required to examine factors instead of individual survey questions since they will not have the power to uniquely predict the desired outcomes. Factor analysis was used to determine reliability of the survey components and to examine what subsets of questions were related to one another. Therefore, post hoc research questions are addressed in addition to the a priori research questions identified prior to data collection.

Discussion of A Priori Research Questions

The first research question related to the current opportunities that exist at NSU for IPE among dental students and health science/nursing students. When asked whether NSU currently provides opportunities for interprofessional collaboration between dental, health care science, and nursing students, only 9.3% of participants strongly agreed with this statement. 33.3% agreed, 20.4% neither agreed or disagreed, 31.5% disagreed, and 5.6% strongly disagreed. When examining the qualitative data from this question, it appears that some IPE activities are taking place at NSU; however, many respondents did not name specific student programs involved in these activities. It also appears that dental students are not involved in many of these activities. Only one respondent specifically mentioned an activity that included dental students. It is possible that dental students are involved in more IPE activities than these particular faculty and staff are not aware of. It appears that IPE activities are taking place, but that all programs are not currently involved. It is also possible that dental students are being included in IPE activities with students from other programs that were not included in this research project. Potentially they may be involved in IPE activities with medical students, for example. Further

research could include a larger sample of faculty and staff from other colleges and departments to obtain a wider understanding of campus IPE activities.

If dental students are not being involved in IPE activities with other departments and programs, this would need to be addressed. Research shows that after IPE faculty development activities, participants have expressed their understanding that oral health needs to be incorporated into IPE programs. A faculty seminar was conducted and evaluated at Southern Illinois University Edwardsville; the seminar was designed to explore the topic of IPE, to encourage dialogue between health professions programs, and to identify opportunities for IPE (Poirier & Wilhelm, 2014). After evaluation, the theme of oral health was deemed to have the potential for further follow up, with faculty members from medicine, nursing, and pharmacy planning to follow up with the faculty member from the school of dental medicine for future collaboration (Poirier & Wilhelm, 2014). This research suggests that when faculty members from different disciplines have the opportunity to network, they can identify opportunities for future collaborations that they may not have considered before; dental medicine certainly has a role to play in these collaborations.

The second research question involved the perceived need for IPE activities for dental students and health science/nursing students. There is a perceived need for IPE among dental, health science and nursing students by faculty and staff at NSU; faculty and staff report that it is important for these students to understand each other's roles and participate in clinical experiences and classroom experiences together. Fewer respondents reported that IPE prepares students for real-world practice; this should be explored in further research, because IPE clinical experiences should be vital in preparing students for a future in which health professionals work together.

Faculty and staff report positive feelings toward the outcomes of IPE as evidenced by their responses to questions 4, 5, 6, 7, 12, and 13. The responses to these questions demonstrate that faculty and staff believe that IPE is beneficial in increasing the ability of students to understand the roles of other disciplines, to work collaboratively in real-world clinical practice, to communicate effectively with other disciplines, to improve patient health care outcomes and patient education. However, the questions that relate to implementation do have more responses from faculty and staff who were neutral on the topic. On question number eight, 29.6% of respondents were neutral on the statement that dental, health science, and nursing students should participate in classes with students from other disciplines. Only 3.7% were neutral when asked in question number nine if students should participate in interprofessional clinical experiences. So, the faculty and staff seem to have a more positive perception of interprofessional clinical experiences than classroom experiences. Further research should focus on why faculty and staff feel more positively about clinical IPE experiences as compared to didactic IPE experiences. Faculty and staff also reported various financial and administrative barriers that could contribute to these outcomes. The reluctance to participate in didactic interprofessional experiences could be due to a lack of training in IPE. Many faculty have not received training in IPE, and research regarding faculty development in IPE is emerging (Jones, Schuer, Ballard, Taylor, Zephyr, & Jones, 2015). The National Center for Interprofessional Practice and Education (NCIPE) is focused on supporting and advancing IPE efforts and provides resources for faculty development; these resources are important in the development of any IPE program to improve faculty motivation and buy-in (Jones et al., 2015). After a faculty development program, all faculty reported that simulation exercises with students were beneficial to faculty development (Jones et al., 2015). Faculty also reported improvements in knowledge

and skills, and the majority expressed a desire to participate in future IPE events (Jones et al., 2015). Faculty development activities could improve faculty motivation to participate in development of IPE programs. After targeted faculty development at the Oregon Health and Science University, faculty evaluations of the training were extremely positive, and many participants reported an "IPE epiphany" after discovering new colleagues and potential collaborations (Mladenovic & Tilden, 2017, p. 12). Downstream effects of the training were positive, as student evaluations of faculty were very positive with few negative reviews (Mladenovic & Tilden, 2017).

The third research question involved the perceived advantages of an IPE program for dental students and health science/nursing students. Approximately 85 percent (85.1%) of respondents strongly agreed or agreed that patients' health outcomes (examples: blood glucose control, periodontal conditions, nutritional status, etc.) might improve if dentists, health care professionals, and nurses work collaboratively to develop treatment plans (Question #10). Almost 89 percent (88.9%) of respondents strongly agreed or agreed that quality of patient education will improve if dentists, health care professionals, and nurses work cooperatively (Question #11). Overall, faculty and staff agreed that participation in IPE activities can improve patient outcomes and patient education; therefore, further research should examine the barriers that prevent implementation of IPE activities.

Most IPE research has focused on the benefits of IPE for students; however, researchers at the University of Florida examined the benefits to patients and the community as well (Castaneda, Islam, Stetten, Black, & Blue, 2017). Participants reported they appreciated working with students and they felt they were giving back to the community by working with the younger generation (Casteneda et al., 2017). They perceived themselves as mentors to the students and

felt they were contributing to the students' futures as healthcare providers (Casteneda et al., 2017). They reported that the interprofessional student groups provided them with improved health information, emotional support, and companionship; therefore, this particular IPE project contributed to student learning and improvements for patients (Casteneda et al., 2017).

The fourth research question involved the features that should be included in an IPE program for dental students and health science/nursing students. Almost 58 percent (57.4%) of respondents strongly agreed or agreed that dental, health care science, and nursing students should participate in classes with students from other disciplines (Question #8). Almost 30 percent (29.6%) of respondents were neutral, and 13% disagreed or strongly disagreed. Almost 89 percent (88.8%) of respondents strongly agreed or agreed that dental, health care science, and nursing students should participate in interprofessional clinical experiences (Question #9). Further research should examine why faculty and staff are more positive towards clinical IPE experiences in comparison to classroom experiences. Almost 67 percent (66.6%) of respondents strongly agreed or agreed that dental students should receive training from faculty in health care sciences/nursing (Question #14). Almost 67 percent (66.7%) of respondents strongly agreed or agreed that health care science/nursing students should receive training from dental school faculty (Question #15). The responses to question number 14 show that 25.9% of the respondents were neutral on the topic of dental students receiving training from faculty in health care science/nursing. On question number 15, 24.1% were neutral about whether health care science/nursing student should receive training from dental school faculty. Further research should seek faculty input regarding the most beneficial types of IPE clinical experiences and which classes could be designed to allow participation from different groups of students.

Research comparing different types of IPE programs is emerging and can be beneficial in planning future IPE programs. In 2011, researchers compared programs at three different universities; the three different models represented a didactic program, a community-based experience, and an interprofessional simulation experience (Bridges, Davidson, Odegard, Maki, & Tomkowiak). The didactic program focused on team building skills, knowledge of other professions, patient centered care, service learning, culture and its impact on healthcare delivery, and an interprofessional clinical component (Bridges et al., 2011). The community based experience focused on providing services to patients through interprofessional collaborations and examining how access to resources affected patients' health status (Bridges et al., 2011). The interprofessional simulation experience was used to help students develop skills in communication and leadership (Bridges et al., 2011). Each of these models has common elements that contributed to their success. The researchers named certain elements that need to be included in all IPE programs regardless of format; these include: responsibility, accountability, coordination, communication, cooperation, assertiveness, autonomy, and mutual trust and respect (Bridges et al., 2011). They also presented four recommendations for a successful interprofessional program, no matter the type of program an institution chooses; they include: administrative support, interprofessional programmatic infrastructure, committed and experienced faculty, and acknowledgment of student efforts through awards, certificates, or grades (Bridges et al., 2011). They found that all three models were effective in helping students to understand others' professions and their own role in the health care team, as well as the impact of interprofessional efforts (Bridges et al., 2011).

The reluctance to participate in didactic IPE courses may be due to the barriers that faculty and staff report regarding time, scheduling, and space. The University of California San

Francisco has used a blended learning approach using both asynchronous and synchronous learning to overcome some common barriers (Chen et al., 2017). These authors discussed the fact that some of the most common barriers to IPE are scheduling, space, time for training, matching levels of learners, faculty development, and institutional buy-in (Chen et al., 2017). This blended format used online modules and facilitated face-to-face small group sessions in the classroom thereby eliminating many of the barriers normally reported (Chen et al., 2017). Having the online content allowed all learners to receive the same access to content when it fit their schedules and allowed them to be better prepared for their face-to-face sessions (Chen et al., 2017). This preparation allowed the face-to-face sessions to include more meaningful interactions with peers from other disciplines (Chen et al., 2017). This type of program could be a potential model for elimination of barriers and improving faculty buy-in.

The fifth research question involved the barriers to the implementation of increased IPE activities for dental students and health science/nursing students. Respondents noted the following financial barriers to IPE: billing for clinical patients, class sizes, compensation, facilities, financial savings, time, unsure, and determining which department funds the program/event. These financial considerations may play a role in faculty/staff reluctance to agree that students should receive didactic educational experiences from faculty in other departments or colleges, despite the fact that they report positive perceptions of IPE. In planning for increased IPE courses, it would be important to survey faculty, staff, and administrators regarding these financial barriers and strategies for overcoming them. To obtain faculty buy-in to any program that involves interprofessional didactic courses, they would need to be involved in planning. This would require administrators from the different colleges to budget for IPE facilities and funding of faculty to teach interdisciplinary courses.

Faculty and staff also mention difficulties in billing for patients in clinical settings; however, community clinics that incorporate students from multiple disciplines are wonderful learning experiences, and they provide care to many underserved communities. The Oregon Health and Science University has benefitted from the construction of a collaborative life sciences education building which is under the central control of the university, as opposed to individual departments or colleges (Mladenovic & Tilden, 2017). It is equipped with spaces for large and small learning groups and simulation labs (Mladenovic & Tilden, 2017). While a new building may not always be feasible, the authors recommend examining underutilized space and equipment (Mladenovic & Tilden, 2017).

Many respondents shared administrative concerns related to the implementation of increased IPE activities. Approximately 85 percent (85.2%) of participants agreed or strongly agreed that there are administrative considerations to the implementation of increased IPE activities (Question #19). Respondents noted the following administrative barriers to IPE: lack of evidence of the benefits of IPE, coordination of providers, curriculum development issues, equipment, facilities, faculty buy-in, faculty training, faculty workload, institutional issues, location issues, relevance to dental, scheduling, time, and determining which department should fund the program/event

Curricular issues can be barriers to IPE because typically courses are approved by school curriculum committees; establishing a review and approval process for IPE courses by a university curriculum committee could help eliminate this issue (Mladenovic & Tilden, 2017). The administrative concerns shared by faculty and staff are probably common to different institutions. Many of the administrative concerns mentioned are related to financial and budgetary concerns, as well. This suggests that the successful implementation of increased IPE

activities will require a commitment from the institution to provide adequate financial support to the development of these programs and activities. Since each program, department, and college has its own interests, they must be assured that increased IPE activities will benefit their particular students and that there will be no detrimental effects to their current budget. It appears that the majority of faculty and staff have positive perceptions of IPE activities for their students; however, they are also aware of the barriers and concerns. It appears that no department or college wants to lose funding or space to create IPE programs; therefore, communication and planning that involves faculty, staff, and administrators from all the programs involved would be important. Having a separate budget and buildings for IPE activities could be a possible solution. Although centers for IPE exist they are often small, underfunded, and without adequate staff and faculty support (Chen, Delnat, & Gardner, 2015). For academic health centers to be effective delivery systems for IPE, institutional commitment is necessary.

Researchers at the Medical University of South Carolina examined how IPE has been incorporated into their institutional culture; they state that for implementation of IPE to have longevity and sustainability, there must be a strategic institutional approach (Blue, Mitcham, Smith, Raymond, & Greenberg, 2010). At their institution, IPE is incorporated into four different domains: curricular, extracurricular, faculty development, and health care simulation (Blue et al., 2010). They state that faculty must embrace interprofessional collaboration in their work with students and in their other academic functions to be good role models and mentors for IPE (Blue et al., 2010). As a sign of the institutional commitment to IPE, faculty interprofessional collaboration is included in criteria for faculty promotion and university faculty awards (Blue et al., 2010). This is an effective way to demonstrate that interprofessional collaboration is valued by the institution.

Researchers at the University of Washington also found that providing incentives was important in encouraging faculty participation in IPE activities, especially since most IPE activities are in addition to regular workloads (Willgerodt et al., 2015). These incentives included thank you notes and letters to department chairs and supervisors that could be used later to demonstrate participation and contribution to IPE activities for career progression (Willgerodt et al., 2015). Faculty are more willing to participate in planning and implementation of IPE activities when they feel that they are appreciated for their efforts and that they will be rewarded professionally. Allowing faculty and staff to be involved in the planning process for IPE projects is important, as well. Anderson and Thorpe (2010) found that educators who take on a leading role in developing, designing, and delivering IPE curricula develop stronger working relationships with colleagues and exhibit improved quality of instruction.

The barriers identified by faculty in the current research project are similar to those identified at other institutions (Lawlis, Anson, & Greenfield, 2014). Lawlis et al. (2014) also identified factors that enable IPE adoption at the government, institutional, and individual level. At the government level, they identified the following enabling factors: establishment of collaborative groups, stakeholder commitment, shared ownership and unified goals, and government funding (Lawlis et al., 2014). At the institutional level, the enablers identified were funding by the institution, development of appropriate organizational structures and administrative support, and faculty development programs (Lawlis et al., 2014). The majority of enablers identified were at the individual level including skill of the facilitator, enthusiasm of the facilitator/staff, staff as role models, champions for IPE, commitment to IPE, understanding of IPE, shared interprofessional vision, and the ability to remove boundaries and treat everyone equally regardless of position or background (Lawlis et al., 2014). Therefore, funding and

institutional support are very important in developing IPE programs, but so is faculty development and developing a culture where faculty and staff value IPE at the individual level. Lawlis et al. (2014) stated that faculty development programs are key drivers in addressing barriers to IPE and facilitating change. Faculty participants at the University of Missouri confirmed the value of a faculty development program with peer learning arising from the faculty development community, adaptation of curricula, experiential learning, and ongoing coaching and mentoring being especially effective (Hall & Zierler, 2015). Developing faculty and imbedding these development programs within the structures of academic health centers is essential for success (Hall & Zierler, 2015).

Adult learning theory (ALT) has been the theory most often associated with IPE (Hean et al., 2012). One of the underlying assumptions of ALT is that students and faculty can work together demonstrating mutual trust and respect to shape and deepen understanding (Hean et al., 2012). This is applicable to IPE because one of the main goals of IPE is to encourage professionals to work together by providing the knowledge, skills and attitudes required to collaborate (Sargeant, 2009). To collaborate effectively, practitioners must demonstrate respect for other professions, understand the roles of others, communicate effectively, resolve conflict effectively, and share common goals (Sargeant, 2009). Facilitators of IPE must have adequate knowledge of education and group learning theories, be skilled at managing group dynamics, have problem solving skills, and encourage students to take responsibility for their own learning (Hean, 2012). These skills should be addressed in faculty development activities. Another assumption underlying ALT is that adult learners are responsive to some external motivators; however, their most potent motivators are internal (Hean et al., 2012). Motivation to participate in IPE must be present for these programs to be successful. Adult learners must actively engage

in their learning, and small group work is an effective way to encourage this (Freeman, Wright, & Lindqvist, 2010). Freeman et al. (2010) successfully designed a faculty facilitator development program using the principles of ALT; the program's goal was to train facilitators who would sustain the enthusiasm needed to motivate, encourage and support the process of IPE for students. This internal motivation to lead student in IPE activities is essential for long-term success.

The Medical University of South Carolina designed and implemented a faculty development program based on the conceptual framework of ALT which included an institute, fellowship, and teaching series (Shrader, Mauldin, Hammad, Mitcham, & Blue, 2015). This faculty development program has aided in sustainability of the university's interprofessional program, and led to improvements and growth in IPE activities over the six years it has been in place and faculty participation continues to increase (Shrader et al., 2015). Support from administration in terms of time and money were keys to success (Shrader et al., 2015).

The social cognitive theory (SCT) is a theory of observational learning that focuses on the idea that human learning occurs in a social environment (Schunk, 2016). Bandura's theory states that people acquire knowledge, rules, skills, strategies, beliefs, and attitudes by observing others (Schunk, 2016). IPE allows different health professionals to interact with and observe the behaviors of other disciplines, which is beneficial since much human learning occurs vicariously by observing the behavior of others (Schunk, 2016). A central component of SCT is learning through observation; this highlights the importance of role models and demonstration of collaborative practice by preceptors (Mann et al., 2009). Mann et al. utilized several instructional approaches based on social SCT to train an interprofessional group of students; these included: active learning and experience in solving problems, small group collaborative

practice and problem solving, problem-based learning, opportunities for reflection and integration of learning, and cooperative learning (2009). They emphasize the importance of further research on theoretical frameworks related to IPE.

Another important concept in SCT is perceived self-efficacy (Schunk, 2016). For IPE programs to be effective, faculty and staff need to feel that they are capable of leading their students in IPE activities; higher levels of perceived self-efficacy enhance motivation and performance (Coogle, Hackett, Owens, Ansello, & Mathews, 2016). In the current research project, question number 16 asked participants whether they feel confident in their ability to lead their students in an interprofessional activity with other health care professions. Over 75% of the respondents strongly agreed or agreed with the statement. This is encouraging; however, faculty development activities can be developed to increase perceived self-efficacy. Self-efficacy beliefs influence which activities someone decides to undertake, how much effort they will expend on the activity, and how long they will persist if difficulties should arise (Williams, Beovich, Ross, Wright, & Ilic, 2017). Self-efficacy can be developed over time and modified depending on experiences (Williams et al., 2017). Research has shown that educational programs can improve student self-efficacy (Williams et al., 2017); therefore, faculty self-efficacy may be improved by faculty development programs. Coogle et al. reported significant improvements in perceived self-efficacy and changes in academic teaching, career development, and clinical supervision after completion of an interprofessional faculty development program involving geriatric patients; this improved self-efficacy led to improved behavioral motivation and performance (2016).

Observational learning refers to learning that takes place through observing the behavior of others (Lee, Kim, & Park, 2015). Nursing students who participated in simulation activities

reported that they learned the importance of observing how their peers handled situations, understanding of group dynamics, the efficiency of teams, and recognizing teachable moments after taking on the role of observers (Lee et al., 2015). Observational learning through modeling occurs when individuals display new patterns of behavior after observing the modeled behaviors; there are four processes of observational learning: attention, retention, production and motivation (Schunk, 2016; Renkl, 2014). Observer attention is required so that relevant events are meaningfully perceived; the learner must pay attention to the relevant behavior (Schunk, 2016; Renkl, 2014). Retention occurs when the individual cognitively organizes, rehearses, codes, and transforms modeled information for memory, while production involves translating those memories of modeled events into actual behaviors (Schunk, 2016). Motivation is important to observational learning, because individuals are more likely to engage in the previous three processes if they believe that the modeled behavior is important (Schunk, 2016). Participant enthusiasm and motivation toward IPE affects their willingness to fully engage in the learning experience (Van Soeren et al., 2011). Research has shown positive effects of observational learning in academic learning (Renkl, 2014). Therefore, insight into faculty perceptions is very important regarding IPE; faculty must feel that interprofessional practice is important, and they must be able to convey this to students in order for effective observational learning to occur. Faculty must value IPE in order for them to feel motivated to participate effectively in IPE programs and to model that behavior for students. Motivation is affected by many variables; there may be contextual variables that interfere with faculty/staff motivation to participate in IPE programs (Schunk, 2016).

Discussion of Post Hoc Research Questions

The two post hoc research questions involved what factors accounted for the variance in items on the survey instrument relating to pro-interprofessional perceptions and NSU items. Responses were factor analyzed, which revealed two dimensions: Positive IPE Perception and NSU IPE. Principal components factor analysis shows that two factors account for approximately 72% of the variance in the overall total score of Likert items on the survey instrument. The first component (Positive IPE Perception) accounts for a reliable 62% of the variance in the total score. The second component (NSU IPE) accounts for another 9.8% of the variance in the total score. Factor analysis is an important step when evaluating any new survey instrument, and this factor analysis demonstrates that one component accounts for 62% of the variance in the 16 Likert (non-demographic) survey items. Other components could have possibly become evident if there was a larger sample size or less 4 and 5 (agree, strongly agree) responses.

Component one (Positive IPE Perception) is correlated with numerous survey items. There is an overwhelmingly positive response to IPE for dental, health science, and nursing students as evidenced by component one (Positive IPE Perception); however, there seems to be a more negative perception about IPE at NSU as evidenced by component two (NSU IPE), possibly due to financial and administrative considerations.

Factor analysis of this data, legitimizes the need for future survey development. With only nine administrators and four staff, the researcher cannot say that any one group is more positive regarding IPE than the other groups; however, it is evident that faculty have positive perceptions of IPE. Since this research demonstrates that faculty and staff have a positive perception of IPE, future survey development should focus on examining why there is a

difference in perception regarding didactic versus clinical experiences and seeking input from faculty and staff on overcoming barriers that have been reported in this study.

Implications

Factor analysis of the data obtained from the Health Professions IPE Survey can be used to assess the survey's psychometric properties and can assist in future development of a survey instrument with robust psychometric properties that measures constructs relating to faculty perceptions of IPE. This future survey could be used with a larger sample of faculty and staff from a larger number of colleges and department to gather data on the perceptions of faculty from a wider variety of disciplines.

The results of this research can be used in designing IPE programs and activities in the future. Understanding how faculty and staff perceive IPE and its benefits and barriers to implementation can lead to designing successful IPE programs that have more faculty/staff acceptance.

Faculty reluctance to engage in IPE activities can be addressed by faculty development programs; the first step is introducing faculty from different disciplines. These faculty are likely to develop collaborative relationships and to discover areas of potential collaboration that they may not have considered previously. Perceived self-efficacy will also be increased with participation in faculty development programs. Faculty should be involved during the planning stages of these faculty development programs to improve faculty buy-in. Including faculty and staff in the planning process leads to educators taking on a leadership role in developing, designing, and delivering IPE curricula and leads to stronger relationships among colleagues. ALT concepts can be used in designing these programs. Incorporating IPE into criteria for faculty promotion and awards can lead to increased motivation to participate in IPE activities.

This improved motivation to model IPE behaviors increases the potential for observational learning.

Financial barriers can be addressed by funding IPE activities from the university rather than individual colleges or departments; this addresses the issue of determining who should fund the activities. Having a building specifically for IPE activities that is funded by the university rather than individual colleges or departments is ideal; however, it is not always feasible. Imbedding faculty development programs within the structure of academic health centers can lead to increased success. Creating a university curriculum committee for approval of IPE courses instead of at the college level could also eliminate barriers. Institutional commitment and financial support is essential for success of any IPE program.

Recommendations

Future research should include a larger sample from other colleges and departments to assess whether dental students are being included in IPE activities with colleges or departments that were not included in the present study. Future research should also investigate why faculty did not as strongly agree that IPE prepares students for real-world clinical practice, in spite of the fact that they were positive toward IPE. Why faculty feel more positively toward clinical versus classroom IPE experiences should also be explored. Faculty and staff should be asked for input regarding the most beneficial types of IPE experiences and specific courses that they feel could be modified to include different student groups. Future research should expand on the barriers reported in this study and investigate how these barriers are or can be reduced or eliminated. They should also be asked to identify enablers for IPE at NSU, and their input should be sought regarding faculty development programs for IPE. Future research should also include faculty, staff, and administrators from other institutions.

Limitations and Delimitations

A potential limitation and threat to external validity in this study was the ability to generalize these results to other populations. Although the respondents were from three different colleges, this study was conducted at a single institution. Other limitations include the small sample size and low response rate.

Summary

Dental and medical professionals have opportunities to work together to improve patient outcomes; however, there is little interaction between dental students and other medical professionals during their education. As a result, dental and medical professionals often do not work together, because they know little about each other's roles. Research has shown a strong correlation between oral and systemic disease; therefore, there is an increased need for collaboration between dental and medical professionals.

This purpose of this study was to examine the current opportunities that exist for IPE at NSU, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that should be included in an IPE program, and the perceived administrative and financial barriers to increased interprofessional activities. Understanding faculty/staff perceptions may be beneficial in designing and implementing future IPE programs.

This study surveyed graduate faculty and staff from NSU's College of Health Care Sciences, College of Dental Medicine, and College of Nursing, regarding their views on IPE. The study used the Health Professions IPE Survey, a mixed-methods survey, in which both quantitative and qualitative data were collected. The survey was administered via an anonymous

online survey. The researcher predicted that faculty/staff do perceive IPE as valuable; however, there may be barriers that are preventing implementation.

A link to the anonymous online survey was sent to 459 graduate faculty and staff; a total of 54 surveys completed. 64.8% of the respondents were faculty, 22.2% were administrators, and 11.1% were staff. 66.7% of the respondents were from the College of Health Care Sciences, 29.6% were from the College of Dental Medicine, and 3.7% were from the College of Nursing. The majority of respondents were positive regarding the benefits of IPE for students. There was multi-collinearity which occurs when predictor variables are highly inter-correlated; this is due to the fact that there were so many positive responses (strongly agree and agree or 4s and 5s). Therefore, conclusions cannot be drawn using single survey questions as predictors. Since there was high multi-collinearity, factor analysis was used to examine factors instead of individual survey questions. Responses were factor analyzed, which revealed two dimensions: Positive IPE Perception and NSU IPE. Principal components factor analysis shows that two factors account for approximately 72% of the variance in the overall total score of Likert items on the survey instrument. The first component (Positive IPE Perception) accounts for a reliable 62% of the variance in the total score. The second component (NSU IPE) accounts for another 9.8% (9.755%) of the variance in the total score. Factor analysis is an important step when evaluating any new survey instrument, and these results can be used in future survey development. There is an overwhelmingly positive response to IPE for dental, health science, and nursing students as evidenced by component one (Positive IPE Perception); however, there seems to be a more negative perception about IPE at NSU as evidenced by component two (NSU IPE), possibly due to financial and administrative considerations. Factor analysis of this data, legitimizes the need for future survey development.

The responses to the survey items were overall very positive toward IPE. Participants reported that IPE activities are taking place at NSU; however, dental students were only reported to be involved in one of the activities mentioned. Faculty and staff reported that dental, health science, and nursing students need to understand each other's skills and roles, that they should participate in classroom and clinical experiences together, that IPE prepares students for real-world clinical practice, that IPE improves students' ability to communicate effectively with other disciplines, that dentist should educate patients about systemic health, and that health care professionals and nurses should educate patients about oral health. However, when asked questions about implementation of IPE, faculty were more positive regarding clinical experiences, rather than didactic experiences. This may be due to the many financial and administrative barriers reported by the respondents. Results from this study can be used for future survey development to examine a larger sample of faculty and staff from other colleges to determine if dental students are being included in IPE activities in other colleges and to further examine the barriers reported by faculty and staff. Enablers for IPE should also be examined by eliciting faculty feedback. Further IPE program development will need to include adequate institutional support, funding, faculty development, and faculty involvement in planning.

Appendix A

Survey Instrument

1. What is your ***primary*** responsibility at Nova Southeastern University?
-Staff
-Faculty
-Administrator

2. In what college do you teach?
-College of Dental Medicine
-College of Health Care Sciences
-College of Nursing

3. What is your primary department?
-Anesthesia
-Audiology
-Dental Medicine
-Health Sciences
-Nursing
-Occupational Therapy
-Physical Therapy
-Physician Assistant
-Speech Language Pathology

Please indicate your level of agreement with the following statements:

4. It is important for dental, health care science, and nursing students to understand each other's skills and roles in patient care.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

5. Dental, health care science, and nursing students should participate in classroom and clinical experiences with one another.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

6. Interprofessional education prepares dental, health care science, and nursing students for real-world clinical practice.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

7. Interprofessional education would improve dental, health care science, and nursing students' ability to communicate effectively with other disciplines.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

8. Dental students, health care science, and nursing students should participate in **classes** with students from other disciplines.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

9. Dental, health care science, and nursing students should participate in interprofessional **clinical** experiences.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

10. Patients' health outcomes (examples: blood glucose control, periodontal conditions, nutritional status, etc.) might improve if dentists, health care professionals, and nurses work collaboratively to develop treatment plans.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

11. Quality of patient education will improve if dentists, health care professionals, and nurses work cooperatively.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

12. Dentists should be able to provide information to their patients regarding systemic health conditions, such as diabetes and cardiovascular disease and how they relate to oral health.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

13. Health care professionals and nurses should be able to provide information to patients regarding oral diseases, such as periodontal disease and dental cavities.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

14. Dental students should receive training from faculty in health care sciences/nursing.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

15. Health care science/nursing students should receive training from dental school faculty.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

16. I feel confident in my ability to lead my students in an interprofessional activity with other health care professions.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

17. NSU currently provides opportunities for interprofessional collaboration between dental, health care science, and nursing students (i.e. didactic courses involving more than one discipline, clinical experiences with other disciplines, etc.)
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

Please describe any current interprofessional activities for dental, health care science, and nursing students.

_____
_____
_____

18. There are financial considerations to the implementation of increased interprofessional activities at NSU for dental, health care science, and nursing students.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

Please identify any financial considerations that you are aware of:

_____
_____
_____
_____

19. There are administrative considerations to the implementation of increased IPE activities at NSU for dental, health care science, and nursing students.
-Strongly disagree
-Disagree
-Neither agree or disagree
-Agree
-Strongly agree

Please identify any administrative considerations that you are aware of:

_____
_____
_____
_____

Appendix B

IRB Approval Letter

MEMORANDUM

To: **Tabitha N Fair, MPH**
College of Health Care Sciences

From: **Rose Colon, PhD,**
Center Representative, Institutional Review Board

Date: **October 20, 2016**

Re: **IRB #: 2016-475; Title, "Faculty and Staff Perceptions of Interprofessional Education: A Comparative Survey of Dental and Health Science/Nursing Faculty and Staff"**

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review under **45 CFR 46.101(b) (Exempt Category 2)**. You may proceed with your study as described to the IRB. As principal researcher, you must adhere to the following requirements:

1) CONSENT: If recruitment procedures include consent forms, they must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.

2) ADVERSE EVENTS/UNANTICIPATED PROBLEMS: The principal researcher is required to notify the IRB chair and me (954-262-5369 and Rose Colon, PhD, respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.

3) AMENDMENTS: Any changes in the study (e.g., procedures, number or types of subjects, consent forms, researchers, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: **Sarah Ransdell, PhD**

Appendix C

Initial Recruitment Email

Dear Nova Southeastern University Faculty and Staff,

I am a student in the NSU PhD in Health Science program, and I am conducting dissertation research. I invite you to participate in this study that will explore faculty and staff perceptions of interprofessional education (IPE) programs for dental, health science, and nursing students. All graduate faculty and staff from the College of Health Care Sciences, College of Dental Medicine, and College of Nursing are invited to participate. The survey is anonymous, and your responses cannot be linked to you personally. The survey should take no longer than 15 minutes to complete. By completing this survey, you consent to participate in the research. Thank you for your participation.

Please click on the following link to begin the survey:

https://www.surveymonkey.com/r/NYH2YPD

IRB protocol #: 2016-475

Principal researcher

Tabitha Fair, RDH, MPH

ptabitha@nova.edu

(423) 957-9561

For questions/concerns about your research rights, contact:

Human Research Oversight Board (Institutional Review Board or IRB)

Nova Southeastern University

954-262-5369/Toll Free: 866-499-0790

IRB@nsu.nova.edu

Appendix D

Participation Letter

Participation Letter

Title of Study: Faculty and Staff Perceptions of Interprofessional Education: A Comparative Survey of Dental and Health Science/Nursing Faculty

Principal researcher:
Tabitha Fair, RDH, BSDH, MPH
East Tennessee State University
Box 70690
Johnson City, TN 37614
(423) 957-9561

Institutional Review Board
Nova Southeastern University
Office of Grants and Contracts
(954) 262-5369/Toll Free: 866-499-0790
IRB@nsu.nova.edu

Description of Study: Tabitha Fair is a doctoral student at Nova Southeastern University engaged in research for the purpose of satisfying a requirement for the PhD in Health Science program. The purpose of this study is to explore faculty and staff perceptions of interprofessional education (IPE) programs for dental, health science, and nursing students. All graduate faculty and staff from the College of Health Care Sciences, College of Dental Medicine, and College of Nursing are invited to participate. If you agree to participate, you will be asked to complete an online survey via the website www.surveymonkey.com. This survey will examine: the current opportunities for IPE at Nova Southeastern University, the perceived need for IPE for dental and health science/nursing students, the perceived advantages of an IPE program, the features that faculty and staff feel should be included in an IPE program, and the perceived administrative and financial barriers to increased IPE activities. The survey will take approximately fifteen minutes to complete.

Risks/Benefits to the Participant: There may be minimal risk involved in participating in this study. There are no direct benefits to agreeing to participate in this study. Please understand that although you may not benefit directly from participation in this study, you have the opportunity to influence the development of future IPE programs at Nova Southeastern University. If you have any concerns about the risks/benefits of participating in this study, you can contact the researchers and/or the university's human research oversight board (the Institutional Review Board or IRB) at the numbers listed above.

Cost and Payments to the Participant: There is no cost for participation in this study. Participation is completely voluntary and no payment will be provided.

Confidentiality: Information obtained in this study is strictly confidential. The research involves an anonymous web-based survey that does not include any personal identifying information, and there is no way that the participants' responses can be linked to them. All data will be secured in a locked filing cabinet, and any survey information will be stored on a password protected computer.

Participant's Right to Withdraw from the Study: You have the right to refuse to participate in this study and the right to withdraw from the study at any time without penalty.

I have read this letter and I fully understand the contents of this document and voluntarily consent to participate. All of my questions concerning this research have been answered. If I have any questions in the future about this study they will be answered by the researcher listed above or his/her staff.

I understand that the completion of the survey implies my consent to participate in this study.

Appendix E

Reminder Email

Dear Nova Southeastern University Faculty and Staff,

This is a follow-up email to request your participation in research that will explore faculty and staff perceptions of interprofessional education (IPE) programs for dental, health science, and nursing students. All graduate faculty and staff from the College of Health Care Sciences, College of Dental Medicine, and College of Nursing are invited to participate. The survey is anonymous, and your responses cannot be linked to you personally. The survey should take no longer than 15 minutes to complete. By completing this survey, you consent to participate in the research. If you have already responded, please disregard this request. Thank you for your participation.

Please click on the following link to begin the survey:

https://www.surveymonkey.com/r/NYH2YPD

IRB protocol #: 2016-475

Principal researcher

Tabitha Fair, RDH, MPH

ptabitha@nova.edu

(423) 957-9561

For questions/concerns about your research rights, contact:

Human Research Oversight Board (Institutional Review Board or IRB)

Nova Southeastern University

954-262-5369/Toll Free: 866-499-0790

IRB@nsu.nova.edu

Appendix F

Qualitative Data Grouped by Codes

ATLAS.ti Report

Faculty and Staff Perceptions of Interprofessional Education: A Comparative Survey of Dental and Health Science/Nursing Faculty and Staff

Quotations grouped by Codes

Report created by Tabitha Fair on Jun 19, 2017

○ Are there benefits to IPE?

1 Quotations:

3:7 Are there any studies out there that show improved patient outcomes by exposing students to interpro…

Content:

Are there any studies out there that show improved patient outcomes by exposing students to interprofessional education?

○ Billing for clinical patients

2 Quotations:

2:9 Financial is a large concern. As far as classes, financial is less of an issue. But clinically it i…

Content:

Financial is a large concern. As far as classes, financial is less of an issue. But clinically it is. For example, how would the opportunity be billed to patients. Also it is faculty resource costs which does have a financial impact. The location (room) is also of financial impact.

2:11 Inability to bill for care provided as part of a team approach because the visit does not fall under…

Content:

Inability to bill for care provided as part of a team approach because the visit does not fall under our disciplines CPT codes (fall clinic)

○ Class sizes

1 Quotations:

2:2 Doubling or tripling class sizes has obvious logistical and financial considerations.

Content:

Doubling or tripling class sizes has obvious logistical and financial considerations.

○ Clinical IPE

1 Quotations:

1:3 IPE opportunities primarily take the form of clinical rotations, currently, and may involve interact…

Content:

IPE opportunities primarily take the form of clinical rotations, currently, and may involve interaction with students from other professions within NSU or even from other colleges/universities. Some basic course interaction has taken place in the past, such as entry-level Anatomy & Physiology.

○ Compensation

2 Quotations:

2:6 Faculty reimbursement for teaching in another college, materials, etc.

Content:

Faculty reimbursement for teaching in another college, materials, etc.

2:9 Financial is a large concern. As far as classes, financial is less of an issue. But clinically it i…

Content:

Financial is a large concern. As far as classes, financial is less of an issue. But clinically it is. For example, how would the opportunity be billed to patients. Also it is faculty resource costs which does have a financial impact. The location (room) is also of financial impact.

○ Coordination of providers

2 Quotations:

3:4 Arrangement of various course curricula to allow for joint classes and clinicals of students from va…

Content:

Arrangement of various course curricula to allow for joint classes and clinicals of students from various professions would require detailed coordination among program administrators.

3:13 Administratively the biggest issue is coordination of the various providers. This is extremely diff…

Content:

Administratively the biggest issue is coordination of the various providers. This is extremely difficult- even in an academic setting.

○ Curriculum development issues

3 Quotations:

3:1 Potential curricula development; activities need to meet the learning outcomes required by the profe…

Content:

Potential curricula development; activities need to meet the learning outcomes required by the professional boards.

3:4 Arrangement of various course curricula to allow for joint classes and clinicals of students from va…

Content:

Arrangement of various course curricula to allow for joint classes and clinicals of students from various professions would require detailed coordination among program administrators.

3:6 Scheduling Faculty Training Program Development

Content:

Scheduling Faculty Training Program Development

○ equipment

1 Quotations:

3:11 Primarily scheduling and sharing of rooms and resource equipment

Content:

Primarily scheduling and sharing of rooms and resource equipment

---

○ Facilities

9 Quotations:

2:8 Time and access

Content:

Time and access

2:9 Financial is a large concern. As far as classes, financial is less of an issue. But clinically it i…

Content:

Financial is a large concern. As far as classes, financial is less of an issue. But clinically it is. For example, how would the opportunity be billed to patients. Also it is faculty resource costs which does have a financial impact. The location (room) is also of financial impact.

2:10 Financial could be the limited space required to engage in interprofessional activities while on cam…

Content:

Financial could be the limited space required to engage in interprofessional activities while on campus. It would take much bigger rooms and additional equipment to handle over 100 students at one time.

3:2 scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

Content:
scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

3:8 Room availability

Content:
Room availability

3:10 Room scheduling, workload

Content:
Room scheduling, workload

3:11 Primarily scheduling and sharing of rooms and resource equipment

Content:
Primarily scheduling and sharing of rooms and resource equipment

3:12 time/scheduling and space considerations

Content:
time/scheduling and space considerations

3:15 Availability of programs being present on campus as the same time and the scheduling of rooms and se…

Content:
Availability of programs being present on campus as the same time and the scheduling of rooms and setting up activities for all students to engage would take time and coordination.

○ Faculty buy-in

1 Quotations:

3:3 time, scheduling issues, faculty buy in

Content:
time, scheduling issues, faculty buy in

○ Faculty training

1 Quotations:

3:6 Scheduling Faculty Training Program Development

Content:

Scheduling Faculty Training Program Development

○ faculty workload

1 Quotations:

3:10 Room scheduling, workload

Content:

Room scheduling, workload

○ Financial savings

1 Quotations:

2:1 Potential financial savings for the colleges in terms of sharing faculty.

Content:

Potential financial savings for the colleges in terms of sharing faculty.

○ General IPE

4 Quotations:

1:2 There are several organizations and events the encourage interprofessional collaboration.

Content:

There are several organizations and events the encourage interprofessional collaboration.

1:10 For the past two years, the Physician Assistant class at the Jacksonville campus & the Nursing, EMT,…

Content:

For the past two years, the Physician Assistant class at the Jacksonville campus & the Nursing, EMT, & Respiratory programs at St. John's River State College have collaborated in a burn simulation, which went very well. The simulation took place at the SJRSC campus in St. Augustine.

1:11 The DPT program at the Tampa campus invites faculty (and students when available) from the OTD progr…

Content:

The DPT program at the Tampa campus invites faculty (and students when available) from the OTD program to participate in their "boot camp" to provide interprofessional experiences for students. In addition, the OTD faculty member who teaches children and youth has been invited multiple times for the DPT pediatric course to provide an interprofessional learning opportunity for the students in the DPT program. Another opportunity was provided through collaboration between the OTD and DPT faculty at the Tampa campus to develop a medical outreach program that outlined services provided by each profession.

1:12 Fall clinic

Content:

> Fall clinic

○ Institutional Issues

1 Quotations:

3:5 Nothing new in this university gets done without a lot of time, red tape and frustration. Everything…

Content:

> Nothing new in this university gets done without a lot of time, red tape and frustration. Everything is overcomplicated.

○ Location issues

2 Quotations:

3:14 There would have to be consideration of how interprofessional classes would be handled if offered at…

Content:

> There would have to be consideration of how interprofessional classes would be handled if offered at both the main campus and satellite campuses. Would it be a video conference lecture with regular face-to-face interactions and labs? Long distance interactions would have to have careful planning and coordination involving all parties.

3:15 Availability of programs being present on campus as the same time and the scheduling of rooms and se…

Content:

> Availability of programs being present on campus as the same time and the scheduling of rooms and setting up activities for all students to engage would take time and coordination.

○ One day IPE event

1 Quotations:

1:6 IPE day

Content:

> IPE day

○ relevance to dental

1 Quotations:

3:16 It would be very challenging to come up with relevant cases where audiology can gain from education…

Content:

> It would be very challenging to come up with relevant cases where audiology can gain from education of a team with all disciplines involved. There are select areas of overlap, but it would

be a challenge to create the framework for the instruction to be relevant. e.g. audiologists learning about how diabetics are at risk of dental problems - not helpful.

○ scheduling

8 Quotations:

3:2 scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

Content:
scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

3:3 time, scheduling issues, faculty buy in

Content:
time, scheduling issues, faculty buy in

3:6 Scheduling Faculty Training Program Development

Content:
Scheduling Faculty Training Program Development

3:9 Coordination of term and class schedules leading to changes in registration times and tuition due da…

Content:
Coordination of term and class schedules leading to changes in registration times and tuition due dates. Also, discrepancies in where tuition dollar allocation for courses that are cross listed.

3:10 Room scheduling, workload

Content:
Room scheduling, workload

3:11 Primarily scheduling and sharing of rooms and resource equipment

Content:
Primarily scheduling and sharing of rooms and resource equipment

3:12 time/scheduling and space considerations

Content:
time/scheduling and space considerations

3:15 Availability of programs being present on campus as the same time and the scheduling of rooms and se…

Content:
Availability of programs being present on campus as the same time and the scheduling of rooms and setting up activities for all students to engage would take time and coordination.

○ Time

4 Quotations:

2:8 Time and access

Content:
Time and access

3:3 time, scheduling issues, faculty buy in

Content:
time, scheduling issues, faculty buy in

3:12 time/scheduling and space considerations

Content:
time/scheduling and space considerations

3:15 Availability of programs being present on campus as the same time and the scheduling of rooms and se…

Content:
Availability of programs being present on campus as the same time and the scheduling of rooms and setting up activities for all students to engage would take time and coordination.

○ Unsure

2 Quotations:

1:5 unable to list the courses

Content:
unable to list the courses

2:5 I am not privy to any financial considerations now. I can not judge the this question.

Content:
I am not privy to any financial considerations now. I can not judge the this question.

○ Which department funds the program/event

4 Quotations:

2:3 For example: the budget plan for each college. What budget to fund.

Content:
For example: the budget plan for each college. What budget to fund.

2:4 Budgeting is done by department with departments being unwilling at times to share resources

Content:

Budgeting is done by department with departments being unwilling at times to share resources

2:7 As a member of the IPEC at NSU, we have discussed the problems with determining how to divide the fe…

Content:

As a member of the IPEC at NSU, we have discussed the problems with determining how to divide the fees and the responsibilities required for billing.

3:9 Coordination of term and class schedules leading to changes in registration times and tuition due da…

Content:

Coordination of term and class schedules leading to changes in registration times and tuition due dates. Also, discrepancies in where tuition dollar allocation for courses that are cross listed.

○ Yes, but no dental

4 Quotations:

1:1 The Health Professions PhD Core offer interprofessional courses for health science and nursing stude…

Content:

The Health Professions PhD Core offer interprofessional courses for health science and nursing students, only. The College of Dental Medicine is not a part of the PhD core

1:4 PA program Jacksonville participates in oral health venues within the local community. Also partici…

Content:

PA program Jacksonville participates in oral health venues within the local community. Also participates with clinics for inter-professional collaboration
IPE clinic, also called the "Fall/Balance Clinic" provides the opportunity for PA, pharmacy, auditory, PT, and OT students to collaborate while seeing the same patient.
I am not certain of the extend interprofessional collaboration exist between dental, health care science, and nursing.

1:8 There are none that I am aware with dental. The IPE humanism day should include, but I am not aware…

Content:

There are none that I am aware with dental. The IPE humanism day should include, but I am not aware that dental students participated at least in any of the groups I was involved in. PT does 1 - 2 interprofessional activities with nursing students. Should be more. PT faculty does teach at least 2 classes to nursing on transfer training and gait training.

1:9 There is an NSU interprofessional fall clinic, it incorporates several professions (medicine, pharma…

Content:

There is an NSU interprofessional fall clinic, it incorporates several professions (medicine, pharmacy, optometry, psychology, PT, OT, audiology), but dental and nursing so far has not been participants.

○ Yes, including dental

1 Quotations:

1:7 The Interprofessional Diabetes Education and Awareness initiative is an excellent opportunity for st…

Content:

The Interprofessional Diabetes Education and Awareness initiative is an excellent opportunity for students to participate in presenting with students from other disciplines about diabetes to persons in our community. The Department of SLP participates in IPE Days each year. We also have experience with other disciplines presenting in our classes (e.g., dental, OT, PT) or collaborating with a faculty member from another discipline in our clinic (e.g., a prosthodontist on the treatment of a patient with cleft palate and hypernasality).

Appendix G

Qualitative Data Grouped by Question

ATLAS.ti Report

Faculty and Staff Perceptions of Interprofessional Education: A Comparative Survey of Dental and Health Science/Nursing Faculty and Staff

Quotations grouped by Documents

Report created by Tabitha Fair on Jun 19, 2017

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1 Question 17 Qualitative Data .docx

Used Codes:
○ Clinical IPE ○ General IPE ○ One day IPE event ○ Unsure ○ Yes, but no dental ○ Yes, including dental

12 Quotations:

1:1 The Health Professions PhD Core offer interprofessional courses for health science and nursing stude…

Content:
The Health Professions PhD Core offer interprofessional courses for health science and nursing students, only. The College of Dental Medicine is not a part of the PhD core

1:2 There are several organizations and events the encourage interprofessional collaboration.

Content:
There are several organizations and events the encourage interprofessional collaboration.

1:3 IPE opportunities primarily take the form of clinical rotations, currently, and may involve interact…

Content:
IPE opportunities primarily take the form of clinical rotations, currently, and may involve interaction with students from other professions within NSU or even from other colleges/universities. Some basic course interaction has taken place in the past, such as entry-level Anatomy & Physiology.

1:4 PA program Jacksonville participates in oral health venues within the local community. Also partici…

Content:
PA program Jacksonville participates in oral health venues within the local community. Also participates with clinics for inter-professional collaboration

IPE clinic, also called the "Fall/Balance Clinic" provides the opportunity for PA, pharmacy, auditory, PT, and OT students to collaborate while seeing the same patient.
I am not certain of the extend interprofessional collaboration exist between dental, health care science, and nursing.

1:5 unable to list the courses

Content:
unable to list the courses

1:6 IPE day

Content:
IPE day

1:7 The Interprofessional Diabetes Education and Awareness initiative is an excellent opportunity for st…

Content:
The Interprofessional Diabetes Education and Awareness initiative is an excellent opportunity for students to participate in presenting with students from other disciplines about diabetes to persons in our community. The Department of SLP participates in IPE Days each year. We also have experience with other disciplines presenting in our classes (e.g., dental, OT, PT) or collaborating with a faculty member from another discipline in our clinic (e.g., a prosthodontist on the treatment of a patient with cleft palate and hypernasality).

1:8 There are none that I am aware with dental. The IPE humanism day should include, but I am not aware…

Content:
There are none that I am aware with dental. The IPE humanism day should include, but I am not aware that dental students participated at least in any of the groups I was involved in. PT does 1 - 2 interprofessional activities with nursing students. Should be more. PT faculty does teach at least 2 classes to nursing on transfer training and gait training.

1:9 There is an NSU interprofessional fall clinic, it incorporates several professions (medicine, pharma…

Content:
There is an NSU interprofessional fall clinic, it incorporates several professions (medicine, pharmacy, optometry, psychology, PT, OT, audiology), but dental and nursing so far has not been participants.

1:10 For the past two years, the Physician Assistant class at the Jacksonville campus & the Nursing, EMT,…

Content:
For the past two years, the Physician Assistant class at the Jacksonville campus & the Nursing, EMT, & Respiratory programs at St. John's River State College have collaborated in a burn simulation, which went very well. The simulation took place at the SJRSC campus in St. Augustine.

1:11 The DPT program at the Tampa campus invites faculty (and students when available) from the OTD progr…

Content:

The DPT program at the Tampa campus invites faculty (and students when available) from the OTD program to participate in their "boot camp" to provide interprofessional experiences for students. In addition, the OTD faculty member who teaches children and youth has been invited multiple times for the DPT pediatric course to provide an interprofessional learning opportunity for the students in the DPT program. Another opportunity was provided through collaboration between the OTD and DPT faculty at the Tampa campus to develop a medical outreach program that outlined services provided by each profession.

1:12 Fall clinic

Content:

Fall clinic

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2 Question 18 Qualitative Data .docx

Used Codes:

○ Billing for clinical patients ○ Class sizes ○ Compensation ○ Facilities ○ Financial savings ○ Time ○ Unsure ○ Which department funds the program/event

11 Quotations:

2:1 Potential financial savings for the colleges in terms of sharing faculty.

Content:

Potential financial savings for the colleges in terms of sharing faculty.

2:2 Doubling or tripling class sizes has obvious logistical and financial considerations.

Content:

Doubling or tripling class sizes has obvious logistical and financial considerations.

2:3 For example: the budget plan for each college. What budget to fund.

Content:

For example: the budget plan for each college. What budget to fund.

2:4 Budgeting is done by department with departments being unwilling at times to share resources

Content:

Budgeting is done by department with departments being unwilling at times to share resources

2:5 I am not privy to any financial considerations now. I can not judge the this question.

Content:

I am not privy to any financial considerations now. I can not judge the this question.

2:6 Faculty reimbursement for teaching in another college, materials, etc.

Content:
Faculty reimbursement for teaching in another college, materials, etc.

2:7 As a member of the IPEC at NSU, we have discussed the problems with determining how to divide the fe…

Content:
As a member of the IPEC at NSU, we have discussed the problems with determining how to divide the fees and the responsibilities required for billing.

2:8 Time and access

Content:
Time and access

2:9 Financial is a large concern. As far as classes, financial is less of an issue. But clinically it i…

Content:
Financial is a large concern. As far as classes, financial is less of an issue. But clinically it is. For example, how would the opportunity be billed to patients. Also it is faculty resource costs which does have a financial impact. The location (room) is also of financial impact.

2:10 Financial could be the limited space required to engage in interprofessional activities while on cam…

Content:
Financial could be the limited space required to engage in interprofessional activities while on campus. It would take much bigger rooms and additional equipment to handle over 100 students at one time.

2:11 Inability to bill for care provided as part of a team approach because the visit does not fall under…

Content:
Inability to bill for care provided as part of a team approach because the visit does not fall under our disciplines CPT codes (fall clinic)

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3 Question 19 Qualitative Data.docx

Used Codes:
○ Are there benefits to IPE? ○ Coordination of providers ○ Curriculum development issues ○ equipment ○ Facilities ○ Faculty buy-in ○ Faculty training ○ faculty workload ○ Institutional Issues ○ Location issues ○ relevance to dental ○ scheduling ○ Time ○ Which department funds the program/event

16 Quotations:

3:1 Potential curricula development; activities need to meet the learning outcomes required by the profe…

Content:

Potential curricula development; activities need to meet the learning outcomes required by the professional boards.

3:2 scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

Content:

scheduling conflicts, facilities (inadequate space and availability of lecture rooms)

3:3 time, scheduling issues, faculty buy in

Content:

time, scheduling issues, faculty buy in

3:4 Arrangement of various course curricula to allow for joint classes and clinicals of students from va…

Content:

Arrangement of various course curricula to allow for joint classes and clinicals of students from various professions would require detailed coordination among program administrators.

3:5 Nothing new in this university gets done without a lot of time, red tape and frustration. Everything…

Content:

Nothing new in this university gets done without a lot of time, red tape and frustration. Everything is overcomplicated.

3:6 Scheduling Faculty Training Program Development

Content:

Scheduling Faculty Training Program Development

3:7 Are there any studies out there that show improved patient outcomes by exposing students to interpro…

Content:

Are there any studies out there that show improved patient outcomes by exposing students to interprofessional education?

3:8 Room availability

Content:

Room availability

3:9 Coordination of term and class schedules leading to changes in registration times and tuition due da…

Content:

Coordination of term and class schedules leading to changes in registration times and tuition due dates. Also, discrepancies in where tuition dollar allocation for courses that are cross listed.

3:10 Room scheduling, workload

Content:
Room scheduling, workload

3:11 Primarily scheduling and sharing of rooms and resource equipment

Content:
Primarily scheduling and sharing of rooms and resource equipment

3:12 time/scheduling and space considerations

Content:
time/scheduling and space considerations

3:13 Administratively the biggest issue is coordination of the various providers. This is extremely diff…

Content:
Administratively the biggest issue is coordination of the various providers. This is extremely difficult- even in an academic setting.

3:14 There would have to be consideration of how interprofessional classes would be handled if offered at…

Content:
There would have to be consideration of how interprofessional classes would be handled if offered at both the main campus and satellite campuses. Would it be a video conference lecture with regular face-to-face interactions and labs? Long distance interactions would have to have careful planning and coordination involving all parties.

3:15 Availability of programs being present on campus as the same time and the scheduling of rooms and se…

Content:
Availability of programs being present on campus as the same time and the scheduling of rooms and setting up activities for all students to engage would take time and coordination.

3:16 It would be very challenging to come up with relevant cases where audiology can gain from education…

Content:
It would be very challenging to come up with relevant cases where audiology can gain from education of a team with all disciplines involved. There are select areas of overlap, but it would be a challenge to create the framework for the instruction to be relevant. e.g. audiologists learning about how diabetics are at risk of dental problems - not helpful.

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