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Unlocking the Power of Experiential Learning: Student Reported Changes Following Combined NICU Instruction

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Unlocking the Power of Experiential Learning: Student Reported Changes Following Combined NICU Instruction

Abstract

Purpose: This study aimed to assess the impact of in-person observation, in conjunction with didactic lectures, on students' perceived knowledge of speech-language pathology's (SLP) role and the roles of other healthcare professionals within the Neonatal Intensive Care Unit (NICU).

Method: Data for this study were initially collected for educational purposes and were later retrospectively analyzed with Institutional Review Board (IRB) approval. Ten participants who met the inclusion criteria underwent a didactic lecture on SLPs in the NICU followed by observing an SLP in action at a local NICU. Participants completed multiple surveys, allowing for a comparison of their perceived knowledge before and after in-person observation.

Results: Participants reported increased self-perceived knowledge regarding the involvement of interdisciplinary team members in a NICU setting (Q3, Q11) and heightened self-reported training on the role of SLPs in the NICU post-observation. However, for five questions (Q2, Q4, Q7, Q8, Q10), mean scores increased from pre-lecture to post-lecture, only to decrease from post-lecture to post-observation.

Conclusions: This study's findings suggest that students exhibit an improved overall understanding of the composition of NICU interdisciplinary teams and report a heightened sense of training when exposed to a combination of didactic lectures and experiential learning.

Keywords

experiential learning, didactic courses, speech-language pathology, NICU

Introduction

In the realm of speech-language pathology (SLP), practitioners encounter a diverse array of settings, disorders, and domains for clinical engagement. Numerous university SLP programs equip their students with a comprehensive knowledge base, positioning them as prospective 'general practitioners' upon program completion. While certain institutions may emphasize pediatric over adult populations or prioritize school-based settings over medical environments, a substantial proportion of these programs offer a well-rounded education spanning diverse domains.

One specific area of the field which the American Speech-Hearing-Language Association (ASHA) states SLPs need to “seek out additional training in” and “consider their level of education, training, and experience” is in the area of pediatric dysphagia, including providing pediatric feeding to infants in a neonatal intensive care unit (NICU) [1]. In the University of the Pacific's Master of Science program in Speech-Language Pathology, while all students are mandated to complete a dysphagia course, the curriculum predominantly emphasizes adult population management. It provides only scant exposure, encompassing one or two lectures, to the intricacies of pediatric feeding and NICU practice. Consequently, students encounter restricted prospects for comprehensive exploration within this highly specialized domain of the field.

Pineda et al., surveyed 468 neonatal PTs, OT, and SLPs between 2015 and 2016 to address three specific areas: the number of PTs, OTs, and SLPs working in the NICU (including amount of time spent in the NICU, years in the NICU, etc.), the educational and professional training they underwent before practicing in the NICU, and if the individual had any interest in a

“neonatal therapy national certification” [2]. Of the therapists surveyed, most believed that oversight was highly important in their practice and that there was a need for a special certification program. These therapists also reported that most of them had only received one lecture about the NICU in their graduate school program and that the remaining education they received was through self-initiated participation in continuing education courses, hospital in-services, and online webinars. Some therapists reported that experiential hands-on training and mentoring in the NICU was also beneficial to their training in this specialized area. Most therapists also reported that mentorship was critical to their training once they started working in this setting [2].

Although research supports that providing didactic coursework in addition to experiential learning opportunities can lead to improved student knowledge and confidence around a topic, to date, there is little to no current research exploring if providing didactic course lectures as well as experiential observations improves SLP students’ reported interest and comfort levels pursuing a career within the NICU setting. To conduct a more thorough analysis of this inquiry, it becomes imperative to scrutinize varied pedagogical approaches employed across diverse healthcare disciplines.

The question of how students can get the most out of their learning experience, combining classroom teaching with hands-on practice, is not a new one. Researchers have been trying to find the right balance since the 1920s, looking for ways to make sure as many students as possible benefit from their education. Nearly 100 years ago, Musser did just this by examining the pros and cons of using a didactic style of teaching specific to medicine vs. experiential learning opportunities [3]. What Musser discovered was that these learning styles worked best in conjunction with each other. By providing students with lectures, students were able to learn

about a wider variety of cases and disorders they might not otherwise see in their hands-on practice. However, Musser also argued that it is not beneficial for students to simply sit in a classroom and have general information presented that could have been read on their own [3]. Although this research comes from the early 1900s, research has continued to support these initial findings.

Nearly 100 years later, researchers further supported Musser's claims, endorsing the positive implications that experiential learning paired with didactic learning opportunities had on student outcomes. After completing a quasi-experiential repeated-measures study of a variety of healthcare students including those from physician assistant (PA), physical therapy (PT), occupational therapy (OT), and nursing, it was found that "a didactic training module paired with experiential learning is effective for health professional students' improvement in perception, knowledge, and attitudes towards telehealth" [4]. Their results indicate that students improved in these parameters after only receiving synchronous, didactic learning; however, they further improved after experiential learning opportunities were completed as well [4]. Although this study did not include SLP students or the NICU setting, it does demonstrate the connection that students in healthcare professional training programs can benefit from a teaching model of didactic lessons paired with experiential learning.

Looking further into research of other disciplines within healthcare programs reveals claims which support the theory that experiential learning, when paired with didactic coursework, improves student learning. Yu et al. found in their study which consisted of both qualitative and quantitative data, that experiential learning actually improved long-term learning outcomes in their students [5]. The study consisted of providing 33 dental students didactic coursework about global health. Following their didactic course, students were asked to complete

a survey that assessed self-reported knowledge. After, three students completed an experiential learning opportunity in Costa Rica and again were surveyed after this experience. The research revealed that while all students achieved similar learning outcomes following the didactic phase, those three students who participated in the experiential learning opportunity exhibited superior performance compared to the group exclusively exposed to didactic learning, a difference that persisted six months after the experience. Although one potential weakness of this study was the small sample size of students who completed the experiential learning opportunity, it can be noted that the results look very similar to those of other studies looking at didactic and experiential learning on student outcomes [5].

While no direct research has yet explored the impact of combined experiential and didactic learning on graduate students' outcomes in the context of SLP and NICU training, insights can be drawn from analogous training paradigms within various healthcare domains that specialize in NICU care. In Finland, researchers assessed the perceptions of NICU nurses on a specific training program which aimed to improve the parent-teaching model [6]. The program included, “theoretical teaching, practice with mentors, and reflection” throughout a 12 month period of training with a mentor and six month period of independent practice [6]. Researchers found that generally, nurses appreciated time to prepare to implement the program, there was a need for motivated mentors, and that feedback was appreciated as the learners moved through the program. They also found that initially nurses were hesitant to have parents allowed to visit with no time constraints when they were first learning the program; however, with time, they began to appreciate the parent’s perspective. Additionally, the study's researchers found that the crucial catalyst for learning, following their engagement in infant care and training to observe various facets of infant behavior, was the discourse with their mentor nurse. Nurses involved in

the research articulated that beyond conversations with their mentor nurse, engaging in discussions with fellow staff members also played a pivotal role in reshaping the collective nursing perspective towards family-centered care [6]. Overall, although this research does not look directly at trends related to student learning in relation to didactic coursework in addition to experiential learning, it provides us with some ideas of what may benefit students when learning new skills during their experiential learning opportunities.

Looking further into the NICU training of nurses in other countries, it was noted in a study conducted by Spence et al., that when asked what nurses preferred learning styles were, they found that there was a preference in doing clinical tasks, learning from peers, and learning from senior nurses [7]. These were found to closely correlate with experiential and practical approaches to learning. Researchers further broke down the findings and categorized them by specific demographic information such as years working in the NICU, nursing status, and specialty training. Researchers concluded that,

“nurses with less than one year in neonatal nursing showed a significantly stronger preference for both experiential and intellectual approaches to learning, than nurses with more than one year in neonatal nursing. Preference for an independent style of learning did not differ significantly between these two groups” [7].

They concluded that although support for learning in the workplace benefited all nurses regardless of demographics, it was particularly important for “novice” and “inexperienced nurses” [7]. Although this data is not directly related to SLP, it has the potential to be applied to the field of SLPs and potentially guide us in how we train not only students, but more novice SLPs who are moving towards working in the NICU.

While SLPs occupy a pivotal position in the interdisciplinary care of infants within the NICU, scant research has hitherto addressed the effectiveness of diverse pedagogical approaches in equipping students with the requisite competence in this distinctive facet of the profession. To assess the effectiveness of different training modalities, a retrospective analysis of previously obtained survey data was analyzed to determine if providing experiential learning through observations in aNICU increased participant's self-reported understanding of the roles and responsibilities of an SLP and other interdisciplinary professionals in a NICU setting compared to experiencing didactic teaching alone. Participants included graduate students in the master's level Speech-Language Pathology program at University of the Pacific. Participants were provided a survey to assess self-reported understanding of the SLP and other professional's roles in the NICU setting. A didactic lecture was then provided, providing information on these topics. Following the lecture, participants were asked to complete a post-lecture survey consisting of the same set of questions used in the pre-survey. Participants were then provided an opportunity to observe a licensed SLP working in the NICU setting providing assessment and/or treatment to infants. Following the observation, participants were asked to complete a post-observation study consisting of the same questions once again. After analysis of the inclusion and exclusion criteria, 10 participants were included in the study results (n=10). It was determined that students reported an increased understanding of what members may be involved in a NICU team as well as an increase in their training level of the NICU after receiving the lecture, as well as further increases after observing an SLP in the NICU.

The data was analyzed for each question, overall mean, individual scores, and a comparative of pre- and post-lecture and observation surveys was conducted. Across all

questions, students reported an increased understanding on the roles and responsibilities of an SLP and interdisciplinary team members in the NICU after receiving the didactic lecture.

Method

Description of the sample

Participants included graduate students in the Department of Speech-Language Pathology at the University of the Pacific. Inclusion in the study required meeting the following criteria: enrollment as a current graduate student in the Master's of Science program in Speech-Language Pathology at the University of the Pacific, attendance at the live in-person guest presentation titled 'NICU: Neonatal Intensive Care Unit, an Overview and Explanation of the SLP's Role' during the Spring 2023 semester as part of the Language Disorders III course, and the completion of a minimum of one hour of observation of pediatric feeding in the NICU under the supervision of the researcher.

To further select participants, the following exclusion criteria was utilized: in order to decrease the risk of prior experience in a NICU impacting overall scores, any student who answered “yes” to the question asking if they had visited a NICU in the past were excluded, participants also could not be a licensed SLP or SLP in their CFY, be a student in another department outside of SLP, or be an undergraduate student within the SLP department.

Of the 31 students who were currently enrolled in the Master’s of Science program and enrolled in the Language Disorders III course, 100% completed the pre-lecture survey prior to receiving didactic lecture on the topic of being a NICU-based SLP. To allow participants ample opportunity for information assimilation and reflection, the post-lecture survey was distributed three days subsequent to the lecture, achieving a 100% response rate. Of the 31 participants, a

total of 12 participants (39%) volunteered to attend an in-person observation of an SLP in the NICU at a local hospital. This observation consisted of students observing in small groups (two to three students per observation) as an SLP provided either a one hour treatment session or one hour assessment of an infant in the NICU. Infants participating in sessions had a variety of reasons for admission to the NICU and treatment diagnoses/plans. The SLP narrated their actions to students throughout the sessions. Students were allowed to ask questions before, during, and after the session. In the hour observation, students were provided a brief tour of the NICU, observed a feeding (assessment or treatment), and received instruction on documentation while the SLP completed charting for the session. For data analysis, after removing participants who did not meet the inclusion criteria or who met the exclusion criteria, a total of 10 participants (32% of the total participants) completed all three surveys (n=10).

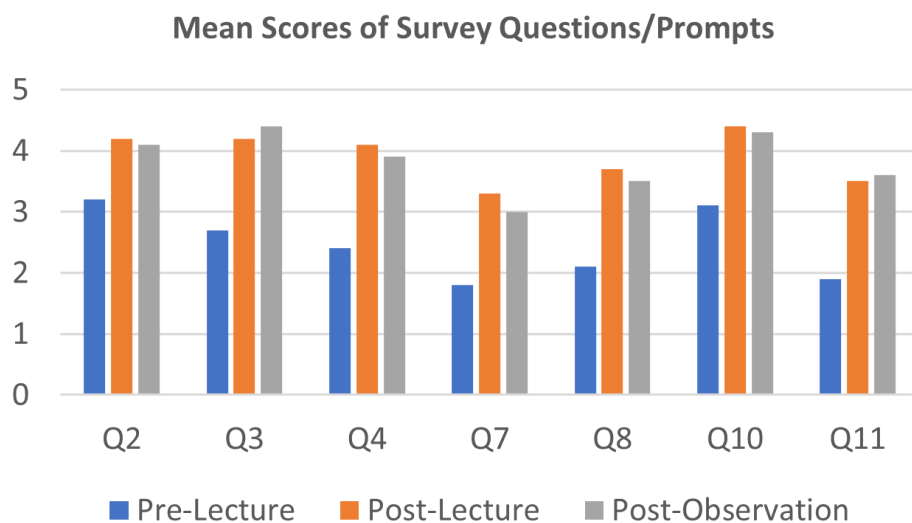
Data analysis procedures

At the time of survey distribution and collection, participants were asked to include their university issued 9-digit ID numbers to de-identify themselves while also leaving the ability to track participants' responses to their past surveys. After surveys were matched together, the ID numbers were blacked out and all participants were instead issued a participant number (P1, P2, P3, etc.) for the remainder of the study analysis. To analyze the data, all survey results were input into a Microsoft Excel sheet categorized by participant (P1, P2, P3 etc.), survey (survey 1, survey 2, survey 3), and question (Q1, Q2, Q3, etc.). Excel software computed the mean (AVG), standard deviation (STDev), minimum (min), and maximum (max) responses from participants for each question, categorized according to survey number. The averages of each response were then compared to assess increases and decreases in the data to determine changes in students'

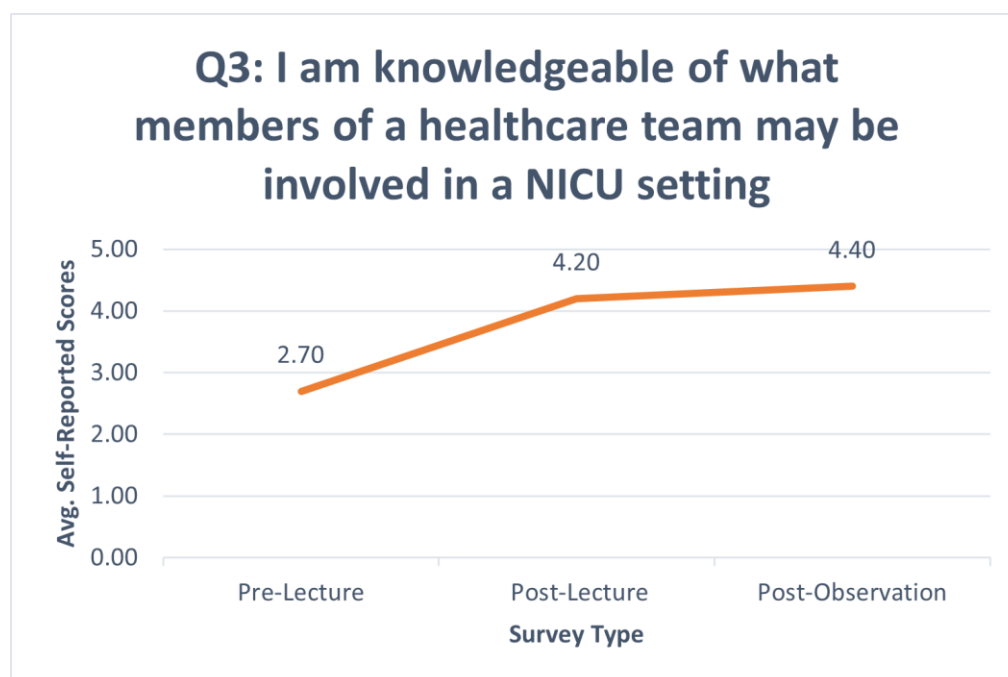
perceptions. The ensuing interpretation of the results is expounded upon in the 'Narrative of Collected Data' section.

Results

All participants (n=10) who completed the three surveys, met all inclusion criteria, and did not meet any exclusion criteria responded to a total of 11 quantitative and four qualitative questions/prompts before receiving didactic lecture, after receiving didactic lecture, and after completing an in-person observation of an SLP providing an assessment or treatment session in the NICU of a local hospital. The data was analyzed to address the main research question, does providing in-person observation of an SLP conducting assessment/treatment services in the NICU improved students' perceived knowledge of the SLP's role as well as the role of other professionals in the NICU compared to didactic teaching alone? Seven of the 11 quantitative questions (Q2, Q3, Q4, Q7, Q8, Q10, Q11) were included in the data set (Fig.1). Fig.1 The questions/prompts were comprised of 5-point Likert scale prompts with the following responses: 1- strongly disagree, 2- disagree, 3- neither agree nor disagree, 4- agree, 5- strongly agree.

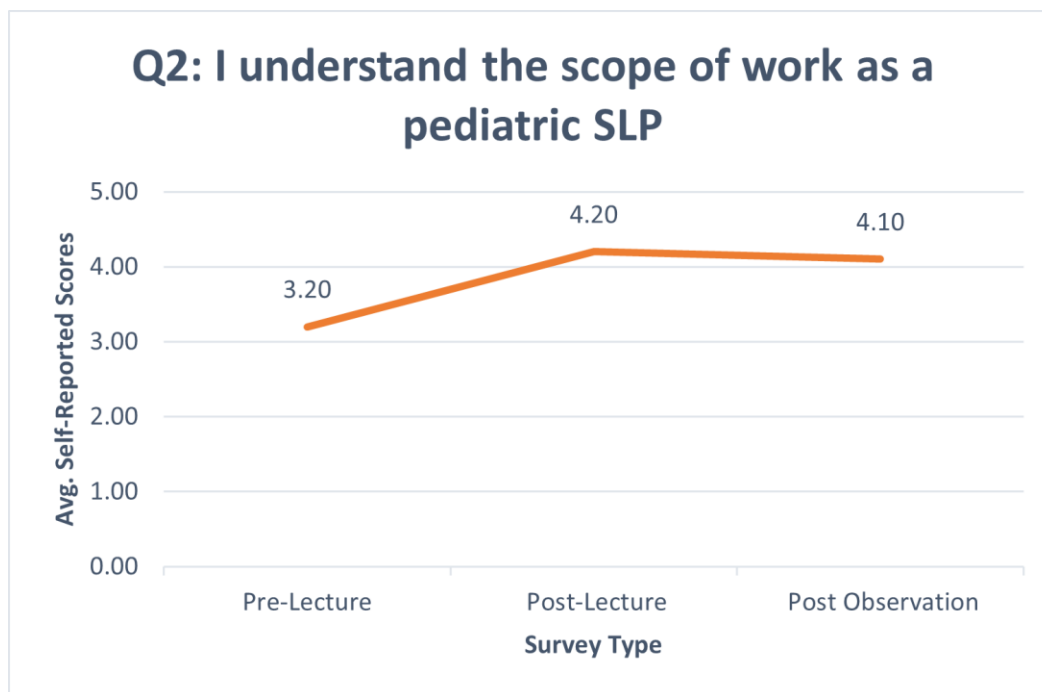


Of the seven analyzed questions, two (Q3, Q11) yielded results which demonstrated an increase in mean between pre-lecture survey results, post-lecture survey results, and post-observation results. This indicates that for these two prompts, participants reported increased self-perceived knowledge of what interdisciplinary team members would be involved in a NICU setting as well as increased self-reported training on the topic of being an SLP in the NICU. For Q3, “I am knowledgeable of what members of a healthcare team may be involved in a NICU setting,” the mean scores increased from 2.70 (0.95) pre-lecture to 4.20 (0.63) post-lecture to 4.40 (0.52) post-observation (Fig.2). Fig.2 Similarly, for Q11, “I have received training on the topic of being a NICU based SLP,” the mean rose significantly from a 1.90 (0.88) pre-lecture to 3.50 (1.35) post-lecture and demonstrated a slight increase once again to 3.60 (1.26) post-observation. This demonstrates that participants reported that receiving in-person observation improved their overall self-perceived understanding of who SLPs may work with in a NICU and their training levels on the topic of SLPs in the NICU compared to when they received information on the topics in didactic lecture alone.



The remaining five questions (Q2, Q4, Q7, Q8, Q10) demonstrated an increase in means from pre-lecture to post-lecture followed by a decrease in mean from post-lecture results to post-observation results. These findings indicate that students initially reported heightened self-assurance and comprehension of the subject matter following didactic instruction. However, their confidence and understanding subsequently declined upon witnessing an in-person SLP NICU session.

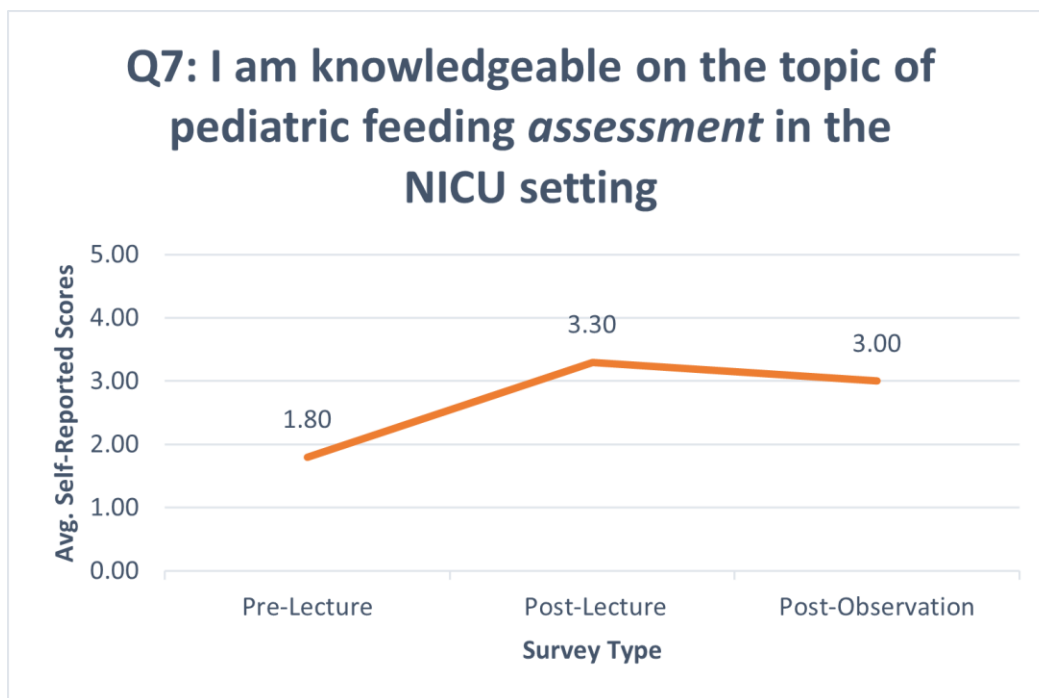
When provided the survey prompt, “I understand the scope of work as a pediatric SLP” (Q2), the mean increased from 3.20 (0.92) pre-lecture to 4.20 (0.42) post-lecture (Fig.3). However, the mean then decreased to 4.10 (0.32) after the participants received in-person observations. Fig.3



For the prompt of Q4, “I am knowledgeable of the general role that each interdisciplinary team member plays in a NICU case” the results also indicated a rise then fall. The mean response

pre-lecture was 2.40 (0.84) which then increased to 4.10 (0.32). After the in-person observation, the mean decreased to 3.90 (0.74).

On Q7, “I am knowledgeable on the topic of pediatric feeding *assessment* in the NICU setting” and Q8, “I am knowledgeable on the topic of pediatric feeding *treatment* in the NICU setting,” participant’s scores once again demonstrated a rise between pre-lecture and post-lecture with a fall of means between post-lecture and post-observation. For Q7, the mean pre-lecture rating was 1.80 (0.63) which then rose to a mean of 3.30 (0.95) after the lecture was delivered (Fig.4). Participants then had a mean score of 3.00 (0.94) following observations. Fig.4 For Q8, the mean pre-lecture rating was 2.10 (0.74) which rose to a mean of 3.70 (0.67) following the lecture and dropped again to 3.50 (0.94) after observations were complete.



For the final question/prompt included in the research results, Q10 stated, “I understand the SLP’s role while working in a NICU setting.” Prior to the lecture, the participant’s mean

score to this prompt was 3.10 (0.74). Post-lecture the mean score for this prompt increased to 4.40 (0.52). Following observations, the mean score decreased slightly to 4.30 (1.26).

Reliability and validity

To increase reliability of test results participants were asked the same set of prompts/questions at each survey point (pre-lecture, post-lecture, post-observation). All questions/prompts were provided with a 5-point Likert scale to ensure that averages could be collected, analyzed, and compared across surveys appropriately. No qualitative data was utilized in this study; therefore, no qualitative coding was completed.

One limitation on the validity of this study is that the questions/prompts utilized were novel questions and had not been utilized in prior research studies. To decrease the possible effects, survey questions/prompts were reviewed by a colleague of the research team who has extensive knowledge in the study areas. Questions/prompts were then modified and altered as needed to increase the validity of the questions measuring what the research was set to assess.

Limitations

One of the primary limitations to this study includes the small sample size (n=10). It is recommended further research be conducted to continue to investigate the hypothesis presented in this paper that providing didactic coursework and observation opportunities will increase students' self-perceived knowledge of the SLP's role and other professionals' roles in the NICU setting. It is also recommended that a reduplication of this study focusing on different specialized areas of the field in SLP and potentially other disciplines such as Physical Therapy (PT), Occupational Therapy (OT), Physician Assistant (PA), etc., be conducted for further insight into student's self-perceived learning through a variety of delivery models.

Discussion

While there was a decline in the mean responses for most survey prompts between Survey 2 and Survey 3, it is worth highlighting that across all inquiries, participants indicated an enhanced comprehension of the broader scope of NICU-based SLP work, an improved grasp of the interdisciplinary team dynamics within NICU cases, and heightened confidence in the NICU SLP domain overall. However, for the majority of these queries, the data showed a slight decrease in mean scores following in-person observations. One possible conclusion that could be drawn from this is that students potentially felt they increased their own knowledge of the SLP's role in the NICU and overall perceived comfort of potentially working in this area of the field later; however, completing observations may have changed their perspective or had more questions than answers come from the experience. Further research including qualitative data in which interviews are conducted with participants to gain further insight into why the mean scores decreased after observations compared to the post-lecture results is warranted.

Future implications

The data initially supports the value of learning experiences/opportunities to increase clinical students' breadth of knowledge. It is recommended that clinical training programs pay close attention to the learning experiences/opportunities they are providing and the outcomes they are hoping to achieve. By looking at student's self-reported understanding and comfort on a topic, programs can begin to determine if changes to their curriculum and/or clinical opportunities may benefit from adjustment. SLP clinical programs can benefit from determining how their students learn best and making modifications to their program as they see fit. For example, observations may be beneficial to students' learning as demonstrated in other research studies; however,

perhaps this information changes depending on the area of study or the timing that the observations occur in a program. While each program needs to consider the specific needs of their students, it is recommended that curriculum reviews include consideration of adding experiential learning opportunities for specific areas of study that students may need more hands-on training to better understand. Faculty should look to current research and other studies similar to this to further explore what may work best for their individual programs.

Recommendations for further study

The overall analysis suggests the need for further exploration as to “why” students demonstrated changes in their perceived understanding/knowledge of topics. Gathering qualitative data would be beneficial, such as potentially completing interviews with participants following each stage of the learning process as well as after all learning opportunities are provided. Research including the timing of the presented material is also warranted to determine if providing didactic lectures prior to experiential learning yields greater student-reported outcomes vs. experiential observations prior to didactic lectures. Further questions that require closer examination include, “Do students benefit from observations prior to didactic lectures to give more context on the topic prior to the ‘heavy learning’?” as well as, “What factors change a student’s self-perceived understanding of a topic?” Reexamination of the wording of select Likert-scale questions would be beneficial in future studies. For example, in question 11, “I have received training on the topic of being a NICU based SLP,” this question lends itself to more of a binary “yes” or “no” option. As the question was intended to assess the amount of training or training experience level of the student, rewording of this question should be considered.

Concluding remarks

Based on the findings from this study, students report an overall increased understanding of which interdisciplinary team members may be part of a NICU team as well as an overall greater sense of training experience when provided a didactic lecture paired with experiential learning. In clinical education it is important to consider the best teaching modalities and learning experiences for students to gain the most knowledge they can in sometimes a short time frame. As such, clinical education programs must continue to assess the way they present information to students, when they teach specific topics, and how they teach students, particularly in areas of study that are extremely specific and may not lead to a significant amount of time used to cover material, such as the NICU based SLP. However, students do not find an overall self-reported understanding/comfort with the topic of being a NICU based SLP, in general, after being provided with both learning opportunities. Instead, some students felt an increase in understanding/comfort following a didactic lecture; however, a decrease in understanding/comfort after receiving observational education following the lecture. It is the responsibility of educators and researchers to continue to explore these topics to ensure the highest outcomes possible for the students who will be future practicing clinicians in our respective areas of study.

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