INTERDISCIPLINARY EDUCATION ON USING THE COMBILIZER FOR GROOMING TASKS IN THE INTENSIVE CARE UNIT

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Abstract

Purpose: The purpose of this study was to provide a teaching and learning program to the interdisciplinary team on how to use the Sara Combilizer with critically ill patients to increase efficacy for early progressive mobility (EPM) by facilitating grooming tasks. **Methods:** A teaching and learning program on using the Sara Combilizer to facilitate grooming tasks was provided to the acute care therapy team at a hospital. The program included an evidence-based lecture, a practice case study, and a digital instructional manual. The program was evaluated through a pre- and post-survey, and a quality improvement survey. The Wilcoxon signed-rank test and descriptive statistics were used to evaluate the results of the surveys. **Results:** A total of 31 care team members participated in the program. The results revealed a statistically significant increase in the overall score by 25%. Each category score also had a statistically significant increase, which included the knowledge score by 27%, understanding score by 22%, and confidence score by 26%. **Conclusion:** In this capstone project, the acute care therapy team at the hospital learned about how to use the Combilizer to increase efficacy for EPM by facilitating grooming tasks. The program included education on the uses and benefits of the device, provided an instructional manual, and helped increase safety awareness on mobilizing patients. Overall, the participants of the program reported an increase in knowledge, understanding, and confidence in using the device with critically ill patients.

Keywords: occupational therapy, Sara Combilizer, grooming tasks, interdisciplinary care team, intensive care unit

Table of Contents

Occupational Therapy in Acute Care

Overview of the Problem

Patients receiving care in the intensive care unit (ICU) are at an increased risk of developing ICU-acquired weakness (Hashem et al., 2016). This increases the risk of a prolonged hospital length of stay (LOS), impaired recovery, and increased risk of death (Hodgson et al., 2022), as well as muscular weakness, deep vein thrombosis, and decreased functional independence (Yataco et al., 2019). A contributing factor to ICU-acquired weakness is the lack of mobilizing from hospital staff, as they may be concerned about the dislodgement of drains, tubes and wires, as well as the hemodynamic stability of the patients (Yataco et al., 2019).

The ICUs have a team of professionals made up of occupational therapists (OTs), occupational therapy assistants (OTAs), physical therapists (PTs), physical therapist assistants (PTAs), speech-language pathologists (SLPs), nurses (RNs), and physicians who work with patients to help them regain their independence. While in the acute care setting, these professionals work on activities of daily living (ADLs) with the patients while they are still stabilizing to ensure the patients are able to complete their basic activities of daily living (BADLs) and return to their basic routine before they are discharged to home or the next level of care such as a rehabilitation hospital. Patients who endure a traumatic event can experience life-altering changes. Occupational therapists in the acute care setting are among the first to help patients regain their independence.

Occupational therapy (OT) is defined as the use of the individual's everyday activities to strengthen functioning and participation [American Occupational Therapy Association (AOTA), 2020]. The goal of OT is to help individuals learn or relearn how to do tasks that are meaningful to them following an illness, injury, or disease. Occupations are personalized activities that can

include activities that they need to do, have to do, and want to do (AOTA, 2020). These occupations include ADLs such as grooming, dressing, and feeding; and instrumental activities of daily living (IADLs) such as community mobility, meal preparation, and home management (AOTA, 2020). Occupational therapy looks at each person from a holistic viewpoint, allowing the practitioner to look at the individual's mental, physical, social, and environmental contexts and how they all interact to affect the person's occupational performance outcomes.

The Sara Combilizer, also referred to as Combilizer in this manuscript, is a sit-to-stand device that can be used to help mobilize patients recovering from an injury or illness. Arjo (2023) states that this device is commonly used for critically ill patients who are mechanically ventilated, have low consciousness, or have poor trunk support. When the patient is securely fastened into the Combilizer, they can be placed in a sitting or standing position. This will include bringing the patient from a supine position to sitting up to 65º of upright sitting or supine to standing up to 75º of upright standing. The device can also offload weight from the patient's bony prominences to decrease pressure injuries by tilting the chair in space or left and right. By elevating the head of the Combilizer, the device can help promote the benefits of early mobilization (EM) safely. This device is also stated to reduce ICU delirium and increase the opportunity for the patient to partake in rehabilitative therapy (Arjo, 2023).

Proposed Solution

The PIO question states, "Can a teaching and learning program for the interdisciplinary care team increase the knowledge, understanding, and confidence of using the Sara Combilizer to increase efficacy for early progressive mobility (EPM) by facilitating grooming tasks in the ICU?" The proposed solution was to provide a teaching and learning program to the care team members focused on utilizing the Combilizer at a designated acute care hospital in Las Vegas.

The teaching and learning program was implemented at one hospital, but the hospital was not named due to their requests for anonymity. In this paper, care team members were referred to as OTs, OTAs, PTs, PTAs, and SLPs. The population was focused on rehabilitation therapists working in the acute care setting. The teaching and learning program included a pre-survey, an evidence-based lecture, one to two case studies to implement their knowledge, a flyer with a QR-code linked to a step-by-step instruction manual, a post-survey, and a quality improvement survey.

Significance of the Project to Occupational Therapy

Educating care team members on using the Combilizer can increase the efficacy of EPM for patients who may not have the ability to mobilize out of bed yet because they are early in their recovery process. This teaching and learning program fell under the AOTA's education research agenda goal of testing the effectiveness of signature pedagogies (AOTA, 2018). This program also fell under the American Occupational Therapy Foundation's (AOTF) research agenda for Health Services Research, specifically to develop and implement a database for use in outcomes research and quality improvement studies (AOTF, 2019). The educational program provided previously was not all-inclusive. The previous program did not provide information about the benefits of using the device, the populations who will benefit from using the device, or how OT can use the device in their interventions. This teaching and learning program included visual, auditory, and application learning to fit multiple types of learning styles to ensure the learning needs are met. Overall, the teaching and learning program was conducted as a quality improvement method to their current education program for professional training on the use of the Combilizer.

Statement of the Problem

Defining the Perceived Problem

Traumatic injuries and illnesses can lead to a decline in a person's functional ability and quality of life (QOL) (Falkenstein et al., 2020). Patients admitted into the ICU can suffer from ICU-acquired weakness, which is defined as detectable weakness with no other explanation other than critical illness (Hashem et al., 2016; Reames et al., 2016) such as deconditioning, muscle weakness, hemodynamic instability, and ICU delirium (Atkins & Kautz, 2015; Hashem et al., 2016; Hester et al., 2017; Yataco et al., 2019) leading to more extended hospital LOS, increased days on the mechanical ventilator, and further complications (Linke et al., 2020; Pandullo et al., 2015; Reames et al., 2016). Patients are receiving delayed mobilization due to bed-rest orders; fear of dislodging of devices, wires, or tubes (Hashem et al., 2016; Yataco et al., 2019); hemodynamic instability such as increases in blood pressure, oxygen saturation, or heart rate; inexperience from the therapist (Falkenstein et al., 2020; Yataco et al., 2019); or there is a lack of resource allocation such as staffing (Hashem et al., 2016; Linke et al., 2020). Patients admitted into the acute care setting, specifically the ICU, are critically ill and are at an increased risk of developing additional complications due to prolonged bed rest.

Significance of This Problem for Occupational Therapy

Suffering from ICU-acquired weakness can lead to increased dependency in ADL tasks due to decreased physical function (Linke et al., 2020; Pandullo et al., 2015) and cognitive impairment (Falkenstein et al., 2020; Linke et al., 2020; Pandullo et al., 2015) which then leads to a decreased QOL. These deficits are significant to OT because they provide an opportunity to improve outcomes and overall functionality, facilitate the patient's ability to complete their ADLs independently, and return them to their routines. In the acute care setting, the patient's

daily routines are disrupted by their illness, injury, or disease, which can have further detrimental effects if additional complications arise due to a lack of preventative measures. The goal for OT in this setting is to help the patient early in their recovery to restore their ability to engage in occupations and improve overall functional ability. Although most literature focuses on EM using only nursing staff and PTs, there is a lack of research indicating the benefits of OT and EM in acute care to improve the functional outcomes of critically ill patients. Nevertheless, OT can help critically ill patients relearn their skills for BADLs in the acute care stage of recovery to give them a sense of independence before they can transition to the next level of rehabilitation. Occupational therapists can also focus on EM with patients in the critical care stage because occupations can be used to improve social, physical, and emotional needs; and they have been shown to improve overall performance by discharge (Weinreich et al., 2017). The purpose of this study was to provide a teaching and learning program to the interdisciplinary team on how to use the Combilizer with critically ill patients to increase efficacy for EPM by facilitating grooming tasks.

Anticipated Outcomes

It was proposed that an educational class using evidence-based materials, step-by-step instructions with photos accessible through a QR code, and case-study scenarios will increase knowledge, understanding, and confidence in using the device with patients in the ICU. The evidence-based lecture was provided using a printout of Google Slides. The slides included background information about the device, the benefits of using the device, and a population base that can benefit from using the device. Next, the flyer with the QR code contained step-by-step instructions along with photos of how to use the device, which included photos of the device's functions and how to position the patients on the device. Then, there were case scenarios along

with questions to apply their knowledge from the lecture. Finally, questions were encouraged at the end of the presentation to clarify any thoughts or confusion about the device.

Need for the Project

The need for this project was assessed through the designated acute care hospital in Las Vegas. Two Combilizers were purchased in April 2023 and there has been inconsistent use of the devices. Although the use of the device was encouraged with PTs through incentives, OTs and SLPs did not have the same requirements or opportunities at this facility. Individuals who have used the device most often are OTs, PTs, and PTAs in the trauma-surgical ICU (TSICU) and neuro-surgical ICU (NSICU). The device has not gained much familiarity with other care team members in other parts of the acute care setting. This project was used to educate the care team staff about utilizing the Combilizer to facilitate grooming tasks and they were provided with an easy-to-access instructional manual for future reference.

Target Population and Agency

The targeted population for this capstone experience were the acute care therapists, which included OTs, OTAs, PTs, PTAs, and SLPs because they can intervene early in the recovery process. The acute care hospital for the current capstone project is a level II trauma center that provides care to many critical care patients in and around Las Vegas in their ICUs. Their TSICU floor has 36 beds and the NSICU floor has 19 beds dedicated to critical care patients (Anonymous, 2022). These critically ill patients lack the ability to mobilize themselves in bed or have orders that prevent them from ambulating out of bed due to their diagnosis. A majority of the admitted patients receive therapy from two of the disciplines if not all three.

The hospital has encouraged the use of the Combilizer since its purchase, but many care team members still lack the education, knowledge, and experience on how to use the device. In

addition to the care team members on the TSICU and NSICU floors, other care team members in the acute care setting also benefited from learning how to use the device with patients who are downgraded to another unit. The care team members at the hospital gained benefits from an educational program to increase their knowledge and comfort with using the Combilizer to help facilitate grooming tasks. Therefore, the hypothesis states, "If a program on how to use the Sara Combilizer for EPM by facilitating grooming tasks is provided to the interdisciplinary acute care team members, then there will be an increase in knowledge, understanding, and confidence of the care team members on how to safely use the device with critically ill patients at the designated acute care hospital."

Definitions

The following terms used throughout this paper are their operational definitions, which are defined according to the current capstone project.

Care team members. Care team members are the healthcare professionals who work together to provide care for patients within the hospital setting (Law Insider, n.d.). These members include OTs, OTAs, PTs, PTAs, and SLPs working the acute care.

Early mobility (EM) and Early progressive mobility (EPM). The terms EM and EPM are used interchangeably in this paper. EM/EPM helps improve patient outcomes in the early stages of recovery (Alverez et al., 2017). Early mobility includes changing the degree of the head of the Combilizer to help the patient with passive sitting and standing balance while facilitating grooming tasks.

Grooming tasks. Grooming tasks are part of the ADLs that one partakes in to care for their physical health and hygiene (AOTA, 2020). These tasks include oral care, washing the face, and combing hair.

Literature Review

Research has found that prolonged bed rest can have detrimental effects on patients' recovery and outcomes. Although there is evidence stating the adverse effects bed rest has on patients, it is essential to look at the factors contributing to the lack of mobilization. These factors may be within the role of OT, the role of the interdisciplinary team, or patient factors that prevent them from being mobilized. Looking at the different variables that contribute to the lack of mobilization provided the framework for determining what is valuable or harmful for this teaching and learning program. The literature was explored using ProQuest, Ovid, and PubMed. The following sections examined the available literature to provide evidence and help support this capstone project.

Occupational Therapy in the Intensive Care Unit

This first section is focused on the effectiveness of OT in the ICU. When patients are admitted into the ICU, they can face many functional deficits due to their injury or disease. Occupational therapy in the ICU can help promote functional performance and functional mobility in the early stages of recovery. Patients admitted into the ICU can benefit from OT services to decrease their risk of complications related to their critical illness, such as hospital-acquired pneumonia, neuromuscular problems, and impairments in completing their ADLs (Dinglas et al., 2013). Early mobility is focused on improving outcomes in the long run and is essential in the ICU (Alvarez et al., 2017; Coakly et al., 2022; Dinglas et al., 2013; Weeks et al., 2017; Weinreich et al., 2017).

First, a randomized controlled trial (RCT) implemented by Alvarez et al. (2017) studied the impact of early, intensive OT on delirium management and functional outcomes at hospital discharge. This study included 65 participants in the control group and 65 participants in the

experimental group. Participants in the control group were involved in reorientation, EM, correction of sensory deficits, management of the environment, sleep protocols, and avoidance of medications that may cause delirium. In addition, the participants in the experimental group participated in polysensory stimulation, BADLs (e.g., hygiene, personal grooming, and eating), simulation of upper extremity motor function, and family participation by trained family members. Results revealed that early intensive OT within 24 hours of admission was shown to help decrease delirium in non-ventilated elderly patients. The patients were also shown to have better outcomes upon discharge such as increased functional independence and grip strength when compared to controls. Limitations include the ability to generalize findings because the study was conducted at a single facility, cultural differences between Chile and the United States, and a lack of research supporting the use of OT in elderly non-ventilated patients in the ICU. However, the study's strengths included compliance with the protocol which was implemented frequently with the patients, and using valid and reliable instruments to collect data. By administering OT interventions, BADLs, positioning, and other methods, patients can have a higher level of independence and better functional outcomes by discharge. These findings are related to the current study because the interventions used to improve functional performance include positioning and BADLs.

Next, a retrospective cohort study conducted by Coakly et al. (2022) investigated the function of 432 patients with COVID-19 admitted into the ICU and non-ICU settings to examine the effects of OT and PT. An analysis of the patient's charts was completed to collect information on the patient's discharge destination, medical interventions, frequency of therapy, and functional status scores using the Functional Status Score for the Intensive Care Unit and Boston Activity Measure for Post-Acute Care, which are reliable and valid. The results found

that patients who were admitted to the ICU and participated in OT and PT four to five times per week demonstrated a higher frequency of therapy and had higher functional status scores by discharge than those who were not admitted into the ICU. Critiques of the study include an inconsistency between types of therapy interventions given between the ICU and the non-ICU settings, as well as types of interventions between therapists, which may lead to varied outcomes. A standardized protocol for patients in the ICU can provide structure and consistency for mobilization in the ICU. To take away, a greater frequency of OT and PT is shown to be beneficial for patients in the ICU. This study is relevant to the current study because it demonstrates the importance of OT and PT in the ICU to promote better functional outcomes.

Equally important, Dinglas et al. (2013) conducted a prospective cohort study to evaluate the association of patient, ICU, and hospital factors with the timing of the first OT intervention in the ICU. The sample included a cohort of 514 patients who were mechanically ventilated with acute lung injury in 11 different ICUs. The Acute Physiology and Chronic Health Evaluation II and Sequential Organ Failure Assessment were used to measure the outcomes of the patients, both of which are valid and reliable. The results found that only one-third of patients received OT during their stay in the ICU for acute lung injury. The absence of OT was contributed by the lack of education and training to provide therapy for individuals with critical illnesses. Critiques of the study include the lack of specification of the type of OT delivered, lack of control in OT interventions, variability to OT application by OTs, and lack of functional independence score to measure functional outcomes. However, the study's strengths include using three different facilities to increase generalizability and using valid and reliable instruments. To take away, a lack of education on how to work with specific diagnoses can lead to delayed or lack of OT. Related to the current study, providing education to mobilize critically ill patients can lead to

increased frequency of mobilization and BADL task performance for critically ill patients.

Furthermore, Weeks et al. (2017) completed a retrospective chart review of patients who were admitted to the medical-surgical ICU and were mechanically ventilated and critically ill with cancer. The team consisted of OT and PT, RNs, respiratory therapists, and physicians to determine if the patients were appropriate for EM. Occupational therapy interventions included self-care tasks at various levels such as in bed, seated at the EOB, or seated in a chair, along with cognitive activities to prevent delirium. The mortality probability model II, a validated model, was scored at admission to determine the severity of illness and probably of mortality. Forty-two mechanically ventilated patients with cancer who were admitted to a medical-surgical ICU were included in the sample. The results showed that the patients had an increase in cognitive scores and a significant increase in functional status scores over time. Some limitations of the current study include generalizability to the general population because it is specific to a single facility, potential confounding factors, and a lack of a comparison group. However, the study had an adequate sample size which helped reduce sampling errors, used a validated model, and the reason for admission was documented to control the confounding factors. Related to the current study, using an interdisciplinary team to conduct EM for critically ill patients has been shown to be beneficial for physical and cognitive functioning.

Moreover, Weinreich et al. (2017) completed a systematic review to synthesize 10 academic articles indicating the use of OT interventions on adults admitted into the ICU. The databases used to select the articles include Ovid MEDLINE, Embase, Cochrane Library, ClinicalTrials.gov, and CINAHL. The results revealed that OT was not well defined or interventions were a combination of PT and OT, making it difficult to determine if OT benefited patients in the ICU. However, OT or similar interventions were found to be safe and feasible,

and positive outcomes such as decreased delirium, improved function, and improved hospital and ICU LOS were shown. Critiques include selection bias because there was no second reviewer and a lack of generalizability due to the studies being conducted at single facilities. To take away, the systematic review showed that there is limited literature describing the use of OT in the ICU, but literature that included OT interventions was considered safe and had positive outcomes. In relation to the current study, providing occupation-based interventions can be beneficial for patients to improve outcomes during their stay in the ICU.

To conclude, although OT interventions have been shown to improve functional outcomes in patients admitted into the ICU with various diagnoses, OT in the ICU is not well defined in the setting. The study by Dinglas et al. (2013) emphasized the importance of educating care team members on how OT can work with critically ill patients to increase OT occurrence. The studies have also shown that patients who received OT in the ICU had improved functional scores and hospital outcomes (Alverez et al., 2017; Coakly et al., 2022; Weeks et al., 2017; Weinreich et al., 2017). Despite the limited studies on the exclusive use of OT interventions in the ICU, interventions similar to OT or described as OT in generalized terms were found to be safe in the ICU (Weinreich et al., 2017). Lastly, the studies relate to the Person-Environment-Occupation-Performance (PEOP) model used in the current study because each article includes how the patient's factors, such as cognition and injury, can influence how the therapists in the environmental context work to improve the patient's ability to their occupations. Care team members can benefit from continuing education courses to increase knowledge and develop skills to work with various critical illnesses to improve efforts in implementing OT interventions.

Interdisciplinary Team and Early Mobilization

This next section explored how interdisciplinary care team members perceive EM. Although there has been research that supports EM and the benefits that it provides to the patients, some healthcare providers may be hesitant to mobilize critically ill patients. The hesitancy may be connected to a lack of knowledge or education regarding working with critically ill patients or fear of providing care to the population. Investigating barriers to EM can lead to better education and training to increase efforts for EM. The following articles examined the perspectives of interdisciplinary teams and the use of EM as an intervention.

First, a prospective study conducted by Chan et al. (2021) implemented a 2-hour interprofessional training program using various teaching methods taught by a PTs to train nurses on the importance of EM. There were a total of 203 RNs and nursing assistants, all of whom participated in audience feedback, gaming, hands-on practice, case studies, and role-play to incorporate the Bedside Mobility Assessment Tool (BMAT). The results showed that there were positive interactions with the classes, increased confidence for prescribing interventions, a high compliance rate for using the BMAT, and overall increased mobility from the RNs. There are limitations to the study which include the lack of a comparison group, the absence of viewpoints from an interprofessional standpoint since the program was meant for interprofessional use, the lack of randomization, and a risk of bias because the study was not blinded. However, the study used educational theories to support the program, included multiple types of teaching methods for different types of learners, and had an adequate sample size. In relation to the current study, providing a mix of teaching methodologies for healthcare professionals to teach or reinforce a skill can improve reaction, learning, and behavior for better

patient outcomes. These teaching methods include interactions with the instructor and colleagues, audience feedback, and case studies to apply their knowledge.

Next, Harris and Shahid (2014) conducted a prospective study on a PT-led EM program for the medical-surgical and cardiovascular ICUs in three different hospitals. Each hospital's interdisciplinary teams organized meetings to discuss concerns and barriers to EM when working with critically ill patients. An anonymous email survey was distributed to critical care RNs and respiratory staff which consisted of nine yes/no responses and open-ended questions. The study results revealed that having open weekly discussions with other disciplines created a support system and allowed the professionals to identify barriers and concerns they were facing. The barriers that were discussed included staffing, interdisciplinary collaboration, safety concerns, the need for more education, and additional time to mobilize patients. There are limitations to the study including not specifying the sample size and possible confounding and selection bias. However, the study looked at the changes at three hospitals which increases generalizability, the patient interaction portion was randomized, and the study was detailed in its methodology. To take away, providing a method for the interdisciplinary team to communicate and collaborate can help decrease barriers to EM, and providing resources for continuing education courses relevant to the ICU can increase confidence in providing care to patients.

Equally important, Hoyer et al. (2015) conducted a cross-sectional, self-administered survey using a 5-point Likert scale to determine the potential barriers that providers faced in the inpatient rehabilitation setting. Eighty-two RNs along with 38 OTs and PTs completed the survey, and it was found that nurses reported greater barrier scores than rehabilitation therapists. However, nurses with more years of experience had lower overall perceived barriers. In addition, the rehabilitation therapists felt more confident in their ability to mobilize patients because they

are specifically trained to do so. Limitations of this study include a selection bias because not all eligible participants responded to the survey, a lack of demographic information in the type of unit the professional worked and their years of working experience, generalizability of the results because the survey was only given to two sites at a single demographic region, and response fatigue. However, the survey had acceptable internal consistency and an adequate sample size. Related to the current study, the survey is focused on interdisciplinary care in mobilizing patients, and it revealed the potential barriers RNs and rehabilitation therapists face in mobilizing patients. This study has shown that education and training on mobilizing patients can help decrease barriers to EM.

Furthermore, Jolley et al. (2014) conducted a cross-sectional anonymous survey to assess the knowledge of EM in the ICU and perceived barriers of EM using a 5-point Likert scale. Ninety-one physicians, 17 RNs, and 12 PTs completed the survey, and it was found that most practitioners are knowledgeable about the potential benefits of EM to help maintain muscle strength for patients who are mechanically ventilated in the medical ICU. In addition, potential barriers to EM included available time and personnel to mobilize patients along with the risk of musculoskeletal injury, work stress, and the delay of usual work. Limitations of this study include selection bias due to convenience sampling, response bias due to the wording of the questions or the order in which they were placed, and generalizability of the results because it was conducted at a single institution. However, the study had an adequate sample size, a sufficient study duration, used a single-blinded method, and had a detailed methodology. Related to the current study, OTs and PTs may be delaying their efforts for EM for critically ill patients due to the risk of workplace injury and a lack of available time despite understanding the potential benefits of EM. Creating a protocol and guidelines on how to mobilize critically ill

patients safely can help make EM part of regular practice and decrease barriers to EM in the ICU.

Furthermore, McCarty et al. (2022) completed a semi-structured interview to investigate the opinions of the interdisciplinary team's (i.e., RNs, OTs, and PTs) use of an EM protocol in the medical ICU. Interviews were completed with 10 RNs and one therapist after implementing an EM protocol in the medical ICU. The results revealed positive responses to the EM protocol from nurses and therapists who stated that patients were getting out of bed more, family members liked seeing their loved ones out of bed, and the mental health benefits of getting out of bed. However, some barriers included the lack of staffing, available space, having to request an order to mobilize patients, fear of patient falls, available time for staff, and the health decline of patients. Limitations of this study include a lack of consistency in implementing protocols, lack of understanding from hospitalists on the application of the protocol, generalizability of findings, and the absence of specification on how the interview data was triangulated. However, the study provided a detailed methodology and standardized protocol for study replication. To take away, there have been documented benefits to EM, but there are barriers that prevent the care team members from implementing it with patients. Related to the current study, education on the benefits of EM and training on how to safely mobilize critically ill patients can help decrease barriers to EM in the ICU.

To summarize the section, care team members face barriers to EM when working with critically ill patients, but some protocols have been shown to help reduce barriers. By providing education to care team members (Chan et al., 2021; Hoyer et al., 2015) and integrating interdisciplinary team meetings (Harris & Shahid, 2014), the barriers are identified and addressed to increase mobilization. Some reported that barriers were due to institutional

structures such as staffing and time (Jolley et al., 2014; McCarty et al., 2022). To help decrease barriers to EM of critically ill patients, an interdisciplinary team teaching and learning program can provide evidence-based information to change attitudes and behaviors on EM for increased efficacy while also fostering teamwork and collaboration to decrease institutional structural barriers. The studies relate to the PEOP model because they address how personal and environmental factors can influence their efforts to implement EM with critically ill patients. The person and environmental factors then influence if and how the patient performs their role, impacting their occupation and performance.

Interdisciplinary Interventions on Patient Outcomes

This next section explored the outcomes of using an interdisciplinary approach to EM in the ICU. Coordination among care team members can involve team meetings to discuss the plan of care for patients (Jolley et al., 2017; Reames et al., 2015). Collaborating as a team can help improve patient outcomes and clarify roles between care team members (Azuh et al., 2016; Black et al., 2020). Early mobility using an interdisciplinary approach can help reduce complications associated with the patient's illness. In the following subsection, each of the articles implemented an EM study using an interprofessional approach to investigate the outcomes of EM in various ICU settings.

First, Azuh et al. (2016) completed a quality improvement study on early active mobility in the medical ICU by utilizing an EM team, which consisted of RNs, OTs, PTs, and mobility aides. A 5-point mobility scale was developed to determine the patient's highest level of mobility achieved while they were in the medical ICU, and the scale ranged from bed rest, edge of the bed, stand to chair, walk with assistance, and walk independently. Over the 1-year study period, 3233 patients were admitted to the medical ICU. The study results showed an increase in

repositioning and assistance with ADLs and the patients had an overall improved experience with the team's interactions. Limitations of the current study include a lack of generalizability because it was conducted at a single facility, inconsistencies in frequency and duration of sessions, a lack of documentation of the patient diagnosis, and the lack of a protocol for consistency. However, the study had an adequate sample size and a sufficient study duration. To take away, EPM and interdisciplinary communication can increase efforts to mobilize patients admitted into the ICU, which can potentially prevent the development of other critical illnesses.

Similarly, Black et al. (2020) also conducted a quality improvement study on an EM protocol using a multidisciplinary approach in the surgical-trauma ICU. The team consisted of physicians, RNs, OTs, and PTs who all collaborated to create strategies on how to mobilize patients using proper techniques safely. Physical therapists provided an in-service for the RNs on how to safely mobilize patients using proper techniques. Results from the study revealed that there was a significant increase in mobilization events in the implementation period compared to the pre-intervention period. In addition, the EM protocol provided nurses with autonomy and clear guidelines on mobilizing traumatically injured patients, and no adverse events related to mobilization occurred. However, there were no statistically significant differences in the reduction of LOS and days spent on the mechanical ventilator. Limitations of this study include having a small sample size, conducting the study at a single facility, limited time on data collection, generalizability to all traumatically injured patients, and a lack of data on why patients were not mobilized. However, the study collected data on pre- and post-intervention results for comparison, and they provided a detailed methodology on how the program was implemented. Related to the current study, the study demonstrated the benefits of providing a teaching and learning program using an interdisciplinary approach to improve patient experience

and outcomes.

Furthermore, Corcoran et al. (2016) conducted a quasi-experimental study to see the effects of an interprofessional medical and surgical ICU team on patient outcomes. They used a prospective data collection method, and the interdisciplinary team comprised RNs, respiratory therapists, physicians, and rehabilitation therapists (e.g., OTs, PTs, SLPs). One hundred twenty-three patients were included in the pre-implementation phase, and 160 patients were included during the implementation phase. The results of the study revealed that the EM project led to an average increase in rehabilitation therapy provided to the patients, there was a decrease in ICU LOS, a decrease in pain scores, and a greater percentage of patients being discharged home without services. Limitations of the study include the lack of control for external variables in the pre-intervention period, lack of documentation of patient refusals or schedule conflicts, and performance bias because the study was not blinded. However, this study had an adequate sample size and a comparison group to analyze the impact of having an interdisciplinary team work together. Concerning the current study, implementing an EPM program with a dedicated interdisciplinary team can lead to increased incidences of rehabilitative therapy.

Furthermore, a pre- and post-intervention study by Falkenstein et al. (2020) examined the impact of an EM program on the quality of service in the trauma ICU using a sample of 44 patients in the pre-intervention group and 43 patients in the post-intervention group. The Richmond Agitation-Sedation Scale, which has high validity and reliability, was used to determine the mobility level of the patients. Methods include using a multidisciplinary EM team consisting of a trauma nurse, RT, OT, PT, and other disciplines. Educational models were created for nursing and the rehabilitation team to promote the administration of EM. The results revealed that although there were no statistically significant differences in hospital and ICU

LOS, the time to out-of-bed, time to walking, time until discharge, duration on mechanical ventilator, and functional status improved for the intervention group. Critiques of the article include not having a method for tracking patient progress for each care team member, lack of control over the interventions, and generalizability. However, this study had an adequate sample size, used an assessment with high validity and reliability, and had a comparison group to indicate the effects of the implementation of the program. To take away, the use of an interdisciplinary care team in the trauma ICU was shown to help clarify roles and encourage nurses to participate in the EM program, leading to better quality of care. In relation to the current study, interdisciplinary collaboration in the promotion and use of the Combilizer can lead to better functional outcomes for the patients.

In addition, Jolley et al. (2017) conducted a two-day cross-sectional point prevalence study with an interdisciplinary team of OTs, PTs, and RNs to determine the type and frequency of EM delivered to patients with acute respiratory failure. Forty-two ICUs from 17 hospitals, which included medical ICU, trauma ICU, and medical-surgical ICU were involved and treated both mechanically ventilated and non-mechanically ventilated patients. The results revealed that non-mechanically ventilated patients were more likely to receive OT/PT than those who were mechanically ventilated. To add, mobility activity that OT or PT provided had a higher intensity than mobility that was not provided by OT or PT and consisted of passive activities. Limitations of this study include a lack of definition of ICU mobility from the nursing staff, a lack of functional assessment scores to indicate the effectiveness of EM, a lack of consistency of mobilization protocols across facilities and ICUs, time constraints, and possible selection bias because all the institutions were connected to the same network. However, the study was conducted across multiple institutions and ICUs, which increased generalizability, and there was

an adequate sample size. Related to the current study, OT and PT can increase the application of EM in critically ill patients, alleviating the workload of nursing staff and increase the frequency of mobilization.

Next, a retrospective pre- and post-intervention conducted by Linke et al. (2020) examined the use of an interdisciplinary approach to increase patient mobility in the medical, surgical, and cardiovascular ICU in three different hospitals with a total of 64 beds. The interdisciplinary team included a physician, nursing staff, OT, PT, RT, and pharmacy. The team worked together to create a mobility program for patients in the ICU and used the time taken to first ambulate as the final outcome measure. Results revealed that using an interdisciplinary approach to EM increased the number of patients ambulated in the ICU; however, there were no significant changes seen in ICU and hospital LOS, or ventilator days. Critiques of the study include limited generalizability of the findings as well as a lack of information regarding the diagnosis, frequency, volume, and duration. However, the study increased generalizability by incorporating three different hospitals, had a detailed methodology along with a figure of the mobility protocol, and was measured across three-time points to determine the impact of the program. Nonetheless, the results indicate how collaboration in an interdisciplinary care team will help ensure stakeholders have a role in the EM protocol. In relation to the current study, interdisciplinary teamwork can lead to increased EM events for the patients.

Furthermore, Reames et al. (2015) conducted a prospective study to evaluate the outcomes of an EM protocol in the progressive care unit. This included the medical and surgical ICU population of a 20-bed unit with a ratio of three patients along with PTs and patient care technicians. The protocol had three phases and required the staff to collaborate to identify patients appropriate for mobilization. Each phase had a different level of intensity of

mobilization and the patient was able to progress to a higher phase when they met the requirements. The results showed an increase in ambulating the patients within 72 hours of admission when the program was first implemented, with an increase in program application two months following the initial implementation due to improvements in staff communication and posted objective measures. Critiques include the generalizability of the results because it was conducted at a single facility, the short duration for program implementation, and a lack of detail on the severity level and diagnosis of the patients. However, strengths include consistency in the frequency of mobilization and a detailed methodology along with a figure of the mobility protocol detailing the phases. As a result, communicating with all staff members can help increase the likelihood of patients receiving EM when admitted into the medical ICU. In relation to this current study, a protocol for mobilizing patients with the Combilizer can help increase efforts for EM in critically ill patients. In addition, interdisciplinary education can improve understanding of interdisciplinary roles.

Lastly, Wood et al. (2014) conducted a quasi-experimental study using an interdisciplinary team to implement an EM program by utilizing mobility aides in the medical-surgical unit. The PTs educated and trained the mobility aides on proper body mechanics, passive range of motion, basic transfers when mobilizing patients, and terminology on the patient's assistance levels. The PTs also placed a mobility guideline sheet on the patient's door for the nurses to use as a reference and to indicate the patient's ambulatory level for mobility aides. Five hundred twenty-one patients were admitted into the medical-surgical unit and participated in the project. It was found that the program is safe for patients and staff, and it was able to help decrease pressure ulcer incidence. Limitations of this study include generalizability because it was conducted at one unit in a single facility and performance bias because the study

was not blinded. However, the study was able to take data from pre- and post-intervention periods for comparison, it had an adequate sample size, and it had a detailed guideline on categorizing the patients into ambulatory or non-ambulatory along with the interventions to perform at each tier. Related to the current study, EM is important to help decrease pressure ulcers for patients admitted into the hospital, and having an EM program with guidelines in addition to utilizing an interdisciplinary team can guide when and how to mobilize patients.

The results of the articles revealed that although there were no statistically significant changes in LOS and ventilator days, however, patients ambulated earlier and engaged in functional activities sooner in the ICU (Black et al., 2020; Falkenstein et al., 2020; Linke et al., 2020; Weeks et al., 2017). In contrast, Corcoran et al. (2016) found that an EM protocol helped reduce average LOS in the medical ICU. In addition, the studies found that an EM protocol increased the number of patients being ambulated earlier from the time of admission (Falkenstein et al., 2020; Linke et al., 2020; Reames et al., 2015), increased repositioning and ADL assistance (Azuh et al., 2016), and reduced pressure injury incidences (Wood et al., 2014). Furthermore, EM programs using an interdisciplinary team increased the amount of OT/PT administered and increased the intensity of therapy services (Jolley et al., 2017). These studies also connect to the PEOP model because they consider how the interdisciplinary care team can play a role in the environmental context of the patient's recovery process.

Early Progressive Mobility on Functional Status

Although it was previously thought that prescribing bed rest was beneficial for recovery, more recent research has shown that immobility can be harmful to recovery. Individuals who are admitted to the ICU are at risk of developing further complications if they do not mobilize. There can be damage to the cardiorespiratory and muscular systems (Schujmann et al., 2020) as well as

other cognitive and psychological impairments (Pandullo et al., 2015). In this section, researchers look at the impact of mobility on patients' functional status in the ICU.

First, Pandullo et al. (2015) conducted a retrospective study on mobility achievements during the phases of hospitalization progressing from the ICU to the general inpatient floor on 182 patients admitted to the ICU. The patient's highest level of mobility in the ICU was compared to their highest level in the post-acute inpatient floor when they were transferred. In addition, mobility levels progressed from bed mobility, transfer to chair or commode, and ambulation. The results revealed that individuals whose highest level of function was bed mobility took the longest to meet or surpass the same level as their ICU level compared to those who ambulated while in the ICU. In addition, individuals who ambulated while they were in the ICU have shown a shorter LOS in the hospital and those who only achieved bed-level mobility had a longer LOS in the hospital. Critiques of the study include a lack of generalizability, convenience sampling resulting in selection bias, and a lack of control over confounding factors. However, the study had a sufficient sample size, interrater reliability, data extraction of the specific type of therapy provided, and documentation of comorbid health conditions. To take away, it will be important to educate patients on the importance of ambulation if they want to improve their functional mobility and decrease their hospital LOS, as well as to make an interdisciplinary plan to maximize mobilization for the patients. In relation to the current study, mobility in the early stages of recovery can influence the recovery process as the patient progresses.

In addition, a RCT conducted by Schujmann et al. (2020) examined how EPM improves the functional status of patients in the ICU by discharge. One-hundred thirty-five patients were randomized into either a mobility program or conventional physiotherapy, resulting in 67

patients in the control group and 68 patients in the intervention group. The primary outcome was measured with the Barthel Index (BI), a valid and reliable tool, score in addition to physical activity level, respiratory, muscular, mobility, and functional status. All the patients in the mobility program had a combination of conventional therapy and EPM that focused on functional mobility and cognition, while the patients in the conventional therapy group only had standard therapy. The results showed that the intervention group had higher BI scores than the control group at discharge and the intervention group also had fewer days in the ICU compared to the control group. Critiques of the study include a lack of generalizability due to restricting the participants to previously healthy individuals. However, this study implemented a control group for comparison, used assessments that were valid and reliable, included a detailed methodology, had a sufficient sample size, and had an adequate study duration. To take away, EPM can help improve the functional status of patients admitted into the ICU and reduce the LOS in the ICU as well, which can overall improve functional independence. In relation to the current study, EPM has been shown to improve functional status and functional mobility.

To conclude, EPM can lead to shorter hospital LOS and fewer days in the ICU (Pandullo et al., 2015; Schujmann et al., 2020). Patients who progressed out of bed while in the ICU had an easier time progressing to ambulation than those who were only at bed mobility level while in the ICU (Pandullo et al., 2015). In addition, those who participated in EM had higher BI scores at discharge than those who had conventional therapy (Schujmann et al., 2020). Finally, the studies also connect to the PEOP model of the current study because each study considers each aspect of how the person, environment, and occupation interact to influence performance. This includes the patient's diagnosis, whether the patient is in the ICU or another setting, the functional activities they are participating in, and how all these aspects impact their functional

outcomes. These studies revealed that EPM can be beneficial for functional outcomes for patients admitted into the ICU.

Progressive Mobility Program in the Neuro-ICU

This section will discuss mobility programs in the neuro-ICU. There are limited studies on the impact of EPM programs on the neuro-ICU population. When working with patients of this population, there may be strict guidelines or parameters the patient has to meet before they can be mobilized. Due to the severity of the patient's illness and the strict parameters, it is essential to monitor the hemodynamic stability of patients in the neuro-ICU when working with them. The constant monitoring and critical condition of this population may intimidate care team members from providing EM to them. However, patients in the neuro-ICU population will also require mobilization to prevent hospital-acquired conditions.

First, Hester et al. (2017) conducted a retrospective analysis of a Progressive Upright mobility Protocol (PUMP) to determine the outcomes of EPM in the neuro-critical care population. There were 1,118 patients in the pre-period, 731 in the post-period, and 796 patients in the sustained period. The protocol included educational modules, instruction on proper technique, documentation into the electronic medical records, and daily rounding to ensure the protocol was being implemented. Data was collected on the LOS, days spent on the mechanical ventilator, percentage of patients requiring mechanical ventilation, mortality, and readmissions. The results found that the neuro-ICU LOS was shorter following intervention compared to pre-intervention and the mobility program improved clinical outcomes such as LOS, and hospital-acquired infections. In addition, the program continued without oversight from leadership. Critiques include a lack of consistency with the frequency and duration of mobility with each patient. However, the study had an adequate study period, a comparison between the pre- and

post-intervention period, detailed demographics including the patient's diagnosis, and an adequate sample size. To take away, the PUMP has shown its benefits in reducing LOS in the neuro-ICU and hospital LOS, which in return reduced the number of hospital-acquired infections. In relation to the current study, a teaching and learning program on how to work with patients using a device is beneficial for hospital outcomes in regard to the neuro-critical care population.

Next, Gaspari et al. (2018) completed a retrospective study on out-of-bed mobilization for patients admitted into the neurosurgical ICU. The sample included 19 patients admitted into the neurosurgical ICU and received clearance to perform out-of-bed activities with an EVD in place. The level of activity was measured from lowest to highest and included tilt-table standing, sitting on a bedside chair, and walking. The results of the study showed that a majority of patients ambulated, followed by active standing, and tied with sitting on the bedside chair and standing using the tilt table. The average time between EVD placement and the first out-of-bed activity decreased from 8 days to 4.2 days. As a result, performing out-of-bed mobilization with patients with EVD placements in the neurosurgical ICU is found to be safe and feasible. Limitations of this study include having a small sample size, a lack of power, being conducted at a single facility, a lack of a step-wise progression in mobility, a lack of consistency in frequency and duration of mobilization sessions, and generalizability of the results to other patients with EVD placements. However, the study pointed out the importance of having two professionals work together to mobilize the patients to ensure patient safety and prevent any adverse effects regarding dislodging the EVD. Related to the current study, using a tilt-table or passive standing can be safe and provide potential benefits to the patients when working on EM.

Then, a prospective, longitudinal, three-group comparative study by Klein et al. (2018)

looked at the sustainability of a nurse-driven EPM program in the neuro-ICU by comparing levels of mobility over time. The sample consisted of 260 patients pre-program, 377 post-program, and 480 patients late-post program, and the outcomes were measured through LOS, discharge disposition, mortality, and hospital-acquired infections, while behavioral health was measured using the Brief Symptom Inventory. The protocol was used to guide decision-making on when to progress patients to the next level of mobilization and it included referrals to the rehabilitation team when the patient was appropriate for that level. The results revealed that EPM delivered in the neuro-ICU led to improved mobility, reduced stays, and improved psychological health. Critiques of the article include attrition rates which lead to inconsistencies in the results. However, the study had a sufficient sample size, adequate study duration, and detailed methodology. To take away, EPM reduces neuro-ICU and hospital LOS, improves patient's level of mobility, and improves psychological health. In relation to the current study, EPM was shown to have positive outcomes for patients admitted into the neuro-ICU.

In addition, Shah et al. (2016) implemented a prospective, observational study on patients who were admitted to the neuro-ICU, had an EVD placement, and received orders for PT to be mobilized. Ninety patients who were admitted to the neuro-ICU deemed safe with stable intracranial pressure and mean arterial pressure were mobilized. The results revealed that the average time between EVD placement and the first PT session was 7.7 days. A majority of patients were at least standing or better, over half of patients were walking with assistance, and only a few patients had a passive range of motion while in bed. Although there were four adverse effects, one of which included the dislodgement of an EVD, EM with an EVD placement was found to be safe. Limitations of the current study include a lack of randomization which may lead to bias and missing data from potential patients, and a lack of generalizability because the

study was conducted at a single facility. However, the study had a detailed methodology that included many safety measures, had an adequate sample size, and had a sufficient study duration. Related to the current study, EM for individuals with EVD placements is found to be safe and can have benefits in decreasing ICU-acquired weakness.

Then, Young et al. (2019) implemented a prospective, observational cohort study utilizing a mobilization protocol for patients admitted into the neuro-ICU. The cohort study had three phases that were implemented which included phase zero where no mobilization occurred, phase one was an OT/PT-driven protocol, and phase two was a RN-driven protocol. The results of the study revealed that patients received an increase in mobilization as the trials progressed in phase one and phase two. In addition, hospital and ICU length of stay decreased as the phases progressed, and the days spent on the mechanical ventilator. The study found that interdisciplinary discussions every morning for each patient allowed the team to identify potential candidates that were appropriate to mobilize. Some limitations of the current study include inconsistencies in the type of mobilization implemented, inconsistencies in the frequency and duration of sessions, and the study being limited to a single facility, leading to a lack of generalizability. However, the study compared a control group with an intervention group to indicate its effectiveness, and the protocol was detailed in what actions the rehabilitation therapists or RNs should take when mobilizing patients. To take away, using an interdisciplinary team to identify and implement a mobilization protocol can help increase EM efforts for critically ill patients, potentially improving their hospital and discharge outcomes.

To conclude, both studies by Hester et al. (2017) and Klein et al. (2018) found that an EPM program reduced the LOS. In addition, the study by Hester et al. (2017) also found that progressive mobility improves other outcomes such as hospital-acquired infections which can

also reduce costs. Similar to other studies in other populations, EM can also improve mobility and psychological health in patients admitted into the neuro-ICU. Not only can EM improve patient outcomes, but mobility programs have also been found to be safe for patients with EVD placements (Gaspari et al., 2018; Shah et al., 2016) and increases the likelihood of care team members performing EM (Young et al., 2019). These two studies connect to the PEOP model because the studies look at the person's cognition, creating and implementing a protocol for more consistency in the environment, and how they affect the performance factors of the patient as they recover. Early mobility programs are shown to be beneficial for the neuro-critical care population.

Synthesis of Literature Review

According to the literature review, there is limited evidence that examines EM in the acute care setting in relation to OT and even more limited information regarding the use of the Sara Combilizer. There was mixed evidence of the benefits of EM for critically ill patients with some studies finding that it can improve hospital and ICU LOS and mobility (Black et al., 2020; Corcoran et al., 2016; Falkenstein et al., 2020; Pandullo et al., 2015; Schujmann et al., 2020; Weeks et al., 2017; Wood et al., 2017); however, there are also studies with findings that state there is not a statistically significant difference between EM and the control groups for factors such as those on mechanical ventilation (Falkenstein et al., 2020). It was also reported that the care team members faced barriers that prevented them from performing EM (Hoyer et al., 2015; Jolley et al., 2014; McCarty et al., 2022). Positive outcomes of the findings in the studies include the increase in functional status scores as well as the safety and feasibility of implementing EM in specific populations (Azuh et al., 2016; Gaspari et al., 2018; Hester et al., 2017; Klein et al., 2018; Linke et al., 2020; Shah et al., 2016). It was also found that EM programs can increase the

amount of therapy provided to patients (Chan et al., 2021; Harris & Shahid, 2014; Jolley et al., 2017; Linke et al., 2020; Reames et al., 2015; Young et al., 2019).

Some general strengths of the articles include the consistency in findings across studies, the use of RCTs to help reduce bias, having an adequate sample size in the studies, and including a detailed methodology. Some general weaknesses of the articles include the generalizability of the studies, the lack of research supporting the use of OT interventions in the ICU, and the lack of specificity of the type of OT interventions implemented. With the currently available evidence, there is still a gap in the literature that supports the interdisciplinary care team in utilizing the Combilizer for EM by facilitating grooming tasks. The current capstone project will examine the effectiveness of a teaching and learning program focused on utilizing the device for an interdisciplinary care team to increase the efficacy of EM by facilitating grooming tasks in the ICU.

Statement of Purpose

Care team members must address grooming tasks in the early stages of recovery to help patients re-establish their daily routines. One of the main goals for OT to address in the acute care setting is to focus on retraining grooming tasks to help the patient address their BADL task performance before progressing to higher-level performance tasks. Hence, this teaching and learning program to use the Combilizer is focused on facilitating grooming tasks in the acute care setting. The purpose of this study is to provide a teaching and learning program to the interdisciplinary team on how to use the Combilizer with critically ill patients to increase efficacy for EPM by facilitating grooming tasks. The hypothesis for this capstone project states, "If a program on how to use the Sara Combilizer for EPM by facilitating grooming tasks is provided to the interdisciplinary acute care team members, then there will be an increase in knowledge, understanding, and confidence of the care team members on how to safely use the device with critically ill patients at the designated acute care hospital." Finally, the objectives of this project are as follows:

- Educate therapy staff on the use of and benefits of the Sara Combilizer to increase efficacy for EPM in critically ill patients,
- Provide an easy-to-access instructional manual to use the device,
- And increase efforts for safe patient handling to reduce worker injury and patient falls.

Anticipated outcomes include:

- Increased understanding of the benefits of using the device for grooming tasks
- Increased knowledge, understanding, and confidence in using the device,
- And safe EPM of critically ill patients.

Theoretical Frameworks

The foundation of this capstone project used the PEOP model. The PEOP looks at how life situations are affected by the person, environment, occupation, and performance factors (O'Brien & Kuhaneck, 2019). Unlike other models, the PEOP uses a holistic approach and focuses on intrinsic and extrinsic factors that affect the person's daily activities. These intrinsic factors include physiological, cognitive, spiritual, neurobehavioral, and psychological (Brown, 2019). The extrinsic factors include social support, social and economic systems, culture, and values, built environment and technology, and natural environment (Brown, 2019). There is an emphasis on “doing” and it is essential for individuals involved to collaborate. This model looks at the individual's past, present, and future goals and considers the person, environment, and occupation factors to match the needs of the person.

Patients admitted into the ICU experience life-altering events that can change their ability to complete occupations. Due to the effects of the injury, the patient may no longer have postural control to stay upright without external support or lack movement in their upper extremities to effectively complete tasks. Using the PEOP model, the practitioner will evaluate how the person, environment, occupation, and performance factors interact to affect the overall outcomes. These injuries can lead to a lack of strength, flexibility, attention, balance, coordination, self-awareness, and motivation, all aspects of intrinsic factors. Extrinsic factors affecting the patient's recovery include emotional support, customs and beliefs, political or economic policies, and tools. biopsychosocial. With the PEOP model, the practitioner can collaborate with patients to make goals that fit their needs and help them regain independence.

As for the interdisciplinary team, the Adult Learning Theory was used to support the program. Knowles (1978) states that adults learn differently than children, meaning adults

require different learning methods to motivate the learner to acquire more knowledge. Adults learn because they are motivated to improve and strengthen their current knowledge and skills. It focuses on applying the individual's experiences and uses less instruction than learning for young individuals. According to the adult learning principles, Knowles states that the student must be motivated for self-education, desire to enhance their experience, be an active participant, and bring their experiences into their new learning. In the current program, the learner will voluntarily attend the in-service without incentive, be encouraged to use their knowledge to apply to the case studies, and participate as an interdisciplinary team. The program will also include different instructional methods to help meet the needs of the different learning styles, which will further motivate the participant to learn about the device. The instructor can tailor the learning experience for the learner to be more successful in acquiring more knowledge or strengthen what the learner already knows by taking the principles into consideration.

Methodology

Design

The study used a pre- and post-survey design to determine the effectiveness of the teaching and learning program. It used a quantitative approach using a four-point Likert scale and included 10 questions in each survey. The surveys were conducted before and after the in-service presentation. The Wilcoxon signed-rank test was used to analyze the quantitative data of the surveys. Six weeks following the initial program implementation, a qualitative survey consisting of five open-ended questions was used to collect feedback on the in-service.

Agency

The doctoral student researcher, Bonnie Lei, implemented the capstone project in the ICU at a designated acute care hospital in Las Vegas between January 2024 and April 2024, where there is a current fully executed educational affiliation agreement. Regarding student placement for the capstone project, Silvia Lobaina, the OTs, and the manager of acute rehab services were contacted. The doctoral student researcher was placed at the hospital in the acute care setting for her level IIB fieldwork placement between May 2023 and August 2023. Bonnie spent most of her fieldwork rotation in the TSICU and had additional experience in the Burn ICU, Medical Cardiac Unit, NSICU, and Adult Oncology Services.

The acute care hospital is a Level II Trauma Center verified by the American College of Surgeons (Anonymous, n.d.). The hospital consists of OT, PT, speech-language pathology, and respiratory therapy for its rehabilitation services (Anonymous, n.d.). The facility is open to serve patients with various needs in and around Las Vegas (Anonymous, 2022). A new tower was added to expand the hospital to meet the city's growing needs and include the TSICU and NSICU units. The rooms in the new tower had adequate space to fit the Combilizer while still

allowing space for care team members to care for the patient effectively.

Sampling and Recruitment

This teaching and learning program used a convenience sampling method at the designated acute care hospital. The target population for this current project was interdisciplinary care team members within the acute care setting of the designated hospital. A total of 64 care team members were eligible to attend the program. The care team members included OTs, OTAs, PTs, PTAs, and SLPs. The care team members also had to work full-time, part-time, and per diem with a range of acute care work experience between less than one year and over 10 years. Exclusion criteria included care team members working in the inpatient rehabilitation setting, RNs, respiratory therapists, patient care technicians, certified nursing assistants, residents, physicians, social workers, case managers, and students. The attendance of the care team members was discussed with the manager of acute rehab services to ensure the in-service did not interrupt the participant's productivity requirements. The care team members voluntarily attended the in-service at a designated time. The advantages of using a convenience sampling method include efficiency and simplicity of implementation; however, the disadvantages include sampling bias, lack of variability, and generalizability.

Procedures

This educational course was offered as an in-service to train care team members on how to use the device as well as the benefits of using the device for EPM. There were five presentations offered on two different days of the week to ensure the program could reach a larger audience. All the sessions were offered between January 2024 and February 2024. The first two sessions were provided on a Wednesday in the late afternoon, the second two sessions were given the following week on a Wednesday in the early afternoon, and the final session was

presented the week following the second session on a Thursday in the early afternoon. The care team members received an email and group message through iMobile, an instant messaging system of the hospital, from the manager of acute rehab services one week before the presentation as an invitation to attend the in-service program. The email and message included the dates and what to expect from the in-service, such as the presentation and the surveys.

The lecture slides were created using Google Slides. The slides included information about the Sara Combilizer, benefits of EPM, benefits of using the device, populations that are appropriate for the device, and instructions on how to use the device along with photos. Due to the lack of technology available to display the learning materials during the presentation, the in-service included the Google Slides printout as a visual aid for individuals who learn best with visual information. The participants were given the option to practice using the device to apply their current knowledge because it also allowed an opportunity to meet the needs of the kinesthetic learners. Two case studies were also given as examples of the type of population appropriate for using the device. After the in-service, the participants were given the opportunity to ask any questions they had regarding the use of the device.

A flyer was posted in the TSICU to help with information retention, and it included the benefits of using the device and a QR code for an instructional manual on how to use the device. The flyer's purpose was to attract the attention of healthcare providers who may have patients who can benefit from using the Combilizer and to be used as a guide on how to use the device. The manual was similar to the presentation materials provided at the in-service, which included step-by-step instructions along with photos to guide the user in using the device. The manual was available through a QR code and in a digital format because all the care team members had access to their personal mobile phones for when the manual was needed.

As a method of evaluation for the effectiveness of the teaching and learning program, a pre- and post-survey along with a quality improvement survey were given to the participants. The pre- and post-surveys were conducted using paper and pen to collect the data. Each survey contained 10 questions related to the care team member's knowledge, understanding, and confidence in using the Combilizer. The participants were given a packet (see Appendix A) containing the consent form, demographics form, pre-survey, presentation slides, flyer with QR code, case studies, and post-survey. The participants were instructed to complete the consent form, demographics form, and pre-survey prior to the presentation. At the conclusion of the in-service, the participants were instructed to complete the post-survey before exiting. The results of the surveys were anonymous. Six weeks following the initial teaching and learning session, a survey link using Qualtrics was sent to the care team members through an email to collect feedback on the quality of the teaching and learning program after the care team members were given some time to use the device (see Appendix B). The survey contained five open-ended questions, which were collected and evaluated by the capstone student and site mentor for investigator triangulation.

Using a pre-survey, post-survey, and quality improvement survey allowed the doctoral student researcher to determine the effectiveness of the teaching and learning program in using the Combilizer for EPM by facilitating grooming tasks. The questions focused on the participant's knowledge, understanding, and confidence in using the device after learning about the device and testing its use. In addition, having a lecture portion, a knowledge application portion, and a step-by-step instructional manual will help different types of learners access the materials for using the Combilizer. All the materials used were designed, created, and provided

by the doctoral student researcher with supporting information provided by the designated acute care hospital.

Data Management and Analysis

To ensure the data was protected, the pre- and post-survey answers were stored on Google Sheets in the UNLV Google Drive. In order to access the drive, the server requires two-step verification for the user to gain access to the Google Sheet. An additional copy of the Google Sheets was also exported into Microsoft Excel for data analysis. The data on the Microsoft Excel sheet was also password-protected and only accessible by the capstone student. The quality improvement survey answers were stored on Qualtrics and Google Sheets in the UNLV Google Drive, requiring two-step verification to access the data.

The demographic data was inputted into Microsoft Excel along with the survey responses. The demographic data was then extracted from the survey responses and analyzed separately. This data included the participants' disciplines, work schedules (e.g., full-time, part-time, per diem), and years of work experience in the acute care setting. A pivot table was created from the information collected to summarize the overall survey demographics. The disciplines, work schedules, and years of work experience were then analyzed through frequency and percentages.

The survey responses were analyzed with the Wilcoxon signed-rank test. The ordinal data was analyzed using the Wilcoxon test because the survey is self-designed and used a four-point Likert Scale, making a non-parametric test appropriate. The ordinal data was displayed as mean, standard deviation, and confidence interval at 95%. The statistical significance was defined as a right-sided $P < .01$. The Wilcoxon critical value, Wilcoxon test statistics, Z-score, and P-value were calculated following the completed pre- and post-survey data collection.

Ethical and Legal Considerations

To protect the participants' identities, the survey forms did not include identifiable information, which allowed the respondents to remain anonymous. The surveys were completed with pen and paper and were identified by a survey number on the top of the first page for data organization needs. In addition, the consent form (see Appendix C) also contained a box for the participant to mark to acknowledge and accept the collection of their survey results for this capstone project. The quality improvement survey completed through Qualtrics was also conducted anonymously and did not require the respondents to input identifiable information. The participants voluntarily attended the in-service without incentive to further reduce ethical concerns.

Results

Out of the 64 eligible care team members, there were 31 participants for the teaching and learning program across five sessions, indicating that 48% of the acute care therapy team attended the program. From the total acute care therapy department, 75% of OT, 39% of PT, and 67% of SLPs attended one of the five program sessions. The demographics of this interdisciplinary care team can be found in Table 1. Of the total respondents of the survey, 29% were from OT, 58% were from PT, and 13% were from ST. The demographics of the survey respondents can be found in Table 2.

Table 1

Acute Care Therapy Demographics

Characteristic	Eligible [a]	Attended [b]	Percentage
Discipline			
Occupational therapy	12	9	75%
Physical therapy	46	18	39%
Speech language pathology	6	4	67%
Work Schedule			
Full time	48	26	54%
Part time	5	3	60%
Per diem	11	2	18%

Note. [a] $n = 64$; [b] $n = 31$

Table 2

Survey Demographics (n = 31)

Characteristic	Frequency	Percentage
Discipline		
Occupational therapist	7	23%
Occupational therapy assistant	2	6%
Physical therapist	14	45%
Physical therapist assistant	4	13%
Speech language pathologist	4	13%
Work Schedule		
Full-time	26	84%
Part-time	3	10%
Per diem	2	6%
Years of Experience		
<1 year	7	23%
1-3 years	12	39%
4-6 years	1	3%
7-9 years	5	16%
>10 years	6	19%

The analysis was completed for the overall pre-survey and post-survey scores to determine the program's overall effectiveness. Upon completion of the data analysis, the mean, standard deviation, Wilcoxon test statistic, Wilcoxon critical value, Z-score, and P-value for the overall survey scores, along with each of the subcategory scores, were reviewed to determine the effectiveness of the teaching and learning program. The knowledge category included two questions, the confidence category included four questions, and the understanding category included four questions. The breakdown of questions for each subcategory is shown in Table 3.

Table 3

Survey Question Category Breakdown

Question	Category
1. I received training on the use of the Sara Combilizer.	Knowledge
2. I am confident in the training that I received on the use of the Sara Combilizer.	Confidence
3. I am confident in my knowledge on how to use the Sara Combilizer for critically ill patients.	Knowledge
4. I understand how to use the Sara Combilizer to facilitate grooming tasks.	Understanding
5. I understand the importance of using the Sara Combilizer on Facilitating grooming tasks.	Understanding
6. I understand the benefits of using the Sara Combilizer to improve patient outcomes.	Understanding
7. I am confident in my skills to use the Sara Combilizer to facilitate grooming tasks.	Confidence
8. I am confident in advocating for my patients to use the Sara Combilizer.	Confidence
9. I understand the interdisciplinary roles (e.g., OT, PT, SLP) that are involved in using the Sara Combilizer.	Understanding
10. I feel the interdisciplinary care team members (e.g., OT, PT, SLP) that are involved in using the Sara Combilizer.	Confidence

Note. OT = Occupational Therapy; PT = Physical Therapy; SLP = Speech-Language Pathology.

The participants completed 10 questions each for the pre-survey and post-survey. The Wilcoxon signed-rank test and descriptive statistics were used to analyze the data. Upon completion of the data analysis, the mean, standard deviation, Wilcoxon test statistic, Wilcoxon critical value, Z-score, and *P*-value for the overall survey scores, along with each of the category scores, were reviewed to determine the effectiveness of the teaching and learning program. The Wilcoxon critical value was 86 with the sample size n = 31 and a right-tailed test at a 1% alpha level. The overall mean of the pre-survey prior to the teaching and learning program was 2.93 and it increased to 3.67 in the post-survey, a 25% increase. The Wilcoxon test showed that the overall survey scores were significantly affected by the teaching and learning program utilizing the Combilizer for grooming tasks with an interdisciplinary approach [$W(86) = 3$, $p < .01$, right-tailed test]; therefore, the results of the overall score fail to reject the null hypothesis. A summary of outcomes can be found in Table 4.

The Wilcoxon signed-rank test was also completed for the three categories: knowledge, understanding, and confidence. The pre-survey knowledge category mean increased from 2.76 to 3.58 in the post-survey, a 30% increase. The Wilcoxon test showed that the knowledge category scores were significantly affected by the teaching and learning program utilizing the Combilizer for grooming tasks with an interdisciplinary approach [$W(86) = 5.5$, $p < .01$, right-tailed test]. The results of the knowledge category score fail to reject the null hypothesis. Similarly, in the understanding category, the pre-survey mean was 3.06 and increased to 3.74 in the post-survey mean, a 18% increase. The Wilcoxon test showed that the understanding category scores were significantly affected by the teaching and learning program utilizing the Combilizer for grooming tasks with an interdisciplinary approach [$W(86) = 3.5$, $p < .01$, right-tailed test]. The results of the understanding category score also fail to reject the null hypothesis. Finally, the pre-

survey confidence category mean was 2.89 and it increased to 3.65 in the post-survey, a 21% increase. The Wilcoxon test showed that the confidence category scores were significantly affected by the teaching and learning program utilizing the Combilizer for grooming tasks with an interdisciplinary approach [W(86) = 0, $p < .01$, right-tailed test]. The results of the confidence category score fail to reject the null hypothesis.

Finally, 13 acute care team members responded to the quality improvement survey. Out of the 13 respondents, two stated they did not attend the in-service due to the limited in-service presentation time slots offered. The respondents stated that it was most beneficial to learn about the different roles of each discipline when using the device. The respondents also stated that it was least beneficial to relearn information and not get hands-on practice with the device. The most common suggestion was to incorporate hands-on practice to improve the presentation for future use. Additional comments on the in-service included positive comments on the helpfulness and thoroughness of the presentation.

Table 4

Summary of Outcomes

	Pre-Survey		Post-Survey				
Category	**Mean**	**SD**	**Mean**	**SD**	**Wstat**	**Z-score**	**P-value**
Overall	2.93	0.86	3.67	0.40	3*	4.55	<.001
Knowledge	2.76	1.03	3.58	0.62	5.5*	4.06	<.001
Understanding	3.06	0.89	3.74	0.39	3.5*	4.29	<.001
Confidence	2.89	0.72	3.65	0.38	0*	4.38	<.001

Note. The Wilcoxon critical value for this sample ($n = 31$) was found to be 86 with a right-tailed test and confidence level of 99%. * W(86) = Wstat, $p < .01$, right-tailed test. Wstat = Wilcoxon Test Statistic.

Discussion

The hypothesis states, “If a program on how to use the Sara Combilizer for EPM by facilitating grooming tasks is provided to the interdisciplinary acute care team members, then there will be an increase in knowledge, understanding, and confidence of the care team members on how to safely use the device with critically ill patients at the designated acute care hospital.” The results of the teaching and learning program were shown to fail to reject the null hypothesis. Therefore, the results suggest that the program effectively increased the interdisciplinary team's knowledge, understanding, and confidence in using the Combilizer for EPM to facilitate grooming tasks.

According to the pre- and post-survey results, the participants had an increase in their knowledge scores following the in-service program. Information about how all disciplines can use the device and background knowledge on the importance of EPM was provided to the participants. The increase in knowledge can be used as a foundation to start advocating for patients because the care team members will be able to recognize which patients will benefit from using the device. Advocating for critically ill patients can increase their likelihood of participating in EPM, potentially preventing other hospital-acquired conditions such as pressure ulcers, muscle weakness, and muscle atrophy.

The increase in understanding scores can also indicate the care team member's ability to explain why a patient can benefit from using the device and to begin using the device with patients. Understanding the multiple uses of the Combilizer and how to use it with patients can increase the efficacy of EPM because the care team members will be able to demonstrate their skills and knowledge by using the device. Providing an instructional manual using a QR code allows the care team members to easily access the instructions if they need a refresher on using

the device. The step-by-step instructions and photos can help decrease intimidation about using the device and increase its usage for appropriate patients.

The increase in the care team member's confidence score can indicate that they can confidently use the device with patients and co-treat with other disciplines to improve the experience for both the patient and other care team members. Incorporating case studies with questions involving teamwork allowed the participants to problem solve and apply their knowledge on interdisciplinary teamwork. The interdisciplinary team will potentially be more proactive in facilitating grooming tasks with the patient while using the device, which can promote working towards independence for the patient. The care team members will also be more likely to confidently use the proper tools and body mechanics to prevent musculoskeletal injuries when mobilizing critically ill patients. The increase in safety awareness can further promote advocacy and use of the device.

The quality improvement survey collected feedback on the program for future implementation. From the quality improvement survey, the respondents stated that they found it most beneficial that they learned about how different disciplines can use the Combilizer. Providing information on how all disciplines can utilize the device can further improve interdisciplinary teamwork, creating a more cohesive experience for the patient. Incorporating the role of OT into the program and emphasizing the importance of BADLs in the acute care setting will also help other disciplines understand how BADLs, such as oral care, play a vital role in preventing hospital-acquired pneumonia when the patient is in the ICU.

In addition, the participants reported it was the least beneficial to relearn information and it was not helpful to not have hands-on practice during the in-service. Those who use the device often may feel that the information was repetitive and did not provide them with additional

knowledge to improve their user experience. However, the in-service can be most helpful to those who did not attend the previous education program or were not exposed to the Combilizer. Additionally, although the previous education program was provided between October 2023 and November 2023, some care team members still felt they needed more hands-on practice with the device. Those who are new hires or work with patients who are not appropriate for the Combilizer may not get to use the device as often as those in TSICU or NSICU, which may indicate the need for more practice.

Finally, it was suggested in the survey that a training course or continuing education course on the Combilizer should be offered for new hires to help them gain confidence in using the device with patients. The previous education program provided by the designated hospital and this current teaching and learning program did not incorporate a hands-on portion within its sessions. Before starting the current program, the care team members reported they had experience with a previous program in using the device. Assuming the care team members gained experience using the device, this resulted in removing the hands-on portion of the current program and emphasizing interdisciplinary case studies instead. However, based on the quality improvement survey, some care team members would like more hands-on practice to familiarize themselves with the device.

The literature supported the results of this capstone project. A barrier that the Harris & Shahid (2014) study found was the need for more education on mobilizing critically ill patients, which was then addressed in this project using evidence-based research in the lecture portion of the in-service. The program also addressed how disciplines can support one another (Harris & Shahid, 2014) to improve collaboration and gaps in staffing as a method to increase efforts for EM (McCarty et al., 2022). As recommended, clear guidelines were provided (Black et al., 2020)

to address safety when mobilizing patients to prevent musculoskeletal injuries (Harris & Shahid, 2014; Jolley et al., 2014), as well as patient falls (McCarty et al., 2022). In addition, providing a teaching and learning program resulted in positive interactions and responses for the program (Chan et al., 2021; McCarty et al., 2022). The program also helped increase confidence in the care team members (Chan et al., 2021).

It is essential to provide a teaching and learning program on utilizing the Sara Combilizer to increase the efficacy of EPM by facilitating grooming tasks in the ICU. As supported by research, educating the care team members will help them understand the importance of mobilizing patients and how to work with critically ill patients safely (Black et al., 2020; Chan et al., 2021; Hoyer et al., 2015). Doing so can help the interdisciplinary team increase their knowledge, understanding, and confidence in how to use the device. These improvements can potentially lead to more patients receiving necessary services, which can help improve patient outcomes and the patient's overall functional status.

The capstone project met the AOTA's education research agenda of testing the effectiveness of signature pedagogy (AOTA, 2018), specifically interdisciplinary education, collaborative learning, and situated learning. The teaching and learning program met the goal through various teaching methods, such as educating on the roles of each discipline and collaborating on situational case studies. The project also fell under the AOTF research agenda for Health Services Research to evaluate performance outcomes for professional training, specifically to develop and implement a database for quality improvement studies (AOTF, 2019). Data using comparison groups was collected to determine the effectiveness of the teaching and learning program. Feedback was also provided to improve the program for future use.

Limitations of the Project

There were limitations to the implementation of the project. The in-service presentation was initially planned to be given in a designated presentation space at the acute care hospital; however, due to miscommunication, the PT, OT, and SLP therapy offices, along with the cafeteria space, were the final spaces allotted for the presentation. In the future, clear and thorough communication with the acute care therapy manager to describe the purpose of the presentation can lead to a reserved, designated space to provide the presentation without external distractors.

In addition, the current capstone project to educate the interdisciplinary team about using the Combilizer was determined to be a need in August 2023. Due to changes in workplace development courses, an educational course on the Combilizer was provided to the care team members between October and November 2023. Rather than having the hands-on portion, the care team members were offered the opportunity to practice using the device if they required more help. Instead, an emphasis was placed on educating on OT's role and how it can be used for ADLs.

Moreover, there are limitations to the generalizability of the study's findings. The current capstone project was implemented at a single facility in one metropolitan area. The availability of the device in other acute care settings and the organizational structure of the acute care team may vary in other settings. Furthermore, the designated hospital's PT department made up 72% (42/64) of the care team members of the overall acute care therapy department, which may skew the results because they were previously incentivized to use the device by the designated hospital before the implementation of the capstone project.

Conclusion

In this capstone project, the doctoral student researcher provided a teaching and learning program to interdisciplinary care team members on using the Sara Combilizer to increase the efficacy of EPM by facilitating grooming tasks. Early progressive mobility is important to help decrease hospital LOS, decrease ventilator days, and improve overall function (Hester et al., 2017; Hodgson et al., 2022; Linke et al., 2020; Pandullo et al., 2015; Reames et al., 2016). In relation to OT, the Combilizer can help facilitate functional sitting and standing postures for grooming task completion, such as oral care, washing the face, and combing hair. Promoting EPM for patients who may be deemed unsafe for unsupported sitting or standing positions is vital because the Combilizer provides safety and support using multiple buckles across the trunk and lower extremities. Using the device can promote independence in grooming tasks, boost overall functionality, and improve outcomes. Care team members can advocate for the patient's needs and transfer the patient into the device to work on grooming tasks and postural control.

The project results were shown to increase the knowledge, understanding, and confidence of the interdisciplinary care team members in using the Combilizer. The participants stated that learning the different roles involved when using the device was helpful. They also stated that it was least beneficial to relearn some of the information provided and that there was a lack of hands-on practice to help them learn how to use the device. It was suggested that a program incorporating hands-on learning would be helpful for new hires or those unfamiliar with the Combilizer. Overall, the program was effective in educating care team members on the Combilizer, provided an easy-to-access instructional manual, and increased safety awareness of the care team members when working with patients.

Recommendations

Future studies can examine the frequency of device use to determine if the program increases the utilization of the device, which may point to an increase in knowledge, understanding, and confidence among the care team members. In addition, future studies can also explore the impact of EPM using grooming tasks on patient outcomes due to the increase in usage amongst interdisciplinary team members. This can include looking at the patient's BI scores, manual muscle scores, range of motion, days spent on the mechanical ventilator, and LOS. Furthermore, future teaching and learning programs on the Combilizer can incorporate a continuing education course that includes hands-on practice and role-playing to allow the kinesthetic learners to build into their skills. Adding hands-on practice or role-playing can encourage care team members to be more familiar with and comfortable using the device, which can potentially increase the efficacy of EPM in facilitating grooming tasks.

Implications for Research

The lack of available literature on the role of OT in the acute care setting indicates the need for more research in the area. More research needs to be conducted to support the effectiveness of OT in the acute care setting. The studies that were found used functional assessments or rehabilitative therapy similar to OT but did not look at the outcomes from an OT perspective. Looking at the patient's functional status and performance from an OT lens can offer a perspective on how the patient's deficits affect their daily living. The OT perspective can offer solutions to promote physical, psychological, and social well-being. In addition, more research needs to be conducted on the effectiveness of OT implementing EPM using ADL tasks. Most research was focused on the work of other disciplines, but there needs to be more research highlighting the role of OT in utilizing EPM.

Implications for Practice

Furthermore, the results have shown that the teaching and learning program is effective in improving care team member's knowledge, understanding, and confidence in using the Sara Combilizer from an interdisciplinary approach. The findings suggest that PT now has a better understanding of how OT can also use the device for EPM rather than strictly working on activity tolerance and endurance. Physical therapists and PTAs will be motivated to collaborate with OTs to work on grooming tasks, which will then create a more pleasant experience for the patient. Furthermore, the findings from this study suggest that there will be an increase in the use of the Combilizer overall. Care team members who attended the in-service now have the tools to use the device for EPM. Not only do they know the type of patients that are potentially appropriate to use the device, but they also have the instructional manual and their interdisciplinary team to support them as well.

Future Implications for OT

Finally, these findings suggest an increase in knowledge and understanding of the role of OT in EPM for patients in the acute care setting. Educating care team members about the role of OT in EPM will encourage interdisciplinary teams to identify and recommend appropriate patients for OT. Occupational therapists will be more motivated to advocate for the profession and the vital role it plays in helping patients recover from critical illness. The additional support for OT can encourage researchers to study OT in acute care, which will then contribute to evidence-based practice. Furthermore, the lack of literature on OT in acute care will urge researchers to examine how the profession affects recovery outcomes from critical illness, such as functional status. The additional research will support the profession as a science-driven and evidence-based practice.

Appendices

Appendix A: Teaching and Learning Packet

Survey #_____

Informed Consent Form Anonymous Survey

Interdisciplinary Education on Using the Sara Combilizer to Increase Efficacy for Early Progressive Mobility to Facilitate Grooming Tasks in the Intensive Care Unit Setting

This study is being conducted by Bonnie Lei, an Occupational Therapy Doctoral student at the University of Nevada-Las Vegas; Dr. Christina Bustanoby OTD, OTR/L; and Dr. Silvia Lobaina OTD, MSOT, OTR/L.

Purpose of Study: You are invited to participated in this study. The purpose of this study is to increase efficacy for early progressive mobility (EPM) in critically ill patients with the use of the Sara Combilizer to help decrease barriers to early mobilization and increase facilitation of grooming tasks by educating care team members.

Participants: You are being asked to participate in this study because you fit these criteria: Aged 18 or older; employed at this Las Vegas acute care hospital; occupational therapists, occupational therapy assistants, physical therapists, physical therapist assistants, and speech therapists are welcome to participate.

Procedure: If you volunteer to participate in this study, you will be asked to do the following: In order to participate you need to complete this online survey. Your participation in this online survey is completely anonymous. No information you share electronically can be traced to you or the mobile device you used. Your participation in the survey indicates you read this consent information and agreed to participate in this anonymous survey. Depending upon the depth of your responses, participation time varies from five minutes to ten minutes.

Potential Benefits of Participation: There may be direct benefits to you as a participant in this study. First, research participants will be contributing to the development knowledge base and may feel good about helping study efforts. Second, participants who are pleased with the information provided at the inservice may experience some satisfaction upon evaluation of their improvement. If you require proof of participation, sign into the attendance sheet provided by the manager of acute rehab services.

Risks of Participation: There are risks involved in all research studies. This study may include only minimal risks. Some individuals may experience temporary dissatisfaction if they are not pleased with the information provided at the inservice by Bonnie Lei.

Anonymity: Your participation in this research is completely anonymous. No information you share can be traced electronically to you, the mobile device you used, nor can you be traced by any information you provide. Data will be kept stored in the Qualtrics' databank. Only Bonnie Lei and Dr. Christina Bustanoby will have access to the data.

Voluntary Participation: Your participation is voluntary, and you may refuse to participate or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. A decision to participate or to withdraw, will not affect your your employment at this Las Vegas acute care hospital.

Contacts and Questions: If you have questions about this study you may email Bonnie Lei OTD/S at leib1@unlv.nevada.edu or Dr. Christina Bustanoby at christina.bustanoby@unlv.edu.

Participant Consent: By marking the box below, you have given your consent to participate. The results of the survey will be collected as part of the following capstone project: *Interdisciplinary Education on Using the Sara Combilizer to Increase Efficacy for Early Progressive Mobility to Facilitate Grooming Tasks in the Intensive Care Unit Setting*. If you would like to be excluded the survey, please flip over your form and discontinue from here.

☐ Agree. I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I have been able to ask questions about the study. I am at least 18 years of age. I give my consent to participate in this survey and to have the results be collected as part of Bonnie Lei's capstone project.

Date: _____

Demographics

Please mark the box in each section that is most applicable to you.

Select one. I am a(n):
□ Occupational therapist
□ Occupational therapy assistant
□ Physical therapist
□ Physical therapist assistant
□ Speech language pathologist

Select one. At this facility, I work:
□ Full-time
□ Part-time
□ Per diem

Select one. My years of working experience in the acute care setting are:
□ <1 year
□ 1-3 years
□ 4-6 years
□ 7-9 years
□ >10 years

Sara Combilizer Pre-Survey

Instructions:

The current UNLV Occupational Therapy Doctoral student, Bonnie Lei, is conducting a survey for her capstone project on the teaching and learning program on the use of the Sara Combilizer. The following survey will be used to gain a better understanding of your knowledge and use of the Sara Combilizer. The survey results will be used to make improvements to the existing tools and features. The same questions will be used for the pre-survey before the inservice presentation and post-survey following the presentation.

To what extent do you agree or disagree with the following statements. Please mark the box that best reflects your opinion.

Rating Scale:

4 = Strongly Agree 3 = Agree 2 = Disagree 1 = Strongly Disagree

Question	4	3	2	1
1. I received training on the use of the Sara Combilizer.				
2. I am confident in the training that I received on the use of the Sara Combilizer.				
3. I am confident in my knowledge on how to use the Sara Combilizer for critically ill patients.				
4. I understand how to use the Sara Combilizer to facilitate grooming tasks.				
5. I understand the importance of using the Sara Combilizer on facilitating grooming tasks.				
6. I understand the benefits of using the Sara Combilizer to improve patient outcomes.				
7. I am confident in my skills to use the Sara Combilizer to facilitate grooming tasks.				
8. I am confident in advocating for my patients to use the Sara Combilizer.				
9. I understand the interdisciplinary roles (e.g., OT, PT, SLP) that are involved in using the Sara Combilizer.				
10. I feel the interdisciplinary care team members (e.g., OT, PT, SLP) can support my discipline's use of the Sara Combilizer.				

STOP HERE. DO NOT PROCEED TO THE NEXT PAGE.

How to Use the Sara Combilizer

By: Bonnie Lei OTD/S
University of Nevada, Las Vegas Department of Brain Health: Occupational Therapy

Background

- Previously prescribed bedrest for healing
- Bedrest increases rapid muscle deconditioning and muscle atrophy
- Bed rest is a risk factor for ICU-acquired weakness
- ICU-acquired weakness is weakness in patients as a factor of critical illness
- ICU-acquired weakness has been shown to
  - Be associated with longer duration of mechanical ventilation
  - Longer hospital stay
  - Increased mortality
  - Decrease physical functioning
  - Decrease quality of life

(Hashem et al., 2016)

Now...

- Early mobility has been shown to
  - Decrease delirium
  - Reducing ventilator days
  - Decreasing length of stay
  - Achieving higher functional status at hospital discharge

(Linke et al., 2020)

Sara Combilizer

- Sit-to-stand aid to facilitate early mobilization (EM)
- Factiliate EM with patients previously stated to be unsafe or inappropriate to mobilize. Includes:
  - Mechanically ventilated
  - Low attention
  - Poor trunk stability
- Promote functional positions for ADL task participation.
- Promote activity tolerance and endurance

How to Use

1. Brakes

2. Straps

3a. Control Panel

3b. Select sitting or standing position

How to Use (contd.)

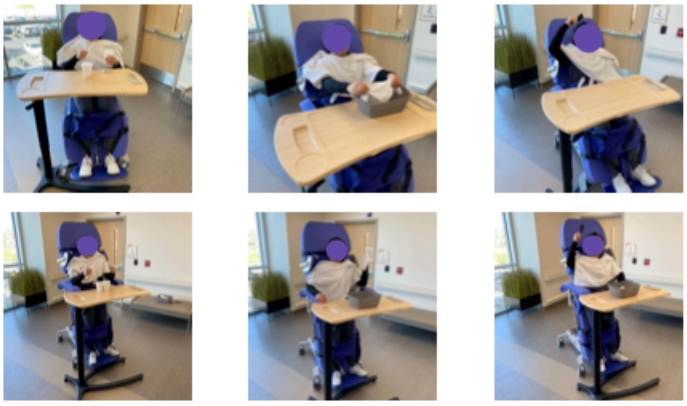
4a. Tilt table/ Standing mode

4b. Chair mode/ Sitting

5. Degree of tilt

6. Shoulder support

To use for ADLs for OTs



Oral Care | Washing Face | Combing Hair

To use for MBS and FEES with ST

- After transferring the patient into the device, place the patient in either a sitting or standing position.
- The chair can be tilted left/right/ or forward/backward to allow for the therapist to get the optimum angle for the evaluation if the patient has difficulty repositioning themselves.
- The device also decreases the need to transfer the patient multiple times between bed and chairs if the patient does not have the ability to independently transfer.

SAFETY!

DID YOU KNOW?

Germs in your mouth can cause pneumonia, leading to a longer length of stay in the hospital and admission into the intensive care unit. This can be prevented with 3 easy steps:

1. Brush teeth, gums, and tongue for 1-2 minutes after meals and at bedtime.
2. Rinse mouth for at least 30 seconds.
3. Use a non-petroleum-based lip moisturizer to prevent cracked lips.

EXTRA: Use of spirometer/aerobika can help loosen biofilm and mucous.*

(HCA Healthcare Center for Clinical Advancement, 2022)

Importance of Teamwork and Collaboration

- OTs, PTs, STs, nursing staff, residents, and physicians can identify potential patients that can benefit from using the Combilizer.
- Therapy staff and nursing staff can coordinate on medication times and mobilization times to further improve patient experience.

Reference(s):

Hashem, M. D., Nelliot, A., & Needham, D. M. (2016). Early mobilization and rehabilitation in the ICU: Moving back to the future. *Respiratory Care*, *61*(7), 971–979. https://doi.org/10.4187/respcare.04741

HCA Healthcare Center for Clinical Advancement. (May 2022). *3 easy steps for mouth care in the hospital*. HCA Healthcare.

Linke, C. A., Chapman, L. B., Berger, L. J., Kelly, T. L., Korpela, C. A., & Petty, M. G. (2020). Early Mobilization in the ICU: A collaborative, integrated approach. *Critical Care Explorations*, *2*(4), e0090. https://doi.org/10.1097/cce.0000000000000090

How to use the Sara Combilizer for Activities of Daily Living (ADLs) with Occupational Therapy (OT)

By: Bonnie Lei OTD/S

To Use for ADLs with OT:

After transferring the patient into the device, place the patient in either a sitting or standing position. Provide the patient with tools for the grooming tasks (i.e. cups, tooth brush, washcloth, comb) on a table that is placed in front of them.

Did you know it can be used with Speech Therapy (ST) as well?

After transferring the patient into the device, place the patient in either a sitting or standing position. The chair can be tilted to allow for the therapist to get the optimum angle for the Modified Barium Swallow (MBS) and Fiberoptic Endoscopic Evaluation of Swallowing (FEES) if the patient has difficulty repositioning themselves.

DID YOU KNOW?

Germs in your mouth can cause pneumonia, leading to a longer length of stay in the hospital and admission into the intensive care unit.*

This can be prevented through oral care with 3 easy steps*:

1. Brush teeth, gums, and tongue for 1-2 minutes after meals and at bedtime.
2. Rinse mouth for at least 30 seconds.
3. Use a non-petroleum-based lip moisturizer to prevent cracked lips.

EXTRA: Use of spirometer/aerobika can help loosen biofilm and mucous.*

Grooming Tasks:

Oral Care

Washing Face

Combing Hair

SAFETY IS IMPORTANT!
Reposition as needed!

Scan me for instructions on how to use the Combilizer

Reference: *HCA Healthcare Center for Clinical Advancement. (May 2022). *3 easy steps for mouth care in the hospital.* HCA Healthcare.
Instructional materials provided on August 2023 by Bonnie Lei OTD/S from Department of Brain Health: Occupational Therapy, University of Nevada - Las Vegas.

Case Study #1:

Peter is a 65 year old male brought in by ambulance following a fall. The patient's wife reports he was laughing too hard and fell backwards from a barstool, leading to a headstrike. He complained of numbness and tingling in all four extremities and an ambulance was called for transport. The neck was stablized with an Aspen collar prior to transportation. Imaging was ordered and provided upon arrival at the hospital and it was found that Peter has a C5 fracture and requires surgery to stablize the neck.

Due to the anterior surgical approach to the cervical spine, Peter is experiencing swelling of his vocal cords and is inhibiting his ability to swallow. In addition, the patient lacks active range of motion in all four extremities and has poor sensation to light and deep pressure touch upon examination. The patient's physician has ordered occupational therapy, physical therapy, and speech therapy due to decreased functional abilities. The patient states he wants to return to his prior level of functioning and to be able to independently care for himself.

Using the information provided in this case study, how can Peter benefit from using the Sara Combilizer? What can each discipline do using the device to improve his functional status? How can the interdisciplinary team work together in regards to using this device?

Case Study #2:

David is a 36 year old male that was brought in by ambulance following a motor vehicle crash. The patient was going at highway speeds when he crashed into another vehicle and was unrestrained when he was ejected from the vehicle. The patient experienced multiple abrasions throughout his body, a neck injury, and a head injury. David is unable to breathe on his own so a tracheostomy tube was inserted. The brain bleed has stablized and the patient does not require surgery additional surgeries at this time.

Upon examination, it was found that the injury to the neck caused paresis of David's four extremities and has lead to an inability to perform active range of motion. In addition, the head injury caused a brain bleed and resulted in aphasia, losing his ability to produce speech. David displays inconsistency in following commands, such as visual tracking, and inconsistently responds to stimuli by groaning. The patient's physician has ordered occupational therapy, physical therapy, and speech therapy due to decreased functional abilities.

Using the information provided in this case study, how can David benefit from using the Sara Combilizer? What can each discipline do using the device to improve his functional status? How can the interdisciplinary team work together in regards to using this device?

Sara Combilizer Post-Survey

Instructions:

The following survey will be used to gain a better understanding of your knowledge and use of the Sara Combilizer. The same questions will be used for the pre-survey before the inservice presentation and post-survey following the presentation.

To what extent do you agree or disagree with the following statements. Please mark the box that best reflects your opinion.

Rating Scale:

4 = Strongly Agree 3 = Agree 2 = Disagree 1 = Strongly Disagree

Question	4	3	2	1
1. I received training on the use of the Sara Combilizer.				
2. I am confident in the training that I received on the use of the Sara Combilizer.				
3. I am confident in my knowledge on how to use the Sara Combilizer for critically ill patients.				
4. I understand how to use the Sara Combilizer to facilitate grooming tasks.				
5. I understand the importance of using the Sara Combilizer on facilitating grooming tasks.				
6. I understand the benefits of using the Sara Combilizer to improve patient outcomes.				
7. I am confident in my skills to use the Sara Combilizer to facilitate grooming tasks.				
8. I am confident in advocating for my patients to use the Sara Combilizer.				
9. I understand the interdisciplinary roles (e.g., OT, PT, SLP) that are involved in using the Sara Combilizer.				
10. I feel the interdisciplinary care team members (e.g., OT, PT, SLP) can support my discipline's use of the Sara Combilizer.				

Appendix B: Quality Improvement Survey

UNLV

Instructions:

The current UNLV Occupational Therapy Doctoral student, Bonnie Lei, is conducting a survey for her capstone project on the teaching and learning program on the use of the Sara Combilizer using an interdisciplinary approach. The survey results will be used to make improvements to the existing tools and features. The survey responses will remain anonymous.

Thank you for taking the time to complete this survey.

Were you present for Bonnie Lei's presentation? If not, please explain why (e.g. conflicting schedule, limited time constraints, presentation not provided on available work day).

What part of the presentation did you find to be the MOST beneficial for improving your understanding, knowledge, or confidence for using the Sara Combilizer?

What part of the presentation did you find to be the LEAST beneficial for improving your understanding, knowledge, or confidence for using the Sara Combilizer?

How can the current presentation be improved for future use?

Additional comments on the process, delivery, etc of the content.

→

Appendix C: Consent Form

Survey #_____

Informed Consent Form Anonymous Survey

Interdisciplinary Education on Using the Sara Combilizer to Increase Efficacy for Early Progressive Mobility to Facilitate Grooming Tasks in the Intensive Care Unit Setting

This study is being conducted by Bonnie Lei, an Occupational Therapy Doctoral student at the University of Nevada-Las Vegas; Dr. Christina Bustanoby OTD, OTR/L; and Dr. Silvia Lobaina OTD, MSOT, OTR/L.

Purpose of Study: You are invited to participated in this study. The purpose of this study is to increase efficacy for early progressive mobility (EPM) in critically ill patients with the use of the Sara Combilizer to help decrease barriers to early mobilization and increase facilitation of grooming tasks by educating care team members.

Participants: You are being asked to participate in this study because you fit these criteria: Aged 18 or older; employed at this Las Vegas acute care hospital; occupational therapists, occupational therapy assistants, physical therapists, physical therapist assistants, and speech therapists are welcome to participate.

Procedure: If you volunteer to participate in this study, you will be asked to do the following: In order to participate you need to complete this online survey. Your participation in this online survey is completely anonymous. No information you share electronically can be traced to you or the mobile device you used. Your participation in the survey indicates you read this consent information and agreed to participate in this anonymous survey. Depending upon the depth of your responses, participation time varies from five minutes to ten minutes.

Potential Benefits of Participation: There may be direct benefits to you as a participant in this study. First, research participants will be contributing to the development knowledge base and may feel good about helping study efforts. Second, participants who are pleased with the information provided at the inservice may experience some satisfaction upon evaluation of their improvement. If you require proof of participation, sign into the attendance sheet provided by the manager of acute rehab services.

Risks of Participation: There are risks involved in all research studies. This study may include only minimal risks. Some individuals may experience temporary dissatisfaction if they are not pleased with the information provided at the inservice by Bonnie Lei.

Anonymity: Your participation in this research is completely anonymous. No information you share can be traced electronically to you, the mobile device you used, nor can you be traced by any information you provide. Data will be kept stored in the Qualtrics' databank. Only Bonnie Lei and Dr. Christina Bustanoby will have access to the data.

Voluntary Participation: Your participation is voluntary, and you may refuse to participate or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. A decision to participate or to withdraw, will not affect your your employment at this Las Vegas acute care hospital.

Contacts and Questions: If you have questions about this study you may email Bonnie Lei OTD/S at leib1@unlv.nevada.edu or Dr. Christina Bustanoby at christina.bustanoby@unlv.edu.

Participant Consent: By marking the box below, you have given your consent to participate. The results of the survey will be collected as part of the following capstone project: *Interdisciplinary Education on Using the Sara Combilizer to Increase Efficacy for Early Progressive Mobility to Facilitate Grooming Tasks in the Intensive Care Unit Setting*. If you would like to be excluded the survey, please flip over your form and discontinue from here.

☐ Agree. I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I have been able to ask questions about the study. I am at least 18 years of age. I give my consent to participate in this survey and to have the results be collected as part of Bonnie Lei's capstone project.

Date: _____

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Curriculum Vitae

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EDUCATION

University of Nevada, Las Vegas (UNLV) – Las Vegas, NV
Doctorate of Occupational Therapy **Expected May 2024**
Capstone: *Interdisciplinary Education on Using the Combilizer for Grooming Tasks in the Intensive Care Unit*
Site Mentor: Dr. Silvia Lobaina OTD, MSOT, OTR/L

University of Nevada, Las Vegas – Las Vegas, NV
Bachelor of Arts in Psychology **May 2018**

College of Southern Nevada – Las Vegas, NV
Certified Nursing Assistant **Dec. 2018**

FIELDWORK EXPERIENCE

Level II Placements

- **Acute Care**, *Sunrise Hospital* **May 2023 - Aug. 2023**
- **Outpatient Low Vision**, *YESnick Vision Center* **May 2022 - Aug. 2022**

Level I (Observation) Placements

- **Community-Based**, *Silverado Red Rock Memory Care* **Sept. 2023**
- **School-Based**, *Cornerstone Christian Academy and Tykes Preschool* **Mar. 2023**
- **Outpatient Pediatrics**, *Tick Talk Therapy* **Feb. 2023**
- **Pediatric Community**, *Cornerstone Christian Academy and Tykes Preschool* **Oct. 2022**
- **Acute Care**, *Henderson Hospital* **April 2022**
- **Adult Daycare**, *Nevada Senior Services* **Sept. 2021**

LEADERSHIP EXPERIENCE

- **Executive Committee Member**, *Vice President of Pi Theta Epsilon Honor Society of the Alpha Phi Chapter at UNLV* **Nov. 2023 – May 2023**
- **Board Member**, *Community Service Chairperson of University of Nevada Las Vegas Student Occupational Therapy Association (UNLV SOTA)* **Jan. 2023 – Dec. 2023**
- **Coordinator**, *Community Service Coordinator of UNLV Distributive Education Clubs of America (DECA)* **May 2016 – Jan. 2017**
- **Officer**, *Vice President of Community Relations of UNLV DECA* **May 2015 – May 2016**

PROFESSIONAL ASSOCIATIONS

- The Honor Society of Phi Kappa Phi at UNLV **April 2024 - Present**
- Pi Theta Epsilon Honor Society of the Alpha Phi Chapter at UNLV **Nov. 2023 - Present**
- UNLV Student Occupational Therapy Association (SOTA) **May 2021 - Present**
- American Occupational Therapy Association (AOTA) **May 2021 - Present**
- UNLV Distributive Education Clubs of America (DECA) **Aug. 2014 - May 2018**

GRANTS/AWARDS

- **OTD General Program Scholarship** **May 2023**
  - UNLV Occupational Therapy Doctoral Program
  - Total: $1000
- **General OTD Scholarship** **May 2022**
  - UNLV Occupational Therapy Doctoral Program
  - Total: $3000

HONORS AND AWARDS

- **Dean's Honor List**, *University of Nevada - Las Vegas* **2016 - 2018**
- **Community Service Award**, *UNLV Collegiate DECA* **May 2017**
- **Most Active Member Award**, *UNLV Collegiate DECA* **May 2017**

CERTIFICATIONS

- Certified Basic Life Support (BLS) **Aug. 2023 - Current**
- Certified KORU Mindfulness **April 2022**
- Certificate of Successful Completion in Nursing Assistant Training Program **Dec. 2018**

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