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# Augmentative and Alternative Communication in the Intensive Care Unit

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By

Jonathan Todd Sizemore

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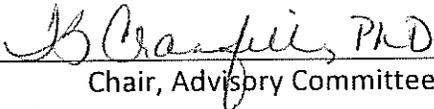
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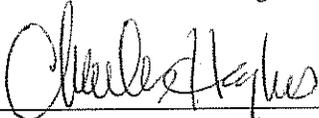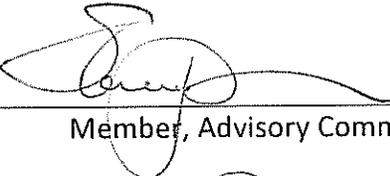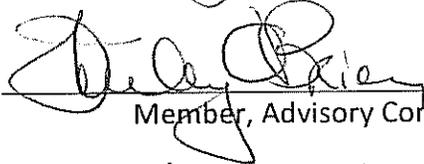
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AUGMENTATIVE AND ALTERNATIVE COMMUNICATION IN THE INTENSTIVE CARE UNIT

By

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Bachelor of Science
Eastern Kentucky University
Richmond, Kentucky
2012

Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements
for the degree of
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May, 2014

DEDICATION

This thesis is dedicated to my wonderful, kind, intelligent, beautiful wife, Jerrica Mae. Without her support and encouragement, I am unsure I could have made it through undergraduate and graduate school. However, I am sure she grew tired of hearing the word 'thesis', but was so patient throughout this process.

All praise goes to the good Lord for all His blessings.

ACKNOWLEDGMENTS

# ABSTRACT

Current research is lacking on the frequency of augmentative and alternative communication (AAC) system use in intensive care units (ICU) and clinical decision making patterns. AAC is use of any alternative method of communication when oral communication cannot be achieved (ASHA, 2013). Patients in the ICU may become nonverbal for many reasons including tracheostomy, mechanical ventilation (McKinley, Pooke, & White, 2010) and intubation (Radtke, Bauman, Garrett, & Happ, 2011). Being nonverbal in the ICU may lead to poorer health outcomes (Patak, Wilson-Stronks, & Costello, 2009). AAC systems may improve outcomes by allowing patients to communicate more clearly with family, friends, and hospital staff. ICU patients communicate with nurses more than any other healthcare professional (Happ, Tuite, Dobbin, DiVirgilio-Thomas, & Kitutu, 2004). AAC systems are crucial for patient-nurse communication. Speech-language pathologists (SLPs) evaluate for and provide AAC systems to individuals across the lifespan and setting, including those in ICU.

Forty SLPs who worked in a hospital with an ICU and 8 RNs who worked in the ICU responded to an electronic survey. Half of the SLPs indicated some form of AAC was being used in the ICU. The majority of RNs (n=5) responded that AAC was seldom used in the ICU. Lack of equipment/resources, time constrains, and feasibility were among the most selected reasons why AAC was not being provided per SLPs. Overall, results from the research suggested that AAC is not standard practice within the ICU.

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Introduction

**Augmentative and Alternative Communication**

Speech-language pathologists (SLPs) work with individuals who are unable to achieve oral speech through evaluation and implementation of augmentative and alternative communication (AAC). The American Speech-Language-Hearing Association (ASHA; 2013) defines augmentative and alternative communication (AAC) as any method used as a means of communication when oral speech cannot be achieved. These methods of communication are used to help individuals express their wants and needs, as well as convey their feelings or express what they are thinking.

AAC systems are classified as either aided or unaided. Aided alternative communication systems are those which require some form of equipment to convey a message (ASHA, 2013). This may include the use of pen and paper, symbol exchange systems such as Picture Exchange Communication System (PECS), a speech-generating device (SGD), or other electronic equipment (e.g., iPad, DynaVox) (Ganz, Earles-Vollrath, Heath, Parker, Rispoli, & Duran, 2012). Unaided communication systems are those in which the physical functioning of the body is used as a means to communicate. This may include pointing, gesturing, sign language, or body language (ASHA, 2013).

**Diagnoses and Conditions Where AAC is Beneficial**

Individuals in need of AAC systems may be found among all age groups. SLPs may work with individuals who are school aged in the evaluation and provision of AAC systems. There are multiple reasons school-aged children with complex communication needs (CCNs) may warrant AAC systems. These may include intellectual disability, autism, (Chung, Carter, & Sisco, 2012), cerebral palsy, dysarthria, as well as other diagnoses. They also noted that children who use AAC systems may use multiple AAC systems. These were inclusive of aided systems, such as tablet personal computers with software, communication books, and picture strips, as well as unaided systems such as facial expressions, gesturing, and eye gaze.

While school-aged children with communication disorders may require AAC systems, there are many medical diagnoses that appear across the lifespan in which implementation of an AAC system may prove useful. These diagnoses may include individuals who are post-stroke and may present with aphasia (Bahr, 2008); individuals who have been diagnosed with Amyotrophic Lateral Sclerosis (ALS), a degenerative motor neuron disease (Casey, 2011); brain injury (Fager, Huz, Beukelman, & Karantounis, 2006); dementia (Bourgeois, Fried-Oken, & Rowland, 2010); and Parkinson's disease (Armstrong, Jans, & MacDonald, 2000). Patients may also require AAC systems post-surgery, particularly those who require head and neck surgeries (Fox & Rau, 2001). Patients who are intubated (Radtke, Bauman, Garrett, & Happ, 2011), have a tracheostomy tube, or are under mechanical ventilation (McKinley, Poole, & White, 2010) may require an AAC system to communicate. In addition to these specific medical conditions, other general medical conditions may prevent oral speech whether disruptions are long or short-term.

**AAC in the Hospital Setting**

Given the broad range of diagnoses and conditions that may cause CCNs, individuals with CCNs will be found throughout the hospital population. These patients may experience CCNs that are secondary to an acute condition, such as hospital admittance immediately post-stroke, brain or spinal cord injury, or other acute life-threatening conditions. Similarly, patients may be admitted to the hospital using an already established AAC system for a pre-existing CCN, such as progression of degenerative diseases like ALS or Parkinson's disease, or longstanding diagnosis of aphasia. Given the nature of conditions where AAC may be necessary, individuals who use AAC are likely to require more medical care than individuals who do not (Wilson-Stronks & Blackstone, 2013, p. 72). This suggests it is crucial that communication needs of patients across the hospital setting be addressed. Such service provision may require the use of an AAC system already in place, or evaluation and implementation for a new AAC system.

**The Joint Commission Patient-Centered Communication Guidelines for Hospitals**

      The need for AAC within the hospital setting is further evidenced by The Joint Commission (2010), a healthcare organization accrediting body, and their recently published standards for patient-centered communication in hospitals.  Among other suggestions regarding communication within the hospital (e.g.,  healthcare literacy, guidelines for patients with English as a second language),  The Joint Commission states that communication needs of individuals with pre-existing sensory or communication impairments, as well as those caused by their current medical condition, should be addressed.  The Commission mandates that the hospital should refer patients to specialities such as speech-language pathology and audiology as needed in order to address communication needs.  These guidelines recommend hospitals assess whether the best channels of communication for patients across the hospital setting, including patients in the ICU, is being provided as standard care.

**Chapter 2**

**Literature Review**

**Complex Communication Needs in the ICU**

A hospital intensive care unit (ICU) houses patients who are critically ill and require constant medical attention. Consequently, most patients admitted to the ICU require respiratory support secondary to compromised respiratory functioning inclusive of intubation, mechanical ventilation, and/or a tracheostomy (Radtke, Bauman, Garrett, & Happ, 2011; McKinley, Poole, & White, 2010). Each would likely render a patient unable to communicate verbally. Each year millions of older adults who are admitted to the ICU require intubation resulting in a loss of voice and a consequent CCN (Happ et al., 2010). Additionally, the patient population in ICUs may experience communication difficulty due to impaired cognition or neuromuscular weakness (Radtke, Baumann, Garrett, & Happ, 2011), head trauma, cardiovascular disease, or severe medical conditions (Costello, Patak, & Pritchard, 2010). When patients are already medically compromised, adding the challenge from a CCN could further complicate the quality of their care as well as overall quality of life.

**Quality of Life and Care for Nonverbal Patients in the ICU**

Quality of life may be severely impacted for patients within the ICU who are unable to communicate verbally (Finke, Light, Kitko, 2008; Patak et al., 2009; Wilson-Stronks, & Blackstone, 2013). Most health care professionals are unsure of how to communicate with patients with complex communication needs, resulting in patients being less involved in their own care (Wilson-Stronks & Blackstone, 2013). Additionally, lack of communication between patients with CCNs in the ICU and their health care providers may cause "medical errors, unnecessary pain, confusion about medication regimes, unaddressed fears, unanswered questions, and human rights violations" (Wilson-Stronks & Blackstone, 2013, p. 71). Patients with communication impairment may also have poorer health outcomes (Patak, Wilson-Stronks, & Costello, 2009). For example, more than one-third of communicative attempts between ICU patients who

were nonverbal and nurses regarding pain were found to be unsuccessful (Happ, et al., 2011).

Failed communication attempts between patient and provider could result in patients experiencing pain that is not appropriately documented or managed with medication (Wilson-Stronks & Blackstone, 2013). These pain indicators could be diagnostic in nature with regard to symptom analysis. Nonverbal patients in the ICU may also feel frustrated, angry, may experience anxiety or sleeplessness, and feel as if their illness is more severe due to their inability to communicate (Happ et al., 2011). With patients who are mechanically ventilated, a leading cause of loss of speech in the ICU, the most difficult symptom is an impairment in ability to communicate (Happ et al, 2011).

**The Intensive Care Unit and End of Life**

Given that many patients in the ICU are critically ill, some may ultimately expire during their admission. Approximately 40% of patients who die within hospitals are in the ICU (Happ et al., 2004). Thus, it is important that patients in the ICU be able to convey their final messages to family and friends (Happ et al, 2004). These considerations make provision of AAC systems to those who are nonverbal significant and necessary in order to add quality to a patient's final days and moments. AAC systems used at the end of life are beneficial to both the patient and the patient's family (Costello, Patak, & Pritchard, 2010).

**ICU Patient Communication with Family**

In addition to patients feeling frustrated from lack of communication, the families of these patients experience frustration as well (Broyles, Tate, & Happ, 2012). The authors reference an e-mail from a family member of an ICU patient unable to communicate verbally:

My brother died in [an intensive care unit] at age 49 after a prolonged intubation. I know there were many things he tried to communicate through his eyes and the 'mouthing of words' but was not successful. He was unable to use his hands and would often become frustrated at his inability to convey what he

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was trying to communicate. He left 2 teenage children and I often wonder what

he would have said to them (p. e22).

As Broyles and colleagues note, this may lead families to have "feelings of loss, dismay, and frustration with the critically ill patient's loss of voice" (2012, p. e22).

Little is known about how families communicate with their family members who are in the ICU, mechanically ventilated, and subsequently unable to speak (Broyles, Tate, & Happ, 2012). Prior qualitative research suggests current methods of communication between ICU patients and family are not adequate (Broyles, Tate, & Happ, 2012). The researchers identified how families communicated with the patients, and what the families and nurses thought about nonverbal ICU patient-family communication. They found that families were not prepared for the communication difficulties that followed a severe illness. They also found that families struggled to use AAC systems provided, adding to patient frustration. Although AAC systems were provided in their research, Broyles, Tate, and Happ note that without ongoing instruction on how to use the AAC systems provided, the families did not use the systems and instead "made do" (2012, p. e30). Patak and colleagues (2009) found that AAC systems considered 'making do"(i.e., mouthing words, gesturing, head nods) were found to be ineffective and ultimately lead to frustration. These data signal the value and need for comprehensive evaluation and selection of an appropriate AAC system rather than simply "making do."

**AAC Systems Used in the ICU**

Multiple AAC systems may be used in ICUs, depending on a patient's physical and cognitive status (Downey & Happ, 2013). The Boston Children's Hospital model for AAC services consists of three phases that are dependent on patient alertness, with alternating AAC systems recommended depending in what phase the child functions. For example, during phase one in which the child is increasingly more alert post-sedation, the need for a nurse call and a method to respond to yes/no questions are established (Santiago & Costello, 2013).

McKinley, Poole, and White (2010), three Australian speech-language pathologists, created and trialed an AAC communication board for an ICU with their health care system. They surveyed 22 nurses to identify what their preferred AAC system would be. The survey results identified a preference for a device that was sturdy, appropriate for all literacy levels and languages, and useable without training. They created a communication board that contained a dry erase section, an alphabet, BoardMaker® images with associated text, and a pain scale. This communication board was determined a successful communication tool and ultimately placed in every ICU within their health care system. Other AAC systems used in ICUs include communication boards, notebooks, speech generating devices (SGDs), SGDs with visual and auditory scanning capability, electro-larynx devices, switches, and devices that provide spelling capabilities (Garrett, Happ, Costello, & Fried-Oken as cited in Augmentative Communication News, 2007).

**Role of Speech-Language Pathology in AAC Implementation in the ICU**

Communication evaluation is needed for each patient since every patient functions at different levels (Costello, Patak, & Pritchard, 2010; Santiago & Costello, 2013). SLPs bring notable expertise to evaluations of individuals who are nonverbal. SLPs are the professionals noted as communication experts. SLPs are the professionals whose training provides the expertise to assist in determining standards of practice for AAC systems (Downey & Happ, 2013). The SLP can bring the same set of skills they provide to students with CCNs to patients that may be admitted to an ICU (Downey & Happ, 2013). The SLP may already have a clinical presence for providing dysphagia services to patients in the ICU (Hafner, Neuhuber, Hirtenfelder, Schmedler, & Eckle, 2008) and so would be familiar with ICU procedures and staff.

**Role of Nursing in AAC Implementation in the ICU**

In any hospital setting, the nurses' role is critical to medical care. Nurses working in the ICU communicate more frequently with the patient than physicians, family members, or any other healthcare professionals (Happ, Tuite, Dobbin, DiVirgilio-Thomas, & Kitutu, 2004). Thus, nurses communicate most with patients in the ICU who

are nonverbal (Radtke, Tate, & Happ, 2012). If nurse-patient communications are limited, then quality of care is likely to be negatively impacted (Finke, Light, & Kitko, 2008). Research suggests that patient-staff interaction is typically less than one minute in length per interaction (Happ, Garrett, Thomas, Tate, Houze, Radtke, & Sereika, 2011). This time sensitive engagement indicates the imperative need for nurses to communicate effectively with patients for optimum care and positive patient outcomes.

The importance of nursing in providing communication channels for patients in the ICU is well documented (Finke, Light, & Kitko, 2008; Happ et al., 2011; Radtke, Tate, & Happ, 2012). The Study of Patient-Nurse Effectiveness with Assisted Communication Strategies (SPEACS; Radtke, Tate, & Happ, 2012) was conducted to determine if training nurses with regard to basic communication strategies as well as communication with electronic AAC systems was effective. The research demonstrated that the SLP-led training resulted in a more positive attitude regarding communication strategies from the nurses. It also changed how the nurses practiced with regard to communication strategies used with patients in the ICU.

Having nursing staff in the ICU who are well-trained and familiar with AAC systems and general communication strategies would likely lead to an increase in quality of care for numerous reasons. Quality of care may be impacted when there is poor communication between nurse and patient (Finke, Light, & Kitko, 2008). Additionally, patient and nurse communication is typically controlled by the nurse and only related to the medical needs of the patients (Finke, Light, & Kitko, 2008). If patients are able to communicate beyond their immediate medical needs as well as communicate with family members, they may be more satisfied and become more comfortable and cooperative with the staff encounters.

**Barriers to Use**

Although AAC systems are useful within the ICU, there may be limitations that impact frequency of use. One set of barriers may stem from the health care provider. As previously stated, nurses are crucial to ICU service provision (Finke, Light, & Kitko, 2008; Happ et al., 2011; Radtke, Tate, & Happ, 2012), and subsequently,

implementation of AAC systems within the ICU.  The attitudes of nursing staff toward AAC systems likely impact the success of implementation (Radtke, Tate, & Happ, 2012). The extent to which the nurses have been trained and exposed to AAC systems may also affect how they relate to and implement AAC systems.  Finke, Light, and Kitko (2008) found that nurses typically received minimal training regarding AAC systems. Additionally, the shift changes in nursing staff and potential uncertainty about the nurses' role in AAC system provision, lack of access to communication tools, and other factors may hinder the implementation process (Downey & Happ, 2013).  Lack of referral to SLPs from physicians may also decrease the provision rates for AAC systems in the ICU (Garrett, Happ, Costello, & Fried-Oken as cited in Augmentative Communication New, 2007).

Multiple patient-related factors may hinder the use of an AAC system in the ICU. Though not exhaustive, these include cognitive and physical status, language impairment, deficiency in psychological state (Finke, Light, & Kitko, 2008), fluctuation in medical and cognitive status, and inability to be assessed by a SLP due to the patient being in other diagnostics or procedures (Downey & Happ, 2013).

## Frequency of AAC in ICU

Some ICUs have established programs for AAC use, while others use no AAC systems (Santiago & Costello, 2013).  Garrett, Happ, Costello, and Fried-Oken (As cited in Augmentative Communication News, 2007) reported that patients with complex communication needs are seldom referred to SLPs for AAC assessments. Rather, gestures, head nods, mouthing words, and writing are typically used by ICU staff with patients who are nonverbal.  Implementation of AAC systems in the ICU are not common (Garret et al., 2007).  Communication devices and materials are often not readily available and provision of AAC systems is not standard practice in ICUs (Radtke, Baumann, Garrett, & Happ, 2011).

## Statement of the Problem

The literature suggests provision of AAC systems for patients in the ICU is not standard practice despite recommendations for communication from The Joint

Commission.  Yet, there is a lack of research that identifies or quantifies what occurs with regards to AAC system use in the ICU from a practitioner-based perspective.  It is unknown whether providers, such as SLPs and nurses, changed their practice patterns subsequent to the 2010 Joint Commission standards for communicative effectiveness in hospitals.  Current literature on frequency of use appear to be more anecdotal and from the researchers' own experience rather than quantitative data from the workforce.  Numerous articles outline how to assess for AAC systems in the ICU (Costello, Patak, & Pritchard, 2010; Santiago & Costello, 2013) as well as the efficacy and outcomes for nonverbal ICU patients post-AAC implementation (McKinley, Poole, & White, 2010; Santiago & Costello, 2013).  However, there is a lack of research identifying whether ICU health care professionals are presently providing evidence-based AAC systems to patients who are nonverbal in the ICU, or whether provision of AAC services occurs at all.  Additionally, research is lacking examining protocols in current practice for AAC use in the ICU.  For example, it is unknown how clinical decision-making is completed, if SLPs are being asked for consultations and/or evaluations, and if nurses are trained on AAC systems while in school or at their place of work.  Similarly, lack of how families adapt to AAC systems is limited and has been researched primarily only using data retrospectively from previously existing research (Broyles, Tate, & Happ, 2012).  Insight on current clinical practices would provide benefit to multiple ICU health care professionals, particularly SLPs and nurses.

It is known that SLPs bring an important and unique skill set regarding communication needs assessment and implementation (Downey & Happ, 2013). In addition, nurses in ICUs are crucial communication partners and vital to the implementation of AAC systems in the ICU (Happ et al., 2004; Happ et al, 2011; Radtke, Tate, & Happ, 2012).  It seems reasonable that these two professional groups would have the most direct experience with AAC systems in the ICU.  Perspectives from these professionals could provide insight into the current practices with regard to AAC systems in the ICU.  SLPs and nurses could provide understanding as to whether AAC

systems are being used in their facilities, and if they are not, the factors that contribute to lack of use.

After a review of the literature, the following research questions were formulated regarding the use of AAC systems in ICUs.

1. How frequently are AAC systems used for nonverbal patients in ICUs?

2. What factors contribute to the current frequency level of AAC system use in ICUs?

3. What/who guides clinical decision making regarding AAC system selection and implementation for nonverbal patients in ICUs?

4. If presently used, who educates patients, family, and staff on AAC systems used in ICUs?

**Chapter 3**

**Methods**

**Research Design**

The Institutional Review Board at Eastern Kentucky University approved the research on May 2, 2013, prior to any data collection.  The research was conducted using a survey design.  Creswell (2009) describes survey designed research as a means of collecting quantitative data that can unique perspectives from the targeted population.  Consequently, a survey design was chosen as a quick and efficient method to gain insight on current practices regarding AAC in ICUs via quantifiable data. The purpose of the survey was to gain insight on current clinical practices among speech-language pathologists (SLPs) and registered nurses (RNs) working, or who have recently worked in ICUs.  In particular, the purpose was to gain perspective on clinical practices regarding use of AAC systems with patients identified as nonverbal and cognitively appropriate.  The survey design was also chosen to encourage professionals, who are busy both professionally and personally, to contribute to current professional knowledge without requiring a significant investment of time.  Data were collected using a self-administered questionnaire (Creswell, 2009).

**Instrumentation**

Three survey instruments were created to collect data for this study: two for SLPs and one for RNs.  All survey instruments were published online via SurveyMonkey.  The major content in all instruments included the survey questions and a section for demographic information (e.g., age, gender, years of experience).  On both of the SLP surveys, an optional section was created to collect contact information for a random gift card drawing.  Additionally, both SLP survey instruments contained statements at the beginning of the instrument clarifying whether the appropriate survey instrument was selected.  The first SLP survey instrument was created for SLPs who identified that they work or have worked in a hospital and have clinical experience working with AAC systems in the ICU.  The second SLP instrument was created for SLPs who identified that they work in a hospital equipped with an ICU, but do not provide AAC systems within

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that ICU.  The purpose of the second SLP survey instrument was to gain perspective from SLPs as to why they did not provide AAC accommodations in the ICU, if they provided a clinical presence in the ICU for other areas of practice, and if they provided AAC systems in other areas of the hospital.  The single survey instrument for RNs was intended for RNs who have worked within the ICU at their hospital of employment.

Each survey instrument and its questions were developed by the principal investigator (PI) in response to current literature on the use of AAC systems in the ICU and feedback from the thesis committee and chair.  Prior to data collection, all survey instruments were reviewed by four doctoral-level faculty serving on the thesis committee.  Three faculty members were from the Communication Disorders Program and one from the Occupational Therapy Program at Eastern Kentucky University. Additionally, survey instruments were piloted among four SLPs, two RNs, and a nurse practitioner to allow additional input prior to publishing the survey.  Post-piloting adjustments were implemented from the feedback provided, resulting in the final versions of the survey instruments.

**SLP Survey Instruments.** The SLP survey instrument-1 consisted of 27 questions (Appendix A).  Question types for the instrument included categorical scales such as yes/no responses; yes/no/other responses; and yes/no/AAC was not used in the ICU. Additionally, rating scales were used for multiple questions.   For example, question two asked about the frequency of appropriate AAC provision to patients in the ICU. Responses to these types of questions included Likert-type responses, which included Never (0%), Seldom (≤25%), Fairly Often (≤50%), Often (≤75%), Always (100%). Questions seeking information on clinical decision making and identification of other professionals involved in decision making were also posed, as well as questions related to clinical practices.

SLP survey instrument-2 (Appendix B) consisted of 13 questions.  These questions examined why SLPs are not providing AAC system to nonverbal patients admitted to the ICU.  Questions included yes/no/other questions,; questions to identify the role of other professionals in their respective setting; open responses where SLPs

provided their reasoning for specific practice choices; and other general clinical practice questions.  No categorical scales were used in this survey instrument.

**Nursing Survey Instrument.** The RN survey instrument (Appendix C) contained question types similar to those of the SLP survey instrument-1.  However, questions were designed for the nursing profession.  For example, question 10 asked how frequently nurses suggested the need for a speech-language pathology consult or evaluation to physicians, physician assistants, or nurse practitioners. Response options were identical to the Likert-type scale used in the SLP survey instrument-1.  When not necessary to be discipline specific, some questions were identical to the SLP survey instrument 2 (e.g., question 2 on the RN survey instrument and question 15 on the SLP survey instrument 1).

Demographic data were collected for all participant groups.  These data included gender, years of practice, years employed in the hospital and/or ICU for which their survey responses were based, level of education, and hospital demographics[1] (Appendix G).  Additionally, SLP participants were provided the option to input contact information to be entered in a random gift card drawing.  Nurses were not admitted into the drawing per the guidelines of AllNurses.com.  Participants were not required to participate in the drawing.  At no point were participants' responses linked to their contact information, as clearly stated in the survey instrument.

**Population Sample and Procedures**

Non-probability convenience and snowball sampling were used to identify potential participants.  Participants were SLPs and RNS who worked or are currently working in a hospital equipped with an ICU within the past year.  The survey designed research was a single stage design, requiring respective participants to respond to a survey instrument once during one window of data collection.  Individuals who met the criteria for participation were selected through multiple modalities.  For the purposes of identifying potential participants, a recruitment letter for SLPs (Appendix D) and RNs

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[1] All tables containing demographic data can be found in Appendix G

(Appendix F) informed respondents of the purpose of the study, data collection processes, how data would be used, the survey URL, and contact information for the PI and thesis chair.

To identify potential participants who were SLPs, the recruitment letter (Appendix D) was made available on special interest groups (SIGs) discussion boards located on the ASHA website and also distributed as a listserv e-mail.  The recruitment letter was posted on three discussion boards:  Neurophysiology and Neurogenic Speech and Language Disorders (SIG 02), AAC (SIG 12), and Swallowing and Swallowing Disorders (SIG 13).  These were chosen as most relevant to the research topic and areas of practice.  The recruitment letter with links to the survey instruments was initially posted on October 4, 2013.  However, an error in the survey links occurred for some participants. The recruitment letter was edited and re-posted with a corrected link on October 4, 2013.  The letter was resubmitted on October 23, 2013 to the SIG 02 and October 24, 2013 to the SIG 13 discussion board to gain additional participants.  A final reminder was posted to the SIG 12 discussion board on November 24, 2013.  Additionally, the recruitment letter was sent through the listserv of the Kentucky Speech-Language-Hearing Association (KSHA) on December 2, 2013.

To recruit potential RN participants, the RN recruitment letter (Appendix F) was posted to AllNurse.com, a popular and recommended website with varying nursing-related discussion boards.  Per AllNurses.com regulations, the recruitment letter and survey instrument were modified to not include an invitation to participate in a gift card drawing.  The website permitted postings on two of its discussion boards: the Academic Nursing Research Requests and a board of the researcher's choice.  AllNurse.com guidelines required a shortened version of the original recruitment letter (Appendix E), subsequently posted to the Academic Nursing Research Requests board, and provided a link to the full recruitment letter on the General Nursing Discussion.  The shortened version of the recruitment letter was posted on October 18, 2013; the full recruitment letter was posted to the General Nursing Discussion board on October 17, 2013.  On both boards, a reminder was posted in the comment section of the board clearly stating

that participation did not require experience with AAC.  The reminder was posted on October 21, 2013 to the Academic Nursing Research Requests board and October 25, 2013 to the General Nursing Discussion board.  Additional participation reminders were posted to both boards on the following dates:  November 11 and 25, 2013, and December 27, 2013.

**Data Analysis**

Data were collected and analyzed using SurveyMonkey, an online service that collects, safely stores, and analyzes survey data.  Descriptive statistics were used to analyze the data.  In particular, measures of central tendencies (mean and mode) were calculated for the survey responses. Descriptive statistics were applied to each of the three groups of participants separately: RNs, SLPs providing AAC in the ICU, and hospital-based SLPs who do or did not provide AAC within the ICU.   Cross tabulation was utilized to compare statistical means among groups to compare group responses.  For example, the response of RNs on a particular question was compared to that of SLPs providing AAC in the ICU for the same question. In addition, inferential statistics were calculated.  Specifically, the *t*-test and the Mann Whitney *U*-test, which was used to analyze statistical difference among participants using responses on Likert-type questions. When using the *t*-test and Mann Whitney *U*-test, the *p* value, or probability ($p \leq 0.05$), was computed when comparing two groups' responses to identify statistical significance.

**Chapter 4**

**Results**

**Reporting and Analyzing Data from Survey Instruments**

Data collected from each of the survey instruments is reported individually and grouped by responses. Data are reported separately from the three surveyed groups: registered nurses (RNs), speech-language pathologists (SLPs) providing augmentative and alternative communication (AAC) in the intensive care unit (ICU), and SLPs not providing AAC in the ICU.

**Participants and Demographics**

Forty-eight participants (*N*=48) completed the survey. The sample population consisted of 40 SLPs (*n*=40) and 8 RNs (*n*=8). Of the SLPs completing survey instrument-1, provision of AAC in the ICU, 19 fully completed the survey. One participant skipped demographic data as well as two informational questions. Nineteen SLPs completing survey instrument-2, no provision of AAC in the ICU, fully completed the survey. One participant did not respond to the optional gift card entry. RN participants (*n*=8) fully completed the respective survey instrument-3.

The population samples were not stratified at any point of the research. Additional demographic data from all participants are provided in Appendix G.

**Frequency of Clinical Use Identified by Speech-Language Pathologists**

Of the SLPs participating in the research (*n*=40), 20 SLP participants (50%) reported providing or had provided AAC systems within the ICU. The remaining 20 SLP participants (50%) were not providing or did not provide AAC systems within the ICU.

Of the SLPs who stated that they provided AAC systems within the ICU (*n*=20), 50% (*n*=10) of those identified that they "seldom ($\leq$ 25%)" provide services. A quarter (25%; *n*=5) reported they provide services "fairly often ($\leq$ 50%)" while 20% (*n*=4) indicated they provide AAC services "often ($\leq$ 75%)" within the ICU. One participant reported "always (100%)" providing AAC services within the ICU.

Mann Whitney $U$-test was used to identify $p$-value for statistical significance in frequency of use identified between SLPs & RNs. Calculated $U$-values were used. A $p$-value 0.0316829 was identified ($p=.0316829$), which is significant at $p\leq0.05$

**Frequency of Clinical Use Identified by Registered Nurses**

Twenty-five percent ($n=2$) of the RNs reported AAC systems were "never (0%)" used in the ICUs in which they worked.  Approximately 63% (62.5%; $n=5$) responded with "seldom ($\leq$ 25%)" and the remainder (12.5%; $n=1$) responded with "fairly often ($\leq$ 50%)". No participants responded with "often ($\leq$50%)" or "always (100%)."

**Results from SLPs Who Provided AAC in the ICU**

**Referrals.** Participants were asked how referrals were received for AAC system use in the ICU.  Only three (15%) of the SLPs who used AAC systems with patients in the ICU ($n=20$) responded they had "never (0%)" received referrals for consults or evaluation. Fifty percent ($n=10$) responded they "seldom ($\leq$ 25%)" receive referrals and 25% ($n=5$) reported receiving referrals "fairly often ($\leq$ 50%)". Only 10% ($n=2$) reported receiving referrals "often ($\leq$ 75%)." No participants indicated that AAC consultations or evaluations were "always (100%)" received.

**Seeking ICU patients for AAC evaluation/consultation.** The majority (60%) of the SLP respondents who provided AAC systems in the ICU reported "never (0%)" (20%; $n=4$) or "seldom ($\leq$ 25%)" (40%; $n=8$) seeking referrals for patients who would benefit from AAC.   Referrals were sought by 5% ($n=1$) "fairly often ($\leq$ 50%),"," and 20% ($n=4$) "often ($\leq$ 75%)". Only three (15%) responded that they "always (100%)" sought referrals for AAC use by patients in the ICU.

**Informing other professionals of AAC services.** The SLPs were asked if they inform other professionals of their willingness to consult or evaluate patients in the ICU for AAC systems. Ten percent ($n=2$) responded with "never (0%)"; 30% ($n=6$) responded with "seldom ($\leq$ 25%)"; 25% ($n=5$) responded with "fairly often ($\leq$ 50%)"; 30% ($n=6$) responded with "often ($\leq$ 75%)"; 5% ($n=1$) responded with "always (100%)".

**Involvement in selecting AAC systems for patients in the ICU.** Ninety-five percent of SLPs ($n=19$) responded with "yes" when asked if they have been involved in

selecting an AAC system for a patient in the ICU. The remaining 5% (*n*=1) responded with "no".

**AAC assessment protocol.** Eighty percent (*n*=16) of the SLP participants who provided AAC systems in the ICU did not have an AAC assessment protocol in the ICU. Twenty percent (*n*=4) responded that they did use an AAC assessment protocol.

**Suggesting evaluation/consultation.** Nearly all respondents had suggested an AAC evaluation or consultation for an ICU patient who was nonverbal. When asked if they had suggested the consultation or evaluation to a physician/physician assistant/nurse practitioner, 90% of responding SLPs (*n*=18) responded "yes", with 10% (*n*=2) responding "no".

**Immediate consideration for AAC systems for ICU patients**. Sixty percent (*n*=12) of SLPs who provided AAC systems in the ICU responded that AAC was not immediately considered for ICU patients who were cognitively intact and alert. Forty percent (*n*=8) responded that AAC systems were immediately considered.

**Nonverbal patient not receiving AAC systems.** Sixty percent (*n*=12) of SLPs who provided AAC systems have observed patients who would benefit from an AAC system but that the patients did not receive one.   The remaining respondents indicated they had not observed an AAC need going unmet (*n*=8).

**Educating ICU staff.** The majority of respondents had not provided education to ICU staff with regard to AAC system use or applications.  Eighty-five percent (*n*=17) responded that, while they do provide AAC in the ICU, they had not provided professional development or training to ICU staff regarding AAC systems. Fifteen percent (*n*=3) reported they had provided some type of professional development or training to ICU staff. However, when asked if they had educated staff formally or informally on the benefits of AAC systems in the ICU, 75% (*n*=15) selected "yes"; the remainder (25%; *n*=5) selected "no".

**Need for ICU staff education.** Nearly all SLPs surveyed (95%; n=19) who provided AAC in the ICU believed ICU staff would benefit from additional education regarding AAC systems. Only one SLP believed ICU would not benefit.

**Patient experience with AAC Systems**. Participants were asked if they would describe the experience ICU patients have with AAC systems as positive. Eighty percent (*n*=16) responded with "yes", while 20% (*n*=4) responded "no." No explanations were provided with regard to the response choices.

**Family experience with AAC Systems.** Eighty percent of SLPs providing AAC (*n*=16) reported the families of AAC users in the ICU as having had positive experiences with use. Twenty percent (*n*=4) suggested that families did not have a positive experience. Responses were not clarified or expanded to identify causes or circumstances influencing either judgment.

**Information on AAC systems during professional training.** Most surveyed SLPs (80%; *n*=16) received information on AAC systems during their pre-service education. Only 20% (*n*=4) reported having no training during their pre-service educational preparation.

**Who is involved in the AAC selection process?** SLPs were asked to identify who was involved in selecting AAC systems for patients in the ICU. Participants were offered the response options of speech-language pathologist, nursing, physicians/physician assistants/nurse practitioners, occupational, and other. If participants selected other, they were asked to specify. All participants (*n*=20) identified speech-language pathologist as being involved in AAC selection. Fifty percent (*n*=10) identified nursing; 10% (*n*=2) identified physicians/physician assistants/nurse practitioners; 45% (*n*=9) occupational therapy; and 25% (*n*=5) identified other involved in selection. Other professions identified included Child Life Specialist, RT (respiratory therapy), chaplain, social work, PT (physical therapy), Technology Specialist, and the patient's family members.

**Time spent educating patients on their AAC system.** SLPs who provided AAC in the ICU were asked to identify the average time spent by specific professions educating patients on selected AAC systems. Participants reported average minutes spent for speech-language pathology, occupational therapy, nursing, physicians/physicians/nurse

practitioners, and other professions. If "other" was selected, they were asked to identify which profession.

Per SLP respondents, speech-language pathology spent the most time educating patients, *m*=34. Occupational therapy, *m*=10, and nursing, *m*=7, were next followed by physicians/physicians assistants/nurse practitioner, and other professionals, *m*=2, respectively. One participant elected to skip this question.

**Time spent educating family members of patients with an AAC system.** Similarly, per SLPs who provided AAC in the ICU, speech-language pathology was also identified as the profession spending the most time educating family members, *m*=16. The same SLPs identified that occupational therapy and nursing, *m*=3, respectively, were next followed by physicians/physicians assistants/nurse practitioners and other professionals, *m*=2, respectively. One participant chose to skip this question as well.

**Time spent educating medical staff on selected AAC system.**

The same group of SLPs reported speech-language pathology spent the most time, m=16, educating medical staff on AAC systems. Nursing and occupational therapy, *m*=3, respectively were identified next with physicians/physician assistants/nurses practitioners, and other professionals, *m*=2, perceived as providing the least amount of AAC education to medial staff.

**Results from SLPs Not Providing or Who Did Not Provide AAC Systems in the ICU.**

**Clinical presence in the ICU for other services.** The majority of SLPs not providing AAC in the ICU (90%; *n*=18) had a clinical presence in the ICU providing other therapeutic services. Most surveyed (85%; *n*=17) provided treatment for patients with tracheostomies (e.g., Passy Muir speaking valve). More than half (60%; *n*=12) provided cognitive-linguistic evaluation or treatment, and speech or language evaluation/treatment (55%; *n*=11). One quarter (*n*=5) provided voice evaluation or treatment. Only one participant (5%) did not provide any clinical service within the hospital's ICU.

**Providing any other services to a non-verbal patient.** Most SLPs not providing AAC in the ICU were providing AAC in other areas of the hospital (80%; *n*=16). Only 20% (*n*=4) were not.

**Suggesting use of AAC systems within the ICU.** When asked if they had suggested AAC for a patient to a physician/nurse practitioner/physician assistant, 60% of SLPs (*n*=12) responded "yes", while 40% (*n*=8) responded with "no".

**Providing AAC services in other areas of the hospital.** Data were obtained on whether AAC systems were provided in units of the hospital other than ICUs. Over half (55%; *n*=11) of the SLPs surveyed not providing AAC in the ICU provided AAC in other units of the hospital. Hospital units included pediatric long term care and sub-acute care, inpatient and acute rehabilitation, telemetry, medical/surgical unit, oncology, orthopedics, and long-term rehabilitation. Forty-five percent (*n*=9) did not provide AAC in any area of the hospital.

**Barriers to using AAC systems within the ICU.** Lack of material or equipment was the most frequently identified barrier to AAC use by the SLPs (68.42%; *n*=13). Feasibility (47.37%; *n*=9), time constraints (36.84%; *n*=7), lack of referrals (36.84%; *n*=7), issues with reimbursement (15.79%; *n*=3) were also identified as barriers to use. Two participants suggested AAC systems are not beneficial to ICU patients, and resistance from other professionals was hindering use, respectively. Approximately 37% of respondents (36.84%; *n*=7) selected "other" reasons for nonuse.   Additional barriers identified targeted more patient-centered factors such as short length of stay in the ICU, levels of patient attentiveness or alertness, and non-verbal status being only for a short period.

**Results from Nursing Participants**

**Familiarity with AAC.** The majority of RNs surveyed (75%; *n*=6) were familiar with AAC per its definition (ASHA, 2013).  Only two participants (25%) were unfamiliar with AAC.

**Information on AAC systems during professional training.** Information on AAC systems was not typically presented during pre-service nursing education.

Approximately 88% (87.5%; *n=7*) of participants did not receive training about AAC during their pre-service education. Only one participant reported receiving training about AAC systems.

**Immediate consideration for AAC systems for ICU patients.** Per the experience of RNs, an AAC system was not typically considered for patients who were cognitively intact upon arrival to the ICU. Only 25% (*n=2*) stated that ICU patients who were cognitively intact and non-verbal were considered candidates for AAC systems.

**Nonverbal patient not receiving AAC systems.** The majority of RNs (62.5%; *n=5*) have treated ICU patients they believed would benefit from an AAC system but who had not receive one. Only 25% (*n=2*) reported ICU patients being in need of systems and not receiving them.

**Patient and family experience with AAC Systems.** Four participants (50%) suggested that patients with AAC systems in ICUs had an overall positive experience with the selected system. Two participants (25%) believed that patients' experiences with AAC systems were typically negative. The remaining respondents (25%; *n=2*) stated they had not observed AAC systems used in the ICU. Data were the same for responses to a question about perspectives of family experience with AAC systems.

**Nursing involvement in the AAC selection process.** Most nurses (50%; *n=4*) had not participated in an AAC selection process. Two (25%) had been involved while the remaining (25%) indicated they had not observed AAC systems being used in the ICU.

**AAC assessment protocol.** RNs generally agreed that assessment protocols for AAC systems in the ICU were not standard practice (75%; *n=6*). Only one RN worked in an ICU that used an assessment protocol; the remaining participant responded that no AAC was used in the ICU.

**Seeking ICU patients for AAC evaluation/consultation.** RNs were not seeking patient referrals for AAC evaluation or consult. Three participants (37.5%) responded "never (0%)"; three participants (37.5%) responded "seldom (≤25%)"; one participant responded with "fairly often (≤50%)" (12.5%); one participant (12.5%) responded with "often (≤75%)".

**Education from other professionals.** Reportedly, other professionals, including SLPs, were not often educating RNs on AAC system. When asked who had provided education on AAC systems in the ICU, only two participants (25%) identified SLPs. One respondent (12.5%) identified occupational therapy as the education source. Two participants (25%) identified other nurses; five (62.5%) identified that they were self-taught; and three (37.5%) selected "other." Those responding under the "other" category indicated that "no one" had provided education or training to them with regard to AAC systems.

**Identifying who educates patients on selected AAC system.** RNs reported that they were the profession most often educating patients on selected AAC systems. When asked which profession educated patients and for how long (minutes), fifty percent (*n*=4) of RN participants chose nursing, *m*=19. One participant (12.5%) responded with "unsure" and one participant (12.5%) identified that AAC was not used. No RN participants selected speech-language pathology, occupational therapy, or physicians/physician assistants/nurses practitioner as professions providing AAC information. Two participants chose not to respond.

**Identifying who educates families of patients on selected AAC system.** Similarly, RNs indicated that they were the profession most often educating families on AAC systems selected for their family members. Three participants (37.5%) identified nursing, *m*=22. Two participants (25%) responded with "unsure" and one (12.5%) identified that AAC was not used. Two participants (25%) chose not to respond. No RN participants selected speech-language pathology, occupational therapy, or physicians/physician assistants/nurses practitioner as providing AAC information or education to families of patients in ICU.

**Identifying who educates medical staff on selected AAC system.** As with patient and family education, RNs reported they were providing the most education to medical staff on AAC systems selected for patients. Two participants (25%) identified nursing, with an average of 18 minutes. Three participants (37.5%) responded with "unsure" and one participant (12.5%) identified that AAC was not used. Two participants (25%) chose

not to respond. No RN participants selected speech-language pathology, occupational therapy, or physicians/physician assistants/nurses practitioner.

## Chapter 5

## Discussion

The research study examined information on current clinical use of augmentative and alternative (AAC) systems in the intensive care unit (ICU), including frequency of use, what and who guides clinical decision making, and who educates the patient, family, and staff on selected AAC systems. The following discussion considers frequency of use, factors contributing to low frequency, what guides clinical decision making, and patient, family, and staff education.

**Nursing Response Rate**

The final review of the research invitation for AllNurses.com survey link revealed that the (registered nurses) RNs survey invitation had several hundred views. However, only 8 RNs met the criteria or chose to respond. The low response rate may indicate that nurses' knowledge, interest, and familiarity with AAC systems is limited. This may be due to minimal exposure and knowledge about AAC systems. The majority of RNs (75%) reported being familiar with AAC systems. However, familiarity with AAC versus knowledge regarding its applications are separate issues. Nursing rightly focuses its energy on patient health and well-being. This would be particularly true in an ICU where patient status is considered more life-threatening. The workload or patient census, at any given time, may prevent RNs from being able to problem-solve beyond the immediate physical needs of the patients. AAC, while permitting the patients to communicate their health status, may be low on the list of priorities depending on patient stability and cognitive status.

Given the critical role RNs potentially contribute to the success of AAC systems in ICUs, the limited response rate suggests a discouraging reflection of current AAC use in the ICU. This is not a negative reflection on RNs. AAC use is not within their scope of practice so few receive training on AAC system during pre-service preparation. Provision of AAC systems in the ICU should largely be the initiative of the speech-language pathologist (SLP) rather than RNs. SLPs could be educating and collaborating with RNs, licensed practical nurses (LPNs), and other ICU professionals to establish AAC systems.

The data indicate that AAC in the ICU continues to be limited.  AAC in the ICU must be increasingly promoted as a new area of AAC use in ICUs is an opportunity for SLPs and RNs to advocate for expanding standards of care for a patient population that is grossly underserved.

**Confusion on What is Considered an AAC System**

The data identified perceptual bias that AAC involves high technology systems. RN respondents were provided with a definition for AAC that identified low and high technology system inclusions.  Despite the definition provided, one participant stated that AAC systems were not used in their ICU, but subsequently identified that pen and paper were used for communication purposes.  This suggests disconnect between perceptions of AAC even when provided definitions that allow for low-tech options. Recent popularity of high technology AAC systems, particularly the iPad (McNaughton & Light, 2013), may influence the confusion about what is and is not an AAC system. Low technology systems, such as alphabet boards, pen and paper, white board and marker, may not be categorized as true AAC systems despite the definition.

Additionally, this may be due to differences in amount of information SLPs receive during educational training versus RNs. Responses from SLPs who provided AAC in the ICU and RNs regarding if training on AAC was provided during education were compared. The *t*-test was used to determine t-values which were used to calculate *p*-value. The *p*-value was .0004 (*p*=.0004), thus the results were significant at *p≤0.05*.

**Frequency of Use**

Half of SLPs surveyed reported providing AAC systems to patients within the hospital.  However, half of those SLPs indicated they seldom provided AAC systems to patients in the ICU.  Responses from the RNs working in ICUs confirmed that AAC use in the units was minimal, if at all.  For patients in ICUs, the ability to communicate verbally is more likely to be compromised when compared to the general hospital population due to increased frequency of intubations, post-operative conditions, and critical illness (Costello, Patak, & Pritchard, 2010; McKinley, Poole, & While, 2010; Radtke, Bauman,

Garrett, & Happ, 2011).  Yet, AAC use does not appear to be a standard consideration for patient care for SLPs or RNs based on data from the current study.

Beyond the documented benefits of AAC in the ICU, professional organizations and accrediting bodies recommend AAC in the ICU given its benefits to patients. In their technical statement, ASHA (2004) outlines standard practices SLPs regarding AAC, including AAC in the ICU. They write that whether AAC implementation may be temporary for a patient, as it may be for an ICU patient, or permanent, it should be stated that a means of communication should be recognized and addressed to prevent communication background. Thus, the importance of SLPs providing AAC is the same regardless of setting.  Similar to ASHA, The Joint Commission (2010) standards should be view as guiding SLPs to provide AAC in the ICU.  The Joint Commission accredits hospitals, ICU are of course part of the hospital, and The Joint Commission states that all patients need to have their communication needs addresses. Patients within the ICU, per The Joint Commission standards, should have their communication needs addresses by specialists, such as SLP, who can provide means of communication to this patient population.

## Factors Contributing to Low Frequency of Use

SLPs who are hospital-based, but are not providing AAC in the ICU, identified multiple factors that influenced lack of use. However, the factors identified may have solutions that would allow more consistent use of AAC with patients in ICU.  A discussion follows for each.

**Lack of access to equipment/materials and reimbursement.** The majority of SLPs who had not provided AAC in the ICU responded that the lack of appropriate materials or equipment primarily prevents AAC systems application.  While this may be probable for higher technology systems such as the Tobii® eye gaze system (Tobii ®, 2014) or other eye gaze systems, many of the complex communication needs (CCNs) of patients may be met by inexpensive, low technology systems.  These may include yes/no picture cards, alphabet boards posted on the wall, personalized BoardMaker® boards, small portable dry erase boards, and visual pain scales  such as Wong-Baker

FACES® Pain Rating Scale (reference). These types of low technology systems can be made or are readily accessible or found through a simple online search.

High technology systems are more expensive and time intensive to gain reimbursement from third party payors. The time and expense may not be sustainable given the rapid turn-over of the patient census in an ICU. One option may be for SLPs and RNs to work toward establishing protocols for maintaining various types of equipment housed in the ICU to permit more rapid applications. A rental system could be established for scaled charges to permit purchasing of more expensive units.

Solutions may require SLPs to target a more long-term solution for the ICU as a whole. Rather than prescribing AAC methods for each patient, a range of options could be developed and sustained. This could be accomplished by seeking grants, writing proposals to hospital administrators with research-based support, or borrowing systems from organizations that rent or lend them on an as-needed basis. Grants or proposals could be written detailing benefits for patients' immediate care, overall healthcare outcomes, and quality of life.

**Not feasible and time constraints.** Nearly half of the SLPs (47.37%) suggested AAC systems use within the ICU was not feasible. However, it could be argued that providing AAC in the ICU should be considered a priority, given the documented benefits. The benefits for patients who are terminally ill to communicate final messages to family and friends (Costello, Patak, & Pritchard, 2010) cannot be understated. An increase in positive medical outcomes by having a means to communicate to healthcare providers (Patak, Wilson-Stronks, & Costello, 2009), and prevention of unnecessary pain or discomfort (Wilson-Stronks & Blackstone, 2013) are also supported benefits.

It is not uncommon for hospital professionals to suggest that their schedules provide little flexibility due to workloads and caseloads. Prioritization and evaluation protocols commonly guide efficient use of time and resources. If protocols and regular expectations for AAC use were standard practice in an ICU, it is more likely that AAC service provision would eventually be viewed as less disruptive to both RNs and SLPs. Just as dysphagia, aphasia, dysarthria, and apraxia treatments are directly targeted to

increase positive communication and overall health outcomes for patients, AAC systems could be viewed as resulting in those same outcomes. The patient in an ICU with a condition that impedes communication deserves the same professional expertise and care as patients in other hospital units. AAC use in the ICU was suggested as not feasible by some participants.  It is unclear if the term is applied as meaning not viable or as being impracticable.  Viability has been discussed with regard to setting protocols, and maintaining re-useable AAC resources within the unit itself.   However, decision-making with regard to service provision for patients in ICU must not be determined based simply on feasibility, if intended to mean impracticality due to time constraints or conditions.  It is within the scope of practice and ethical decision-making for practitioners to meet the patient's needs as they are rather than sacrifice patient care because it may prove challenging to do so.

      **Lack of referrals and resistance from other professionals.** Educating other professionals is imperative to any discipline for obtaining increased referrals.  Referring entities must know what skills and services are available and who would benefit from them before being able to recommend them.  If other professionals, including physicians/physician assistants/nurse practitioners, are increasingly educated on benefits of AAC systems for ICU patients, then referrals would likely increase for those patients who would benefit.  Additionally, SLPs must be proactive in requesting or suggesting referrals from these providers. Persistent encounters and referral requests may eventually lead to an increase in appropriate AAC use in ICUs.  SLP providers must be persistent in their attempts to inform other medical professionals and consumers with regard to the AAC benefits in provision of healthcare in ICUs. Research supports the benefits that include prevention of unnecessary pain as patient can communicate wants/needs, preventing poorer health outcomes versus patient who remain nonverbal without an AAC system (Patak, Wilson-Stronks, & Costello, 2009), providing end-of-life messages (Costello, Patak, & Pritchard, 2010), helping combat medical error, miscommunication regarding medication, and ultimately, helping the patient become more involved in their own medical care (Wilson-Stronks & Blackstone, 2013). -

**Non-beneficial to patients.** A few SLPs who had not provided AAC in the ICU responded that AAC systems are not beneficial to patients who are nonverbal in ICUs. This is not supported by research (Costello, Patak, & Pritchard, 2010; Happ et al., 2011; McKinley, Poole, and White, 2010; Patak, Wilson-Stronks, & Costello, 2009; Santiago & Costello, 2013; Wilson-Stronks & Blackstone, 2013) that indicates AAC results in improved care and quality of life for ICU patients who are nonverbal. Enabling patients to communicate wants and needs is a fundamental goal for the profession of speech-language pathology (ASHA, 2014; Kentucky Board of Speech-Language Pathology and Audiology, 2013). Providing AAC systems for ICU patients who are nonverbal is no less important than providing communication to patients with other communication disorders.  It is suspected that SLPs may view their role in the ICU as disruptive if communication goals are targeted rather than more life-sustaining goals related to dysphagia.  However, research clearly indicates the value to the patient for communicating with regard to their health status (Happ et al., 2011; Patak, Wilson-Stronks, & Costello, 2009; Wilson-Stronks & Blackstone, 2013).

**Lack of nursing knowledge of AAC systems.**  Limited knowledge about AAC systems is understandably a factor contributing to low frequency of AAC use. Most RN participants (87.5%; $n$=7) had received no information regarding AAC systems during their formal education. Proficiency in AAC applications is not within the scope of practice for nursing (Kentucky Board of Nursing, 2011). This suggests an opportunity for SLPs to provide training to pre-service nursing students with regard to AAC applications. Pre-service education opportunities for nursing students could proactively increase their willingness to use AAC when recommended for critically-ill patients in ICUs.  Ongoing workplace education for practicing RNs from SLPs is crucial to encourage shifts in perspectives with a goal for RNs to become more comfortable and knowledgeable in advocating for AAC systems.

Nearly all the SLPs providing AAC in the ICU indicated that medical staff would benefit from further training to increase knowledge and understanding of AAC systems. Most (75%) reported that they had tried to educate staff, whether formally or

informally, on benefits of AAC systems. However, less than one quarter (*n*=3; 15%) had actually provided professional development or training.  This suggests most information about AAC systems occurs in an indirect way through daily encounters or observations. Perhaps, a more direct approach to providing information would result in more AAC use in meeting patient needs.

**Clinical Presence in the ICU—SLPs Not Providing AAC Systems**

Nearly all hospital-based SLPs had a presence in the ICU, but for reasons other than providing AAC assistance. This access to ICU patients is encouraging.   It provides an established gateway for SLPs to educate other professionals, model AAC use, and request AAC evaluations or consultations within the ICU. Rapport building with physicians, physician assistants, and nurse practitioners, in particular, may increase the likelihood that a request for an AAC evaluation or consultation will be met positively. Relationships with physical therapists and occupational therapists in the ICU could result in development of an interprofessional practice team, ideal for a thorough evaluation and intervention plan.

**What Guides Clinical Decision Making.**

**AAC System Selection.**  SLPs who provided AAC in the ICU reported direct involvement in the AAC selection process. Half of the same SLP respondents indicated nursing was also involved in the selection process.  The role of nursing is invaluable in successfully implementing an AAC system for a patient.  Ideally, nursing staff would be involved in all AAC selections. Given that nurses play a key role in patients' overall healthcare, are constantly monitoring ICU patients' status, and interact with patients more than any other profession, including speech-language pathology, the nurse provides an excellent view into the patient's entire function and ability.

Half of RNs surveyed (*n*=4) stated that they had not been involved in selecting an AAC system; only one participant stated that speech-language pathology was involved in selecting AAC systems. Since only half of RNs and few SLPs are involved in selecting AAC systems, more low technology systems are likely being used.   Picture boards, pen and paper, alphabet boards, and photos/pictures cards may not require the skill of an SLP to

implement. These low technology systems are likely provided to the patient without an appropriate evaluation by an SLP.

**Immediate Consideration for an AAC System.** Response data from RNs and SLPs who provided AAC in the ICU revealed that the majority of ICU patients, who were alert and cognitively intact, were not immediately considered as a candidate for an AAC system. Given the broad range of AAC systems, many patients may be able to have their CCN met soon after admission into the ICU. The data in the current study suggest that care providers are not considering the communicative needs for patients who are nonverbal in ICU as urgent as other needs. While maintaining the stability in overall medical status of the patient is critical, providing patients with a means of communication may actually contribute to maintaining the integrity of the patient's overall health status. Patients who are provided with an AAC system can communicate regarding pain, need for medication, respond to cognitive status questioning, and potentially decrease medical error by being more involved in their own care (Wilson-Stronks & Blackstone, 2013).

**Use of Assessment Protocols.** In the hospital setting, it is not uncommon for pre-established assessment protocols to be utilized for a quick, more efficient means of evaluation regardless of professional discipline. However, when AAC was provided within the ICU, the majority of SLPs and RNs were not using assessment protocols. Per SLPs providing AAC, many respondents stated that they seldom used AAC in the ICU. Thus, even when the SLPs did identify that AAC was being used, it was largely being used infrequently. This would decrease the necessity for a protocol of AAC evaluation in comparison to a dysphagia assessment protocol, as dysphagia may be a frequent referral.

**Types of Systems Use**

The SLPs and RNs who identified AAC use in ICUs identified different types of systems that ranged from high technology to low technology being used. Low technology systems identified included pen and paper, dry erase boards, picture cards, picture boards, alphabet boards, yes/no picture cards, manual sign language,

Boardmaker® pages, scanning boards, and gestures. High technology systems identified by SLPs included eye gaze systems (e.g., Tobii® eye gaze), Tech/Talk 8 and 32, electrolarynxes, iPads and tablets, BigMAC Communicator switches. Only one RN identified a high technology system (iPad/writing tablets), while the remainder identified low technology systems only, such as pen and paper, picture/alphabet boards, photos, dry erase boards.  This suggests that patients are offered alternate means of communication that are making do and a complete AAC evaluation is not conducted. This tendency is ineffective and may be frustrating to the patient (Patak et al., 2009). Data from this study neither support nor refute these findings.

Multiple SLPs who used AAC in the ICU identified high technology devices being used such as Tobii®, Tech/Talk, switches, and iPads.  This suggests that SLP involvement in AAC in the ICU results in a range of AAC system applications considered, inclusive of high technology and low technology systems. SLPs are understandably more knowledgeable with regard to types and capacities for AAC use.  More thorough evaluations lead to more effective AAC systems for individual patients and, ultimately, better patient outcomes and satisfaction.

**Patient and Family Education**

RN participants reported that SLPs spent no time educating families and patients on selected AAC systems. This is concerning given that SLPs have the professional expertise for AAC within the interprofessional ICU team. Thus, although AAC may be used, families and patients are receiving training from care providers other than the experts. The RNs reported that they spent the most time educating families and patients. Only one RN identified speech-language pathology as even being involved in the AAC selection process.

By contrast, SLPs identified themselves as the professional who most often educated families and patients regarding the selected AAC system. The reason for the contrasting reports is unclear.  Perhaps, it suggests that when the SLP is directly involved in assessment and treatment using AAC, the tendency is to take the lead in educating families and patients on the particular AAC system used.

**Medical Staff Education**

RNs reported that nurses were the only professionals who educated medical staff with regard to AAC. Conversely, SLPs identified themselves as the profession providing medical staff AAC education most often. Additionally, an explicit definition of staff was not provided. For example, pastoral care, custodial staff, etc. are all ICU staff, but were not mentioned on the survey instruments. This may have changed what SLPs and RNs reported as the average time spent educating.

**Conclusion**

Data from the current study suggest that potential communication needs of patients who are nonverbal in the ICU are not being addressed in direct, purposeful ways. It appears that this patient population is less likely to be provided with AAC systems than others within the hospital, despite the potential for negative impact on quality of life and medical care. While most SLPs are providing other clinical services in the ICU, many still are not evaluating or providing AAC systems to this patient population, even though professional relationships with ICU staff have been established. Reported barriers identified by these SLPs can be addressed or eliminated with some persistence and further review.

The importance of nursing in implementing an AAC system for a patient has been supported (Finke, Light, & Kitko, 2008; Happ et al., 2011; Radtke, Tate, & Happ, 2012). However, RNs continue to lack clear understanding with regard to AAC use and SLPs do not appear to be improving that status. This may have contributed to the low number of RN participants in the current study. Additionally, responses to the survey suggest that education on AAC systems during pre-service educational training is not standard practice for nursing programs. With a goal toward improving interprofessional practice within the ICU, it would be beneficial for SLPs to advocate for and provide continuing education to nurses about AAC benefits, limitations, and potential toward improving health outcomes for patients who are nonverbal in ICU.

Admirably, SLPs and RNs surveyed do appear to be providing education to patients, families, and medical staff regarding selected AAC systems for patients.

However, RNs, who stated that SLPs are infrequently involved in AAC selection and implementation, identified nursing as the profession most often responsible for patient education. Ideally, SLPs would be directly involved in each AAC evaluation, selection, implementation, and educational process. When SLPs are not involved, the risks increase for inappropriate or inefficient AAC system selections that may not be ideal for the patient. Thus, RNs may be educating the patient, family, and staff on an AAC system that may be ineffective for the patient, adding to their perception that AAC use unsuccessful.

**Limitations**

A low response rate is a limitation of the current study. In particular, the low response rate for RNs greatly limits the ability to generalize the data. However, the limited response rate may also be informative. RN awareness of AAC systems appears as limited as the response rate. Lack of knowledge about AAC may have inhibited potential respondents from participating. However, while SLP response rates were higher than the RN responses, it was not to the targeted level for the study. Despite familiarity and expertise with AAC, SLPs did not respond to the survey in overwhelming numbers. Generalization of findings to both professions is limited.

The placement of the SLP survey instruments may also be a limitation. Membership and participation in professional Special Interest Groups (SIG) is not a requirement of ASHA. It is elective for a professional to follow the SIG discussions. In addition, membership within the SIG does not correlate to all members meeting inclusion criteria. Membership in the AAC SIG does not require that practitioners currently provide AAC services. ASHA members seeking to remain current in the topic may be members of any special interest group without ongoing experience or service provision in that specialty.

Professional bias within the survey responses must be acknowledged as a potential limitation. Professionals within the AAC SIG responding to the survey may have been more inclined toward or feel strongly about provision of AAC systems in the ICU than non-members.

**Implications**

The current study suggests that while some AAC service provision occurs in the ICU, it is not standard practice. The majority SLP respondents who provide AAC systems to ICU patients were not doing so frequently. Despite evidence that provision of AAC systems in the ICU results in better medical treatment, outcomes, and quality of life for patients (Costello, Patak, & Pritchard, 2010; Patak, Wilson-Stronks, & Costello, 2009;Wilson-Stronks & Blackstone, 2013),  it continues to be an uncommon practice even when many of these patients may be at the end-of-life.

**Future Research**

Further research regarding AAC systems in the ICU is needed. Replication of this study is recommended to increase generalization to each population.  Identifying more specific information from nursing staff inclusive of other licensed and certification levels with regard to AAC in the ICU would be beneficial. Results from the current study suggest a need to increase nurses' awareness of AAC use, determine areas of collaboration with nursing for service provision to patients who are nonverbal, and insight as to what topics would be relevant to include in pre-service nursing training programs. Research has previously been conducted on nursing's role in AAC in the ICU (Finke, Light, & Kitko, 2008; Happ et al., 2011; Radtke, Tate, & Happ, 2012), but more research on current trends would prove useful in examining the need for increased frequency of AAC use in the ICU.

Survey designed research does limit the depth in which a certain topic can be explore. Qualitative research on the topic may provide more specific insight in terms of the factors that are influencing frequency of use including barriers, what guides clinical decision making, and more in depth detail from RNs and SLPs regarding AAC in the ICU.

Lastly, more hospitals that have established AAC systems in ICUs could report outcomes.  The steps, successes, failures, and patient outcomes would help to guide other facilities in their implementation of AAC in the ICU.

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APPENDIX A:

Survey instrument 1—SLPs who provided AAC in the ICU

***IMPORTANT***

You have selected this survey because you identify as a hospital-based speech-language pathologist who DOES provide augmentative and alternative communication (AAC) systems in the intensive care unit (ICU).

If this is correct, please continue. If this is NOT correct, please click here and complete the survey for speech-language pathologists who do NOT provide AAC systems to patients in the ICU.

Next

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43

Please respond to the following questions by selecting one of the following options:

Never (0%)

Seldom (≤ 25%)

Fairly Often (≤ 50%)

Often (≤ 75%)

Always (100%).

### 1. How often do/did you use AAC in your intensive care unit (ICU) for nonverbal patients?

○ Never (0%)

○ Seldom (≤ 25%)

○ Fairly often (≤ 50%)

○ Often (≤ 75%)

○ Always (100%)

### 2. How often are/were patients in the ICU whom you consider(ed) appropriate for an AAC system provided with an AAC system?

○ Never (0%)

○ Seldom (≤ 25%)

○ Fairly often (≤ 50%)

○ Often (≤ 75%)

○ Always (100%)

### 3. How often do/did you receive referrals from a physician/physician assistant/nurse practitioner for consultation or evaluation for AAC systems in the ICU?

○ Never (0%)

○ Seldom (≤ 25%)

○ Fairly often (≤ 50%)

○ Often (≤ 75%)

○ Always (100%)

**4. I inform other professionals (i.e., nurses, physicians, physician assistants, nurse practitioners, etc.) that I am willing to provide consultations or evaluations for AAC systems for patients in the ICU.**

○ Never (0%)

○ Seldom ($\leq$ 25%)

○ Fairly often ($\leq$ 50%)

○ Often ($\leq$ 75%)

○ Always (100%)

**5. I actively seek/sought patients in the ICU whom I believe(d) would benefit from an AAC system.**

○ Never (0%)

○ Seldom ($\leq$ 25%)

○ Fairly often ($\leq$ 50%)

○ Often ($\leq$ 75%)

○ Always (100%)

Please respond to the following questions by selecting one of the following:

Yes

No

**6. Have you ever been involved in selecting an AAC system for a patients in the ICU?**

○ Yes

○ No

**7. Does the ICU where you worked/work have an assessment protocol for AAC selection?**

○ Yes

○ No

**8. I have suggested to a physician/physician assistant/nurse practitioner that a speech-language pathology consultation or evaluation would be beneficial for a nonverbal patient.**

○ Yes

○ No

**9. For nonverbal patients admitted to the ICU who are cognitively intact and alert, is an AAC system immediately considered?**

○ Yes

○ No

**10. I have seen nonverbal patients in the ICU that I believe would benefit from an AAC system but not receive it.**

○ Yes

○ No

**11. I have provided a professional development/training to a group of ICU staff to increase their general understanding of AAC systems and how they benefit patients.**

○ Yes

○ No

**12. I believe the medical staff in the ICU would benefit from additional training to increase their knowledge and understanding of AAC systems.**

○ Yes

○ No

**13. With the *patients* you have seen who used an AAC system in the ICU, would you describe their overall experience with AAC systems as positive?**

○ Yes

○ No

**14. With the *families* of patients using AAC systems in the ICU, would you describe the *families'* experience with AAC systems as overall positive?**

○ Yes

○ No

**15. Did you receive information on AAC systems during your educational training?**

◯ Yes

◯ No

**16. I have educated the medical staff or a medical staff member on the benefits of AAC systems in the ICU, whether formally (i.e., professional development, etc.) or informally (i.e., in conversation, etc.).**

◯ Yes

◯ No

Please respond to the following questions by selecting **all** of the following choices that apply:

Speech-language pathology

Nursing

Physicians/Physician assistants/Nurse practitioners

Occupational therapy

Other

If you select Other, please specify in the textbox provided.

**17. In your ICU, who was/is involved with the selection of an AAC system for patients within the ICU?**

☐ Speech-language pathology

☐ Nursing

☐ Physicians/Physician assistants/Nurse practitioners

☐ Occupational therapy

☐ Other (please specify)

[                                        ]

Please respond to the following questions by identifying an approximate time spent (in minutes) by the profession(s) selected:

Speech-language pathology

Nursing

Physicians/Physician assistants/Nurse practitioners

Occupational therapy

Other

Please use numbers when responding. If no time is spent by a profession, please respond with "0".

### 18. In your ICU, who educated/educates *patients* on the use of AAC system and for what length of time (in minutes)?

| | |
|---|---|
| Speech-language pathology | |
| Nursing | |
| Physicians/Physician assistants/Nurse practitioners | |
| Occupational therapy | |
| Other | |

### 19. In your ICU, who educated/educates *families* on the use of AAC systems and for what length of time (in minutes)?

| | |
|---|---|
| Speech-language pathology | |
| Nursing | |
| Physicians/Physician assistants/Nurse practitioners | |
| Occupational therapy | |
| Other | |

### 20. In your ICU, who educated/educates *medical staff* on the use of AAC systems and for what length of time (in minutes)?

| | |
|---|---|
| Speech-language pathology | |
| Nurses | |
| Physicians/Physician assistants/Nurse practitioners | |
| Occupational therapy | |
| Other | |

### 21. Please use the textbox below to identify any AAC systems you encountered in

your ICU experience (i.e., alphabet board, picture cards, etc.).

[text box]

For each question, please select the appropriate answer(s) regarding the demographics of the ICU where you work(ed) as well as information about yourself.

## 22. My ICU is/was classified as

- [ ] For profit
- [ ] Non-profit
- [ ] Public
- [ ] Private
- [ ] University
- [ ] Teaching
- [ ] Federal government
- [ ] Urban
- [ ] Rural

## 23. My entire facility (not just the ICU) has/had ___ beds.

- ( ) 0-15
- ( ) 16-30
- ( ) 31-50
- ( ) 51-75
- ( ) 76-100
- ( ) 101-150
- ( ) 151-200
- ( ) 201-300
- ( ) 301-400
- ( ) 401-500
- ( ) 501-greater

## 24. My highest level of education is a

○ Bachelor's degree (BA, BS, BHS, etc.)

○ Master's degree (MA, MAEd, MS, MCD, etc.)

○ Doctor of Clinical Science (CScD, SLPD, etc.)

○ Doctor of philosophy (PhD)

## 25. I am a

○ Female

○ Male

○ Prefer not to answer

## 26. Please identify the number of years you have been employed in a hospital setting.

Number of years      [                    ]

## 27. How many years have you practiced speech-language pathology?

Number of years      [                    ]

[ Prev ]    [ Next ]

28. You are almost complete! As stated in the survey invitation, there will be a random drawing for a $25 Visa gift card. You may submit your name and preferred contact information so that you may be entered and notified should your name be drawn. Please note that the provision of your name and contact information is entirely voluntary and at no time will your information be linked to your survey responses.

Name: 

Address: 

City/Town: 

State: — select state —

ZIP: 

Country: 

Email Address: 

Phone Number: 

Prev    Done

Appendix B:

Survey instrument 2—Hospital-based SLPs who did not provided AAC in the ICU

\*\*\*IMPORTANT\*\*\*

You have selected this survey because you identify as a hospital-based speech-language pathologist who does NOT provide augmentative and alternative communication (AAC) systems in the intensive care unit (ICU).

If this is correct, please continue. If this is NOT correct, please click here and complete the survey for speech-language pathologists who DO provide AAC systems to patients in the ICU.

Next

**1. Please identify the reason(s) for your clinical presence in the ICU. Select all that apply. If you select Other, please specify in the textbox provided.**

- [ ] Dysphagia evaluation/treatment
- [ ] Cognitive-linguistic evaluation/treatment
- [ ] Speech/language evaluation/treatment
- [ ] Voice evaluation/treatment
- [ ] Tracheostomy (i.e., Passy Muir, etc.)
- [ ] Do not provide services within the ICU
- [ ] Other (please specify)

Please respond to the following questions by selecting one of the following:

Yes

No

**2. Have you treated a nonverbal client in the ICU for any reason (other than providing an AAC system)?**

- ◯ Yes
- ◯ No

**3. Have you suggested using AAC in the ICU in your facility to a physician/nurse practitioner/physician assistant?**

- ◯ Yes
- ◯ No

Please respond to the following questions by selecting one of the following:

No / Yes

If you select Yes, please explain in the textbox provided.

**4. Are you providing AAC services to other inpatients in your facility?**

◯ No

◯ Yes (please specify which units)

[text box]

**5. Have you attempted to initiate an evaluation for an AAC system for a client in the ICU, but were unable to do so?**

◯ No

◯ Yes (please explain the circumstance)

[text box]

**6. Please identify <u>any</u> of the following reasons that influence why you are not presently providing AAC systems to nonverbal individuals within the ICU. If you choose Other, please respond in the space provided.**

☐ Time constraints

☐ No referrals

☐ Resistance from other professionals

☐ Reimbursement issues

☐ Non-beneficial to patients

☐ Not feasible

☐ Don't have access to appropriate materials/equipment

☐ Other (please specify)

[text box]

For each question, please select the appropriate answer regarding the demographics of the hospital where you work(ed) as well as information about yourself.

**7. My hospital is/was classified as (check all that apply):**

☐ For profit

☐ Non-profit

☐ Public

☐ Private

☐ University

☐ Teaching

☐ Federal government

☐ Urban

☐ Rural

## 8. My entire facility has __ beds.

○ 0-15

○ 16-30

○ 31-50

○ 51-75

○ 76-100

○ 101-150

○ 151-200

○ 201-300

○ 301-400

○ 401-500

○ 501 or greater.

## 9. Please identify your gender.

○ Female

○ Male

○ Prefer not to answer.

## 10. Please provide the number of years you have been employed in a hospital setting.

Number of years [                    ]

## 11. How many years have you practiced speech-language pathology?

Number of years [                    ]

## 12. Please identify your present level of education

◯ Bachelor's degree (BA, BS, BHS, etc.)

◯ Master's degree (MA, MAEd, MS, MCD, etc.)

◯ Doctor of Clinical Science (CScD, SLPD, etc.)

◯ Doctorate of philosophy (PhD)

[ Prev ]    [ Next ]

13. You are almost complete! As stated in the survey invitation, there will be a random drawing for a $25 Visa gift card. You may submit your name and preferred contact information so that you may be entered and notified should your name be drawn. Please note that the provision of your name and contact information is entirely voluntary and at no time will your information be linked to your survey responses.

Name: [ ]

Address: [ ]

City/Town: [ ]

State: [ -- select state -- ▼ ]

ZIP: [ ]

Country: [ ]

Email Address: [ ]

Phone Number: [ ]

[ Prev ]   [ Done ]

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Appendix C:

Survey instrument 3—RNs who have worked in the ICU

\*\*\*IMPORTANT\*\*\*

You have selected this survey because you identify as a registered nurse who is licensed and has worked in an intensive care unit (ICU) within the past year.

If this is correct, please continue. If this is NOT correct, please discontinue the survey.

<div align="center">

Next

</div>

Please respond to the following questions by selecting one of the following:

Yes
No

**1. Are you familiar with augmentative and alternative communication (AAC)? The American Speech-Language-Hearing Association (2013) defines AAC as "all forms of communication (other than oral speech) that are used to express thoughts, needs, wants and ideas."**

◯ Yes

◯ No

**2. Did you receive information on AAC systems during your educational training?**

◯ Yes

◯ No

**3. For nonverbal patients admitted to the ICU who are cognitively intact and alert, is an AAC system immediately considered?**

◯ Yes

◯ No

For the following questions, please respond with one of the following:

Yes
No
Haven't seen AAC used

**4. If you have seen patients who used an AAC system in the ICU, would you describe the *patient's* overall experience with the AAC system as positive?**

◯ Yes

◯ No

◯ Haven't seen AAC used

**5. If you have seen patients who used an AAC device in the ICU, would you describe the the *families'* overall experience with the AAC system as positive?**

○ Yes

○ No

○ Haven't seen AAC used

**6. Have you ever been involved in selecting an AAC device for a patient in the ICU?**

○ Yes

○ No

○ Haven't seen AAC used

**7. Does the ICU where you worked/work have an assessment protocol for AAC selection?**

○ Yes

○ No

○ Haven't seen AAC used

**8. I have seen nonverbal patients in the ICU that I believe would benefit from an AAC system but were not provided with one.**

○ Yes

○ No

○ Haven't seen AAC used

Please respond by selecting one of the following options:

Never (0%)
Seldom (≤ 25%)
Fairly Often (≤ 50%)
Often (≤ 75%)
Always (100%)

**9. How often does/did the ICU where you work/worked use AAC system for patients who are nonverbal?**

○ Never (0%)

○ Seldom (≤ 25%)

○ Fairly Often (≤ 50%)

○ Often (≤ 75%)

○ Always (100%)

**10. How often do/did you suggest that a physician/physician assistant/nurse practitioner refer a nonverbal patient to speech-language pathology for an AAC evaluation/consultation?**

○ Never (0%)

○ Seldom (≤ 25%)

○ Fairly Often (≤ 50%)

○ Often (≤ 75%)

○ Always (100%)

Please respond to the following question by selecting **all** of the following that apply:

Speech-language pathologist
Occupational therapist
Nurses
Self-taught
Other.

If Other is selected, please specify in the textbox provided.

**11. During your time in the ICU, who (has) educated you on the use of AAC systems?**

☐ Speech-language pathologist

☐ Occupational therapist

☐ Nurses

☐ Self-taught

☐ Other (please specify). If no one, please respond "no one".

[                                    ]

Please respond to the following questions by selecting **all** of the following that apply:

Speech-language pathology

Occupational therapy

Nursing

Physicians/Physician assistants/Nurse practitioners

Unsure

AAC is (was) not used

Other.

If Other is selected, please specify in the textbox provided.

**12. If you have experience with AAC in the ICU, who is involved in the selection process?**

☐  Speech-language pathology

☐  Occupational therapy

☐  Nursing

☐  Physicians/Physician assistants/Nurse practitioners

☐  Unsure

☐  AAC is (was) not used.

☐  Other (please specify)

[                                    ]

Please respond to the following questions by identifying an approximate time spent (in minutes) by the profession(s) selected:

Speech-language pathology

Occupational therapy

Nursing

Physicians/Physician assistants/Nurse practitioners

Other

Unsure

AAC is (was) not used

Please use numbers when responding. If no time is spent by a profession, please respond with "0". If you're unsure about which profession provides education *or* AAC is (was) not used in your ICU, please respond by putting a "999" in the corresponding textboxes.

**13. If your ICU used/uses AAC systems, who educates/educated *patients* on the use of the AAC system and for what length of time (in minutes)?**

| | |
|---|---|
| Speech-language pathology | |
| Occupational therapy | |
| Nursing | |
| Physicians/Physician assistants/Nurse practitioners | |
| Unsure | |
| AAC is (was) not used. | |

**14. If your ICU used/uses AAC systems, who educates/educated patients' *families* on the use of the AAC system and for what length of time (in minutes)?**

| | |
|---|---|
| Speech-language pathology | |
| Occupational therapy | |
| Nursing | |
| Physicians/Physician assistants/Nurse practitioners | |
| Unsure | |
| AAC is (was) not used. | |

**15. If your ICU used/uses AAC systems, who educates/educated *medical staff* on the use of the AAC system and for what length of time (in minutes)?**

| | |
|---|---|
| Speech-language pathology | |
| Occupational therapy | |
| Nursing | |
| Physicians/Physician assistants/Nurse practitioners | |
| Unsure | |
| AAC is (was) not used. | |

**16. Please use the textbox below to identify any types of AAC systems you encountered in your ICU experience (i.e., alphabet board, picture cards, etc.).**

For each question, please select the appropriate answer(s) regarding the demographics of the ICU where you work(ed) as well as information about yourself.

### 17. My ICU is/was classified as

- [ ] For profit
- [ ] Non-profit
- [ ] Public
- [ ] Private
- [ ] University
- [ ] Teaching
- [ ] Federal government
- [ ] Urban
- [ ] Rural

### 18. My entire facility (not just the ICU) has/had __ beds.

- ( ) 0-15
- ( ) 16-30
- ( ) 31-50
- ( ) 51-75
- ( ) 76-100
- ( ) 101-150
- ( ) 151-200
- ( ) 201-300
- ( ) 301-400
- ( ) 401-500
- ( ) 501-greater

### 19. Please provide the number of years you have been employed in a hospital setting.

Number of years

**20. How many years have you practiced nursing?**

Number of years [                    ]

**21. Please identify your present level of education**

○ Associate's degree (ADN, etc.)

○ Bachelor's degree (BSN, etc.)

○ Master's degree (MSN, etc.)

○ Doctorate (DNP, DNSc, etc.)

○ Doctorate of philosophy (PhD)

**22. Please identify your gender.**

○ Female

○ Male

○ Prefer not to answer.

**23. Please identify the state in which you practice.**

[                    ]

Prev    Done

Appendix D:

SLP recruitment letter

Dear Potential Participant,

I am Jonathan Sizemore, a graduate student in the Communication Disorders Program at Eastern Kentucky University.  My master's thesis examines the use of augmentative and alternative communication (AAC) in intensive care units (ICUs).  The survey design research looks to examine the use of AAC systems in ICUs from the perspective of both speech-language pathologists and registered nurses. Your participation and input as a respected professional would be greatly valued.

If you have not already responded to this request, please select the appropriate survey from the links below:

If you identify as a hospital-based speech-language pathologists who does NOT provide AAC systems in the ICU, please select this link:
https://www.surveymonkey.com/s/DYYP9NG

If you identify as a hospital-based speech-language pathologist who DOES provide AAC systems within the ICU, please select this link:
https://www.surveymonkey.com/s/DYVDR8J

Should you have any question about the research or your participation, please contact me at jonathan_sizemore46@mymail.eku.edu, or my thesis mentor, Tamara Cranfill, PhD, CCC-SLP, atTamara.Cranfill@eku.edu.

Thank you for your time and consideration.


Jonathan Sizemore
Graduate Student
Communication Disorders
Eastern Kentucky University
jonathan_sizemore46@mymail.eku.edu

Appendix E:

RN condensed recruitment letter with link to full letter

Hello,

I'm a graduate student in speech-language pathology conducting research on augmentative and alternative communication in the ICU. It would be grealy appreciated if you visit my post on the Student Research forum (http://allnurses.com/academic-nursin...ve-883655.html) for more information on the research and the link to the survey. Your input as a nurse is imperative to the research.

Thank you!

Appendix F:

Full RN recruitment letter

Dear Potential Participant,

I am Jonathan Sizemore, a graduate student in the Communication Disorders Program at Eastern Kentucky University. My master's thesis examines the use of augmentative and alternative communication (AAC) in intensive care units (ICUs). AAC is defined for this study as any form of communication used when oral speech cannot be achieved. The survey design research looks to examine the use of AAC systems in ICUs from the perspective of both speech-language pathologists and registered nurses. It aims to examine frequency of use of AAC systems in the ICU, nurses' knowledge about AAC, clinical decision-making, and family and staff education on selected AAC systems. Your participation and input as a respected professional would be greatly valued.

In order to participate in the survey, you must be a licensed and ASHA certified speech-language pathologist or a licensed registered nurse and have worked in the ICU within the past year. Your participation in this survey is entirely voluntary. You are not required to provide any personally identifiable information. All data will be reported in aggregate in my thesis as well as at professional conferences and/or meetings.

Please click link below if you meet the participation requirements:
https://www.surveymonkey.com/s/DYWCW8G

Should you have any question about the research or your participation, please contact me at jonathan_sizemore46@mymail.eku.edu, or my thesis mentor, Tamara Cranfill, PhD, CCC-SLP, at Tamara.Cranfill@eku.edu.

Thank you for your time and consideration. Your participation will inform the profession with regard to AAC use in ICUs.

Jonathan Sizemore
Graduate Student
Communication Disorders
Eastern Kentucky University
jonathan_sizemore46@mymail.eku.edu

Appendix G:

Demographic tables

**Table 4.1** Demographic Information for SLPs Who Provided AAC in the ICU—Hospital
Classification

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My ICU is/was classified as:** | | |
| Non-profit | 15 | 78.95% |
| Urban | 8 | 42.11% |
| Public | 6 | 31.58% |
| Teaching | 6 | 31.58% |
| For profit | 2 | 10.53% |
| University | 2 | 10.53% |
| Private | 1 | 5.26% |
| Rural | 1 | 5.26% |
| Federal government | 0 | 0% |

**Table 4.2** Demographic Information for SLPs Who Provided AAC in the ICU—Number of Beds in Hospital

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My entire facility (not just the ICU) has/had __ beds.** | | |
| 0-15 | 0 | 0% |
| 16-30 | 2 | 10.53% |
| 31-50 | 0 | 0% |
| 51-75 | 2 | 10.53% |
| 76-100 | 0 | 0% |
| 101-150 | 0 | 0% |
| 151-200 | 1 | 5.26% |
| 201-300 | 3 | 15.79% |
| 301-400 | 2 | 10.53% |
| 401-500 | 1 | 5.26% |
| 501-greater | 8 | 42.11% |

**Table 4.3** Demographic Information for SLPs Who Did Not Provide AAC in the ICU—Hospital
Classification

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My ICU is/was classified as:** | | |
| Non-profit | 14 | 70% |
| Urban | 7 | 35% |
| Public | 5 | 25% |
| Teaching | 5 | 25% |
| For profit | 5 | 25% |
| University | 2 | 10% |
| Private | 2 | 10% |
| Rural | 1 | 5.% |
| Federal government | 2 | 10% |

**Table 4.4** Demographic Information for SLPs Who Did Not Provide AAC in the ICU—Number of Beds in Hospital

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My entire facility (not just the ICU) has/had __ beds.** | | |
| 0-15 | 0 | 0% |
| 16-30 | 0 | 0% |
| 31-50 | 1 | 5% |
| 51-75 | 0 | 0% |
| 76-100 | 0 | 0% |
| 101-150 | 2 | 10% |
| 151-200 | 2 | 10% |
| 201-300 | 4 | 20% |
| 301-400 | 6 | 30% |
| 401-500 | 3 | 15% |
| 501-greater | 2 | 10% |

**Table 4.5** Demographic information for RNs who worked in the ICU—Hospital Classification

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My ICU is/was classified as:** | | |
| Non-profit | 3 | 37.50% |
| Urban | 2 | 25% |
| Public | 1 | 12.5% |
| Teaching | 3 | 37.5% |
| For profit | 2 | 25% |
| University | 1 | 12.50% |
| Private | 2 | 25% |
| Rural | 2 | 25% |
| Federal government | 1 | 12.50% |

**Table 4.6** Demographic Information for RNs Who Worked in the ICU—Number of Beds in Hospital

| Question | Number (n=) | Mean (m=) |
|---|---|---|
| **My entire facility (not just the ICU) has/had __ beds.** | | |
| 0-15 | 0 | 0% |
| 16-30 | 0 | 0% |
| 31-50 | 0 | 12.50% |
| 51-75 | 0 | 0% |
| 76-100 | 0 | 12.50% |
| 101-150 | 0 | 12.50% |
| 151-200 | 0 | 12.50% |
| 201-300 | 0 | 12.50% |
| 301-400 | 0 | 12.50% |
| 401-500 | 0 | 12,50% |
| 501-greater | 0 | 12.50% |