

Will teaching focused medical Spanish phrases to anesthesia providers improve communication abilities with Spanish speaking intubated patients?

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### **Abstract**

**Purpose of Project:** Communication is an essential aspect between providers and patients in the healthcare setting. Adequate communication can help attenuate potential risks posed to patients as a result of the ineffective transfer of information. The potential for patient safety compromise is increased in situations that present barriers to communication, regardless of the healthcare setting (Agency for Healthcare Research and Quality [AHRQ], 2012). Limited English Proficiency (LEP) patients are subjected to increased safety risks resulting from ineffective communication with their providers (The Joint Commission [JCAHO], 2015). It is imperative in the healthcare setting to develop methods of communication that can reduce the potential safety risks to patients. It is equally important to increase provider confidence in their abilities to successfully communicate.

**Methodology:** Student Registered Nurse Anesthetists (SRNAs), attending [REDACTED], partook in a study that involved educating them on medical Spanish phrases focused on assessing LEP patients emerging from anesthesia via interactive e-Learning modules with audio-visual features as the intervention. Data was gathered from 44 SRNAs in their third-year or second-year student cohorts to analyze self-efficacy in communication abilities with LEP Spanish speaking intubated patients encountered in the operating room. Prior to the intervention, a written pre-test was administered to gather baseline data. After the intervention, a written post-test was administered for comparative analysis. Thereafter, a 30-day post-intervention provider self-efficacy survey via a questionnaire produced data on perceived experiences, and self-efficacy as a result of utilizing learned course content.

**Results:** Scores were averaged from pre-tests (38.24%) and post-tests (85.52%). There was a 47.3% improvement following the intervention (e-Learning course). 30-day post-intervention

provider self-efficacy survey results in communicating with LEP patients yielded a positive correlation identified between the e-Learning course & enhancement in provider self-efficacy.

**Implications for Practice:** It is perceived that improving provider communication abilities with respect to the emergence of an intubated LEP patient will allow for an increase in efficiency of care delivered, will promote safe extubation, and will enhance both provider and patient satisfaction during interactions. As communication barriers are overcome through enhanced provider communication, thereby attenuating negative patient outcomes, it is perceived that cost reductions of care are likely as communication barrier associated adverse events decrease.

**Keywords:** *Communication barriers, Limited English Proficiency, Communication tool, Anesthesia emergence, SRNA self-efficacy*

Adequate communication in the healthcare setting between providers and patients is a vital facet related to the provision of safe care. Barriers to communication have been associated with adverse events, whether they involve medication errors, harmful occurrences during the provision of care for the patient, or errors occurring in clerical paperwork, such as inaccuracies related to informed consents. The risk for potential errors due to inadequate communication is further compounded in situations that involve patients who have language barriers associated with them. The patient population characterized by an intrinsic language barrier related to a deficiency in the ability to speak the English language fluently is considered to be of Limited English Proficiency (LEP). In the United States, LEP patients are a population that is at increased risk for associated adverse events related to communication barriers. Such adverse events, which may involve unintentional or accidental patient harm, can occur in the perioperative setting due to the impediment of adequate communication. Initiatives need to be undertaken to ensure the best practice measures are implemented to overcome communication barriers, allowing for the provision of the safest and most appropriate care to LEP patients by their providers.

### **Background and Significance**

Recent statistics indicate that approximately 20 percent of the population in the United States, about 57 million people, speaks another language at home, other than English. Of these individuals, it is estimated that 25 million of them are considered LEP (The Joint Commission, 2015). Current projections, according to the Pew Research Institute, indicate that by 2021, 50 percent of newly insured individuals will be considered minorities, and will likely have limited English proficiency (JCAHO, 2015). This data suggests that the frequency of encounters

between providers and LEP patients in the healthcare setting will increase, along with an increased incidence of situations characteristic of communication or language barriers.

A landmark study conducted by JCAHO (2007), revealed that “communication breakdowns, whether between providers or between provides and their patients, was the root cause of the nearly 3,000 sentinel events – unexpected deaths and catastrophic injuries - that have been reported to the Joint Commission.” Additionally, the study found that LEP patients were at an increased risk for longer hospital stays, infection acquisition, surgically related adverse events, and re-hospitalization. Clearly, LEP patients are at increased risks for negatively associated outcomes in the healthcare setting, ultimately compromising their safety, the efficiency of care provided, and overall health status. These findings reveal an imperative need to improve the delivery of care through the creation and implementation of policies and/or interventions to overcome communication barriers and promote the improvement of patient safety outcomes.

In 2012, the Agency for Healthcare Research and Quality (AHRQ) created a guide for healthcare institutions to address safety issues related to LEP patients. The guide provides various suggestions and resources that can be accessed by healthcare institutions in their respective efforts to overcome communication barriers. Various areas of healthcare are addressed as they relate to the LEP patient, including the admission process, patient-provider communication, and the provision of care in various settings. Key aspects of this plan focus on the use of medical interpretative services to reduce error and potential harm as it relates to communication faults. The suggestion is made that providers should aim to improve their own non-English language proficiency reflective of local population demographics, which will allow for improved communication when interpretative services are not readily available. One unique



setting highlighted by the AHRQ was the perioperative environment. The agency suggested that this setting's associated providers would greatly benefit from improvements made to their non-English language proficiency, which would result in improved outcomes for LEP patients in urgent situations.

### **Needs Assessment**

United States national policies have struggled to address issues related to individuals considered LEP in the healthcare setting. As part of the Civil Rights Act of 1964, one statute required the initiation of a federally funded program to develop methods for improving access to care for LEP individuals. However, a deficiency in knowledge on the enforcement of this law resulted in poor compliance. This perpetuated the continual rise of problems relating to language barriers, which continue today. Another popularly debated issue in healthcare involves cost and practicality requirements of care. Insurance companies dispute that interpretive services should not be a covered benefit. They claim that interpretive services cannot be deemed medically necessary as insufficient evidence exists in correlating its use to improved patient outcomes. However, it is important to note that the lack of an identifiable correlation should not be based on the suggested intrinsic failures of interpretive services or translational tools but is the result of its poor utilization by clinicians. Complexities involved in enforcing policy related to interpretive services may be unique depending on geographical location. For example, institutions with a low incidence of exposure to LEP patients argue that they should not be mandated to uphold the same standards as institutions with high LEP patient exposure, citing negatively incurred fiscal costs (Jacobs et al. 2006).

Since 1964, multiple public policies have been written, revoked, and revised. As the population of LEP individuals grows in the United States, policies directly addressing these

individuals will remain a pivotal topic for deliberation. According to the study “Changes in research on language barriers in health care since 2003: A cross-sectional review study” by Schwei et al. (2016), language barrier research will continue to increase with the goal of influencing public policy changes. Furthermore, insurers will be able to make more informed research-based decisions when debating interpretive services as a necessary covered benefit.

Language barrier research has been traditionally focused on the relationship between the existence of language barriers and the effects on patient care. Not surprisingly, the results of such research typically conclude that there is a correlation between poor patient outcomes and decreased cost-effective care when a language barrier is present. As such, most research on the topic is descriptive in nature, meaning the research revolves around identifying that a language barrier problem exists. Unfortunately, such research does not directly offer remedies in how to alleviate the obstacles presented from a barrier to communication. Schwei et al. (2016), suggest that to influence better patient care when a language barrier exists, future research must focus on creating interventions to decrease the detrimental effects of barriers on patient care, rather than simply identifying that a problem exists. In other words, the type of research that is needed should demonstrate interventions which display evidence of improved patient-provider satisfaction, better patient outcomes, and cost-effective care.

### **Problem Statement**

Language barriers produce an impediment to quality of care because of the inability of healthcare professionals to communicate with LEP patients. According to Jacobs et al. (2006), when comparing English proficient patients to LEP patients, the study displayed that LEP patients are more likely to be admitted to the hospital, have longer stays, receive insufficient anesthesia, are subjected to unnecessary diagnostic testing, and have increased exposure to

medical errors. Furthermore, the study highlights specific situations in which LEP children were more likely to be intubated.

This scholarly project was tailored to clinicians that have exposure to intubated LEP patients. The negative effects stemming from a language barrier are exacerbated in situations involving intubated LEP patients whom are devoid of spoken words and further limited in their communication abilities, hindering assessment techniques during emergence. An optimized online interactive e-Learning course, inclusive of audio and visual functionality, was provided to study participants as the intervention. We hypothesized that if a non-Spanish speaking clinician, having learned essential phrases related to LEP patient assessment during anesthesia emergence, would have an increased self-efficacy in their ability to effectively communicate allowing for improved patient outcomes, safety, and satisfaction.

### **Aims and Objectives**

Although clinicians today are trained to be highly scientific and well educated, ineffective communication will impede their ability to apply developed skills and knowledge to clinical practice. Language translation services, such as a translator by phone or in-person, are not always readily available or applicable in every situation. Unfortunately, situations arise in which medical professionals are not able to communicate with LEP patients, and they fail to utilize adequate translation services. This may result in the use of insufficient translation methods, such as a LEP patient's bilingual child or another provider (who may not be credentialed to perform assessments) for communication, increasing the risk for adverse outcomes. The risk for adverse outcomes is potentiated in the operating room in which translation-based services are less accessible, thereby limiting its regular utilization within this setting.

The objectives of this scholarly project were to equip practitioners with learned essential phrases to perform their jobs effectively, which would subsequently be assessed to identify associations between learned phrases and communication. Special consideration was given to clinicians caring for Spanish speaking only intubated patients. Clinicians completed a lesson concentrated on learning essential medical phrases necessary to assess the neurological and respiratory status of an intubated patient. It was hypothesized that SRNAs would be able to improve self-efficacy in communicating with Spanish speaking intubated patients; this would allow for patients to effectively meet emergence and extubation criterion. It is perceived that the results from this study will reveal an increase in quality of care provided and will validate the need to train medical professionals in overcoming communication barriers encountered when interacting with LEP individuals.

### **Review of Literature**

#### **Search Strategy**

To ascertain the current significance of the clinical question, a thorough assessment of existing literature was conducted. Information analyzed and appraised for the literature review process was gathered through the utilization of the Rutgers University George F. Smith Library website, available to all currently enrolled students. Sources were identified primarily using established online academic databases which include: CINAHL, ovid MEDLINE, and PubMed.

#### **Inclusion Criteria**

An initial broad search was conducted to identify relevant information in grey literature sources on the topic with a goal of discovering government-based reports and related publications available from the American Association of Nurse Anesthetists online website. Sources that were appraised met specific inclusion criteria created for this project. First,

publications needed to address an issue that was directly or indirectly the result of language or communication barriers between providers and patients. Thereafter, a need to resolve these issues had to be demonstrated. The literature revealed commonly identified consequences of inadequate communication related to cost of care, patient safety outcomes, and inefficiency in the provision of high-quality care by practitioners. Secondly, literature that utilized interventions in resolving these aforementioned issues were further investigated. Special attention was focused in identifying information pertinent to anesthesia providers, LEP patients, and the perioperative setting.

Information gathered was limited to publications within the last ten years, with a concentration on newer material within five years. An exception to time constraints of publication was granted in respect to sources identified as preliminary studies or data addressing the topic. These sources provide fundamental information directly related to the communication barriers in the healthcare setting. They are essential in establishing a timeline of the problem and provide guidance for impending questions related to communication barriers warranting further investigation.

The following key words or phrases were utilized in searching for targeted literature: *“anesthe\*”, “communication barrier”, “emergence”, “extubation” , “health care”, “hospital”, “intraoperative”, “intubation” , “language barrier”, “LEP”, “limited English proficiency”, “operating room” , “perioperative” , “policy”, “safety”, and “translation service.”* 14 total publications were identified to meet the standards specific to our defined inclusion criteria. Publications assessed for this project are in Table 1 of Appendix B.

**Information Assessment**

The initial focus of the search was to gather baseline information about communication barriers in the healthcare setting, with their respective consequences, as they relate to LEP individuals. Two JCAHO publications, from 2007 and 2015 respectively, provide significant background statistics about the topic. It was noted that approximately 9% or 25 million people in the US were considered LEP, with trends suggesting that continual increase of this population, and a concurrent rise of individuals entering the healthcare market. One can ascertain that the potential for adverse events will increase if appropriate measures are not established to enhance communication. Both JCAHO publications determined that the most common outcomes of events were increased costs, safety concerns, and inefficient care delivery.

Data analysis of sentinel events occurring in 6 JCAHO accredited hospitals across the US, conducted by the government in 2005, revealed 1,083 cases directly related to LEP patients. A recent publication by Guttman et al. (2018), “Dissecting communication barriers in healthcare: A path to enhancing communication resiliency, reliability, and patient safety,” identifies the same adverse outcomes currently prevalent as presented in the 2005 JCAHO study. All three reports support that a clear need exists to address this problem. It is suggested that overcoming barriers requires a better understanding of LEP patient needs, and most importantly suggests that adequate language translation services are necessary for efficient communication.

Further needs assessment information was addressed in publications by Jacobs et al. (2006), “The need for more research on language barrier in health care: A proposal research agenda,” and by Shwei et al. (2016) “Changes in research on language barriers in health care since 2003: A cross-sectional review study.” Jacob et al. (2006) identified 151 studies conducted prior to 2006 with analysis indicating a correlation between language barriers and negative

outcomes to LEP patients pertaining to the access, quality, and satisfaction of care received.

They specifically cited that LEP intubated patients were at increased risk of medication errors or inefficient care, and this claim was dually supported by research conducted by Rodriquez et al. (2016) “Enhancing the communication of suddenly speechless critical care patients.” Shwei et al. (2016) analyzed 426 studies conducted between 2003-2010 in a cross-sectional review to determine if research focused on language barriers had increased, revealing that limited research has been focused on interventions, with only a single study identified by Jacobs et al. (2006) to be focused on interventions. In both publications, it was determined that a need exists for interventional based research. Similar findings were supported in publications by Finke & Kitko (2008) “A systematic review of the effectiveness of nurse communication with patients with complex communication needs with a focus on the use of augmentative and alternative communication” and Ross (2018) “Effective communication improves patient safety.”

It is important to highlight that adverse events related to communication barriers and LEP patient interaction is not exclusive to the United States. Two of the research publications reviewed revealed that this problem is significantly prevalent throughout healthcare systems in Europe. The study by Taylor et al. (2013) “Cross-cultural communication barriers in health care,” analyzed barriers perceived by providers in the UK as a result of recent increases of non-native migrants in the region. Qualitative data highlighted the same issues needing to be addressed as in the US. Also, a study by Van Rosse et al. (2016) used mix-methods analysis of language barriers and LEP individuals in their study “Language barriers and patient safety risks in hospital care. A mixed methods study,” to identify similar issues with respect to adverse outcomes associated with non-native patients in the Netherlands.

The most recent US publication, by Burgener (2017) “Enhancing communication to improve patient safety and to increase patient satisfaction,” retrospectively identified approximately 12,122 sentinel events occurring from 1995 – 2015 based on government statistics, with an average of 606 per year, directly related to communication barriers, supporting a needs assessment for intervention.

Three publications directly suggest that interventions should be implemented in response to attenuate the adverse events of barriers. “Enhancing effective communication among non-verbal patients,” by Boles & Baddley (2018) and “Enhancing communication skills with additional language acquisition,” by Lundgren (2018), recommend interventions aimed at provider training, the use of technology, and language learning were needed as primary methods to greatly reduce the number of barrier related adverse events. A prominent publication focusing on the implementation of interventions was published by the US government Agency for Healthcare Research and Quality (AHRQ) in 2012. AHRQ developed a government funded policy guideline entitled “Improving patient safety systems for patients with limited English proficiency: A guide for hospitals” in response to government statistics related to sentinel events and the population projections of LEP individuals in the US. The suggested interventions focused on implementing the use of medical grade translation services and the necessity for providers to learn medical phrases of the language most encountered in the region representative of the local demographics. Spanish was unequivocally identified as the most prevalent non-English language in the US, affecting virtually all regions throughout the country.

All 14 publications meeting the guidelines of our inclusion criteria provided background information, statistics, causative factors, and adverse outcome information identifying a need to be addressed. 6 of the 14 publications provided insight into potential interventions or actions



that should be undertaken or implemented to address needs. Only 2 articles specifically mentioned adverse events related to intubated patients, inclusive of patients that may be characteristic of LEP. At this current time, we were unable to find any articles specific to communication barriers or strategies to overcome the aforementioned barriers related to anesthesia providers in the OR environment and intubated LEP patients. A clear need to address our specific circumstance is warranted for this project's proposal supported by the analysis of the limited currently available research on the topic. This proposal aims to research and develop implementation strategies focused on medical Spanish phrases that can be utilized by anesthesia providers in their communications with intubated LEP patients during the emergence phase of surgery. This will allow for safe extubation conditions and for the provision of efficient care with a goal of reducing or preventing adverse outcomes.

### **Theoretical Framework**

The theoretical framework adopted in guiding this project was Rogers' Diffusion of Innovation Theory. This behavioral change model was developed by Rogers to provide guiding principles, determined as necessary to enable the successful adoption of newly developed research-based information, ideas, behaviors, or products by individuals or groups in a given setting (LaMorte, 2018). The premise of this framework was created in response to Rogers' observations of the process by which information was adopted over a given timeline, and is dependent on effective communication between innovators, stakeholders, and potential adopters (Rogers, 2003).

### **Theory Components**

The theory is composed of five specific guiding principles of innovation, which enable those utilizing the framework to successfully promote the adoption of information by a given

target population. The five principles by which adoption occurs are knowledge, persuasion, decision, implementation, and confirmation (LaMorte, 2018). The categories of individuals that are subject to adoption are defined as being innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). The resultant adoption of the diffused implement or innovation is ultimately categorized as an optional, collective, or authoritative innovation.

### **Theory Application**

For this project, Rogers' framework was adapted as a guide for innovation in the public health setting, specifically targeting anesthesia providers as potential adopters of the research-based knowledge to alleviate communication barriers presented in the operating room setting with patients. As previously described, the problem addressed through the utilization of this framework was that of limited or inadequate communication with LEP patients and their anesthesia providers in the healthcare setting.

Our goal as the innovators, defined as the researchers who are undertaking the task of change implementation, was to utilize research based findings to guide the improvement of communication by anesthesia providers, who in the context of this framework are representative of being potential adopters, with LEP patients in the operating room through the use of an implemented communication e-Learning course. Specifically, the course was specific in aiding the anesthesia provider's communication with intubated LEP patients during emergence at the concluding phase of surgery. Furthermore, the course provided the anesthesia provider with emergence specific phrases in the LEP patient's native language (Spanish, as determined for this project). The provider will use these phrases or commands to improve communication with the patient, allowing for accurate assessment of emergence components, resulting in their safe extubation.

**Theory Limitations**

In attaining the end goal of the e-Learning course implementation for the adopter population, the driving characteristics outlined in the framework which include knowledge, persuasion, decision, implementation, and confirmation was thoroughly addressed to ensure that applicable research had been sufficiently examined prior to implementation. Known barriers and limitations within the theory's model were additionally addressed. Known limitations of the framework include its application to health innovation, as it was originally intended for use on larger social systems or populations. Additionally, the theory did not originally consider active participation of potential adopters and related outcomes to promote the progress of diffusion, which this study aimed to satisfy. Lastly, the theoretical framework is focused on the adoption of behaviors, irrespective to the cessation or divergence of previously established practices and did not provide guidance with respect to the availability of resources necessary for innovation within a specific setting.

**Methodology****Study Design**

The design of this project is a non-experimental correlational design which allowed the researchers to evaluate outcomes based on the implementation of a specific intervention associated with quality improvement. The intervention involved the use of a web-hosted online interactive e-learning course. This course was developed by the primary researchers of this project using a third-party application development website, [openleaning.com](http://openleaning.com), with a focus on interactive learning. Research has demonstrated that the utilization of active learning methods as superior for knowledge retention compared to passive learning methods in various subjects such as science, mathematics, and language (Lynch, 2016). Passive learning methods aim to deliver

knowledge retention through limited sensory input or cognitive domain utilization. For example, simply reading over material from a textbook with a goal of knowledge retention, utilizes the visual cognitive domain alone since the student only engages in ‘seeing’ written words or simply listening to a lecture with the goal of retaining information from ‘heard’ words. Active learning focuses on utilizing multiple cognitive domains to reinforce learned materials and has been shown to enhance knowledge retention (Brown, Pesta, Wiscott, & McDaniel, 2014). Our interactive e-learning course engages the student’s visual, auditory, and tactile cognitive domains with course content.

The subject-matter of the online course was medical-Spanish terminology, with an emphasis placed on pertinent phrases related to this project’s question and hypothesis. A pre-test assessment was used to gain baseline data from the individuals participating in the study, followed by the implementation of the intervention, and concluded by a post-test evaluation. A subsequent comparative data analysis of the pre- and post-test was conducted to identify significance and validity of the intervention.

The participants of the study were controlled, and subjected to the pre-test, intervention, and post-test. Randomization of participants was not pertinent to the study design. The need for both a control group and experimental group was not supported, as all participants had equal exposure to each phase of implementation. The pre- and post- tests on medical-Spanish terms and/or phrases were identified by the researchers to be pertinent to the clinical question. The intervention aimed to educate participants of the relevant medical-Spanish phrases, with the hypothesis that improvement would be established in the post-tests scores, as compared to pre-tests scores. At the end of the intervention, the subjects were provided a supplemental ‘badge buddy’ tool that had both the English and corresponding Spanish phrases from the course that

were assessed to be the more common and prioritized phrases used. The ‘badge buddy’ tool was fitted for size and shape to be easily worn with the providers ID badge. Following a 30 day period, a survey for provider self-efficacy in communication abilities related to SRNA interactions with LEP Spanish speaking patients in the operating room was used for data analysis. Data was obtained via an anonymous questionnaire 30 days after the intervention to ascertain their perceived changes in self-efficacy as a result of their participation in the study. The questionnaire was developed using the Qualtrics database with valid and reliable questions that are developed in such a manner as to limit study biases.

### **Setting**

The study was implemented at the [REDACTED], a single free-standing education building, located at [REDACTED]. Participants completed each phase of implementation at this site.

### **Study Population**

Student Registered Nurse Anesthetists (SRNAs) enrolled in the DNP Nurse Anesthesia program were the participants subjected to voluntary involvement. Participants were composed of individuals from two separate cohorts composed of third year and second year SRNAs, with expected graduation dates of May 2020 and May 2021 respectively. Participants to be excluded in the study were those who consider themselves fluent in the Spanish language. Voluntary student participants to be included in the study were those who did not consider themselves fluent in the Spanish language and who had started clinical rotations involving direct patient care, inclusive of potential interactions with primarily Spanish-speaking LEP patients. 44 participants were obtained through voluntary recruitment.

**Subject Recruitment**

Voluntary participation was predicated on the desire to increase cultural competency, quality improvement, and self-efficacy as requested via distributed flyers (Appendix B). The flyer and information related to prospective participation were distributed as an e-mailed correspondence to the targeted study participants by the administrative assistant of the [REDACTED] DNP Anesthesia program. The information for participant recruitment was made available one week prior to implementation of the initial pre-evaluation to promote maximal turnout of individuals meeting inclusion criteria. Approval of the appropriate study recruitment measures were validated by the eIRB prior to initiation.

**Consent Procedure**

Participation was voluntary and a consent form (Appendix C) indicating the study's objectives, participant involvement, and participant duty was obtained. SRNA agreement for participation in the study, derived from the aforementioned cohorts designated by the anticipated graduation dates of May 2020 and May 2021 respectively, was obtained via signed written consent of the eIRB approved consent form (Appendix C). Participants were made aware of their right to terminate their participation at any time without recourse. Participants were present during the implementation phase of the study, and by voluntarily taking part in the study, the subject's consent was implied.

**Risks/Harms**

Voluntary involvement in this study does not qualify or suggest that participants are eligible, competent, or certified as medical-Spanish professional translators. As such, legal consent for surgery, blood products, or anesthesia is to be obtained using an institution approved professional translator. The possibility of misnomers and inaccuracies in accents or dialects

exists, posing the risk of miscommunication between providers and patients. The benefits of any language learned by participants in this study may present as clinically useful or may provide advancements related to cultural competencies, with or without the assistance of the translator tool implemented referred to as a 'Badge Buddy;' however, it is imperative to understand that the potential for unsuitable utilization of perceived benefits resultant of participation can expose a patient to potential harm. The creators and developers of this study, the associated medical language learning course, and 'Badge Buddy' translator tool, do not implicate the aforementioned entities to any legal responsibilities for wrongdoing or potential negative outcomes that may occur.

### **Subject Costs and Compensation**

Participants were not subjected to any gains or losses of their personal fiscal status. As outlined in the written consent, participant involvement was strictly on a voluntary basis. Compensation for a participant's time or means of transportation, that may be required to be voluntarily involved in the study, were not be made in the form of any monetary dispersals to any participant.

### **Study Interventions**

Data collection for baseline assessment on language competency relating to anatomy, commands, and phrases were obtained from a written pre-test. Thereafter, interactive modules with audio and visual reinforcement of terms or phrases relating to anesthesia emergence were featured in the interactive online-hosted e-Learning course was provided to participants as the intervention. These modules also contained games and exercises aimed to strengthen course content. At the completion of the course, data was collected from written post-tests that are identical to the pre-tests for analytical comparison. As an adjunct, participants were provided

with a ‘Badge Buddy’ quick reference tool containing terms and phrases determined to be of priority from the online module. This tool could be voluntarily utilized by the participants as a reference in the clinical setting. After a 30-day period following the conclusion of the intervention, participants were surveyed via a questionnaire to assess their perceived experiences, and self-efficacy as a result of utilizing learned course content. Responses to the questionnaire provided quantitative data for analysis.

### **Outcome Measures**

Several outcome measures were identified related to the implemented intervention. An analytical comparison of post-test responses against pre-test responses will allow for the identification of any statistically significant data or trends. The post-interventional survey will be analyzed to identify measurable changes in provider confidence or self-efficacy as a result of the implementation. Potential policy implications may be revealed as they pertain to fiscal changes associated with the resulting statistical analysis.

### **Project Timeline**

The establishment of the DNP team members and question development was completed in January 2019. From January-April 2019, the DNP project proposal was completed with a formal presentation for permission to submit for [REDACTED] eIRB review. Following successful approval by [REDACTED] eIRB, the phases of subject recruitment, implementation, and data analysis of the study took place from August-September 2019. Thereafter, between September-December 2019, the DNP final paper and poster were completed broadly summarizing the study’s course and findings. A formal presentation will be given, allowing the opportunity to defend the project’s objectives following this period, with a date to be determined for early 2020. Please refer to Appendix D for a GANTT chart of the study’s timeline.



**Resources Needed**

It is anticipated that the total approximate costs for the development and implementation of the study in terms of required resources to be approximately \$150-\$200 USD. This was based on approximated costs required to conduct the study with an anticipated 40-50 participants. Costs involved were predicted as follows: printing materials from available printers at Rutgers University at 0.04 cents per black/white page and 0.25 cents per full color pages, with about \$12-\$18 for approximately 300 printed black/white pages; approximately \$20-\$25 related to materials printed in color; the costs associated with final poster creation to be less than or equal to \$20; miscellaneous resources approximately \$25. Additionally, the online website currently being utilized for the development of the interactive e-Learning course costs \$15 per month to maintain.

**Evaluation Plan****Data Maintenance & Security**

All materials to be created during the duration of the project will be strictly controlled to ensure privacy and integrity. [REDACTED] eIRB pre-test, post-test, post-intervention evaluation, consent forms, and recruitment flyers will be in the secured possession of the primary researchers and DNP chair in a secured office. The filled-out versions of the aforementioned applicable forms will be secured in a locked office of an approved entity within the [REDACTED] [REDACTED]. Access to the filled-out forms for the purpose of implementation and data analysis will only be available to the project team members.

All information provided by voluntary participants was anonymous, with the potential exception of the eIRB consent form. In the event a legible signature is required on a potential consent form, all signed forms will be secured in a locked office of an approved entity.

Confidential or personal identifying information was not required or suggested to be provided to either the primary researchers or associated project chairs. Broad information about study participant demographics and/or comments related to the project was collected; however participants did not provide personal identifying information.

### **Data Analysis & Results**

Data gathered in the implementation phase of the project was derived from the number of participants involved, the pre-tests, and post-tests. These evaluation tests were composed of fill in the blank questions to evaluate the participant's knowledge. The questions were scored based on whether it was answered correctly or incorrectly based upon the Cambridge University free-text online translation website and at the discretion of the researchers. Two classes of questions will be utilized: a set of questions based on simple terms and a subsequent set of questions based on phrases containing a subject, verb, & predicate. Scores were analyzed in the form of overall percentage correct, with subsequent item analysis conducted for each question. This process took place for both the pre- and post-tests.

A quantitative comparison of mean, median and mode was conducted for pre- and post-tests. The goal of data analysis was to compare the calculated results of the post-test against the pre-test evaluations. Statistical analysis of the data was conducted in SPSS analytical software; specific statistical tests to be used for analysis are the Pearson's R and Spearman's rho formulas which analyze the relationship between ratio or interval variables, such and pre- and post- test data. The aim of data analysis was to determine whether the intervention given after the pre-test affected the results of the post-test. Analysis was conducted for a P-value  $< 0.05$ , to identify if the data is statistically significant, suggesting a correlation between the post-test scores and intervention.

Pre- and post-test data for 41 participants meeting inclusion criteria was utilized for analysis. Three participants were deemed exempt from study participation as they were fluent Spanish speakers. A Spearman's rho formula was utilized for comparing the data in the SPSS software, in which an R-coefficient is calculated and falls within a scale of -1 to +1, which indicates no statistically significant correlation to statistically significant correlation. The calculated R-coefficient of covariance was 0.571, with a derived two-tailed p-value of a normal distribution was 0.00017. The derived r-coefficient indicates that a strong positive correlation exists between pre- and post-test scores as a result of the interactive e-learning intervention. The derived p-value for the data indicates that the analysis is statistically significant at the 95% confidence interval based on a P-value of less than 0.05.

Post-intervention survey data was interpreted via quantitative analysis utilizing survey responses related to perceived self-efficacy and confidence in communication abilities. Response data was based on a 7-point Likert scale composed of subjective responses on a graded scale, which were in turn used for quantitative ordinal analysis. Chi-Square Test (Qualtrics) analysis calculated a P-Value of 0.00187 at the 95% confidence interval (P-Value < 0.05). A Chi Square value of 65.6 was calculated. Analysis suggests a strong statistical relationship between post-intervention survey responses and a perceived increase in provider self-efficacy. Therefore, data analysis supports the observed positive correlation between the interactive e-Learning course and improved provider self-efficacy based on subject responses.

### **Anticipated Findings**

It was anticipated that a data analysis comparing statistical information between the pre-test and post-test would be significant. It was anticipated that a correlation would be identified at a P-value < 0.05 confirming the hypothesis, thereby rejecting the null hypothesis, suggesting that

the interactive e-Learning module has desirable impacts on post-test evaluation scores. It was also anticipated that qualitative data analysis gathered from the post-intervention questionnaire would support the hypothesis of a projected increase in clinician self-efficacy.

### **Discussion & Policy Implications**

Various implications can be drawn from improved provider communication abilities in their interactions with LEP patients. These aspects are applicable to all patients as they relate to adequate communication. Patient safety risks are attenuated, irrespective of extenuating or unrelated circumstances, when adequate communication results in a thorough assessment of a patient which dictates care delivery.

Potential policy implications as a result of this study's findings include increased patient safety profiles, a decrease in communication barrier related adverse events, improved patient-provider rapport, as well as reductions in fiscal expenses. It is perceived that improving provider communication abilities in respect to the emergence of an intubated LEP patient will allow for an increase in efficiency of care delivered, will promote safe extubation, and will enhance both provider and patient satisfaction during interactions. As communication barriers are overcome through enhanced provider communication, thereby attenuating negative patient outcomes, it is perceived that cost reductions of care are likely as communication barrier associated adverse events decrease.

### **Summary**

Effective communication is essential between providers and patients in the healthcare setting. Failures in communication can result in patient safety compromise and negative outcomes. Interactions involving Limited English Proficiency (LEP) patients are at an increased risk for harm and negative outcomes as is evidenced by data gathered by JCAHO and AHRQ.

Barriers to communications with LEP patients have result in sentinel events to the patient, as a result of ineffective communication. Language differences between a provider and patient encompass the root cause of barrier associated adverse events. It is imperative to establish methods and guidelines to attenuate patient harm and safety compromise. Although translation-based services are commonly available in the healthcare setting, situations arise in which these services are not readily available or accessible. Such is the scenario when providers are caring for a patient undergoing surgery who is receiving anesthesia.

The emergence phase of anesthesia during the conclusion of surgery is a critical situation in which adequate communication is paramount. In the event that a communication barrier is present, such as a language barrier, negative outcomes can result to the patient. This applies to anesthesia emergence, and the failure by the provider to obtain adequate assessment information that is necessary to successfully terminate anesthesia delivery. The potential for patient harm in this scenario is greatly elevated. Avenues for adequate communication must be established to address such situations in order to provide safe and efficient patient care. Providers must likewise be confident in their abilities to communicate with any given patient, such as those considered LEP.

This study aimed to address such a scenario by educating SRNAs at [REDACTED] about communication barriers that may present through interaction with LEP patients in the operating room. The students partook in an interactive e-Learning module that taught focused medical Spanish phrases, which are the equivalent to the translated English phrases that are used for patient assessment during anesthesia emergence. Thereafter, they were provided a badge buddy tool that had both the English and corresponding Spanish phrase to be used. Following a

30-day period, a survey related to self-efficacy in communication abilities of their interactions with LEP Spanish speaking patients in the operating room was used for data analysis.

Data analysis of all pre-test, post-test, and post-intervention survey responses was performed. The analytical process was done via SPSS statistical software and through the utilizations of Qualtrics, as previously stated. Results overwhelming displayed the existence of a positive correlation between the interactive e-Learning course, and improved post-test scores in comparison to the pre-test. Dually, a perceived improvement in communication self-efficacy was derived from post-intervention survey data in regards to provider confidence before and after the intervention.

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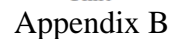
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### *Theoretical Framework – Diffusion of Innovations*



Article	Date/Author	Evidence Type, Level, & Quantity	Publication or Study Purpose	Sample, Sample Size, Setting	Findings related to presented topic	Limitations & Comments
1	Agency for Healthcare Research and Quality. (2012). Improving patient safety systems for patients with limited English	Level V(a)  Government derived policy or guideline  Grey Literature	Provision of government recommended guidelines for communicating with LEP & culturally diverse patients	N/A for specific sample size  Based on government derived statistics related to adverse events	Identifies that adverse events occur due to communication barriers in healthcare setting  Supports need	Pro: Suggests interventions to aid in the prevention of adverse events (use of qualified interpretive services)

	proficiency: A guide for hospitals				assessment	Limitation: does not address specific scenarios & interventions that may be needed intraop.
2	Boles, J., & Baddley, D. (2018). Enhancing effective communication among non-verbal patients	Qualitative ; Background Information	Focusing on HCP & patient perspective in relation to interaction  Discussing verbal & non-verbal communication affecting patient care & satisfaction	N/A for sample size	Identification of issues causing ineffective communication	Pro: Suggests methods to improve communication  Limitation: Background information
3	Burgener, A. M. (2017). Enhancing communication to improve patient safety and to increase patient satisfaction	Level III Retrospective  Quantitative & Qualitative	Highlights the need to improve communication with patients to reduce sentinel events & to improve satisfaction scores; focused on reducing preventable costs of adverse event	N/A for sample size  Utilized JCAHO data from 1995-2015; reported 12,122 sentinel events  Data from healthcare settings nationwide, required to report sentinel event data	Highlights that communication provided to patients by HCPs either overwhelming or ineffective  Identified as a contributed cause to sentinel events	Pro: addresses various aspects between patients, PCPs, & other HCPs that highlight ineffective communication as a cause of impacting patient safety  Limitation: retrospective analysis of government provided

						data
4	Finke, E. H., Light, J., & Kitko, L. (2008). A systematic review of the effectiveness of nurse communication with patients with complex communication needs with a focus on the use of augmentative and alternative communication	Level II  Systematic Review  All analyzed studies were RCTs or quasi-experi	Identify barriers – communication  Identify strategies to overcome barriers as a means to improve communication between providers & patients with limited ability	11 total RCT & quasi experimental studies were analyzed  Studies from 1990 – 2007, based in US	Identified barriers in nurse – patient communication related to: failure to build rapport, limited time for interaction, patients with limited knowledge, & access to a means of communicating with LEP patients  Identified a need exists to improve communication	Pro: Suggested strategies to enhance interaction such as training for staff, optimizing time during interaction, ensuring understanding of context within provider-patient interaction, & the use of tools to enhance communication  Limitation: Small number of studies assessed  A clear need for similar studies to be conducted to enhance results
5	Guttman, O. T., Lazzara, E. H., Keebler, J. R., Webster, K. L., Gisick, L. M., &	Level IV  Provides background information	Identifies various aspects that can be viewed as a root cause analysis of communication	N/A for specific sample size  Focused on communication barriers	Identifies cost, safety, & inadequate care provision as issues  Supports our	Pro: highlights cost consequences of adverse related events


	Baker, A. L. (2018). Dissecting communication barriers in healthcare: A path to enhancing communication resiliency, reliability, and patient safety	Provides guidelines  Consensus panel review of established statistics and data	n error, resulting in adverse events  Focuses on the development & implementation of tools to improve communication with patients		clinical question in terms of adverse effects; identifies potential root causes of communication barrier	Discusses the number of adverse events related to barriers  Highlights ineffective care as a result of barrier  Limitation: is a review of available information from published statistics
6	Jacobs, E., Chen, A. H., Karliner, L. S., Agger-Gupta, N., & Mutha, S. (2006). The need for more research on language barriers in health care: A proposed research agenda.	Level III  Mixed methods study  Essential foundation study establishing the needs assessment	To assess the current state of knowledge related to language or communication barriers  To establish a research agenda that addresses the needs to improve communication & interactions with LEP patients to reduce adverse events caused by communication barriers	N/A for sample size  Analysis of 151 research articles; 124 quantitative vs 27 qualitative Research analyzed primarily from the US (60%) related to various healthcare settings  At the time of this research (2006), it was	Establishes the foundation of this project's proposed needs assessment  Identifies potential causes of adverse events due to communication barriers and provides guidance of topics warranting further investigation	Pros: Initial study laying the foundation of guiding a research agenda to address known issues related to barriers  Analysis over 151 quantitative & qualitative studies including RCTs  Limitation: Over 10 years old

			Goal is to develop a plan to reduce healthcare costs, improve care, & improve communication	determined that 21 million US inhabitants are LEP		Systematic review of existing research at the time  Newer information related to this topic exists
7	Lundgren, L. (2018). Enhancing communication skills with additional language acquisition	Qualitative	Focuses on interventions to improve communications  Identifies the positive results of doing so	N/A for sample size  Anecdotal information	Provides examples of interventions that improve HCP & patient communication	Pro: intervention suggestion for positive outcomes  Limitation: Anecdotal Qualitative; weak strength; use only for background information

8	Rodriguez, C. S., Rowe, M., Thomas, L., Shuster, J., Koeppel, B., & Cairns, P. (2016). Enhancing the communication of suddenly speechless critical care patients	Level II Quantitative Quasi – Experimental Study	To determine to effectiveness of technologically based communications with patients who are unable to verbally communicate due to surgical procedure	4 cohorts of patients meeting inclusion criteria analyzed (inability to verbally communicate)  n = 78 included patients  English vs Spanish speaking patients analyzed  Setting: 2 unnamed tertiary care settings that perform surgical procedures	Specific to patients who undergo intubation & cannot verbally communicate  Highlight the need to address a problem due to established & observable inefficiency of communication between provider & patient as a result of intubation or surgical manipulation	Pro: control of variables  Quasi – experimental  Multi-site  Multiple variables analyzed  Limitation: Single site study  Sample size limited
9	Ross, J. (2018). Effective communication improves patient safety	Background	Provides recommendations for communication enhancement between providers exchanging patient information during hand off	N/A for sample size  Developed in response to the 2006 JCAHO report related to sentinel adverse events; revealed that 70% of the events had a fault in communication	Addresses the need for the development & implementation of communication enhancing tools  Supports the identified problem of this project	Pros:  Limitation: Background review  Based on data provided by a government agency

				ion involved		
10	Schwei, R. J., Pozo, S. D., Agger-Gupta, N., Alvarado-Little, W., Bagchi, A., Chen, A. H., ... Wong, D. (2016). Changes in research on language barriers in health care since 2003: A cross-sectional review study	Level III  Cross – sectional review  Background information	To assess the state of research directed towards mitigating the barriers related to communications between HCPs & LEP patients in the healthcare setting Hypothesized that research related to this topic would increase as a result of policy change implemented by Clinton administration which improved access to care by immigrants, many of which are designated as LEP	2010 census estimated that 25.2 million inhabitants of the USA were LEP (9% of total population). This suggests that provider interaction with LEP patients would increase  126 studies conducted prior to 2003 & 426 studies conducted between 2003 – 2010 were analyzed  60% of the studies were qualitative vs 12% were intervention based	Results revealed that both US & worldwide research rates into communication barriers related to LEP care increased; this implicates that a need was demonstrated to address this topic  Research commonly aims in addressing needs, identifying consequences of barriers, the provision of care, & costs of care associated with LEP individuals	Pro: Large amount of studies utilized allowing for significant analysis of the topic in current times  Included both quantitative & qualitative research  Identified causes, consequences, & potential interventions of communication barriers related to LEP patients; addressed areas requiring the need for subsequent research  Limitation: Cross-sectional study of previously conducted research;



						<p>weaker level of evidence than original research</p> <p>A 6 year period between the last year assessed in the study to its publication may contain important studies conducted related to the same topic, resulting in a potential knowledge gap</p> <p>Majority of studies retrospectively analyzed were qualitative (60%)</p>
11	Taylor, S. P., Nicolle, C., & Maguire, M. (2013). Cross-cultural communication barriers in health care	Level V Qualitative	To assess & determine the barriers as identified by healthcare providers in terms of communication with LEPs	34 healthcare professionals  Structured interview method 	Language & literacy inadequacy identified by HCPs as main determinant resulting in sub-optimal patient experience	<p>Pro: identifies consequences related to communication barriers, supportive of our claim</p> <p>Limitation: subjective &amp; presents</p>

				UK	Supports topic	bias potential by HCPs
12	The Joint Commission . (2007). “What did the doctor say?:” Improving health literacy to protect patient safety	Level V(a)  Government derived policy or guideline  Grey Literature	Government based policy or guideline  Provides methods for effective communication as a response to addressing adverse consequences of communication barrier	N/A for sample size  Is derived from analysis of reports by other government agencies reporting specific issues; Response to data or reports from JCAHO, NIM, IOM, & AHRQ	Provides interventions that are to be undertaken by healthcare institutions, inclusive of all healthcare providers, & ancillary staff	Pros: provides policy based on extensively reported data from other agencies  Limitation: Not original research/data
13	The Joint Commission . (2015, May 28). Overcoming the challenges of providing care to LEP patients	Level III  Government conducted systematic review	Root-cause analysis of statically identified problem  Identifies risk factors potentiating the issue  Identifies population at risk in a given setting	6 JCAHO accredited hospital nationwide  Analysis of 1083 adverse events directly caused by ineffective communication between providers & patients  Determine statistical causes of adverse outcomes	49.1% vs 29.5% of adverse events: LEP vs non-LEP respectively  46.8% vs 24.4% increased harm as a result of ineffective communication: LEP vs non-LEP respectively  LEP patient at markedly increased risk during medical treatment	Pro:  Limitation: Only analyzed data from 6 large hospitals  Focused on retrospective data analysis  No control or independent variable

					due to communication barriers	
14	Van Rosse, F., De Bruijne, M., Suurmond, J., Essink-Bot, M. L., & Wagner, C. (2016). Language barriers and patient safety risks in hospital care. A mixed methods study	Level III  Mixed methods study	Analyze patient data to determine if language barriers resulted in adverse consequences among patients who are non-native speakers  Conducted in response to limited research availability of the topic in Europe	Analysis of 576 ethnic minority patient records  12 in-depth interviews for qualitative assessment  Data collected from 30 different units from 4 separate city based hospitals in the Netherlands	Identified that adverse events occurred as a result of ineffective communication  Events were related to medication errors, pain management, medical management, & loss of life in a few outlying examples  A need to address the issue was established to augment patient safety & attenuate negative outcomes; focus on assessing the extent of barrier during initial patient-provider encounter	Pro: Addressed similar concerns related to language barriers in non-US region  Identified similar causes of adverse events  Ascertained a need to address communication barriers  Limitation: Retrospective analysis  Small sample size of studies obtained from a low number of medical institutions

**Table 2 - Prisma Search**

Dates	Database	Search Terms	Results	Notes
01/22/19	PubMed	“LEP”, “limited English proficiency”, “communication barrier”, “language barrier”, “patient safety”, and “risk”	13 articles →  3 articles related to government statistics, needs assessment, and policy related to communication and LEP patients	Filters included:  Publications with no set timeline constraint  Part of initial search for background information
1/22/19	PuBMed	“anesthes*”, “language barrier”, “limited English proficiency”, and “policy”	63 results →  1 article focused on needs assessment & development of a proposed research agenda related to language barriers	Filters included:  Publications with no set timeline constraint  Part of initial search for background information
1/25/19	CINAHL	“anesthes*”, “language barrier”. “hospital” and “safety”	10 results →  1 article focused on assessing the extent of research related to LEP patients in response to US government policy changes increasing access to care for immigrants	Filters included:  Publications within 2009-2019 years
2/16/19	Ovid MEDLINE	“communication barrier”, “language barrier, and “patient”	32 results →  1 article focused on communication enhancement by with intervention proposals	Filters included:  Publications with 2009-2019 years

02/16/19	Ovid MEDLINE	"communication", "patient*", and "safety"	41 results →  5 articles related to enhancing communication to reduce safety risk  1 additional article	Filters included:  Publications with 2009-2019 years  Search expanded from 2008-2019
02/16/19	CINAHL	"communication barriers", "patient", and "safety"	132 articles →  2 articles addressing safety risks associated with communication or language barriers for at risk patients	Filters included:  Publications with 2014-2019 years

## Appendix C

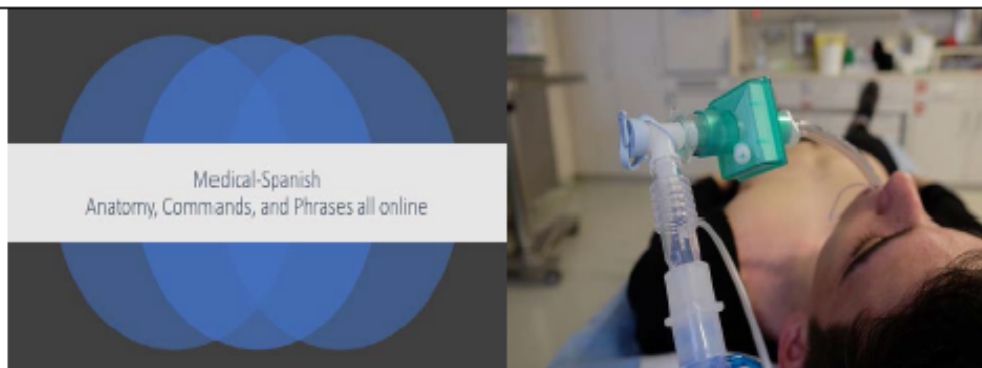
*Recruitment Flyer*

**Attention SRNA students** [REDACTED]: Your participation is desired for a DNP project focused on developing an interventional tool to breakdown language barriers

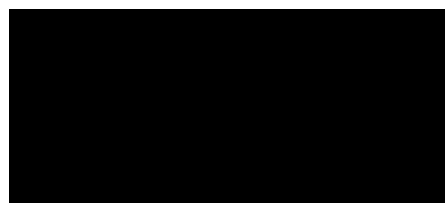
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**STUDY INFORMATION**

- **Project:**  
Implementation of a focused medical-Spanish language learning online course to increase clinician self-efficacy in communication abilities with Limited English Proficient (LEP) Spanish-speaking intubated patients.
  - Lecture on language barriers
  - Online course with a pre-test, audio/visual interactive content, & post-test
  - Questionnaire
  - Badge Buddy
- **Researchers**  
Michael McLaughlin, DNP, APN/CRNA  
Steven Cortes SRNA [REDACTED]  
Maciej Nawracaj SRNA [REDACTED]
- **Principal Investigator Div. & Dept.**  
Rutgers University Doctorate in Nurse Anesthesia Program



Version Number:  
Protocol Number: (If Available)  
PI Name:  
Protocol Title:



*Consent Form***Study Title:**

Will teaching non-Spanish speaking clinicians focused medical Spanish phrases improve clinician self-efficacy in communication abilities with Limited English Proficient (LEP) Spanish speaking intubated patients?

**Principal Investigators:**

Steven Cortes, BSN, CCRN  
Maciej Nawracaj, BSN, CCRN

**Study Summary:**

This is an informed consent form for the research study to be conducted. The purpose of the form is to provide you, the prospective participant, information about your involvement in the research and the objectives of the study. The purpose of study is to address SRNA-patient interactions that involve communication barriers, and to provide a method of improving communication. Your participation is completely voluntary, without any consequence if you choose not to take part in it. If you choose to participate in the study, you will be asked to take part in an education course at [REDACTED] that may take 30 minutes to complete. On a later date, and additional survey will be completed by you. If you no longer want to participate in the study after starting it, you may leave at any point. There is no risk of harm or limitation of your rights during this study. Additionally, no monetary benefits will be provided to any participants. In taking part of this study, you are implying consent, and your signature is not required.

**Study Purpose:**

SRNAs will be formally educated on communication barriers that occur in the perioperative setting and the negative outcomes that may occur as a result of inadequate communication. The study specifically addresses interactions with LEP Spanish speaking patients that are intubated for surgery and the communication barriers that may present during the emergence phase of anesthesia when translation based services are not readily available. An education module on focused medical Spanish phrases for emergence will be conducted. A tool will be provided to SRNAs containing focused medical Spanish phrases focused on emergence. A follow up evaluation will be conducted to analyze SRNA self-efficacy in communication during emergence in the post-implementation period for analysis.

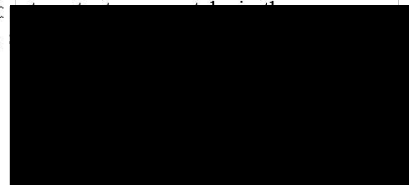
**Why is this study being done?**

This study is being done to teach SRNAs basic medical Spanish phrases that will help them communicate with LEP Spanish intubated patients during the end of surgery. The goal is to improve SRNA confidence of their communication skills to provide safe and appropriate care.

**Who is able to participate in the study?**

[REDACTED] SRNAs who do not consider themselves proficient in Spanish and at the time of implementation are in clinical rotations that involve direct patient care. SRNAs that consider themselves proficient in Spanish, of implementation are excluded.

Consent Version 1.0



**Participant Involvement:**

SRNAs who imply consent and meet inclusion criteria will partake in the study. Approximately 40-50 participants will be involved. Each SRNA will be provided with information about barriers and consequences that occur as a result of inadequate communication with LEP patients. Participants will subsequently be asked to take a pre-test, partake in an online-interactive education module with auditory and visual cues based on focused medical Spanish phrases specific to anesthesia emergence, with a subsequent post-test at the conclusion of the module. This will span over an approximate 30 minute time period. A 'badge buddy' tool will be provided to SRNAs which will contain medical Spanish assessment phrases that may be used over the following 4 week period. At the conclusion of this implementation phase, SRNAs will then be asked to complete a brief survey assessing their perceived self-efficacy related to learned course content.

**Risk or discomforts:**

There are no physical or mental risks posed to SRNAs who partake in the study. There is the potential that the SRNA may be uncomfortable using the learned phrases or implementation tool in the clinical setting. The SRNA may choose to not utilize use the learned phrases and/or tool, and may choose to confide in their preceptor for guidance during an applicable situation.

**Benefits:**

Participation in the study will provide SRNAs with important medical Spanish phrases that are necessary during the assessment of anesthesia emergence involving LEP Spanish speaking intubated patients. The potential to improve communication with these LEP intubated patients during emergence may attenuate potential negative consequences that result from barriers of adequate communication, while augmenting a SRNAs confidence in communication. This will allow for the safe delivery of care by SRNAs to these patients if they are able to adequately assess a LEP patient's readiness to be extubated by utilizing focus learned phrases, ultimately preventing patient harm. These perceived benefits may also reduce fiscal costs incurred as a result of undesirable or negative outcomes related to communication barriers.

**Participant Information Privacy:**

Responses to all material completed during the study is confidential and anonymous. Completed study tests or surveys will only be accessible to the primary investigators and team members of this study. All study materials will be secured within Dr. McLaughlin's, the DNP chair, private locked office. Participant information will not be shared or distributed to any outside entities.

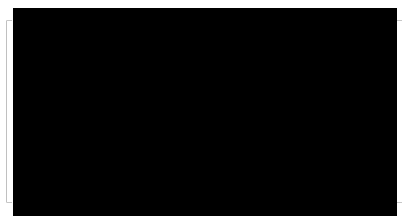
**Financial benefits of the study?**

Study participants will not receive compensation for their participation.

**Non-participation or withdrawal:**

Participation is strictly voluntary. If the participant wishes not to participate, in decides to withdraw from the study at any point, they may freely so without any consequences.

*Consent Version 1.0*





**How will information or results from the study be used?**

Information or data from the study will be used to address potential correlations, limitations, or improvements to be made applicable to the research or study methods. Findings will be presented by the researchers via a poster presentation, with the potential of this study to be published.

**Contact information:**

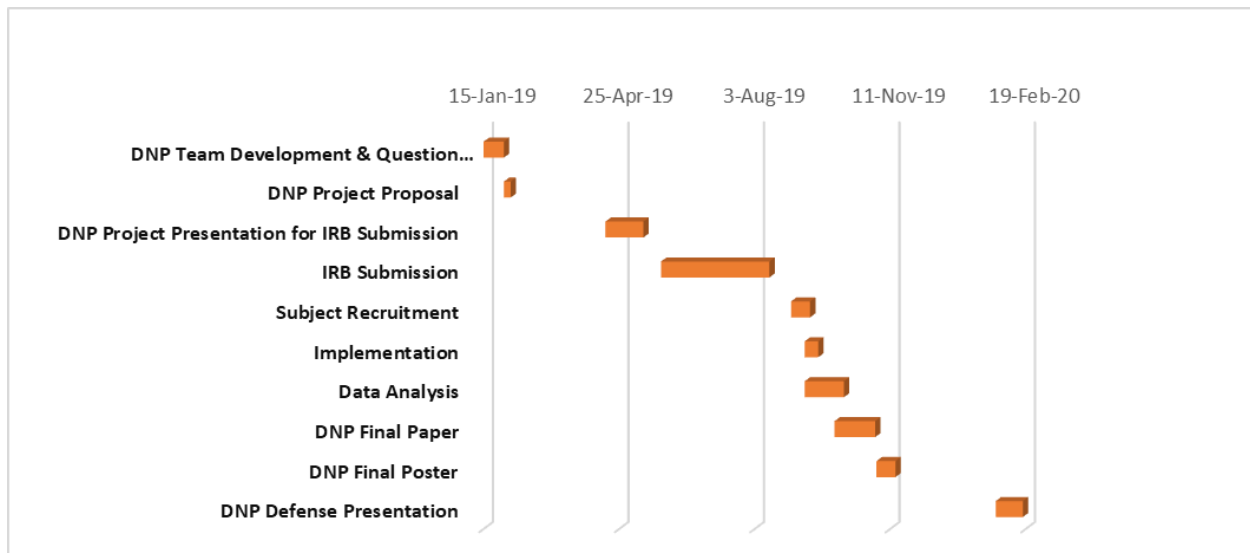
Any questions, concerns, or desire to seek more information about the study can be done by contacting the primary researchers of this study. Please contact Steven Cortes at [REDACTED] or Maciej Nawracaj at [REDACTED]

If you have questions about your rights as a research subject, you can call the Rutgers Newark IRB Director at: 973-972-3608 or the Rutgers Human Subjects Protection Program at (973) 972-1149.

By participating in the education module and partaking in the subsequent tests or surveys, your consent is implied as a willing voluntary participant. Withdrawal from study participation can be free done at any point without penalty or consequence.



## Appendix E

*GANNT Timeline*

## Appendix F

*Pre-test*

## Pre-test #1: Anatomy and Commands

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Hand"?

2. "Fingers"?

3. "Toes"?

4. "Foot"?

5. "Eyes"?

6. "Tongue"?

7. "Head"?

8. "Mouth"?

9. "Lungs"?

10. "Legs"?

}

}

## Pre-test #2: Commands

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Squeeze"?

2. "Relax or Calm down"?

3. "Move"?

4. "Lift"?

5. "Open"?

6. "Close"?

7. "Stick out"?

8. "Cough"?

9. "Listen"?



## Pre-test #3: Phrases

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Squeeze my hand"?

2. "Lift up your feet"?

3. "Open your eyes"?

4. "Open your mouth"?

5. "Stick out your tongue"?

6. "Lift up your head"?

7. "Do you have pain"?

8. "Take a deep breath in and out"?

9. "I'm going to listen to your lungs"?

}

}

*Post-test*

## Post-test #1: Anatomy

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Hand"?

2. "Fingers"?

3. "Toes"?

4. "Foot"?

5. "Eyes"?

6. "Tongue"?

7. "Head"?

8. "Mouth"?

9. "Lungs"?

10. "Legs"?



## Post-test #2: Commands

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Squeeze"?

2. "Relax or Calm down"?

3. "Move"?

4. "Lift"?

5. "Open"?

6. "Close"?

7. "Stick out"?

8. "Cough"?

9. "Listen"?



## Post-test #3: Phrases

Directions: Translate the English term(s) to Spanish on the response line. If you do not know the answer, leave the response line blank.

How do you say.....

1. "Squeeze my hand"?

2. "Lift up your feet"?

3. "Open your eyes"?

4. "Open your mouth"?

5. "Stick out your tongue"?

6. "Lift up your head"?

7. "Do you have pain"?

8. "Take a deep breath in and out"?

9. "I'm going to listen to your lungs"?





Appendix G - *Post Intervention Survey*

## Post Intervention Questionnaire

[https://rutgers.ca1.qualtrics.com/jfe/form/SV\\_249hrsEDrQuoL4N](https://rutgers.ca1.qualtrics.com/jfe/form/SV_249hrsEDrQuoL4N)

1 To which [REDACTED] DNP cohort do you currently belong?

☐ 3<sup>rd</sup> Year

☐ 2<sup>nd</sup> Year

2 During the post implementation period, how often did you interact with a Spanish speaking patient in the clinical setting?

☐ Daily

☐ 4-6 times a week

☐ 2-3 times a week

☐ Once a week

☐ Never

3 Before course content, how would you rate your self-efficacy during your interactions with Spanish speaking intubated patients in the clinical setting?

☐ Far above average

☐ Moderately above average

☐ Slightly above average

☐ Average

☐ Slightly below average

☐ Moderately below average

☐ Far below average

4 After course content, how would you rate your self-efficacy during your interactions with Spanish speaking intubated patients in the clinical setting?

- ☐ Far above average
- ☐ Moderately above average
- ☐ Slightly above average
- ☐ Average
- ☐ Slightly below average
- ☐ Moderately below average
- ☐ Far below average

5 What was your most favorite aspect about the course?

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6 What was your least favorite thing about course?

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7

Please share any additional feedback that could help us improve our course

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