

Effectiveness of the Nurse Practitioner-Driven Enteral Feeding Protocol

Submitted by

Jho Mary Tnagcora

A Direct Practice Improvement Project Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Nursing Practice

Grand Canyon University

Phoenix, Arizona

August 3, 2020

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Effectiveness of the Nurse Practitioner-Driven Enteral Nutrition Protocol

by

Jho Mary Tangcora

has been approved

August 3, 2020

APPROVED:

Neil Williams II, DNP, DPI Project Chairperson

Zerlina Wong, MD, Committee Member

Yoko Takashina, MS, RD, CNSC, Committee Member

ACCEPTED AND SIGNED:



Lisa G. Smith, PhD, RN, CNE

Dean and Professor, College of Nursing and Health Care Professions

8/9/2020

Date

Abstract

The delay in initiating enteral feeding (EF) in the critical care unit is known to cause malnutrition which may lead to poor patient outcomes. The purpose of this quasi-experimental quantitative project was to determine if the nurse practitioner (NP)-driven enteral nutrition protocol recommended by the Society of Critical Care Medicine (SCCM) and the American Society for Parenteral and Enteral Nutrition (ASPEN) will psychologically empower the NP toward reducing the delay on initiating EF and lowering the length of stay (LOS) of adult patients in an intensive care unit in urban California over four weeks. This project utilized the theoretical foundation of Imogen King on goal attainment. The total sample size was 16, with ($n=9$) in the comparative group and ($n=7$) in the implementation group. The NP empowerment score was measured using Spreitzer's Psychological Empowerment Scale. A paired t -test showed no statistically significant increase in psychological empowerment scores among the NPs ($M=5.14$; $SD=1.53$; $p=0.659$). An independent t -test showed no statistically significant reduction in the timing on EF ($M=34.1$; $SD=27.6$; $p=0.062$) however there was a statistical and clinically significant reduction in the length of hospital stay ($M=13.23$; $SD=3.93$; $p=0.005$) after the intervention. The recommendation is to sustain the project using the EF protocol to empower the health care team members toward the improvement of the clinical practice in implementation of EF which may reduce the LOS and improve patient outcomes.

Keywords: Enteral feeding, Early enteral feeding, Psychological empowerment, Nurse practitioner, Malnutrition, Enteral feeding protocol, Process improvement.

Dedication

I dedicate this paper to my very understanding husband, Arthur Tangcora. You supported me despite my long awakening hours and provided me the strength in times whenever I feel wanting to give up. You always offered me psychological support to move further on advancing and completing the degree. I am happy to have you beside me from the beginning of my nursing, completion of doctoral studies, and future career. To my children, Jasper, Katrina, and Kalley, I want to thank you for believing in me. I hope the journey will be a source of inspiration for your future careers. I am very proud of how you are all becoming now.

Acknowledgments

I would like to acknowledge the nurse practitioners of CTICU (Tracy, Allison, Zoey, Melody, Lauren, Julia, and Rhona) who participated and have been very supportive during the implementation of the DPI project. You are all an astounding team.

I also like to thank my mentor, Dr. Zerlina Wong, who provided clarity and direction. You always make sure to have time for me to find a solution within the day whenever needed guidance. Your patience in answering all my questions astonishing.

To the registered dietitian team members, thank you for feedback that includes alignment of the project to the current hospital practice. I am thankful to the Grand Canyon University professor and chairperson, Dr. Neil Williams, who communicated and enlightened me throughout the project journey.

Lastly, I want to thank the Lord for the strength, guidance, and good health during the completion of the project. The SARS-CoV-2 pandemic was the challenging part of the doctoral journey. "I can do all things through Christ which strengthened me" Philippians 4:3. Thank you Lord, for keeping my family and me safe during the pandemic.

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Chapter 1: Introduction to the Project

Malnutrition was a common presentation of patients admitted to the intensive care unit (ICU) (Verghese, Mathai, Abraham, & Kaur, 2018). Multiple sources of evidence present malnutrition link to poor patient outcomes throughout the hospital course and after discharge, which can overall increase the cost of care (Han Lew et al., 2018; Hejazi, Mazloom, Zand, Rezaianzadeh, & Amini, 2016; Murali, Chandra, & Kumar, 2017). Aside from malnutrition, the critical illness results in systemic inflammatory changes that make the patients at a higher risk of gastric dysmotility or intolerance (Taylor et al., 2016). The organizations surrounding the clinical practice guidelines for nutrition, Society of Critical Care Medicine (SCCM), American Society for Parenteral and Enteral Nutrition (ASPEN), American College of Gastroenterology (ACG), European Society for Clinical Nutrition and Metabolism (ESPEN), and European Society of Intensive Care Medicine (ESICM), recommends early initiation of enteral feeding (EF) (within 24-48 hours) or early enteral nutrition (EEN) among critically ill patients (McClave et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019; Taylor et al., 2016). A low dose EF and administration of the medications that can cause an increase in bowel motility have shown to protect the gastrointestinal integrity, improve gastric tolerance, and clinical outcomes once the hemodynamic status is stabilized (Reintam Blaser et al., 2017; Taylor et al., 2016).

At the academic medical center in Los Angeles, the ICU liberation ABCDEF bundle of care with system based bedside rounds was often practiced in a cardiothoracic intensive care unit (CTICU). The ICU ABCDEF liberation bedside rounds include "A" for Assessment, Prevention, and Manage Pain; "B" for both spontaneous awakening trials and spontaneous breathing trials; "C" for the choice of analgesia and sedation; "D" for

delirium assess, prevent, and manage; "E" for early mobility and exercise; "F" for family engagement and empowerment to improve the outcome and reduce the variation of practice (Stollings et al., 2020). System based needs of critically ill patients were often included during bedside rounds that include skin issues, nutrition, and medication needs during toward improvement of the patient's condition. However, despite the thorough bedside report, delay in nutrition is still an ongoing problem.

The advanced practice nurses of CTICU verbalized that there was no process to follow on when to start and who qualifies for EF, leading to delayed initiation of nutrition that results in a high incidence of malnutrition causing lack of energy for mobility, a longer stay in the ICU and longer recovery days. The inconsistency in nutritional practice leads to a lack of action to initiating EF that can cause delays and non-advancement to the goal of nutrition. The withholding of EF is secondary to patients' weaning from respiratory support and critical condition. The weaning from respiratory support can make the patient eligible for oral intake within 24 hours. The critical conditions, such as low blood pressure with inotropic agents (milrinone, dobutamine, dopamine, and epinephrine) and vasopressor support (norepinephrine and vasopressin), and high lactic acid, are contraindicated because of possible gastrointestinal dysfunction. However, there was no specific amount of inotropic infusion, vasopressor, and lactic acid level to follow for the safety start of EF.

Research has shown that implementation of an enteral nutrition protocol increases the delivery of nutrition and improves dietary practice in a critical care unit (Kim et al., 2017; Li et al., 2017b; Orinovsky & Raizman, 2018; Padar, Uusvel, Starkopf, Starkopf, & Blaser, 2017; Wikjord, Dahl, & Sovik, 2017). The SCCM and A.S.P.E.N. also recommended to design and implement an enteral nutrition protocol to facilitate the

delivery of EF in the critical care unit (Taylor et al., 2016). The enteral nutrition protocol is an empowering tool (Taylor et al., 2016). This Direct Practice Improvement (DPI) project was to design and implement the Nurse Practitioner (NP)-driven enteral nutrition protocol in CTICU recommended by SCCM and A.S.P.E.N to improve the patient outcome. The NP-driven enteral nutrition protocol provides an outline of intervention based on the clinical practice guidelines specific to the practice issue CTICU. The overall outcomes measured with the utilization of the EF protocol were the improvement of the clinical practice (reduction of the timing in hours on initiating EF) and patient outcome (decrease in the length of hospital days) among critically ill patients in CTICU.

Background of the Project

Malnutrition is an issue that strongly links to worsening clinical outcomes in ICU (Han Lew et al., 2018). The poor nutrition that was present during admission can progressively worsen during the hospital stay (Verghese et al., 2018). Multiple studies showed that there is a high pre-existing nutritional deficiency during the ICU admission (Murali et al., 2017). The patient's condition worsens when they present malnourished because of the inadequate intake of calories necessary to support a hypermetabolic state during critical illness (Hejazi et al., 2016). There is a high association between 28-day mortality and an increasing degree of malnutrition based on a prospective cohort study of Han Lew et al. (2018). Cuong, Banks, Hannan-Jones, Ngoc Diep, and Gallegos (2018) cross-sectional study showed that malnourished patients were more likely to stay over ten days.

The academic medical center of Los Angeles followed all the necessary guidelines within the institutional policy for early assessment of the malnutrition risk and abrupt intervention to assist critically ill patients in meeting the nutritional demand for

recovery from illness. A nutrition screening risk protocol within the institutional policy during admission triggers the registered dietitian (RD) to see the patient based on the patient nutritional risk score, such as home diet, weight loss, and appetite. A score of "2" or greater in the nutritional screening risk protocol indicates high nutrition risk and will result in automatic nutrition consult in the system. However, nutritional screening is challenging to utilize among patients who are sedated and mechanically ventilated in ICU. The RDs also follow hospital guidelines for prioritization to see the patients ranging from within 1 to 3 days. According to the Director of the RDs, the hospital guidelines prioritization and nutrition risk assessment are the hospital policy, but the practice is different. The multidisciplinary bedside rounds may capture the patient's nutritional needs. However, the delays of EF during bedside daily rounds are secondary to eligibility to take oral intake in 24 hours (weaning off the mechanical ventilatory support) and multiple medications to support the blood pressure, a certain level of lactic acid, and weaning from mechanical ventilatory support. The trial weaning from mechanical ventilatory support extends until day three or more after admission leading to prolonging waiting time on initiating enteral nutrition. Some ICU patients who recovered from the mechanical ventilator support stayed longer from gastric complications, such as food or feeding intolerance, ileus, and gastric bleeding. Other patients have prolonged recovery days or potentially require to be on long term mechanical ventilatory support.

Despite all the hospital interventions that assist in meeting the nutritional needs of critically ill patients, delays in the initiation happen in the academic medical center in Los Angeles. The start of EF happens mostly after the second to fourth day after admission or surgical intervention if the trial weaning off from the mechanical ventilatory support is not possible. The advanced practice nurse of CTICU stated that “there was no standard

process on who qualifies for EF” (A.Crane, personal communication, January 13, 2020). The clinical practice guidelines presented that EEN assists in maintaining the gastrointestinal structure, balancing the systemic immune response, and preventing the overgrowth of the bacteria (McClave et al. 2016, Reintam Blaser et al., 2017; Singer et al., 2019). The delay of initiating EF among patients who have low blood pressure with inotropic and vasopressor support and elevated lactic acid is the recommendation of SCCM, ASPEN, ACG, and ESPEN (McClave et al. 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Taylor et al., 2016). However, EF should start upon resolution of the uncontrolled blood pressure instability happens. No evidence exists on safety initiation of EF based on specific blood pressure, inotropic and vasopressor support, and lactic acid level. Clinical assessment and critical thinking are both essential to identify if patients can safely receive EF. The goal was to initiate EF early once critically ill patients are not going to have oral intake within 24 and assessed to be hemodynamically stable (mean arterial pressure of higher than 65mmHg with reduction of vasopressor and inotropic support and level of lactic acid). The commencing of EF early was to avoid complications associated with delaying enteral feeding and meeting the goal of nutrition for recovery from critical illness and improve the patient outcome.

Problem Statement

Support in nutrition is essential among critically ill patients because of the increasing energy needed on high metabolic demands for healing from the disease phenomenon and maintenance of homeostasis (Mutrie & Hill, 2018). Despite the extensive knowledge and evidence surrounding the presence of malnutrition among critically ill patients, delay in initiating of EF is still an ongoing issue secondary to patient’s hemodynamic instability and procedures in ICU (Kim et al., 2017). The most

common critical illnesses associated with hemodynamic instability in CTICU are cardiogenic shock, bleeding, and septicemia resulting in the production of lactic acid from end-organ low perfusion or cellular hypoxia. The delay of EF is the recommendation if the critically ill patients are showing signs of decreasing delivery of oxygen to the organ, shock with evidence of severely low oxygenation, acidosis, and hypercapnia (Reintem Blaser et al., 2016). However, once the condition of the patient in ICU stabilized, nutrition should commence secondary to the EEN beneficial effect to the GI mucosal integrity and improvement of the immune response to the disease process (van Zanten, De Waele, & Wischmeyer, 2019; Taylor et al., 2016).

The advanced practice nurses of CTICU work 12 hours per shift and cover seven days a week. The nutrition practice improvement was a process that made the advanced practice nurses have a meaningful role to perform and make decisions, ensuring best practice toward the improvement of the nutritional result of critically ill patients.

Providing knowledge is known to create a change that will result in an innovative process in healthcare (Abualoush, Obeidat, Tarhini, Masa, & Al-Badi, 2018). Empowerment is not an obligation, but it assists in improving practice to achieve the intended result (Asiri, 2016). Psychological empowerment is the power and belief that an individual has a role within the organization (Thuss, Babenko-Mould, Andrusyszyn, & Lasching, 2016).

While literature indicates that psychological empowerment can lead to positive outcomes, it is not known at the academic medical center in Los Angeles if NP-driven enteral nutrition protocol will psychologically empower the advanced practice nurses toward reduction of delay in initiating EF and lowering the length of hospital stay of patients in CTICU.

Purpose of the Project

The clinical practice guidelines recommend EEN to meet the nutritional demands for recovery from illness and maintenance of intestinal integrity (Reintam Blaser et al., 2017; Singer et al., 2019; Taylor et al., 2016). Reducing the delay of the EF was the first step by education and implementation of a process that will improve the nutritional practice in CTICU. The NP-driven enteral nutrition protocol was an empowering activity approved by the academic medical center in Los Angeles. The NP-driven enteral nutrition protocol has two key drivers: knowledge and practice improvement. The expertise of the RDs in nutrition will assist in the incorporation of nutrition knowledge among advanced practice nurses. Education improves performance that can result in creating a process and link to better outcomes in the organization (Hasani & Sheikhesmaeili, 2016). Practice improvement was a standardized practice that outlines evidence-based practice and clinical practice guidelines. The enhancement of knowledge and standardization of clinical practice to reduce the delay can increase the empowerment among the advanced practice nurses. Empowerment influences performance that is now important, especially in a complex and continually changing work setting, such as healthcare (D' innocenzo, Luciano, Mathieu, Maynard, & Chen, 2016).

The purpose of this quasi-experimental quantitative project was to evaluate if the nurse practitioner (NP)-driven enteral nutrition protocol recommended by the SCCM and A.S.P.E.N. will psychologically empower the advanced practice nurses toward reduction of delay on initiating EF and lowering the length of hospital stay of patients in the cardiothoracic intensive care unit. The NP-driven nutrition protocol guided the advanced practice nurses toward a structured practice to reduce the delay in initiating EF in CTICU. This DPI project was be determining if the NP-driven enteral nutrition protocol

will result in aligning the nutritional practice that thereby increases the goal attainment drive and psychological empowerment among advanced practice nurses. The quantitative quasi-experimental design using a single group was used to compare psychological empowerment among advanced practice nurses before and after the DPI. The quantitative quasi-experimental designed project compared the dependent variables (e.g., the timing of EF initiation and length of hospital stay data) before and after the intervention in two independent groups of critically ill patients older than 18 years of age who required enteral nutrition in CTICU. The timing of starting EF in hours (clinical practice) and length of hospital stay on days (patient outcome) were the independent variables that will be measured. The dependent variable was the psychological empowerment scores among CTICU advanced practice nurses.

Clinical Questions

It was not known at the academic medical center in Los Angeles if NP-driven enteral nutrition protocol will psychologically empower the advanced practice nurses toward reducing the waiting time on initiating EF and lowering the length of hospital stay of CTICU patients. The dependent variable score, such as psychological empowerment, was measured before and after the presentation of the NP-driven enteral nutrition protocol. The independent variables, initiation timing (clinical practice), and length of hospital stay (patient outcome), were compared before and after the implementation of the DPI project.

The CTICU patients were the target population. The patient data included were the clinical practice (timing in hours of initiating enteral feeding) and outcome (length of hospital stay by the number of days). The overall patient data was to assist in determining if the NP-driven enteral nutrition protocol was effective toward improvement in clinical

practice and patient outcome. The average timing of initiation (from admission or post-surgical procedure) was the clinical practice, and the length of hospital stay was the patient outcome of the DPI project. The following clinical questions that guided this DPI project were:

Q1: Is the average waiting time of initiating EF reduced following the implementation of the NP-driven enteral nutrition protocol?

Q2: Is the length of hospital stay reduced following the implementation of the NP-driven enteral nutrition protocol?

Q3: Is there a significant increase in psychological empowerment among advanced practice nurses after the implementation of the NP-driven enteral nutrition protocol?

The three clinical questions that guided this DPI project ensured that the statements of the problem were answered. The first question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the initiation time of EF, as evidenced by a reduction of the waiting time. The second question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the length of the hospital stay. The third question was to determine if the NP-driven enteral nutrition protocol increased psychological empowerment among the advanced practice nurses. Thus, if the psychological empowerment improved, the NP driven enteral nutrition protocol was an empowering tool toward the improvement of clinical practice and patient outcome.

Advancing Scientific Knowledge

The increasing protein and energy needed for metabolism from infection, trauma, and surgery require early initiation of EF toward optimum nutrition (Hejazi et al., 2016).

In the modern era, nurses have a pivotal role in the care plan, ensuring the early initiation and optimum nutritional support during critical illness (Schaefer et al., 2018). The advanced practice nurses of CTICU are adult gerontology acute care nurse practitioners (AGACNPs) who completed further education and training in a specific specialty of care (Lambert & Housden, 2017). Multiple pieces of evidence present contributions of advanced practice nurses to patient outcomes. The improvement of patient outcomes with NP driven processes of care to optimize the care process among high-risk patient populations was shown in multiple studies (Kerr, Kalowes, & Dyo, 2017; Zozya-Monohon & Corona, 2019; Innes Walker et al., 2019).

Nutrition practice should be individualized, not generalized. The NP-driven nutrition protocol that incorporates recommendations for clinical practice guidelines will increase the psychological empowerment of advanced practice nurses toward the improvement of the nutrition practice. This DPI project was based on the theory of goal attainment by Emogene King. The advanced practice nurses are interacting between the environment, person, and health (Alligood, 2017). The overall goal of this DPI project was to improve the clinical practice and patient outcome by implementing an NP-driven enteral nutrition protocol.

The development of empowerment started in the 1970s, which now influences the rights of citizenship and healthcare practice (Neves & Ribeiro, 2016). Since then, empowerment is an essential aspect of healthcare because of the improvement of autonomy in practice. The structured clinical practice in patient care results in independent decision-making that supports independence (Ohlhauser, Lasiuk, & Norris, 2017). The NP-driven enteral nutrition protocol potentially increases the psychological empowerment of advanced practice nurses. The psychological empowerment exists in

healthcare clinical practice when an organization provides an opportunity to grow by structural empowerment and employees to be motivated to decide to do their job well (Neves & Ribeiro, 2016).

Significance of the Project

Multiple kinds of literature support the essential role of nutrition in the healing and recovery of critically ill patients. The delay in EF is predominant in ICU despite the knowledge of the importance of nutrition to patient outcomes. The clinical practice guidelines of A.S.P.E.N., SCCM, ESPEN, and ESICM recommends the initiation of the EF within 24 to 48 hours upon admission (Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). This study's goal was to improve the nutritional practice that will result in better patient nutrition outcomes in CTICU. The findings of this DPI project provided additional evidence that advanced practice nurses' empowerment has a vital role in patient practice outcomes. The psychological empowerment among advanced practice nurses will result in early initiation and reduction of interruption toward meeting the nutritional demand of critically ill patients.

The advanced practice nurse practices are based on the national certification, ethical code of conduct, current practice standards, and evidence-based principles trained to care for patients in a critical care setting (Bell, 2017). A substantial amount of literature presented the contributions of advanced practice nurses to the patient outcome. This study was to shed light that structural empowerment by allowing the implementation of NP-driven enteral nutrition protocol aligning inconsistency and increasing the knowledge on evidence-based practices surrounding the nutritional practice in CTICU. The implementation of NP-driven change in nutrition practice from the structural empowering organization resulted in an empowering psychological drive toward

improving the patient practice outcome. Sinha (2017) stated that psychological empowerment happens when independence in the workplace and the organization provides a structural empowering working environment that facilitates empowerment.

The NP-driven enteral nutrition protocol drove the advanced practice nurses to order early RD consultation, initiate safe enteral feeding, and improve the nutritional practice in CTICU. The NP-driven enteral nutrition protocol was an empowering structure of the academic medical center in Los Angeles to allow the advanced practice nurses in CTICU to be productive and contribute to the outcome of patient care (Horwitz & Horwitz, 2017). The psychological empowerment was based on the theory of Spreitzer. Psychological empowerment drives the advanced practice nurses to be connected with their job responsibility, believing in the capability to achieve the nutritional goal, autonomously perform the task, and be committed to contributing to the positive patient outcome (DiNapoli, O'Flaherty, Musil, Clavelle, & Fitzpatrick, 2016).

Rationale for Methodology

This DPI project utilized a quantitative non-experimental methodology to determine if the NP-driven enteral nutrition protocol increases the psychological empowerment of the advanced practice nurses, reduces the initiating timing, and lowers the length of hospital stay. The project methodology was designed to improve the overall nutritional clinical practice and patient outcome in CTICU. This quantitative project presented a more structured and unbiased result with an analogy of measurement that shows a strong validity and reliability in testing the theory in practice (Rutberg & Bouikidis, 2018). The quantitative methodology utilized assisted in comparing the variables to answer the clinical questions within the DPI project (Bloomfield & Fisher, 2019).

For the first clinical question, the independent variable was the average timing of initiating EF. The timing of initiating EF was the mean hours from the time of admission to CTICU until the start of EF. The initiation timing was based on each patient's admission and arrival from surgery requiring EF. The average initiation timing was measured before and after the NP-driven enteral nutrition protocol. The patients who were not able to take oral intake within 24 to 48 hours were selected to receive EF. The second clinical question, the independent variable, was the length of hospital stay. The length of hospital stay was measured before and after the NP-driven enteral nutrition protocol. The third question was to determine if the NP-driven enteral nutrition protocol based on evidence-based guidelines and pieces of literature results in increasing the psychological empowerment among advanced practice nurses and improvement of the patient practice outcome.

Nature of the Project Design

The quasi-experimental quantitative design was comparing the variables being measured before and after the NP-driven enteral nutrition protocol, a fundamental empowerment process that is approved by the hospital leaders. The quasi-experimental quantitative design was a non-experimental project to compare and determine if there is a difference that exists between the groups (Hedges & Williams, 2014). The project did not use a control group and experimental project design because of the unethical reason. The sample target patient data in CTICU consisted of the timing in hours and length of hospital stay in days.

The independent variables, initiation timing of EF and length of hospital stay, were compared before and after the NP-driven enteral nutrition protocol. The dependent variable scores, psychological empowerment score among advanced practice nurses,

were measured before and after the NP-driven enteral nutrition protocol. The quasi-experimental quantitative design was to determine if the NP-driven enteral nutrition protocol embraces the knowledge needs of nutrition and aligns the decision making that overall improves the psychological empowerment among advanced practice nurses. The third clinical was collected to determine if the psychological empowerment of the advanced practice nurses result in improvement in the clinical practice and patient outcome. All the intended variables were measured and compared toward conclusive findings.

Definition of Terms

The explanation of terminology will provide clarification of the terms for the readers. The keywords needing definition are sternotomy, enteral feeding, hemodynamic, promotility or prokinetic agents, feeding intolerance, vasopressor agents, inotropic agents, and clinical practice guidelines.

Sternotomy. The cardiothoracic surgeon does a surgical procedure by opening the breastbone for surgery access to the chest cavity (Ford-Martin, Davidson, & Oberleitner, 2015).

Enteral feeding (EF). A feeding tube inserted into the nose to the gastric or small intestinal area use for delivery of nutrition. The purpose of enteral feeding is to provide access for nutrition to patients who are unable to swallow. Enteral feeding that is defined in the project is in a continuous feed, such as 10 milliliters to 60 milliliters per hour (Marcovitch, 2018).

Early enteral nutrition (EEN). Initiation of EF support within 24-48 hours in critically ill patients who are unable to ingest nutrition based on clinical practice guidelines for nutrition (McClave et al., 2016, Taylor et al., 2016, Singer et al., 2019).

Hemodynamic. Terminology involves the mechanism for circulation concerning heart functioning, such as blood pressure, heart rate, and ejection capacity of the heart (Hemodynamic, 2016).

Feeding intolerance. Feeding intolerance is defined as a sign of not tolerating enteral nutrition with symptoms of abdominal distention, reduction of the passage of flatus and stool, abnormal abdominal imaging, vomiting, and patient complaining of abdominal discomfort (Taylor et al., 2016). Feeding intolerance is the result of the neurohormonal changes from severe illness, administration of sedatives/paralytics, prolonged bed rest, severe malnutrition, and imbalance of intestinal flora (Xu et al., 2017).

Vasopressor agents. Medications that are infusing to increase blood pressure (Vasopressor, 2015). The vasopressor medications commonly infusing during the admission and utilization in CTICU are norepinephrine and vasopressin.

Inotropic agents. Medications that are infusing to increase the force of contraction of the heart muscle (Inotrope, 2016). The inotropic drugs commonly infusing during the admission and utilization in CTICU are epinephrine, dopamine, and milrinone.

Clinical practice guidelines. The clinical practice guidelines for nutrition are recommendations based on new kinds of literature surrounding best practice on nutrition to improve the clinical nutritional outcome. The clinical practice guidelines are composed of multidisciplinary healthcare providers in various organizations: SCCM, A.S.P.E.N, ESICM, ACG, and ESPEN. The organizations were developed to provide evidence-based nutrition guidelines to improve the nutrition process in various healthcare facilities.

Assumptions, Limitations, Delimitations

The RDs were driven to initiate EEN based on the nutrition protocol policy of the

hospital and guidelines surrounding nutritional specialty. Having the involvement of the RDs in the implementation of NP-driven enteral nutrition protocol is feasible because of expertise in the field of nutrition and the inter collaborative planning approach to meeting the goal practice in the unit. The project assumed that NP-driven enteral nutrition protocol would empower and structure the practice in CTICU, which resulted in abrupt consult, EEN toward meeting the nutritional demand, and improvement of patient length of hospital stay (Taylor et al., 2016). The theoretical assumption was that NP-driven enteral nutrition protocol was a structured empowering guideline that will psychologically empower the advanced practice nurses to assist in EEN among critically ill patients.

The limitation of this project was that patient admission cannot be controlled. Admissions in CTICU daily can range from one to five patients during weekdays and one to two patients during the weekends or holidays. The low admission of patients can be small to generate statistical findings. The patient admission during the SARS-CoV-2 pandemic was lower than expected, leading to a reduction in the number of target patients for data collection. Patients for a minimally invasive procedure or endovascular elective surgeries were most likely able to take oral intake within 24 hours after surgery because of the faster recovery. A higher number of patients for a minimally invasive procedure can impact the number of target patient population. Another limitation was the data collection days (30 to 45 days) because of the timeframe required to complete the project. However, delimitation was the case encountered needing EEN secondary to the implementation of NP-driven enteral nutrition protocol, which potentially increased the practice of early initiation of EF in CTICU. These patients who were not eligible to take oral intake in 24 hours had shorter EF days and recovered from critical illness. All the

complexities gathered were upon completion of the Institute Review Board (IRB) and discussed further upon completion of the project.

Summary and Organization of the Remainder of the Project

Malnutrition was common in the critical care setting and found to result in reduced patient outcomes (Murali et al., 2017). The nutritional screening, guidelines for prioritization of nutrition, and system-based bedside rounds are not enough to assist in initiating EEN among critically ill patients toward recovery from illness and improvement of the overall outcome. The delay of starting EF was an issue related to increasing malnutrition incidence in CTICU of the academic medical center in Los Angeles. The multiple trials to weaning off the ventilatory support contributed to a possibility that the patient can take oral intake within 24 hours and hemodynamic instability were the most common issues causing a delay in the initiation.

The EEN is the recommendation of A.S.P.E.N., SCCM, ACG, ESICM, and ESPEN because it prevents issues associated with feeding intolerance or dysmotility and malnutrition. After all, EF can result in increased gastric motility and the maintenance of intestinal integrity (McClave et al., 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). The A.S.P.E.N. and SCCM also recommend designing and implementing enteral feeding protocol to improve the nutritional practice in healthcare facilities (Taylor et al., 2016).

Chapter two will be presenting literature reviews surrounding the DPI project concepts. Chapter three will be presenting the methodology, research design, population sampling, instrumentation, validity, reliability, ethical considerations, and data collection procedures that are essential for the project. Chapter four will provide descriptive data, analysis of data gathered, results of the project, and a summary of the findings. Chapter

five will provide comprehensive argumentation and explanation of the findings of the project, as results relate to the existing body of research surrounding the improvement of nutritional practice.

Chapter 2: Literature Review

Malnutrition has a strong link to poor outcomes in the general patient population. The increase in the metabolic demand during critical illness requires high calorie as compared to patients with a simple medical condition (Kimiaei-Asadi & Tavakolitalab, 2017). The poor outcomes associated with malnutrition were a higher risk for infection, reduced wound healing, increasing morbidity and length of hospital stay that can overall reduce the quality of life and cost of care (Kozenieki, McAndrew, & Patel, 2016; Murali et al., 2017).

The delay in initiating EF is an essential factor that can further contribute to poor outcomes among critically ill patients. The retrospective study of Stewart, Biddle, and Thomas (2017) presented that withholding of EF is secondary to delays gaining access (orogastric or nasogastric tube) for enteral nutrition and confirmation of post-pyloric feeding tube. The delay in initiating EF can cause loss of the gastrointestinal functional ability, an adverse event during critical illness, leading to mortality and poor outcome (Taylor et al., 2016). The SCCM, A.S.P.E.N., ACG, ESPEN, and ESICM recommended EEN within 24 to 48 hours after admission. The EEN protects the integrity of the gastrointestinal system, promotes gastric emptying, and improves the hemodynamic because of the advancement of the nutrition (Reintam Blaser et al., 2017; Taylor et al., 2016).

The AGACNPs are advanced practice nurses who completed the master's or doctoral degree in nursing and trained clinically to diagnose diseases, perform invasive bedside procedures, prescribe medications, and initiate treatment plans (Buerhaus, 2019). The advanced practice nurses are accountable to direct and engage in research that is essential to the specific clinical need of the practice environment (Lambert & Housden,

2017). Multiple pieces of literature present the contribution of advanced practice nurses to the outcome of care. The driving factor that contributes to successful change is the empowerment that assists in having control and responsibility toward the achievement of the intended patient goal (Arogundade & Agogundade, 2015). The study by Innes-Walker et al. (2019) emphasized that empowerment among the nurses drives the confidence toward the improvement of the outcomes in practice.

Improvement of the nutritional practice has always been the primary goal and found to result in the improvement of patient outcomes. The NP-driven enteral nutrition protocol will assist in guiding the need for EEN, advancement to meet the demand, and reduction of the waiting time in initiating EF during critical illness. The designing and implementation of EF protocol recommended by SCCM and A.S.P.E.N. is a structural empowering activity by healthcare leaders that will assist in optimizing the nutrition and aligning the clinical hospital practice (Li et al., 2017).

The review of the literature chapter will provide a substantial amount of literature that supports this DPI project. The PICOT (Population target, Intervention, Comparison, Outcome, and Time) question concepts were:

P - among advanced practice nurses working in the CTICU

I - how does implementation of NP-driven enteral nutrition protocol

C - compared to routine hospital nutrition practice

O - result in early initiation of enteral feeding and reduction of the length of hospital stay

T - in 30 days

The primary investigator conducted used in the digital library includes CINAHL, MEDLINE, PubMed, and EBSCOHost. The evidence from the literature that surrounds

the ideas within the PICOT resulted in a search for malnutrition in ICU, NP, psychological empowerment, clinical practice guidelines, nutrition protocol, and nutritional practice improvement and outcome.

The literature review chapter was to provide an in-depth understanding of the concepts surrounding this DPI project, starting with the theoretical framework to present the foundation of the DPI project toward the attainment of the goal nutrition in CTICU. The goal attainment theory by Emogen King aligns the current trends of evidence-based practice because of the presentation of the interaction of various systems in healthcare to align the process toward the improvement of results of patient care. Understanding malnutrition during critical illness is important to present. Han Lew et al. (2018) and Verghese et al. (2018) research presented that poor nutrition among critically ill patients was under-recognized, leading to worsening of patient outcomes. Increasing metabolic demands during critical illness require early EF to meet the required nutrition for recovery are important because of the increasing amount of energy for recovery (Murali et al., 2017). The delay in initiating EF results in malnutrition and poor patient outcomes (Hejazi et al., 2016).

The malnutrition among critically ill patients provides information on prevalence and pre-existing poor nutrition during admission in the critical care unit. The evidence from the literature presented that EEF is essential among critically ill patients. The mechanical ventilator concept was included in the literature review because of the majority of mechanical ventilatory support among critically ill patients, which requires a feeding tube for EF. Overall, the presence of sedation during ventilatory support leads to gaps in nutritional risk assessment within 24 to 48 hours, which may overall cause a delay in nutrition.

The advanced practice nurse roles are vital in the discussion because of the contribution to evidence-based practice. The healthcare organization leaders play a crucial role in the work environment. Various studies present that the aligning process in healthcare facilities can lead to multiple improvements in practice. The argument in the project is that increasing the knowledge on evidence-based practice in combination with aligning the process will increase psychological empowerment. The increase in psychological empowerment among advanced practice nurses is a more exceptional contribution toward meeting the goal of nutrition in the academic medical center in Los Angeles.

Theoretical Foundations

Understanding the theoretical framework must be addressed to present underlying issues and concepts surrounding the nutritional practice. Nursing practice is composed of knowledge that is based on models, disciplines, concepts, principles, and theories (Smith & Parker, 2015). Various theories in nursing practice are concepts that frame the connections toward projecting the outcome. “Theories provide structures for making sense of the complexities of reality from both practice and research” (Smith & Parker, 2015, p. 8). The application of nursing theory into patient care practices provides a clear view of a structure that reflects how nursing functioning lead to improvement of the process in healthcare. The implication of the theoretical foundation in the DPI project is to provide alignment and direction in the specific practice improvement project.

The theory of goal attainment (TGA) by Emogene King was introduced in 1981 (King, 1981). The philosophical foundation of the theory was that nurse practice revolves around the nature of the patient and the interaction with the internal and external environment (Smith & Parker, 2015). The interaction happens when the two or more

individuals within the social system are organized and directed toward the attainment of the goal (Alfes & Frey, 2017). King's theory initiated as a mutual goal setting between the nurse and patient interacting with participatory behavior (Smith & Parker, 2015).

Significant assumptions of King's goal attainment theory (Alfes & Frey, 2017):

1. The nurse is an interpersonal process that reacts, interacts, acts, and transacts.
2. The person has a unique individuality. The individuality can be the spiritual, social, personal, and psychological concept that makes the person interact uniquely in the social system.
3. Health is a dynamic state that adapts to stress, whereas illness inhibits the social process.
4. The environment is the interaction and system concept essential to maintaining health.

The TGA by Emogene King posits three systems that interact: personal, interpersonal, and social systems. The personal system is the individual uniqueness that has a distinct perception or personality (goal-seeking behavior) toward meeting the goal. The interpersonal system is communication, interaction, and transaction. The social system within the TGA conceptual framework is the organization, power, authority, control, and degree of support toward attainment of the goal. It is the environment within the assumption (Dewey, 2018). The TGA emerged from the belief that the health interacts with the person and environment. The nurse is the interaction that connects with the systems in meeting the goal (health or illness) (Adib-Hajbaghery & Tahmouresi, 2018). In research, the theory of King was utilized in decision-making, collaborative alliance relationship, patient satisfaction with nursing care, and philosophy of group empowerment within the organization (Smith & Parker, 2015).

Goal Attainment Theory on Project. King's conceptual framework now aligns with the current trends in nursing, such as evidence-based practice, evidence-based nursing interventions, communication, protocols, evidence-based planning, and other goal-setting behavior in various stakeholders in care (Alfes & Frey, 2017). The project development posits the goal attainment of improving nutrition practice in CTICU. The process of interaction is within the social system of interdisciplinary collaboration initially before the implementation of an NP-driven enteral nutrition protocol to align the process and to find the feedback mechanism that will assist in meeting the goal of improvement in the process.

The personal system is the patient in CTICU who requires EF and at risk of malnutrition secondary to delay and interruptions surrounding the nutritional practice. The social system is the hospital system supporting all the necessary supplies and support committed to supporting the nutritional need of critically ill patients. The interpersonal system is the nutrition outcome that can be improved or not significantly improved. The intersection is the advanced practice nurses who are interacting between the environment and social system toward meeting the goal of nutrition that will improve the overall outcome.

The personal system is the person representing the patient. The social system is the environment representing healthcare organization support to patient's nutrition. The interpersonal system is the outcome representing an improvement of the nutritional practice. All the interaction is driven by advanced practice nurses making sure the intersection is continually happening.

Review of the Literature

Malnutrition was a common ongoing issue in CTICU known to be associated with poor patient outcomes during the hospital stay. Substantial evidence supported the connection of delay in initiation timing upon admission in ICU to malnutrition (Han Lew et al., 2018; Kozenieki et al., 2016; Murali et al., 2017). The prevalence of pre-existing poor nutrition during admission was often under-recognized, leading to increased morbidity, high mortality risk, and high cost of care (Murali et al., 2017; Kimiaei-Asadi & Tavakolitalab, 2017; Cuong et al., 2018).

Malnutrition during critical illness. Malnutrition presents a global issue that strongly correlated to worsening patient outcomes (Han Lew et al., 2018). Verghese, et al. (2018) stated that poor nutrition among ICU admissions is under-recognized progressively that worsen during the hospital stay. Murali et al. (2017) study confirmed a pre-existing high deficiency in nutrition during hospitalization. The inadequate nutritional intake worsens the outcome because of the lack of support for the hypermetabolic state (Hejazi et al., 2016).

Prevalence. The chronic diseases and current co-morbidities present a high metabolic demand for healing and recovery from illnesses. Patients who are admitted may have enteral or no enteral access that cannot be determined if nutrition has been attained from outside hospitals based on the NP in CTICU. Patients who are transferred to CTICU after surgery needing nutrition for energy towards recovery. In addition to the critical illness are the comorbidities and problems associated during the hospital stay or surgical procedure. The deficiency of nutrition has been shown to correlated to prolonging the length of ICU/hospital stay secondary to morbidity that is also strongly linked to mortality (Hejazi et al., 2016).

The study of Murali et al. (2017), Kimiaei-Asadi and Tavakolitalab (2017), and Cuong et al. (2018) presented that there is pre-existing malnutrition before admission or transfer to other hospitals. The studies led to a recommendation for improvement of nutritional practice, such as education to understand the impact of malnutrition to critically ill patients, interdisciplinary decision making with experts, and daily monitoring of nutritional status is imperative in the critical care unit. The implementation of nutrition protocol and abrupt intervention that can optimize the outcomes of critically ill patients (Murali et al., 2017; Kimiaei-Asadi & Tavakolitalab, 2017; Cuong et al., 2018).

Poor outcome. The poor results associated with malnutrition are higher risk for infection, reduced wound healing, increasing morbidity and length of hospital stay that can reduce the quality of life and cost of care (Kozenieki et al., 2016; Murali et al., 2017). The poor outcomes associated with malnutrition are mortality, morbidity, increase gastric injury and feeding intolerance, and increase the cost of care.

Mortality. The study of Han Lew et al. (2018) was aimed to determine the association of patients' nutritional status to 28-day mortality. The study revealed a high association of 28-day mortality is linked with an increasing degree of malnutrition based on the prospective cohort study (adjusted relative risk 1.33, 95 percent, CI: 1.05-1.69). The implication of the study is to develop measures to effectively determine the nutritional status of the critically ill patients that will result in an intervention. Ceniccola et al. (2018) retrospective study used a logistic regression model to predict hospital mortality with malnutrition. The investigation resulted in 2 times higher mortality risk (95 percent, CI 1.38-4.46, $p = 0001$) among patients who are malnourished with the utilization of the A.S.P.E.N. and American Nutrition Dietetics (AND) scoring. The recommendation is to utilize the AND-ASPEN tool to estimate the prevalence of

malnutrition that can predict mortality among ICU patients (Ceniccola et al., 2018).

Mogensen et al. (2015) aims are to determine the relationship between nutritional status and mortality among ICU patients. The result is a high association between low nutritional condition and 30-day mortality. The data was driven based on malnourished patients who had a severe disease that can be one confounding factor to high mortality risk.

Increase in the cost of care. The increase in the cost of care concerning the nutritional deficit is related to the length of hospital stay, readmission, treatments, and patient outcome. The literature review by Palma Milla et al. (2017) showed an increase in the cost of care among malnourished patients is related to the prolonged hospital stay in ICU, transitional care referral, readmission rates, and higher cost of treatments. A state direct medical cost prevalence study by Goates, Du, Braunschweig, & Arensberg (2016) showed a high expenditure among malnourished individuals specific in Washington, D. C. with a national cost (United States) of \$15.5 billion. The increase in hospital stay among moderately and severely malnourished patients in the hospital is costly when compared to well-nourished patients based on the prospective cohort study of Curtis et al. (2017).

Acute gastric injury. Acute gastric injury (AGI) is a common issue resulting in delay and feeding intolerance among patients in ICU (Chen, Zhang, Li, Wu, & Wang, 2015). The AGI is a consequence secondary to hypoperfusion of the gastrointestinal system leading to changes in hormonal mediators and delay in gastric emptying (Reintam Blaser, Jakob, & Starkopf, 2016). Taylor et al. (2016) stated that AGI is consistent with acute patient illness leading to a disruption of the mucosal gastric barrier, atrophy of the gastrointestinal tissue, reduction of the gut-associated lymphoid tissue (GALT), and

alteration in motility. Common symptoms observed among critically ill patients in the academic medical center of Los Angeles are abdominal distention, high gastric residual, and vomiting. According to Hu et al. (2017), the AGI symptoms are mostly associated with feeding intolerance, leading to delay in nutrition and malnutrition among critically ill patients. High incidence of mortality and increase severity of illness are the outcomes of severe gastric dysfunction or AGI (Hu et al., 2017; Li, Chen, Huo, Wang, & Zhang, 2017). Chen et al. (2015) recommended the utilization of the AGI scale as a warning to medical professionals. Multiple nutrition protocols incorporated the gastric dysfunction protocol toward implementation of the intervention, continuous assessment, and initiation of trophic feeding to prevent poor patient outcome (Orinovsky, & Raizman, 2018; Hu et al., 2017; Wikjord et al., 2017; Padar et al., 2017).

Mechanically ventilated patients. Suboptimal nutritional support is an issue among mechanically ventilated patients. The presence of sedation and a breathing tube that restricts communication of the need for food or water often causes misinterpretation that the patient is comfortable and not needing nutrition. The nutritional risk assessment during admission from the operating room is also a difficult task among mechanically ventilated patients that may present a communication barrier resulting in poor practice in nutrition assessment and delay in a consultation with nutritionist or RD.

Kalaiselvan, Renaku, and Arunkumar (2017) did a prospective observational study aiming to determine the nutritional risk with modified Nutrition Risk in Critical Ill (mNUTRIC) and outcome data to assess the relationship with ICU number of days, mechanical ventilatory days, and mortality rate. The result is that 42.5 percent of the mechanically ventilated patients have a high mNUTRIC score that correlated to the increase ($p < 0.0$) and length of ICU stay mortality ($p < 0.01$). The predicted mortality

based on the high nutrition screen presented an under cure of 0.582 (95 percent, confidence interval 0.535–0.628).

Ventilator-associated pneumonia (VAP) is also explored among mechanically ventilated patients. The weak reflex to protect the airway among mechanically ventilated patients places them at a higher risk to an aspiration that can cause further to poor outcomes from VAP. Another consideration is that critical illness with sedation can cause gastrointestinal hypomotility that delays gastric emptying resulting in high gastric volume (Alkhawaja, Martin, Butler, & Gwandry-Sridhar, 2015). The randomized controlled study of Alkhawaja et al. (2015) evaluates the VAP episode among patients with the gastric and post-pyloric feeding tube. The study revealed a low incidence of VAP among patients with a post-pyloric feeding tube (Alkhawaja, 2015). There is a strong perception in practice that gastroesophageal reflux of feeding can cause aspiration associated pneumonia that leads to increased parenteral nutrition use in the healthcare setting (Makris, Luna, & Nseir, 2018). No substantial evidence or study is addressing that gastric aspirate volume can increase the risk of ventilator-associated pneumonia (Reintam Blaser et al., 2017). However, a study by Zhu, Yin, Zhang, and Wei (2018) presented a reduction of VAP among patients with post-pyloric EF with evidence of reduction of vomiting and abdominal distension. The use of prokinetic agents is recommended to assist in increasing the gastric emptying (Taylor et al., 2016; Reintam Blaser et al., 2017).

Parenteral nutrition versus enteral nutrition. The use of parenteral and enteral nutrition is explored further secondary to an increase in use among patients who are severely malnourished and unable to take enteral nutrition, such as bowel ischemia or gastrointestinal dysfunction, impairment in the absorption of nutrients, and bowel or abdominal obstruction (Taylor et al., 2016). Taylor et al. (2016) stated that parenteral

nutrition should only be reserved on specific patient conditions, such as not having EF be sufficient or not be accessible for nutritional goals with a very low level of evidence. The clinical practice guidelines recommended the use of parenteral nutrition as soon as possible during the hospital stay if the patient is within the criteria based on the hospital policy (Taylor et al., 2016, Reintam Blaser et al., 2017). The clinical practice guidelines presented that parenteral nutrition is associated with increased risk of infection rates that can increase the risk for morbidity and mortality among critically ill patients (Taylor et al., 2016). Monitoring for complications associated with nutritional therapy is very important.

Multiple pieces of literature found to support the initiation of EF versus parenteral nutrition. Aydogan et al. (2018) aim to compare the effects of EF versus parenteral nutrition among critically ill patients. The outcome measure is to determine the length of ICU stays among post-surgical patients. The patients who were started on EF have a lower length of ICU stay as compared to patients who were started with parenteral nutrition. A study by Guzman et al. (2020) presents another complication aside from infection among patients who received parenteral nutrition. The study revealed that parenteral nutrition could result in gastrointestinal injury because of the atrophy of the gastric mucosal layer. Another study by Wang, Zhao, Zhang, and Liu (2018) presented increased complications associated with parenteral nutrition as compared to EEN among patients with gastric cancer. Complications associated with parenteral nutrition are increasing liver function test, metabolic disorder, electrolyte imbalances, and infection. The EEN had a lower cost of care with a p-value of <0.05 (Wang et al., 2018).

Adult gerontology acute care nurse practitioner (AGACNP). NPs are advanced practice nurses who completed the master's or doctoral degree in nursing and

trained clinically to diagnose diseases, perform invasive bedside procedures, prescribe medications, and initiate treatment plans (Buerhaus, 2019). The role of the NP merges in the 1960s to fill in the gaps because of the shortage of physicians (Avadhani, 2017). The lack of physicians and the increasing availability of NPs resulted in a full practice role in some states (Avadhani, 2017). The American Nurses Credentialing Center (ANCC), together with 40 nursing organizations, developed a Consensus Model of Advanced Practice Registered Nurse (APRN) to provide uniformity on what is the expected role of the NPs to practice (Miller, 2019). In 2015, specialty care, such as primary, acute care, adult-gerontology, mental health, family, and other more, merge in to present the specific population focus (Miller, 2019). Advanced practice nurses are NPs that have specialty training (academic and skills) in taking care of patients in need of specialized acute care (Haut & Madden, 2015). The advanced practice nurses in the CTICU are AGACNPs who work 12 hours per shift and covers seven days a week.

There are multiple pieces of literature surrounding the contributions of advanced practice nurses in patient outcomes. The study of Kerr et al. (2017) aimed to reduce the post-operative hyperglycemia among cardiac surgery patients by implementing NP-led quality improvement. The comparative analysis of the study showed a glyemic improvement and significant difference with the use of NP-led glyemic control. Kerr et al. (2017) stated that best patient outcomes are achievable when NPs carry out the autonomous intervention in evidence-based practice. Zozya-Monohon and Corona (2019) did a study to reduce the readmission by the implementation of an NP-led interdisciplinary team that will optimize the care among high-risk patient populations. Barriers seen were the primary care physicians' lack of trust and adaptation of the shared care plan. Despite the obstacles, the study resulted in a reduction of readmission (28

percent to 9 percent). The implication of the study is to provide an opportunity for NPs to expand the role by cultivating engagement and collaboration (Zozya-Monohon & Corona, 2019).

The study of Innes-Walker et al. (2019) provided an eye-opening presentation of the nursing collaborative approach (nurses and NPs), a nurse-led model of care, as empowerment to improve the clinical outcome by increasing the implementation of the evidence-based practice in wound management. The result of the study increases confidence because of the empowerment in the care management of the wounds. The recommendation of the literature is to expand the model of care to advance further the improvement of the outcomes (Innes-Walker et al., 2019).

Scope of practice. The scope of practice in the specialty is not based on the area, but patient care needs (APRN Consensus Model, 2008, as cited by Miller, 2019). In the state of California, NPs have a restricted role in patient care practice (Chattopadhyay & Zangaro, 2019). However, the NPs based on the scope of practice dictated by the academic medical center in Los Angeles policy presented that standard procedure can be performed without the immediate observation, direct supervision, or approval of the physician. The objective is not intended for NPs to independently present diagnosis, treatment, and management of the disease but to allow assessment and management of condition based on the standard procedure and collaborative relationship between the NPs and physicians toward meeting the individualized needs of the patient.

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Spreitzer psychological empowerment. Psychological empowerment theory was developed initially by Conger and Kanungo in 1988 and expanded by Spreitzer in 1995 (Friend & Seiloff, 2018). The organization assisting and redistribution of the power in decision-making contributes to the improvement of employee performance (Zheng & Tian, 2019). The psychological empowerment was linked to motivation that impact commitment, which expanded by Spreitzer in 1995 into four compositions: impact, meaning, self-determination, and competence (Sinha, 2017). The effect is the sense of positively affecting the care outcome (Thuss et al., 2016). The development of psychological meaning is when the employee feels his or her role fits the performance (Thuss et al., 2016). The self-determination happens when there is autonomy to perform the job (Thuss et al., 2016). Competence is the feeling of being capable of performing the job well (Thuss et al., 2016). Psychological empowerment is linked to the structural empowerment of the healthcare organization. The perceived power created is expressed by the willingness to act and behave that will yield motivation and visibility toward more exceptional practice in the work environment (Sinha, 2017).

A leader may present an empowering behavior allowing the employees to provide all the necessary opportunities to improve professional performance by supporting, encouraging, and enabling proactive response (ul Haq, Ahmed, & Khalid, 2019). The

leader empowering behavior is structural empowerment influencing the employees to develop an intrinsic motivation impacting the workplace (ul Haq, Ahmed, & Khalid, 2019). Psychological empowerment is the employees' perception of work and performance to the organization (Li et al., 2018). Zhang and Bartol (2010) perceived psychological empowerment as an "enabling process that enhances an employee's task initiation and persistence" (as cited in Mostafa, 2016, p. 268). Both empowerments (structural and psychological) are essential, and the critical drivers to engagement and quality outcomes (DiNapoli et al., 2016).

Psychological empowerment in healthcare. Psychological empowerment is vital in healthcare because of the impact on quality performance (Azizi, Heidarzadi, Soroush, Janatolmakan, & Khatony, 2020). Psychological empowerment is an intrinsic motivation that is characterized by individual perception and role in the organization (Spreitzer, 1995). Since advanced practice nurses work independently with the physician, being internally motivated and autonomous to decide is based on the knowledge and NP-driven enteral feeding protocol. The psychological empowerment is the feeling of personally empowered about responsibilities, the scope of practice, and a specialized role in the unit (D'innocenzo et al., 2016). In healthcare and nursing aspect, multiple kinds of literature presented relationship of psychological empowerment with assertiveness, commitment to work, job performance, engagement, implementation of a change process, and goal attainment (Azizi et al., 2020; DiNapoli et al. 2016; Asiri, 2016; D'innocenzo et al. , 2016; Fan, Zheng, Liu, & Li, 2016; Montani, Courcy, Giorgi, & Boilard, 2015; Segal et al., 2015; Wang, & Liu, 2015).

The NP-driven enteral feeding protocol is a structurally empowering change process approved by the academic medical center in Los Angeles. The practice

improvement change is essential toward reducing the delay and improvement of the length of hospital stay. When it comes to change, psychological empowerment is critical to allow the advanced practice nurses to feel they have a meaningful role in their practice and continuously be self-determined in meeting the goal.

Montani et al., (2015) study aim to examine the relationship of the psychological and behavioral empowerment among the nurses to resistance to change. The study of Montani et al. (2015) presented that psychological empowerment is essential to ensure the effectiveness of healthcare change. A recommendation is a leader empowering role to nurture the individualized empowerment among nurses (Montani et al., 2015).

Engagement is also an essential aspect of every process improvement project. The relationship between engagement and psychological empowerment was also studied among nurses. Wang and Liu (2015) studied the relationship between psychological empowerment and work engagement among nurses. The result is that psychological empowerment positively affects work engagement. Fan et al. (2016) did a quantitative survey to registered nurses to determine the relationship between engagement to the job and psychological empowerment. The result is that psychological empowerment increases the engagement of the nurses in their careers. DiNapoli et al. (2016) also studied the relationship between structural empowerment, psychological empowerment, and commitment. The result showed a strong correlation between engagement and empowerment.

Evidence-based nutrition guidelines. The organization surrounding the clinical practice guidelines for nutrition: SCCM, A.S.P.E.N., ACG, ESPEN, and ESICM, recommends early initiation of EF (within 24-48 hours) or EEN among critically ill patients (McClave et al., 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et

al., 2019). The A.S.P.E.N. and SCCM both worked together in developing a set of guidelines supported by multiple types of literature intended to guide and improve the nutritional practice among critical care patients (Taylor et al., 2016). The ACG clinical guidelines synchronize with A.S.P.E.N. and SCCM practice in nutrition guidelines with pieces of literature compiled by a group of experts within the nutritional committee (Taylor et al., 2016). The ESPEN guidelines provided guidelines based on evidence and expert opinions addressing multiple aspects of patient care in critical care, such as renal replacement therapy, extracorporeal membrane oxygenation, sepsis, trauma, and other more complex ICU patients (Singer et al., 2019). The ESICM guidelines are to provide recommendations on EEN, delayed EN, and early parenteral nutrition (Reintam Blaser et al., 2017). The objective of the ESICM is to provide recommendations based on pieces of evidence surrounding EEN, delayed EN, and early PN (Reintam Blaser et al., 2017).

Early enteral feeding. All the nutrition practice guidelines specified in this DPI project recommended EEN initiation among critically ill patients. The EN aids in maintaining gastrointestinal structural integrity, balancing the systemic immune response, and preventing the overgrowth of the bacteria (Taylor et al., 2016). The EISCM stated that infection risk reduced based on 11 randomized controlled studies with EEN as compared to delayed EN (Reintam Blaser et al., 2017). The ESPEN grade of evidence recommendation is B (strong consensus) on EEN within 48 hours among critically ill patients who are not eligible to have oral intake rather than delay EN. There were six studies in ICU, and four studies in the non-ICU setting revealed a reduction of infection complications with EEN (Singer et al., 2019). EEN was also compared with PN, which showed a decline of infection, leading to a lower ICU and overall hospital stay with EEN (Singer et al., 2019). The ACG recommended initiation of EN with low-level evidence

presenting that the effect of the practice is real that may provide substantially variable from the predicted result (McClave et al., 2016).

Stewart et al. (2017) evaluated the nutritional practice at an academic medical center in the U.S. The result of the study presented that delay in the initiation of EF among 67 percent of the sample chart resulted in a delay in meeting the nutritional demand for recovery from critical illness (Stewart et al., 2017). The study Koga et al. (2018) aimed to determine the association of EEN with mortality among septic patients with and without decreased functional capacity. The retrospective study showed that EEN among septic patients with decreased functional capacity results in a lower infection that overall link to a reduction of in-hospital mortality (OR 0.18, 95 percent, CI 0.05-0.71, $p = 0.014$). The recommendation of the study is the support with EEN because of the positive benefit.

Noor, Iqbal, Sajid, Ahmed, and Qaiser (2016) did a comparative study between EEN and delayed EN among patients with severe acute pancreatitis. The investigation resulted in the achievement of nutrition goals among patients with pancreatitis despite the gastrointestinal failure that led to lower hospital stay based on the mean hospital stay of the two groups ($p < 0.001$). The study recommended EEN because it effectively supports the nutrition of patients with severe acute pancreatitis. Ohbe et al. (2018) did a comparative study to determine the outcomes of EEN and delayed EN among patients with venous-arterial extracorporeal membrane oxygenator (VA ECMO). The study resulted in a lower mortality rate (hazard ratio 0.75, 95 percent, CI 0.56-0.97, $P = 0.031$), with the conclusion of EEN improved the outcome without any associated harm.

NP driven enteral nutrition protocol. The SCCM and A.S.P.E.N. recommendation is to design and implement an enteral feeding protocol as a critical

strategy to improve nutritional practice. The feeding protocol with education will assist in early initiation that will link to supporting enteral feeding and optimum nutrition. The design and development should incorporate evidence-based literature to assist in overcoming the barriers and improve the process of implementation in the critical care setting (Kim et al., 2017).

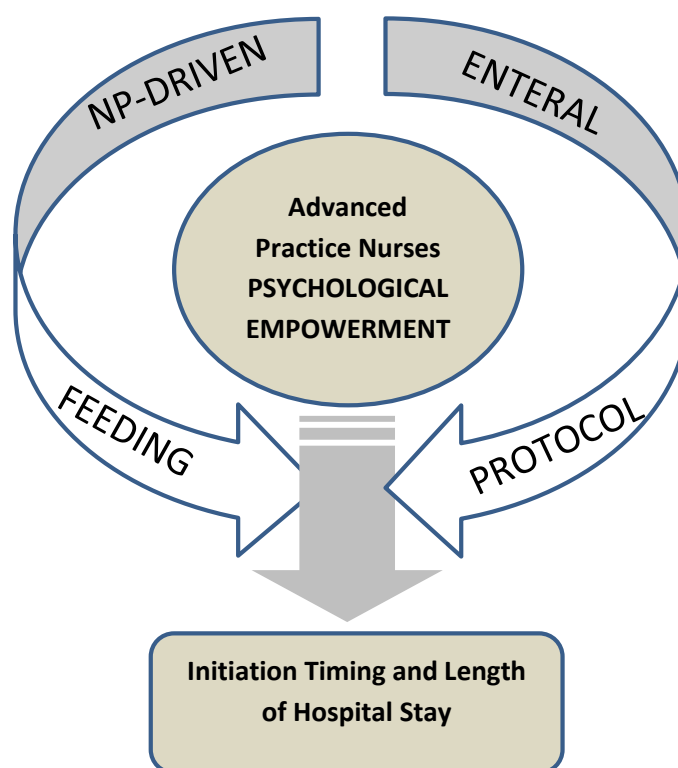


Figure 1. Presents NP-driven enteral feeding protocol conceptual framework to provide alignment of concepts targeting the improvement of the enteral feeding timing and length of hospital stay. The conceptual framework was designed by the author to present the conceptual framework of the DPI project.

A conceptual framework was developed to provide a presentation on how NP-driven enteral nutrition protocol guides the advanced practice nurses toward attainment of

the goal of minimizing the waiting time of initiating enteral feeding and reducing the length of hospital stay (see Figure 1).

Lack of process. The study of Kozeniecki, McAndrew, and Jayshil (2016) revealed that variation of practice, which is a lack of process, is an issue that results in suboptimal nutrition among critically ill patients. The alignment of the process can be possible by developing a nutrition protocol. The implementation of nutrition protocol led to improvement and increased the delivery of nutrition in ICU (Li et al., 2017; Wikjord et al., 2017; Orinovsky & Raizman, 2018; Padar et al., 2017; Kim et al., 2017).

Multiple kinds of literature are surrounding the EF protocol. The observational study by Padar et al. (2017) in a medical-surgical ICU was to standardize the practice and allow the nurses to assess the patients early within six hours of admission and refer to physical for starting EF. The study resulted in an increase in nutrition implementation with the utilization of nurse feeding protocol without any concomitant complications associated. Li et al. (2017b) study was by revising the prior EF protocol and incorporate the AGI. The AGI scale can align the process of thinking among nurses to determine how the EF rate should be and when to stop toward referral for parenteral nutrition. The study showed an increase in the delivery of nutrition in ICU without any change in the mortality, infection rate, and mechanical ventilatory days (Li et al., 2017b). Wikjord, Dahl, & Sovik (2017) study aimed to revise the EF protocol to be easier to follow and be accessible to utilize in the facility. Wikjord et al. (2017) retrospective observational study result is an improvement in the administration of nutrition after the implementation of nutritional support protocol in ICU.

Kim et al. (2017) aimed to improve the nutrition intake among mechanically ventilated patients in ICU. The retrospective study on the implementation of enteral

feeding protocol resulted in an improvement of nutritional practice and reduction of complications associated with a critical illness Kim et al. (2017). The study of Orinovsky and Raizman (2018) is a nurse-driven EF protocol to improve nutritional practice and clinical patient outcomes. The study resulted in an improvement in nutrient intake among critically ill patients and a decrease in mortality with the use of nurse-led feeding protocol (Orinovsky & Raizman, 2018). The most recent study is Jiang et al. (2020), intending to explore the effects of the EF protocol. The investigation resulted in an improvement of the calorie intake and decreased the incidence of feeding intolerance.

Pieces of literature and guidelines to improve nutritional practice. Education on the surrounding evidence and clinical practice guidelines is essential to best practice. Another issue surrounding malnutrition is the withholding of the EF that can also be in conjunction with the delay of initiating EF. The advanced practice nurses provided feedback regarding the reasons for the withholding of EF, such as postpyloric feeding tube, procedures, high vasopressors, use of paralytics, gastric bleeding, absent bowel sounds, and feeding intolerance. Exploring further and education on the issues surrounding the interruptions of EF will provide empowerment to be competent and self-determine toward advocacy for patients' nutritional needs.

Post pyloric feeding tube. In the current clinical setting, almost all patients have a postpyloric feeding tube. The SCCM and ASPEN stated that gastric versus postpyloric feeding is based on institutional practice. However, the stomach is an acceptable delivery because of easy access and reduction of delay (Taylor et al., 2016). Still, the ESPEN, ASPEN, and SCCM recommend postpyloric feeding tube placement among patients who are deemed to be high risk for aspiration (Taylor et al., 2016, Singer et al., 2019).

The case study by Gokhale et al. (2016) showed that post-pyloric feeding is the safest, simple, and best approach toward preventing parenteral nutrition and achievement of daily target nutrition for recovery from critical illness. The reduction of pneumonia associated with ventilatory support in meta-analyses did not correlate to mortality, hospital stay, or length of mechanical ventilator days. The recommendation based on the study was postpyloric feeding tube insertion among patients with gastric feeding intolerance and high risk for aspiration (Taylor et al., 2016; Singer et al., 2019).

Procedures. Procedures, such as weaning to extubate from the ventilator, surgical intervention, interventional radiology, and bedside procedures (tracheostomy, percutaneous drain, chest tube placement, and ultrasound), often result in withholding the feeding EF in ICU. Prolonged fasting before surgery or procedure should be minimized. The ESPEN did not recommend prolonging preoperative fasting with grade recommendation of A (Weimann et al., 2017). Surgery or any procedure can cause increased catabolism requiring energy for optimal healing and recovery (Weimann et al., 2017). However, the recommendation is based on the patient who can eat and drink, not on enteral feeding. Assessment of the need to be off the enteral feeding is individualized and not generalized. Some simple bedside procedures, such as central line placement, chest tube placement, and imaging, can have the feeding on hold during the procedure. Another consideration is the amount of infusion of EF the patient is receiving. However, it will be a different decision for critically ill patients who have gastric dysfunction.

Vasopressors. Critically ill patients who are having shock are likely to be underfed. There are multiple inconsistencies in the pieces of literature provided by the clinical practice guideline. However, the physiologic outcome from EEN is the preservation of gastrointestinal integrity, leading to a reduction of insulin intolerance and

inflammatory response (Taylor et al., 2016; Singer et al., 2019; Reintam Blaser et al., 2017). The ESPEN, ESICM, SCCM, and ASPEN recommended that EEN should be the goal once the hemodynamic status is stabilized among critically ill patients (Taylor et al., 2016; Singer et al., 2019; Reintam Blaser et al., 2017).

The delay in feeding can result in refeeding syndrome. Refeeding syndrome is a systemic imbalance of electrolytes after long periods of starvation, leading to arrhythmias, alteration in level of consciousness, delirium, edema, and other metabolic syndromes (Matthews, Capra, & Palmer, 2018). Repletion of the nutrition with supplementation of necessary vitamins and minerals is essential to prevent refeeding syndrome (Pourhassan et al., 2018). The retrospective cohort before and after the checklist's intervention found out that early enteral feeding among patients with shock resulted in shorter ICU stay and lower mechanical ventilatory support days (Mao et al., 2019).

Paralytic and sedatives. Increasing the feeding rate with a neuromuscular blocking agent is mostly a question. The use of a neuromuscular blocking agent is common among patients with acute respiratory distress syndrome (ARDS) for ventilatory synchrony. Murray et al. (2016) recommend the utilization of neuromuscular blocking agents during the early stage ARDS for the stability of the patient's oxygenation. Taylor et al. (2016) stated that the neuromuscular blocking agent does not have a direct effect on gastric emptying. This statement may strongly correlate to the study of Marca et al. (2016) that combination sedatives with neuromuscular agents and hypoperfusion of the gastrointestinal tract strongly links to the high gastric residual and feeding intolerance. The sedation infusion directly slows the gastric emptying resulting in a recommendation to initiate prokinetic agents if necessary (Taylor et al., 2016).

Gastric bleeding. There was no latest research found within five years on gastric bleeding, except the study of Khoshbaten, Ghaffarifar, Jabbar Imani, and Shahnazi (2013) resulted in a significantly shorter hospital stay among patients who had early oral intake who had a peptic ulcer. It is unknown if feeding can cause rebleeding that leads to keeping the stomach empty with gastric bleeding (Khoshbaten et al., 2013). However, ESICM stated that EF protects the gastrointestinal system from stress ulceration and serves as a protective factor against re-bleeding. The prolonging lack of nutrition in critically ill patients can be more harmful. The absence of supporting evidence leads to a recommendation to start feeding after the resolution of the gastric bleeding (Reintam Blaser et al., 2017).

Feeding intolerance. There was no latest research found within five years on gastric bleeding, except the study of Khoshbaten, Ghaffarifar, Jabbar Imani, and Shahnazi (2013) resulted in a significantly shorter hospital stay among patients who had early oral intake who had a peptic ulcer. It is unknown if feeding can cause rebleeding that leads to keeping the stomach empty with gastric bleeding (Khoshbaten et al., 2013). However, ESICM stated that EF protects the gastrointestinal system from stress ulceration and serves as a protective factor against re-bleeding. The prolonging lack of nutrition in critically ill patients can be more harmful. The absence of supporting evidence leads to a recommendation to start feeding after the resolution of the gastric bleeding (Reintam Blaser et al., 2017).

Summary

Despite the compliance of the academic medical center in Los Angeles to clinical practice guidelines to improve the nutrition among critically ill patients, the delay in initiating enteral feeding has been an ongoing issue because of the lack of process in

CTICU. Malnutrition is a global issue that is linked to worsening critically ill patients' outcomes, the morbidity during the hospital stay leads to an increase in the cost of care and mortality based on the pieces of literature. It is so overwhelming to see the entire research surrounding poor outcomes among malnourished patients. The connection is possibly secondary to the presentation on the pre-existing malnutrition upon admission (Murali et al., 2017, Kimiaei-Asadi & Tavakolitalab, 2017; Cuong et al., 2108) The delay in initiating EF can predominantly cause further issues and contribute to the poor outcome among critically ill patients.

Advanced practice nurses are trained and educated to deliver the best possible practice that will result in optimum patient results. According to pieces of evidence, advanced practice nurses have a substantial contribution to the improvement of clinical practice and the overall outcome of the care. Providing the necessary information and structure approved by the hospital leaders will assist in increasing the empowerment to make a difference in results among the target patient population. Based on the literature, additional engagement and collaboration are needed to harness the potentiation of the advanced practice nurses toward the improvement of the process.

The academic medical center of Los Angeles embraces the core value of structural empowerment that can increase the psychological empowerment of the advanced practice nurses in the organization. The psychological empowerment resulted in increasing involvement, dedication, autonomy, and performance to improve the nutritional practice in the CTICU.

The NP-driven enteral nutrition protocol recommended by SCCM and A.S.P.E.N. was designed toward early EF initiation that can result in increasing the advanced practice nurses' psychological empowerment and improving the nutritional practice in the

unit. The TGA presents a clear conceptual framework on how goal nutrition can be attained within the social system by leadership support on allowing the utilization of the NP-driven enteral nutrition protocol that was a structural empowering aspect within the healthcare organization. This DPI project goal was to improve the nutritional practice in CTICU that can result in the optimum patients' outcome. The next chapter 3 will present the project methodology design, population sampling, instrumentation, data collection procedures, and ethical considerations.

Chapter 3: Methodology

Evidences from literatures indicated that malnutrition is strongly correlated to worsening the critically ill patients' outcomes (Han Lew et al., 2018; Kozenieki et al., 2016; Murali et al., 2017). The pre-existing malnutrition state during admission was the conclusive findings in the studies by Murali et al. (2017), Kimiaei-Asadi and Tavakolitalab (2017), and Cuong et al., (2018). The result of the studies among critically ill patients admitted with malnutrition presented an assumption that delay in initiating EF causes complications associated with a longer hospital stay, increase morbidity, and increase the cost of care (Murali et al. 2017; Kimiaei-Asadi and Tavakolitalab, 2017; Cuong et al., 2018). The recommendation was to design and implement EF protocol toward the improvement of practice and optimization of the patient outcome in nutrition (McClave et al., 2016; Taylor et al., 2016; Singer et al., 2019).

The purpose of this quasi-experimental quantitative project was to evaluate if the nurse practitioner (NP)-driven enteral nutrition protocol recommended by the Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) will psychologically empower the advanced practice nurses toward reduction of delay on initiating EF and lowering the length of hospital stay of patients in the cardiothoracic intensive care unit. The clinical practice pieces of evidence with increasing psychological empowerment were the improvement of the waiting time of initiation and reduction of the length in the hospital stay. This chapter provided a detailed methodology of the project that includes the project design and methodology, instrumentation and sources of data toward analysis, and validity and reliability of the measuring tools. This chapter presented analysis and data collection, ethical considerations, potential bias and mitigation, and limitations of the project.

Statement of the Problem

Support in nutrition is essential among critically ill patients because of the increasing energy needed on high metabolic demands for healing from the disease phenomenon and maintenance of homeostasis (Mutrie & Hill, 2018). Despite the extensive knowledge and evidence surrounding the presence of malnutrition among critically ill patients, delay in initiating of EF is still an ongoing issue secondary to patient's hemodynamic instability and procedures in ICU (Kim et al., 2017). The most common critical illnesses associated with hemodynamic instability in CTICU are cardiogenic shock, bleeding, and septicemia resulting in the production of lactic acid from end-organ low perfusion or cellular hypoxia. The delay of EF is the recommendation if the critically ill patients are showing signs of decreasing delivery of oxygen to the organ, shock with evidence of hypoxemia, acidosis, and hypercapnia (Reintem Blaser et al., 2016). However, once the condition of the patient in ICU stabilized, nutrition should commence secondary to the EEN beneficial effect to the GI mucosal integrity and improvement of the immune response to the disease process (van Zanten et al., 2019; Taylor et al., 2016).

The advanced practice nurses in the CTICU works 12 hours per shift, covering 7days a week. The nutrition practice improvement can be a process by making the advanced practice nurses have a meaningful role to perform and make decisions, ensuring best practice toward the development of the nutritional result of critically ill patients. Providing knowledge is known to create a change that will result in an innovative process in healthcare (Abualoush, Obeidat, Tarhini, Masa, & Al-Badi, 2018). The enhancement of the knowledge and development of the practice toward the improvement of the nutrition process will influence attitude by empowering the advanced practice nurses.

Empowerment is not an obligation, but it assists in improving the clinical practice to achieve the intended result (Asiri, 2016). Psychological empowerment is the power and belief that an individual has a role within the organization (Thuss et al., 2016). While literature indicates that psychological empowerment can lead to positive outcomes, it is not known at the academic medical center in Los Angeles if NP-driven enteral nutrition protocol will psychologically empower the advanced practice nurses towards improving the nutritional clinical practice and patient outcome in CTICU.

Clinical Questions

It was not known at the academic medical center in Los Angeles if NP-driven enteral nutrition protocol will psychologically empower the advanced practice nurses toward reducing the waiting time on initiating EF and lowering the length of hospital stay of CTICU patients. The independent variable score, such as psychological empowerment, was measured before and after the presentation of the NP-driven enteral nutrition protocol. The dependent variables, initiation timing (clinical practice), and length of hospital stay (patient outcome), were compared before and after the implementation of the DPI project.

The CTICU patients were the target population. The patient data included were the clinical practice (timing in hours of initiating enteral feeding) and outcome (length of hospital stay by the number of days). The overall patient data was to assist in determining if the NP-driven enteral nutrition protocol was effective toward improvement in clinical practice and patient outcome. The average timing of initiation (from admission or post-surgical procedure) was the clinical practice, and the length of hospital stay was the patient outcome of the DPI project. The following clinical questions that guided this DPI project were:

Q1: Is the average waiting time of initiating EF reduced following the implementation of the NP-driven enteral nutrition protocol?

Q2: Is the length of hospital stay reduced following the implementation of the NP-driven enteral nutrition protocol?

Q3: Is there a significant increase in psychological empowerment among advanced practice nurses after the implementation of the NP-driven enteral nutrition protocol?

The three clinical questions that guided this DPI project ensured that the statements of the problem were answered. The first question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the initiation time of EF, as evidenced by a reduction of the waiting time. The second question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the length of the hospital stay. The third question was to determine if the NP-driven enteral nutrition protocol increased psychological empowerment among the advanced practice nurses. Thus, if the psychological empowerment improved, the NP driven enteral nutrition protocol was an empowering tool toward the improvement of clinical practice and patient outcome.

Project Methodology

The DPI project methodology utilized a non-experimental quantitative method to determine if the NP-driven enteral nutrition protocol intended to increase psychological empowerment among the advanced practice nurses leading to the improvement of clinical practice and lowering the length of hospital stay. The project methodology was designed to improve the overall nutritional clinical practice and patient outcome in CTICU. The quantitative project presented a more structured and

unbiased result with an analogy of measurement that shows a strong validity and reliability in testing the theory in practice (Rutberg& Bouikidis, 2018). The quantitative methodology assisted in comparing and correlating the variables to answer the clinical questions within the DPI project (Bloomfield & Fisher, 2019).

For the first clinical question, the dependent variable was the average timing of initiating EF. The timing of initiating EF was the mean hours from the time of admission or arrival from surgery to CTICU until the start of EF. The initiation time was based on each patient's admission or arrival requiring EF. The average initiation timing was measured before and after the NP-driven enteral nutrition protocol. The second clinical question, the dependent variable, the length of hospital stay was measured before and after the NP-driven enteral nutrition protocol. The third question was to determine if the NP-driven enteral nutrition protocol based on evidence-based guidelines and pieces of literature results in increasing the psychological empowerment among advanced practice nurses and improvement of the patient practice outcome.

Project Design

The quasi-experimental quantitative design was comparing the variables being measured before and after the NP-driven enteral nutrition protocol, a fundamental empowerment process that is approved by the hospital leaders. The quasi-experimental quantitative design was a non-experimental project to compare and determine if there is a difference between the comparative and intervention groups (Hedges & Williams, 2014).

The project did not use control and experimental project design because of the unethical reason. The sample target patient data in CTICU for EF consisted of the timing in hours to initiation and length of hospital stay in days. The dependent variables, initiation timing of EF and length of hospital stay, were compared before and after the

NP-driven enteral nutrition protocol. The dependent variable scores, psychological empowerment score among advanced practice nurses, were measured before and after the NP-driven enteral nutrition protocol. The quasi-experimental quantitative design was to determine if the NP-driven enteral nutrition protocol embraces the knowledge needs of nutrition and aligns the decision making that overall improves the psychological empowerment among advanced practice nurses. The third clinical was collected to determine if the psychological empowerment of the advanced practice nurses resulted in a reduction of the timing of initiation of EF and lowering the length of hospital stay among patients in CTICU. All the intended variables were measured and compared toward conclusive findings.

Population and Sample Selection

The CTICU has a 10-bed capacity ranging from one to five patient admissions during weekdays and one to two patient admissions during weekends. The target patients in CTICU were adult patients greater than 18 years of age who are for emergent, elective, or post-operative cardiothoracic surgery, such as Coronary Artery Bypass Graft, Bentall procedure for aortic dissection, valve surgery repair or replacement, and transcatheter endovascular valvular or vascular procedure. The patients transferred from an outside hospital for a surgical higher level of care were also included in this project. The surgical interventions were not included in the data collection but only the comorbidities associated during the hospital stay. The comorbidities presented during the study were a cerebrovascular accident, high blood pressure or hypertension, high blood cholesterol levels or hyperlipidemia, heart disease or coronary artery disease, inflammation of the heart muscle or endocarditis, cardiac valve disease, heart failure, aortic vessel disease, hypothyroidism, diabetes, and chronic kidney disease.

Patients who were critically ill needing EF before or after the surgery because of complications associated with disease phenomenon narrows down the target population. Patients that were excluded in the project were age less than 18, lactating and pregnant female, and “do not resuscitate,” or DNR patients. The patients who have ischemic colitis or ischemic bowel, gastrointestinal bleeding requiring parenteral nutrition, abdominal obstruction, and abdominal compartment syndrome were also excluded in this project because of the absolute contraindication for EF.

Three sets of patient data were measured: demographics, clinical nutrition practice, and patient outcome. The patient demographics were age, gender, and comorbidities, the clinical nutrition practice is the initiation of the EF, and the patient outcome is the length of the hospital stay. The data was measured with the use of descriptive data to present the mean specific variable being measured. The inclusion of the demographic data was to show the description of the patient population that can also offer a conclusive finding to the clinical nutrition practice and patient outcome.

The CTICU of the academic medical center in Los Angeles has advanced practice nurses who work collaboratively with physicians, RDs, and bedside nurses on safe initiation and advancement of EF daily. This DPI project composed of three phases (assessment, intervention, and evaluation) because of the internal and external factors to consider during the investigative approach of the project (Dang & Dearholt, 2018). This DPI project presented that the employees working within the organization were the main drivers of change toward meeting the goal and improvement of the outcome in care practices.

The assessment phase starts with the advanced practice nurses of CTICU working 12 hours a shift at a variable work schedule (night or day) covering 24 hours from

Monday until Sunday (including holidays and weekends). The determination of the level of psychological empowerment among the advanced practice nurses assisted in determining the pre-implementation attitude. The invitation to participate was gathered with the initial survey during the assessment phase before the implementation. During the assessment phase, the gathering of patient data from the Cerner electronic health system proceeded after the IRB approval to determine the patient demographic, timing of initiating of EF, and length of hospital stay before the implementation of the NP-driven enteral nutrition protocol.

The AGACNPs are advanced practice nurses with national certification under American Nurses Credentialing Center (ANCC), work collaboratively with multidisciplinary under the direct supervision of the attending, and expected to practice within evidence-based principles (Bell, 2017). Knowledge of nutrition is essential toward an attitude that will drive the advanced practice nurses to early initiate and reduce the interruption of enteral nutrition. Knowledge assists in creating and development of ideas toward the improvement of the performance (Hasani & Sheikhesmaeili, 2016). The incorporation of the knowledge on pieces of evidence and nutrition guidelines surrounding clinical practice was during the intervention phase. Knowledge is imperative to drive and empower advanced practice nurses to decide on when to initiate and improve the nutritional practice in CTICU safely.

Instrumentation or Sources of Data

There were two sources of data: Cerner electronic health record for practice and survey on Spreitzer Psychological Empowerment Scale. The CTICU patient data was taken from the Cerner system, and it was during the assessment and evaluation phases of the DPI project. As stated from the project methodology, the timing was based on

initiation on EF and length of hospital stay (per patient). All the information was gathered before (30 days) and during the implementation of the NP-driven enteral nutrition protocol (30 days). The total number of days of the project was 60 days.

The psychological empowerment was in the form of a survey questionnaire during the assessment and evaluation phase. The invitation to participate approved by the institution was included during the assessment phase of the DPI project. The psychological empowerment scale was with the use of the tool developed by Spreitzer (Spreitzer, 1995). The Spreitzer Psychological Empowerment Scale is a 12-item question that has four subdimensions: meaning, competence, self-determination, and impact (Spreitzer, 1995). Each scale score ranges from 1 to 7. Dr. Spreitzer approved the utilization of the tool (see appendix B). The full detailed information about the Spreitzer Psychological Empowerment Scale instrument is available in the Appendix C section of this paper.

Validity

Validity is measuring and evaluating the credibility of the DPI project (Dang & Dearholt, 2018). The SCCM and A.S.P.E.N. recommended the feeding protocol with moderate to a high quality of evidence (Taylor et al., 2016). This project intends to measure if the psychological empowerment among the advanced practice nurses with the implementation of the NP-driven enteral nutrition protocol results in an improvement in the timing and reduction in length of hospital stay. The survey tool measures the psychological empowerment of advanced practice nurses surrounding. The validity of the Spreitzer Psychological Empowerment instrument is very good (Spreitzer, 1995). The Spreitzer Psychological Empowerment Scale was utilized successfully on 50 different studies ranging from nursing to other service workers (Spreitzer, 1995).

The enteral feeding protocol has been studied by multiple researchers to improve nutritional practice and patient clinical outcomes. The SCCM and A.S.P.E.N. recommended to design and implement an enteral feeding protocol to enhance the clinical nutritional process in the institution (Taylor et al., 2016). The enteral feeding protocol empowers the target healthcare team member toward the intended result in nutrition. The investigator represents the NP as a target population designed to be empowered to early order initiation of EF toward the improvement of the patients' clinical outcome. The project replicated the concept of having a feeding protocol that aligns the process toward intended practice, which is EEN among critically ill patients.

The Cerner system was utilized for more than five years at the academic medical center in Los Angeles on all patient data entry and documentation. All the employees were highly trained in the utilization of the Cerner electronic health record.

Reliability

Reliability was describing the consistency of the instrument or tool (Dang & Dearholt, 2018). The reliability was to answer the question if the project and the tools utilized within the project can be replicated (Dang & Dearholt, 2018). Each critical care units at the academic medical center in Los Angeles has different practices surrounding nutrition because of the variable patient population, unit protocols, and clinical practices. An example is that nutritional clinical practice in Surgical ICU (SICU) covering patients who had gastric surgeries, liver transplant, kidney transplant, and other abdominal surgeries is different because of the various patient conditions. The nutrition practice issue in the SICU can be varied in CTICU. The reliability of the psychological empowerment tool is around 0.80, based on Cronbach's alpha scoring system (Spreitzer, 1995).

The reliability of the Cerner system with the retrospective data cannot present the relationship of the timing delay to patient condition. An example was unable to find the surrounding patient condition associated with delaying based on retrospective data to compare to the current data. The Cerner system was the only documentation process in the hospital used for all patient documentation. Since data collection will merely be objective, such as patient demographics and timing of EF without any correlation to patient condition, the Cerner will be a reliable tool to use to compare if intervention resulted in the change in the patient practice outcome (EF timing). Demographic data will only be used to provide descriptive information. However, it can be a piece of valuable information to present if the demographic, such as age, gender, and comorbidities, is also related to the patient practice outcome (EF timing).

Data Collection Procedures

To conduct the DPI project, approval was obtained from the Academic Quality Review (AQR) and Institution Review Board (IRB). The project had three phases (assessment, intervention, and evaluation) that were divided into subcategories.

Assessment phase. The assessment phase was divided into two subcategories: practice outcome and nurse practitioners attitude. The patient data collection included the assessment of the patient practice outcome: the collection of the clinical practice (timing of enteral initiation feeding) and patient outcome (length of hospital stay) before the implementation. The clinical practice and patient outcome before the implementation were gathered from the Cerner electronic health record (upon IRB approval). The nurse practitioner data was in one survey questionnaire that includes an invitation to participate and psychological empowerment scale. The utilization of the psychological empowerment scale was approved to use by Dr. Spreitzer (see Appendix B and C).

Intervention phase. The intervention phase had two subcategories: NP-driven enteral nutrition protocol and patient data gathering. The NP-driven enteral nutrition protocol is a recommended key strategy by SCCM and A.S.P.E.N. designed to improve the nutritional practice in CTICU based on the clinical practice guidelines toward the best patient outcome. The advanced practice nurses working in CTICU received a 30-minute education and training that include a presentation about evidence-based practice surrounding the implementation of the change. The presentation consisted of a case study and demonstration of the proper use of the NP-driven enteral nutrition protocol. The patient data gathering started after the education and during the implementation phase until the evaluation phase.

Evaluation phase. The evaluation phase was divided into two subcategories: patient practice outcome and advanced practice nurses evaluation of psychological empowerment. The patient practice outcome was to finalize the patient data information on the timing of initiation and length of hospital stay to evaluate if the implementation of the NP-driven enteral nutrition protocol resulted in the improvement of the nutritional practice and clinical outcome. The attitude or psychological empowerment re-survey was to evaluate if the NP-driven enteral nutrition protocol resulted in the improvement of psychological empowerment among advanced practice nurses.

Data Analysis Procedures

Data collection was divided into two sets: advanced practice nurses and CTICU patients' data. The advanced practice nurses' data information was by a survey to determine the pre-implementation and post-implementation psychological empowerment. The pre-implementation psychological empowerment survey was during the assessment phase of the project. The post-implementation was 30 days after the NP-driven enteral

nutrition protocol. The psychological empowerment score was compared with the use of paired *t*-test calculated by the professional statistician within the institution to determine a significant difference in scoring. A professional statistician was utilized to avoid bias within this DPI project. The CTICU patients' data gathering started after the AQR and IRB approval by gathering data pre-implementation (30 days before) and during the implementation (30 days during the implementation).

The CTICU patient's data was documented into a spreadsheet with the specific patient identifier (P1, P2, P3). The spreadsheet includes the demographics of the target population: age, gender, and co-morbidities. The spreadsheet also included the timing of initiating and length of hospital stay. The timing of starting EF was per patient admission or arrival from surgery to CTICU until the initiation of feeding in hours. Table 1 will present the illustration of the spreadsheet.

Table 1
Patient Demographics, Timing of Nutrition, and Length of Hospital Stay

Patient ID	Date of Admission	Age	Gender	Co-morbidities	Timing Initiation (hours)	Length of Hospital stay
P1						
P2						
P3						

The demographic data was with the use of descriptive data. The age was presented in mean value. Mean is defined as the most common measure of central tendency by taking the sum or average of the data collected (Grove, Burns, & Gray, 2017). The co-morbidities were presented in a group frequency table (Grove et al., 2017). The timing of initiation was based on the patients requiring EF. The timing in hours was divided by the number of patients to present the average hours' delay of initiation. All the

data information was compared in a table to display the alignment of the pre-implementation and post-implementation data.

After the descriptive data, the mean clinical nutrition practice and patient outcome (timing of initiation and length of hospital stay) were uploaded by the professional statistician into a statistical analysis system (SAS) version 9.4 for data analysis to determine the significant difference.

Potential Bias and Mitigation

Professional practice in project implementation is a very powerful act to prevent bias and be structured in capturing all the target patient populations within the project (Klamer, Bakker, & Gruis, 2017). All the patients targeted in the project which received EF under the care of advanced practice nurses in CTICU were randomly sampled. The comparative patient data was initiated on the first day of the month before the intervention for uniformity of data sampling. The intervention data collection was initiated after the completion of the training and education of the nutrition protocol among advanced practice nurses. The project was straightforward and followed the 30 days before and after the intervention.

Another method to avoid bias in the study was the hiring of the professional statistician on data analysis. During the project implementation, a one-tailed test for significance was planned by the primary investigator to test the significant difference based on one specificity of the direction of each clinical question. However, the professional statistician stated that conducting a two-tailed test on data analysis is more conservative and avoids false-positive findings (W. Mack, personal communication, June 5, 2020).

Ethical Considerations

Ethical considerations in this DPI project was to ensure the protection of human subjects. The project went through a review and approval process by the IRB before data collection among the target population. Approval is required to safeguard the rights of the target population. The ethical considerations were ethical expectations and confidentiality of the population during the project implementation.

The ethical expectation was the investigator's compliance and adherence to the Belmont Report principles during the project implementation, such as respect, beneficence, and justice (National Commission for the Protection of Human Subjects of Biochemical and Behavioral Research, 1978 as cited by Friesen, Kearns, Redman, & Caplan, 2017). Respect applies to informed consent or upholding the right to decide among the target population (Friesen et al., 2017). Beneficence is an obligatory moral task to analyze the risk and benefits of the project. Justice is fairness in subject selection (Friesen et al., 2017). Informed consent is the cornerstone of the research with careful consideration of the two elements “informed” and “consent” (Fleming, & Zegwaard, 2018).

This quality improvement project was a quality improvement project that does not require informed consent. However, the project provided an option to participate in the project among advanced practice nurses since the NP- driven enteral nutrition protocol was not a hospital policy but a process improvement to improve the nutritional practice in the unit. The initiation and advancement of EF do not require consent because nutrition is a routine hospital practice (i.e., diet such as heart-healthy and supplementation) that directly benefits all the general patient population.

However, the quality improvement project, such as enteral nutrition protocol, will be a

new standardized nutritional practice to improve the patient outcome (length of hospital stay).

The maintenance of confidentiality was by respecting privacy and ensuring that the target population is protected (Friesen et al., 2017). No identifier used for the advanced practice nurses. However, the patient requires identifiers from demographic data that were only known to the sole investigator during the project implementation process. The identifier was necessary for the accuracy of the demographic and clinical practice pre- and during the implementation process. The IRB did not require a Health Insurance Portability and Accountability Act (HIPAA) waiver of the institution.

All hard data copies of data collected (survey) were saved in the secured locker in the institution. The electronic data spreadsheet that contains patients' data were stored in the investigator's identification-protected personal computer in which no other individuals will have access. No reproductions made. The data was stored based on the Grand Canyon University policy. The project will be published after, and the development was based on the requirement for completing the Doctoral of Nursing Practice program at Grand Canyon University.

Limitations

Limitations of the project were inherent to the project. The data was collected primarily in CTICU within the coverage of advanced practice nurses, which will limit the patient's size. The unpredictability of the patient admission and transfer, especially with the ongoing novel coronavirus pandemic, added possible risk that the patient intended number would be small. The limited-time for project implementation after the AQR and IRB approval made it challenging to get a significant amount of patient data to support the clinical outcome. However, counting each occurrence of withholding the feeding shed

information about improvement in timing and faster commitment to meet the nutritional goal after the nutrition program.

Summary

This chapter provided a project focus on a methodology that includes project design, sample population, characteristics of sources and instruments, and presentation of the validity and reliability of the clinical outcome of the project. This chapter also presented steps of data collection, data analysis, ethical considerations surrounding the project, and limitations concerning the outcome of the methodology. Chapter 4 will present the results surrounding the project. Chapter 5 will provide the conclusive findings, recommendations, and suggestions for an upcoming project that will assist in finding answers surrounding nutrition practice issues in a different health care facility.

Chapter 4: Data Analysis and Results

The clinical practice guidelines on nutrition recommend EEN among critically ill patients within 24 to 48 hours after admission (McClave et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019; Taylor et al., 2016). The EEN can result in lower mortality rates, reduction of the length of hospital stay, and low infection rates based on the randomized controlled trials (Reintam Blaser et al., 2017; Singer et al., 2019; Taylor et al., 2016). The academic medical center in Los Angeles follows the necessary practices and guidelines for early assessment of malnutrition risk, bedside rounds, and nutritional risk assessment toward the improvement of the nutrition of critically ill patients. The delay in initiation EF continues to happen despite the necessary practices and guidelines in the institution.

The implementation of the enteral nutrition protocol was the recommendation by clinical practice guidelines of the SCCM and A.S.P.E.N. (Taylor et al., 2016). The SCCM and A.S.P.E.N. stated that enteral nutrition protocol would empower to assist in the improvement of clinical practice. Evidences for literatures have shown that implementation of an enteral nutrition protocol increases the delivery of nutrition and improves dietary practice in a critical care unit (Kim et al., 2017; Li et al., 2017b; Orinovsky & Raizman, 2018; Padar et al., 2017; Wikjord et al., 2017). The advanced practice nurses' practices are based on national certification, ethical code of conduct, current practice standards, and evidence-based principles trained to take care of the patients in the critical care setting (Bell, 2017). Evidences from literatures presented the contributions of advanced practice nurses to the patient outcome (Innes-Walker et al., 2019; Kerr et al., 2017; Zozya-Monohon & Corona, 2019).

The purpose of this quasi-experimental quantitative project was to evaluate if the designed nurse practitioner (NP)-driven enteral nutrition protocol recommended by SCCM and A.S.P.E.N will psychologically empower advanced practice nurses toward reduction of delay on initiating EF and lowering the length of hospital stay of patients in the cardiothoracic intensive care unit (CTICU).

The clinical practice pieces of evidence with increasing psychological empowerment are the improvement of the waiting time of initiation and reduction of the length of hospital stay. The principal investigator aimed to answer the clinical questions determining if the NP-driven enteral nutrition increased psychological empowerment, reduction of the average waiting time of initiating EF (clinical practice), and improvement of the length of hospital stay (patient outcome).

This chapter will provide the result of the data analysis from Chapter 3. The first descriptive data provides psychological empowerment data score obtained from the advanced practice nurses' and patients' data (clinical practice and patient outcome) in CTICU. Then, the data analysis presented comparative results of psychological empowerment, timing in initiating EF, and length of hospital stay before and after the implementation of NP-driven enteral nutrition protocol. The analysis resulted from the data collected presents conclusive findings.

Descriptive Data

The project was implemented in the academic medical center in Los Angeles. All the descriptive data were summarized by the mean, standard deviation (*SD*), median (interquartile range or *IQR*), percentage, and range. The descriptive data were the psychological empowerment scores, patient demographics, initiation timing of EF, and patient length of hospital stay.

Advanced practice nurses' descriptive data. The advanced practice nurses sample consisted of seven participants who received education and training on NP-driven enteral nutrition protocol. The advanced practice nurses were asked to complete the psychological empowerment before and after the NP-driven enteral nutrition protocol. The psychological empowerment scale was divided into four dimensions: meaning, competence, self-determination, and impact. The scoring is based on the Likert scale with a very strongly disagree score as 1 to very strongly agree as 7.

Table 2
Descriptive Data Advanced Practice Nurses Psychological Empowerment Scores

Psychological Empowerment Subdimension	Mean (SD)	Median (IQR)	Range
Competence			
Pre-implementation	5 (0.87)	5 (4, 6)	3, 5
Post-implementation	5 (1.5)	5 (5, 6)	1, 7
Meaning			
Pre-implementation	6.6 (0.57)	7 (6, 7)	5, 7
Post-implementation	5.9 (1.19)	6 (5, 7)	2, 7
Self-determination			
Pre-implementation	4.81 (0.59)	5 (4, 5)	4, 6
Post-implementation	5.23 (1.14)	5 (5, 6)	1, 7
Impact			
Pre-implementation	4.48 (1.18)	4 (3.5, 5.5)	3, 5
Post-implementation	4.43 (1.56)	5 (3, 5)	1, 7
Total			
Pre-implementation	5.23 (1.186)	5 (4, 6)	3, 7
Post-implementation	5.14 (1.53)	5 (5,6)	2,7

All advanced practice nurses ($N = 7$) responded to the psychological empowerment survey. Table 2 presents the psychological empowerment subdimension scale and total scores. The descriptive presentation is by mean, *SD*, median (IQR), and range.

Patient descriptive data. The patient data collection was initiated before and during the implementation of NP-driven enteral nutrition protocol. The patients in CTICU are mostly male (68%) with age ranging 25 to 83 years old with a mean age of 60 ($SD = 19$). The majority of comorbidity is hypertension (62%), followed by cardiac valve issues and heart failure (37%). Table 3 presents the patient variables and demographic data.

Before NP-driven enteral nutrition protocol, the initiation timing of EF mean was 61.2 hours ($SD = 25.7$), the median was 54 hours (IQR= 54, 69), and range 30 to 120. The length of hospital stay mean was 24.01 days ($SD = 7.82$ days), the median was 23.8 (IQR = 22.8, 28.8), and range 8.4 to 36.6 days. During the implementation phase, the patient admission was 41, with seven patients (17%) received EF. During the implementation of NP-driven enteral nutrition protocol, the initiation timing of the EF mean was 34.1 hours ($SD = 27.6$), median 16 (IQR = 16, 72), and range 9 to 73 hours. The length of hospital stay mean was 13.2 days ($SD = 3.93$), the median 12.2 (IQR= 9.7, 16.3), and range 9.2 to 20.2 days. During the pre-implementation and implementation phase, two patients expired (one pre-implementation and one during the implementation). Both received enteral nutrition. The two patients were not included in the descriptive and data analysis. Tables 4 and 5 presents the descriptive data presentation of hours to initiation of EF and length of hospital stay.

Table 3
Frequencies and Percentages of the Patient Demographics

Patients Variables	Before Implementation <i>N</i> = 9 (%)	After Implementation <i>N</i> = 7 (%)	Total Patients <i>N</i> = 16 (%)
Demographic			
Age in years, \bar{x} (<i>SD</i>)	66.4 (14.6)	53 (21.08)	60 (19)
Gender			
- Male	6 (700)	5 (70)	11 (68)
- Female	3 (30)	2 (30)	5 (32)
Comorbidities			
- Cerebrovascular accident	1 (10)	2 (30)	3 (18)
- Hypertension	8 (90)	2 (30)	10 (62)
- Hyperlipidemia	4 (40)	1 (10)	5 (32)
- Coronary Artery Disease	3 (30)	2 (30)	5 (32)
- Endocarditis	2 (20)	1 (10)	3 (18)
- Cardiac Valve Issue	3 (30)	3 (40)	6 (38)
- Aortic Disease	3 (30)	3 (40)	6 (38)
- Dissection	2 (20)	1 (10)	3 (18)
- Aneurysm	2 (20)	1 (10)	3 (18)
- Endocrine			
- Hypothyroidism	2 (20)	0	2 (13)
- Diabetes Mellitus	2 (20)	1 (10)	3 (18)
- Chronic Kidney Disorder	4 (40)	1 (10)	5 (31)

Where: \bar{x} = mean, *SD* = standard deviation, *N* = total patients, % = percentage based on total patients (*N*) within the specific column for descriptive presentation

Table 4
Descriptive Presentation of Hours to Feeding Initiation

Clinical Practice	<i>N</i>	Mean (<i>SD</i>)	Median (IQR)	Range
Pre-implementation	9	61.2 (25.7)	54 (53, 69)	30, 120
During Implementation	7	34.1 (27.6)	16 (16, 72)	9, 73

Table 5
Descriptive Presentation of Length of Hospital Stay

Patient Outcome	N	Mean (SD)	Median (IQR)	Range
Pre-implementation	9	24.01 (7.82)	23.8 (22.8,28.8)	8.4, 36.6
During Implementation	7	13.23 (3.93)	12.2 (9.7, 16.3)	9.2, 20.2

Data Analysis Procedures

The principal investigator collected six sets of data during the assessment and evaluation phases. The assessment phase data had three sets of data: advanced practice nurses' psychological empowerment, clinical practice (timing of initiating EF), and length of hospital stay (patient outcome). During the assessment phase, psychological empowerment in the form of a survey was distributed before education and training of the NP-driven nutrition protocol. The pre-implementation clinical practice (timing of initiating EF) and patient outcome (length of hospital stays) 30 days before the NP-driven enteral nutrition protocol was also collected as well. The evaluation phase has three sets of data similar during the assessment phase. During the evaluation phase, the implementation of clinical practice (timing of initiating EF) and patient outcome (length of hospital stays) were both collected within 30 days. At the end of 30 days, the advanced practice nurses received another psychological empowerment survey. All the data collected for 60 days.

All the data collected was uploaded to the SAS version 9.4 for data analysis to compare for a significant difference between the pre-implementation and implementation data. For the patient clinical practice outcomes, the EF initiation and length of hospital stay mean data were compared by independent *t*-test. A comparison of the paired pre-

during implementation mean values on the NP-completed empowerment scale used paired *t*-test. All the statistical testing was 2-sided.

The first approach was to determine a considerable reduction in the waiting time of initiating EF before and during the implementation phase. The second approach was to identify the significant decrease in the length of hospital stay before and during the implementation phase. The third approach was to determine the substantial score in the advanced practice nurses' psychological empowerment before and after the implementation of the NP-driven enteral nutrition protocol. The overall result of the patient data provided information on the nutrition protocol affects the clinical practice and patient outcome. The NP survey significant score will provide information if the advanced practice nurses' psychological empowerment has a relation to the clinical practice and patient outcome.

Results

The project was implemented during the SARS-CoV-2 pandemic resulted in a reduction of patient admission (see Table 6). During the implementation phase, most of the elective admissions were minimally invasive or endovascular procedures with lower recovery hours and eligible to have oral intake within 24 hours after the surgery as compared to patients who require thoracotomy approach and bypass machine support during the surgical procedure. Despite the lower admission and number of the target population, 17% of the admission rate before and during the implementation phase was the target patient population (see table 6). The result section presented the summary and result of the comparative data analysis by answering the three clinical questions.

Q1: Is the average waiting time of initiating EF reduced following the implementation of the NP-driven enteral nutrition protocol?

Q2: Is the length of hospital stay reduced following the implementation of the NP-driven enteral nutrition protocol?

Q3: Is there a significant increase in psychological empowerment among advanced practice nurses after the implementation of the NP-driven enteral nutrition protocol?

Table 6

Target Patients Based on Admission Before and After Implementation

Patient Data	Before Implementation <i>N</i> = 53 (%)	During Implementation <i>N</i> = 41 (%)
Target Patient Population	9 (17)	7 (17)

Where: *N* = total patients admitted, % = percentage based on total patients within the column.

Clinical question 1. The first question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the initiation time of EF, as evidenced by a reduction of the waiting time. The project question investigated if there is an improvement in the waiting time as evidence by a substantial decrease in the hours in initiating enteral feeding. Table 5 provided a reduction of mean waiting time by 27.08 hours (pre-implementation 61.2 days and during implementation 34.14 days). An independent *t*-test was performed by a professional statistician to determine if the reduction of the waiting time is significantly different or not. The result of the independent *t*-test was presented in Table 7.

Based on the data analysis, the *p*-value of 0.062 from the independent *t*-test presents that there was no significant reduction in the waiting time between the pre and during the implementation of NP-driven enteral nutrition protocol. Despite the significant change in the mean timing between the pre and during implementation hours to initiation of feeding, the *p*-value provided information that the clinical practice did not have a

significant change after the implementation of the NP-driven enteral feeding protocol.

Table 7
Presentation of Independent T-test Result on Hours to Feeding

Clinical Practice	t	df	Significant (2-tailed p -value)
Before and After Intervention Hours to Feeding	2.027	14.000	0.062

Where: t = t-test value, df = degrees of freedom

Clinical question 2. The second question was to determine if the NP-driven enteral nutrition protocol results in an improvement in the length of the hospital stay. The project question was to investigate if there is an improvement in the length of hospital stay as evidence by a substantial decrease in the number of days in the hospital after the early enteral feeding. Table 6 presented a mean reduction of length of hospital stay by 10.77 days (pre-implementation 24 days and implementation 13.23 days). An independent t-test was performed to determine if the reduction in the length of hospital stay is significantly different or not. The result of the independent t -test was revealed in Table 8.

Table 8
Presentation of Independent T-test Result on Length of Hospital Stay

Patient Outcome	t	df	Significant (2-tailed p -value)
Before and After Intervention Length of Hospital Stay	3.324	14.000	0.005

Based on the analysis of the data, the p -value of 0.005 from the t -test present a significant reduction in the length of hospital days among patients who received EEN during the implementation of the NP-driven enteral nutrition protocol. The nutrition protocol resulted in an improvement in the patient outcome.

Clinical question 3. The third question was to determine if the NP-driven nutrition protocol increased psychological empowerment among the advanced practice nurses. Table 10 presents the advanced practice nurses psychological empowerment score. The principal investigator examined each subdimension and total scores of the psychological empowerment.

The primary investigator analyzed significant change on each subdimension by doing a paired t -test. Table 9 presents the p -value score of each subdimension. A p -value of > 0.05 score on all the subdimensions means that there is no significant difference before and after the implementation. There was no significant increase in psychological empowerment among advanced practice nurses with the implementation of the NP-driven enteral nutrition protocol.

Table 9
Presentation of the Paired T-test Scores on Psychological Empowerment among Advance Practice Nurses

Advanced Practice Nurses Psychological Empowerment	t	df	Significant (2-tailed p -value)
Before and After Intervention Psychological Empowerment Scores	0.443	83	0.659

Summary

The project was implemented in the academic medical center in Los Angeles. The education and training were focused on the clinical practice guidelines surrounding enteral nutrition, pieces of evidence of early enteral nutrition, the contribution of NPs to clinical practice, and implementation of the NP-driven enteral nutrition protocol. Although the independent *t*-test did not present a significant difference in the clinical practice (hours to initiation of EF), the descriptive data presented an improvement in the waiting time of EF and length of hospital stay. The advanced practice nurses who followed the NP-driven enteral nutrition protocol were most likely to have an increase in psychological empowerment toward the improvement of clinical practice (initiation of EF) and patient outcome (length of hospital stays) based on the clinical question of the project. However, the data analysis revealed no significant increase in the advanced practice nurses' psychological empowerment with the utilization of the NP-driven enteral nutrition protocol. Chapter 5 will present a summary of the project, conclusive findings, implications, and recommendations of the project.

Chapter 5: Summary, Conclusions, and Recommendations

Malnutrition among critically ill patients is a common presentation that leads to poor patient outcomes. The presence of malnutrition during admission results in a recommendation to start EF within 24 to 48 hours or EEN by clinical practice guidelines among critically ill patients (McClave et al., 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). The A.S.P.E.N. and SCCM guidelines recommended the designing and implementation of EF protocol in the critical care unit as an empowering tool to assist in early initiation toward optimum patient outcomes (Taylor et al., 2016).

The academic medical center in Los Angeles follows the guidelines to improve nutrition among critically ill patients. However, the lack of alignment of the process results in a delay in initiating enteral feeding in CTICU. This quality improvement project addressed the problem by designing and implementing an enteral nutrition protocol to align the process toward improving the clinical practice and improving the patient outcome. The NP-driven enteral nutrition protocol is an empowering tool to align the process toward EEN that will enhance the length of hospital stay.

The purpose of this DPI project was to present if the NP-driven nutrition protocol results in increase empowerment among advanced practice nurses, improvement of the waiting time of initiating EF, and reduction of the length of hospital stay among critically ill patients. This chapter presented a summary of the project, findings, and conclusions. The principal investigator provided on this chapter the implications of this DPI project in terms of theoretical, practical, and future investigation.

Summary of the Project

The principal investigator's goal was to present if the evidence-based recommendation on EEN will result in a reduction in the length of hospital stay based on

the recommendations of clinical practice guidelines and multiple types of literature surrounding EF. The EN itself assists in the maintenance of the gastrointestinal integrity, the balance of the body's immune response, and the reduction of bacterial overgrowth (Taylor et al., 2016). Thus, EEN found to be a recommendation by clinical practice guidelines because of the decline of complications associated with malnutrition that can lower the length of hospital stay (Singer et al., 2019).

The SCCM and A.S.P.E.N. recommended the designing and utilization of the enteral feeding protocol to improve the nutrition process by empowering the target individual (Taylor et al., 2016). Thus, the designing and utilization of the NP-driven enteral nutrition protocol are to initiate early EF to improve the length of hospital stay.

The principal investigator provided education and training on the approved NP-driven enteral nutrition protocol to empower the advanced practice nurses assigned in CTICU. To determine if the implementation resulted in increasing empowerment among advanced practice nurses, a pre- and post-implementation psychological empowerment survey was distributed. The advanced practice nurses are independent practitioners who should be capable of being empowered individually and self-determined to improve the clinical practice in CTICU.

The psychological empowerment should be a driving factor among advanced practice nurses toward the improvement of the timing of initiation of EF (clinical practice). Thus, it should result in improvement of the patient outcome as evidence by the reduction of the length of hospital stay based on the clinical guidelines and kinds of literature. The next section conveys the specific finding of the DPI project.

Summary of Findings and Conclusion

Multiple kinds of literature provided information on EEN, enteral feeding protocol, nursing psychological empowerment, and NPs' positive contribution to clinical practice and patient outcomes. The target patient in the CTICU were patients who were not eligible to have oral intake within 24 hours and hemodynamically stable. The patients who were admitted are 53 with only nine patients who received EF, pre-implementation, and 41 with seven patients who received EF, post-implementation. The implementation started within the peak of the SARS-CoV-2 pandemic resulted in a lower number of admission and minimally invasive elective surgeries. The patients who underwent minimally invasive surgeries and endovascular most likely weaned off the mechanical ventilator within postoperative day1 and were eligible to have oral intake in 24 hours. Despite the low target population, analysis of data result revealed a significant reduction of the waiting time based on the descriptive data and length of hospital stay based on the independent *t*-test. However, the psychological empowerment survey score among advanced practice nurses did not present any considerable increase after the implementation of the NP-driven enteral nutrition protocol.

Clinical Question 1

The first clinical question was to investigate if the mean waiting time on initiating enteral feeding will reduce with the implementation of the NP-driven enteral nutrition protocol. The average waiting time during the pre-implementation phase was 61.2 hours, with 34.14 hours during the implementation phase. A paired *t*-test was conducted to determine the significant improvement of the initiation timing. The result of the data analysis was no significant reduction in the waiting time on initiating enteral feeding despite the descriptive data presentation of the difference in mean timing of 27.08 hours.

The reason for the potential reduction of the waiting time was the surge of the patients during the first week after the education provided to the advanced practice nurses. The increased surge of potential patients during the first week of the implementation led to EEN among patients who are not eligible to have oral intake within 24 hours and hemodynamically stable. Another consideration was that the NP-driven enteral nutrition protocol provided an easy step by step layout, presenting early identification of the potential patients needing EF during the recovery stage. The advanced practice nurses verbalized that the enteral nutrition protocol was easy to follow and provided specific steps toward EEN. The nutritionist involvement during the bedside rounds also assisted in emphasizing the initiation of EF. The potential reason for a non-significant difference was the standard deviation and outlier data long waiting time on two last patients. The reason behind this was the weaning off the ventilator and both patients not passing the swallow evaluation needing to optimize nutrition status during the stay in the CTICU.

The feeding protocol based on multiple kinds of literature results in increase delivery of nutrition and improvement of nutrition practice (Padar et al., 2017; Li et al., 2017b; Wikjord et al., 2017, Kim et al., 2017; Orinovsky & Raizman, 2018; Jiang et al., 2020). During the implementation stage, there was a change in the culture of practice in the unit. The prior bedside nursing practice was to start EF only if the patient has a post-pyloric feeding tube. Since the NP-driven enteral nutrition protocol entails training and education among the advanced practice nurses on processes toward improving the EF and nutrition in ICU, the advanced practice nurses transferred the knowledge gained to the bedside nurses of CTICU. The EF began to start with trickle feeding (10cc/hr) on an oral gastric feeding tube then advance to goal based on the recommendation of the RD. The

nutrition protocol on early initiation of EF led to a reduction of the waiting time despite no significant change based on data analysis.

Clinical Question 2

The second clinical question was to investigate if the NP-driven enteral nutrition protocol resulted in a significant improvement in the length of hospital stay. The mean duration of hospital stay during the pre-implementation is 24 days and implementation 13.23 days. The implementation length of stay was lower as compared to the pre-implementation. The result of the data analysis with the use of an independent t-test was a significant reduction in the length of hospital stay.

The clinical practice guidelines presented that EEN resulted in a decline in infection, lower ICU stays, and lower length of hospital stay (McClave et al., 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). During the implementation phase, patients began to have more energy and start commencing oral intake while in CTICU. The advanced practice nurses denied any incidence of feeding intolerance, nausea, and vomiting. The EF based on studies assists in maintaining structural integrity and preventing the bacterial overgrowth of the gastrointestinal system (Taylor et al., 2016).

Patients during data collection observed to have better energy for mobility and faster recovery during the CTICU stay. The EEN assists in meeting the nutritional demand during recovery from critical illness (Stewart et al., 2017). Overall, the reduction of infection rates, better recovery from illness, and lower ICU stay secondary to EEN resulted in a significantly reduced length of hospital stay

Clinical Question 3

Evidences from literatures surrounding psychological empowerment in a commitment to work, job performance, engagement, implementation of a change process, and goal attainment (Azizi et al., 2020; DiNapoli et al., 2016; Asiri, 2016; D'innocenzo et al., 2016; Fan et al., 2016; Montani et al., 2015; Segal et al., 2015; Wang, & Liu, 2015). There are also pieces of evidence surrounding the contribution of NPs in healthcare, such as improvement of the patient outcome: reduction of post-operative hyperglycemia, reduction of readmission, and improvement of the wound care management (Kerr et al., 2017; Zozya-Monohon and Corona, 2019; Innes-Walker et al., 2019).

The third clinical question was to present a significant increase in psychological empowerment among advanced practice nurses after the implementation of the NP-driven enteral nutrition protocol. Overall, the total psychological empowerment scores were 62.7 pre-implementation and 61.7 post-implementation. Although the result presents a reduction in score, the data analysis revealed no significant difference. The subdimensions were also separated to determine areas of significance based on the survey. The competence, self-determination, meaning, and impact presented no significant difference based on the data analysis.

The competence subdimension was similar to pre and post-implementation surveys. The advanced practice nurses' belief in their capability to decide on commencing EF is identical before and during the implementation phase. The self-determination score was higher, means that the advanced practice nurses felt autonomous in the workplace by ordering EF based on the nutrition protocol. The impact was slightly lower, which means that advanced practice nurses have a belief in making a difference in the patient outcome

(D’Innocenzo et al., 2016). The meaning subdimension is the belief of the importance of deciding EEN because of the advanced practice nurses' role in nutrition (Thuss et al., 2016). The advanced practice nurses' score was significantly lower during the implementation as compared to pre-implementation. Potential reason from the result is that the advanced practice nurses of CTICU were already psychologically empowered to decide EF in CTICU from the start of the implementation phase. The nutrition protocol was to align the process of thinking toward improving the clinical practice that resulted in optimizing the patient outcome. Advanced practice nurses are capable of deciding independently, autonomously decide in the workplace, and determined to make a difference in the unit.

The SARS-CoV-2 pandemic also created an impact on the working environment resulting in lower admission rates. The smaller number of potential patients for EEN resulted in lower decision-making in promoting nutrition and skills that can impact the individualized psychological empowerment. The consistency in practice that enhances the competence, skills, and mastery of the decision toward EEN and optimum nutrition that accumulates in a more extended period is essential to optimize the psychological empowerment (Abhichartibutra & Tungpunkom, 2019). Another potential reason for the non-significant result in the survey was the short timeline of the project. The psychological empowerment needs time to see the potential for improvement by looking at the process and increase interaction within the members of the team that will boost the sense of individual empowerment (D’Innocenzo et al., 2016).

Implications

The clinical practice guidelines recommended EEN among critically ill patients (Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). The lack of process was the main issue that resulted in delaying initiating EF and suboptimal nutrition, leading to poor outcomes in CTICU. Having a process in place by standardization of the practice that outlines the evidence-based practice and clinical practice guidelines will assist in aligning the practice. The SCCM and A.S.P.E.N. recommendation is to design and implement an enteral feeding protocol as a key strategy to improve nutritional practice (Taylor et al., 2016). Another argument within the project is that advanced practice nurses' psychological empowerment is essential to consider facilitating the process toward the improvement of clinical practice and patient outcome.

The optimum result in clinical practice and patient outcome was secondary to the protocol that initially aligns the process of deciding EEN. The NP-driven enteral nutrition protocol overall improved the clinical decision-making toward EEN that assist in optimizing the nutrition of critically ill patients toward preventing complications associated with malnutrition, enhancement of the recovery process, and reducing the length of hospital stay.

Theoretical implications. The project was guided by the TGA that outlines the interaction between two or more individuals in the social system (Alfes & Frey, 2017). The TGA by Emogene King presents the philosophy that nurses revolve around the patient, environment, and health by interaction (Smith & Parker, 2015). An academic medical center in Los Angeles provided a structural empowering work environment by approving an NP-driven enteral feeding protocol to psychologically empower the advanced practice nurses to provide the best possible decision to assist critically ill

patients in meeting their nutritional demands that will improve the health (length of hospital stay).

A patient is a personal system that has different needs. The specific conditions (co-morbidities), diet (vegan, lactose intolerance, and others), developmental (age), and gender are also factors to consider when looking at meeting the goal nutritional status toward the recovery process. According to Adib-Hajbaghery and Tahmouresi (2018), understanding of the unique individual need of the personal system is essential toward the attainment of the goal. The NP-driven enteral nutrition protocol considers the patient eligibility and hemodynamic before the decision of AGACPs to initiate EEN.

The NP-driven enteral nutrition protocol is within the social system wherein the advanced practice nurses interact. The NP-driven enteral protocol was a guide to advanced practice nurses in the decision-making process by interacting with the personal system (patient condition and meeting the criteria) and interpersonal system (early initiation of EF) to achieve the goal of lowering the length of hospital stay. The social system also includes the working environment, admission rates, leadership support, supplies, and interdisciplinary team members working to facilitate nutrition. The SARS-CoV-2 pandemic was also included in the social system that influences the advanced practice nurses within the system. The clinical practice outcome, initiation of EF among critically ill patients, is an interpersonal system that resulted in the improvement of the length of hospital stay.

The improvement of the waiting time in initiating enteral feeding was a result of the intersection of the advanced practice nurses within the system based on the theoretical framework of TGA. The result was a reduction in the length of hospital stay or health within the interpersonal system. Alfes and Frey (2017) stated that TGA is aligning the

current trends in nursing, such as evidence-based practice, communication, protocols, and goal-setting behavior.

The non-significant difference in the psychological empowerment was the result of the social system (low admission from the SARS-Cov-2 influenza pandemic). The small number of admission and target patients for nutrition resulted in a shorter interaction and inability to elevate the advanced practice nurses' level of psychological empowerment (Adib-Hajbaghery & Tahmouresi, 2018).

Practical implications. Interaction within the system should be constant to maintain the use of the NP-driven enteral feeding protocol toward continuous improvement of the waiting time on initiating EF and low length of hospital stay. The project cannot predict if the driving factor or psychological empowerment will improve in a span of months. However, interdisciplinary communication and collaboration between the interdisciplinary team, especially with the RD support and education, will assist in emphasizing the importance of EEN in critical care settings toward the attainment of the optimum patient outcome.

Future implications. There may be pre-existing malnutrition among critically ill patients during admission based on the study of Murali et al. (2017). The critical condition and co-morbidities result in high calories for recovery from illness (Hejazi et al., 2016). The delay in initiating EN is an issue that happens in other ICU, which can result in longer recovery and costly hospital stays.

The first implication for future projects is to include interruption timing in the clinical practice to determine the potential reason for the withholding of EF during the hospital stay. Instead, during the project implementation, education was provided to the advanced practice nurses regarding solutions to reduce the interruption during the

implementation of the NP-driven enteral nutrition protocol. Another implication is an exploration of the reason behind the interruption and reduction of the EF infusion. During the project implementation, there are gaps in EF infusion seen. The gaps seen were withholding and reduction of the EF (lower than the goal nutrition) in hours secondary to respiratory status and high pressor/inotropic support during critical illness. Exploring the interruptions of withholding can assist in providing an overview of the reason why optimum nutrition is not established during the hospital stay leading to prolonging recovery process, rehabilitation, and even mortality.

Recommendations

The EEN was found to improve patient outcomes based on clinical practice guidelines and kinds of literature (McClave et al., 2016; Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). The utilization of the EF protocol has found to improve clinical practice and patient outcome (Padar et al., 2017; Li et al., 2017b; Wikjord et al., 2017; Kim et al., 2017, Orinovsky & Raizman, 2018; Jiang et al., 2020). There are several recommendations for future projects and practices that will assist in finding evidence about critically ill patients' improvement in nutrition practice.

Recommendations for future projects. A longer timeline of the project will provide a better number of target patients that will assist in exploring more information about the effects of EEN during critical illness. The SARS-CoV-2 pandemic resulted in a lower number of admissions and target patients. The additional patient outcomes to measure in future projects, such as mechanical ventilatory days, length of ICU stay, and bloodstream infection, is another recommendation to provide further improvement secondary to EEN.

The withholding of EF has seen to be an issue in the current unit and even in the other critical care units. Exploring further issues related to withholding will assist in developing a project toward optimizing the nutrition of critically ill patients and other outcome measures. The gastrointestinal problems and feeding intolerance, such as nausea, vomiting, and high gastric residual, and potential gastric injury from high vasopressor/inotropic support, are a nutritional issue based on the communication of the advanced practice nurses during the assessment process. Adding gastrointestinal problems, such as feeding intolerance and acute gastric injury (scale or protocol) on future research, can also link to answer on delays in nutrition and parenteral nutrition.

Recommendations for practice. There are multiple recommendations for practice based on the implementation of the project. The first recommendation in the current practice is the implementation of the interdisciplinary enteral feeding protocol that can facilitate EEN in all the critical care settings in the academic medical center in Los Angeles. The project will entail a longer timeline for re-designing the nutrition protocol, interdisciplinary team meetings, and education to increase the surge of optimum nutrition in the facility. The SCCM and A.S.P.E.N. recommended to design and implement EF protocol to meet the nutritional demand of critically ill patients (Taylor et al., 2016). The empowerment will be a team approach and not psychological (individual empowerment) because of the interdisciplinary collaboration toward improving nutrition in all the critical care units in the facility.

Another recommendation is the incorporation of the EF protocol in the Cerner system for easy access during the daily multidisciplinary rounds. The integration of the EF protocol in nursing assessment documentation in the Cerner will assist in directing the nurses to relay the advanced practice nurses and providers the need for EF in the critical

care unit. Additional screening tool on post-pyloric feeding tube placement is another recommendation to reduce the complication associated with aspiration, especially among patients who are on mechanical ventilatory support and high risk for aspiration. Insertion of the post-pyloric feeding tube is one among the recommendations of clinical practice guidelines because of the lower aspiration pneumonia based on evidence (Taylor et al., 2016; Reintam Blaser et al., 2017; Singer et al., 2019). There was no standardized timeline on the withholding of the EF before the procedure. Having a standardized timeframe of withholding feeding based on specific ICU intervention will help aid in avoiding loss of nutrition during the recovery stage from critical illness.

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Appendix A

GCU IRB APPROVAL LETTER



GRAND CANYON
UNIVERSITY™

3300 West Camelback Road, Phoenix Arizona 85017 602.639.7500 Toll Free 800.800.9776 www.gcu.edu

DATE: April 21, 2020
 TO: Jho Tangcora
 FROM: Grand Canyon University Institutional Review Board
 STUDY TITLE: Effectiveness of Nurse Practitioner Driven Enteral Nutrition Protocol
 IRB REFERENCE #: IRB-2020-2157
 SUBMISSION TYPE: Submission Response for Initial Review Submission Packet
 ACTION: Determination of Exempt Status
 DECISION DATE: April 21, 2020
 REVIEW CATEGORY: Category 2
 Category 4

Thank you for submitting your study materials.

Grand Canyon University Institutional Review Board has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations. You now have GCU IRB approval to collect data.

If applicable, please use the approved recruitment script and informed consent(s) that are included in your published documents.

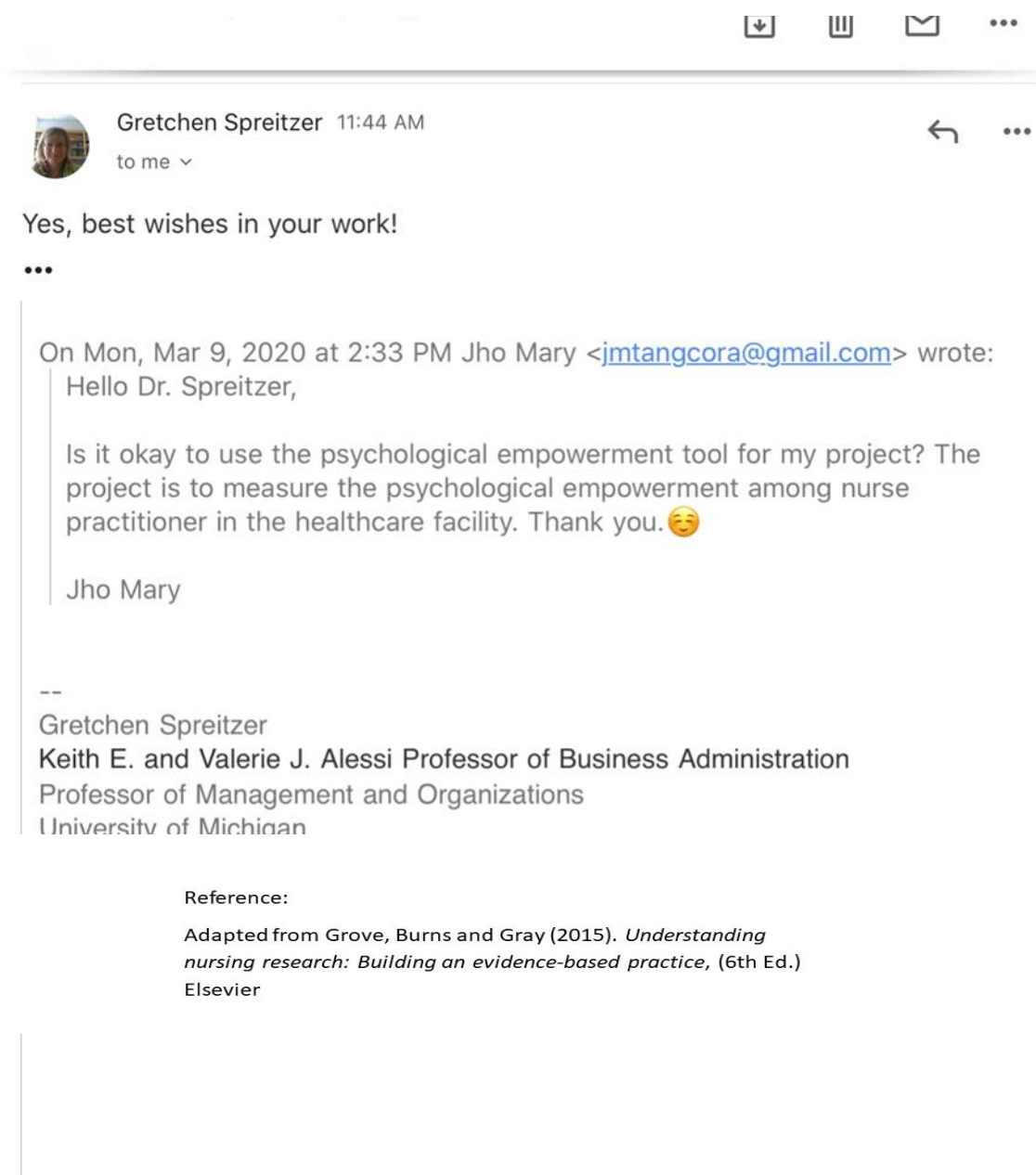
We will put a copy of this correspondence on file in our office.

If you have any questions, please contact the IRB office at irb@gcu.edu or 602-639-7804. Please include your study title and reference number in all correspondence with this office.

Dr. Cynthia Bainbridge
Assistant Dean, Research and Dissertations

Appendix B

Spreitzer Approval



Appendix C

Spreitzer Psychological Empowerment Scale

A. Very Strongly Disagree		E. Agree
B. Strongly Disagree	D. Neutral	F. Strongly Agree
C. Disagree		G. Very Strongly Agree

- ___ I am confident about my ability to do my job.
- ___ The work that I do is important to me.
- ___ I have significant autonomy in determining how I do my job.
- ___ My impact on what happens in my department is large.
- ___ My job activities are personally meaningful to me.
- ___ I have a great deal of control over what happens in my department.
- ___ I can decide on my own how to go about doing my own work.
- ___ I have considerable opportunity for independence and freedom in how I do my job.
- ___ I have mastered the skills necessary for my job.
- ___ The work I do is meaningful to me.
- ___ I have significant influence over what happens in my department.
- ___ I am self-assured about my capabilities to perform my work activities.

The scale is composed of 4 subdimensions: meaning, competence, self-determination, and impact. More information on the empowerment profiles can be found in Spreitzer and Quin (2001).