

UCLA

UCLA Electronic Theses and Dissertations

Title

The Impact of a Hematology Education Module on Knowledge and Self-efficacy of Hematology Nurse Practitioners

Permalink

<https://escholarship.org/uc/item/17v3x3g2>

Author

Seipel, Lauren Rose

Publication Date

2022

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

The Impact of a Hematology Education Module on Knowledge and Self-efficacy of Hematology
Nurse Practitioners

A dissertation submitted in partial satisfaction of the
requirements for the degree
Doctor of Nursing Practice

by

Lauren Rose Seipel

2022

© Copyright by
Lauren Rose Seipel
2022

ABSTRACT OF THE DISSERTATION

The Impact of a Hematology Education Module on Knowledge and Self-Efficacy of Hematology
Nurse Practitioners

by

Lauren Rose Seipel

Doctor of Nursing Practice

University of California, Los Angeles, 2022

Professor Wendie Robbins, Chair

Background: Nurse practitioners (NP) entering the hematology specialty often lack the hematology-specific knowledge needed for practice. Deficiencies in hematology education are attributed to the minimal amount of hematology content included in NP programs and during job orientation. Knowledge deficits among NPs are associated with unpreparedness to practice and feelings of anxiety, insecurity, inadequacy and guilt. **Objectives:** To examine the impact of a hematology education module on hematology NP knowledge and self-efficacy to practice in the hematology specialty. **Methods:** A convenience sample of 11 hematology NPs was obtained from a tertiary care cancer hospital in Southern California. Participants were asked to complete an online learning module containing education about common hematological malignancies. A

pretest/posttest design using knowledge and self-efficacy (SE) surveys was utilized for data collection. Knowledge and SE scores obtained before and after the learning module were then compared to assess for improvement. **Results:** Mean NP knowledge scores increased by 2.5 points (20.8%) after receiving the intervention. Statistical significance was established for NP knowledge ($p= 0.025$). Nurse practitioner self-efficacy after the intervention was essentially the same, with a mean pretest score of 32.6 points (out of 40) and a mean post-test score of 32.3 points. Participant feedback affirmed that the learning module was helpful, imparted new knowledge on the participants and that it would be helpful to incoming NPs during onboarding. **Conclusion:** A learning module emphasizing hematological malignancies was proven effective in increasing NP knowledge of hematology. Self-efficacy did not change as a result of the module. This project establishes the feasibility of using the module as a learning tool for incoming NPs to help improve hematology knowledge.

The dissertation of Lauren Rose Seipel is approved.

Mary Ann Lewis

Su Yon Jung

Tia Wheatley

Wendie Robbins, Committee Chair

University of California, Los Angeles

2022

This dissertation is dedicated to my incredibly supportive family and my partner in crime and life. None of this would have been possible without your unwavering support. Also to Penny, the best, most supportive and unconditionally loving dog I could ever ask for.

TABLE OF CONTENTS

CHAPTER ONE: INTRODUCTION.....	1
CHAPTER TWO: THEORETICAL FRAMEWORK.....	3
CHAPTER THREE: REVIEW OF LITERATURE.....	5
Synthesis of Literature Review.....	11
CHAPTER FOUR: METHODS.....	12
Sample and Setting.....	12
Instruments.....	14
Intervention.....	15
Procedure.....	16
Analysis.....	16
CHAPTER FIVE: RESULTS.....	17
Strengths.....	24
Limitations.....	24
Ethical Considerations.....	25
Future Implications.....	26
Appendix A: Benner’s novice-to-expert model.....	31
Appendix B: Self-efficacy assessment tool.....	32
Appendix C: Knowledge assessment tool.....	33
Appendix D: Participant feedback survey.....	36
TABLE OF EVIDENCE.....	37

REFERENCES 45

List of Figures and Tables

Figure 1: <i>Comparison of participant knowledge scores</i>	20
Figure 2: <i>Comparison of participant self-efficacy scores</i>	22
Table 1: <i>Participant demographics</i>	18
Table 2: <i>Participant knowledge test scores</i>	21
Table 3: <i>NP pre- and post-test knowledge score percentiles</i>	21
Table 4: <i>Participant self-efficacy scores</i>	23
Table 5: <i>NP pre- and post-test self-efficacy score percentiles</i>	23

ACKNOWLEDGEMENTS

I would like to acknowledge my DNP scholarly project committee chair Dr. Wendie Robbins, thank you so much for your guidance throughout this process! Thank you to my other DNP committee members Dr. Mary Lewis, Dr. Su Yon Jung and Dr. Tia Wheatley for your wisdom and support of my DNP project. I truly could not have done this without all of you. Last but not least, thank you to Dr. Erin Kopp, my mentor and colleague who has been a tremendous pillar of support throughout the course of this program.

CURRICULUM VITAE

Lauren R. Seipel, MSN, RN, PHN, FNP-C, AOCNP

EDUCATION

BS (Health Science)	California State University, Fullerton, CA	2009
MSN	Western University of Health Sciences, Pomona CA Master's Entry and Family Nurse Practitioner Program	2013
DNP	University of California, Los Angeles	Expected 2022

LICENSURE

California	Registered nurse (RN) #: 791726	Exp. 12/31/22
California	Nurse Practitioner (NP) #: 23755	Exp. 12/31/22
California	NP Furnishing #: 23755	Exp. 12/31/22
California	Public Health Nurse (PHN) #: 79955	Exp. 12/31/22
Drug Enforcement Administration	DEA #: MS3757296	Exp. 2/28/25

BOARD CERTIFICATIONS

Family nurse practitioner (FNP-C)	American Academy of Nurse Practitioners (AANP) F1013602	Exp. 10/31/23
Advanced Oncology Certified Nurse Practitioner (AOCNP)	Oncology Nursing Certification Corporation (ONCC) 751129	Exp. 12/31/24

PROFESSIONAL EXPERIENCE

8/2011-1/2014	White Memorial Medical Center, Los Angeles, CA	Registered Nurse, Labor and Delivery
10/2013-11/2015	Johnathan Azizzadeh, MD., Inc., Los Angeles, CA	Nurse practitioner, Obstetrics and Gynecology
1/2014-12/2015	Planned Parenthood of Pasadena and San Gabriel Valley, Pasadena, CA	Nurse practitioner, Women's Health

1/2016-9/2019	AltaMed Health Sciences, Los Angeles, CA	Nurse practitioner, Family Practice
9/2019-present	City of Hope National Medical Center, Duarte, CA	Nurse practitioner, Hematology and Hematopoietic Cell Transplant

HONORS

2010- Inducted into Sigma Theta Tau International

Dec. 2020- Recipient of the UCLA Doctor of Nursing Practice Scholarship

Jan. 2022- Recipient of Gorman Family Centennial Nursing Scholarship

PROFESSIONAL ORGANIZATIONS

Member of AANP, Oncology Nursing Society (ONS), Advanced Practitioner Society for Hematology and Oncology and Sigma Theta Tau International

PRESENTATIONS

Invited Guest Lectures – UCLA Health, Department of Nursing

5/5/21	N214: Advanced Concepts in Oncology Nursing for APNs. Instructor: Dr. Cecilio Cay	Guest lecturer, topic: multiple myeloma
--------	-----------------------------------------------------------------------------------	-----------------------------------------

CHAPTERS

1	Advanced Oncology Nursing Certification Review and Resource Manual (3 rd edition) Published by and in collaboration with ONS. Contributed content on cancer imaging modalities in <i>Chapter 3: Cancer Diagnosis and Staging</i> . Submitted April 2021, pending press
---	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

SCHOLARLY WORKS

In progress	Exploring the impact of a hematology education module in NP orientation on knowledge and self-efficacy of hematology nurse practitioners. DNP Scholarly Project, UCLA School of Nursing Chair: Dr. Wendie Robbins; Committee members: Dr. Mary A. Lewis, Dr. Su Yon Jung and Dr. Tia Wheatley
-------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CHAPTER ONE: INTRODUCTION

Hematology is an extremely specialized focus of healthcare in desperate need of support from nurse practitioners (NP). In 2022, it is estimated that there will be more than 1.9 million new cancer diagnoses in the United States. Of these cases, an estimated 184,000, or 9.7%, are hematologic malignancies, including leukemia and lymphoma (American Cancer Society, 2022). As of 2018, there are approximately 270,000 practicing NPs in the United States, and an estimated 3,600 to 4,800 of them work in hematology/oncology (Coombs et al., 2020). Given this data, it is apparent that a greater number of NPs will be needed to fulfill the advanced practice nursing role for cancer care. A barrier to meeting this demand lies in the fact that many NPs lack sufficient hematology knowledge, thus making it difficult for them to transition into specialty practice. Specifically, a dearth of oncology-specific education is provided to NPs both in their professional licensure program and workplace orientation/onboarding. A needs assessment conducted by Hwa and colleagues (2019) found that 90% of NP respondents felt unprepared to practice in hematology and bone marrow transplant (BMT) with the education received in graduate school. It was also noted that approximately 57% of them reported that their professional programs' curricula contained less than five percent hematology-related content. Rosenzweig et al. (2012) also report a need for more oncology training on the job in the first year of practice, which was identified from a web-based assessment. The survey of 610 self-reported oncology nurse practitioners (ONP), found that ONPs described themselves as "not at all prepared" or "somewhat prepared" in chemotherapy regimens (78% of respondents), recognition and management of oncologic emergencies (70% of respondents) and detection and management of drug-related toxicities (61% of respondents). These data demonstrate that NPs require more knowledge about hematology/oncology-specific care upon entry into practice. However, many healthcare institutions have limited orientation programs for new NPs (Bush & Lowery, 2016).

Thus, NPs new to hematology report feelings of inadequacy, anxiety, stress and insecurity (Rosenzweig et al., 2012; Schofield & McComiskey, 2015).

Consistent with the published literature, a knowledge deficit was also identified within the advanced practice provider (APP) hematology department of a local National Cancer Institute (NCI)-designated tertiary comprehensive cancer care center. This institution is where the proposed DNP scholarly project will be implemented. To better identify learning needs among newly hired NPs at this institution, a preliminary informal needs assessment was conducted. All six of the respondents in this assessment reported that they would have liked to receive education on specific hematologic diseases, chemotherapy regimens, CAR-T cellular therapy, immunotherapies, oncologic emergencies and time with a preceptor during orientation. Of these topics, information on chemotherapy regimens and disease-specific content received the most responses. These findings, and those illuminated from the published literature, confirm NPs want and need more hematology education to enrich their practice.

The scientific underpinnings of nursing are responsible for shaping it into the discipline and profession that it is today. Zacagnini and White (2017) state that the scientific underpinnings are adopted from the knowledge that nurses acquire from basic sciences such as biology, physiology, zoology, mathematics, chemistry and physics. Advanced nursing practice is also believed to be founded from these same elements (Butts & Rich, 2018). This interpretation suggests that nurses are responsible for molding the foundation that guides their practice. Therefore, addressing learning needs of hematology NPs would expand their hematology knowledge base and strengthen the very foundation that helps define nursing and enhance its role in the hematology specialty. Given the above findings, the clinical inquiry for this DNP scholarly project is: For hematology nurse practitioners hired in the hematology department within the past

18 months **(P)**, will the implementation of a hematology education module in conjunction with current learning practices of self-study, shadowing and preceptorship **(I)**, as compared to no additional hematology education module **(C)**, increase nurse practitioners' overall level of hematology knowledge and perceived level of self-efficacy to practice as a hematology provider **(O)**, within three months of receiving the intervention **(T)**?

CHAPTER TWO: THEORETICAL FRAMEWORK

Professional development and knowledge acquisition are at the heart of Patricia Benner's novice-to-expert model. In this model, Benner (1982) draws upon Dreyfus's model of skill acquisition to identify the processes that take place in the professional development of nurses. Benner posits that nurses move through five levels of proficiency in their professional development, which came from Dreyfus's model. These levels include novice, advanced beginner, competent, proficient and expert (Benner, 1982) (See Appendix A). As nurses move through each of these levels, three types of movement are occurring and contributing to the nurse's progression: 1. Movement from a reliance on abstract principles to experiences that help guide nursing practice, 2. Movement from seeing all pieces of a scenario as being of equal importance to seeing the big picture with a varying degree of important pieces and 3. Movement from the "detached observer" to the "engaged doer" (Butts and Rich, 2018).

In each of the movements described above, the nurse begins as a "novice" and then transitions through each competence level until they have become an "expert," thereby demonstrating mastery in the specific skill or knowledge that was learned. Movement between these levels, according to Benner, is not one-directional, and there is no beginning or end to them (Butts and Rich, 2018). Rather, the nurse can move in and out of a competency level depending on the clinical or patient situation they are in. In addition to the five levels of nursing practice, Benner also identified expert competencies that are classified into seven domains of nursing

practice. These included the helping role, the teaching/coaching function, the diagnostic/patient-monitoring function, effective management of a rapidly changing situation, administering and monitoring therapeutic interventions and regimens, monitoring, and ensuring the quality of healthcare practices and organizational/work-role competencies (Benner, 1984). Collectively, Benner's contributions to nursing theory have paved the way for nursing practice and how nurses acquire knowledge at educational and practice levels.

Application of Benner's Model

Given the lack of hematology education provided during NP education and training, most hematology NPs are viewed as novices to the specialty when they are hired into their roles. Utilizing a conceptual framework like Benner's novice-to-expert model would be extremely beneficial in the acquisition of skills and knowledge pertinent to hematology practice. Novices, according to Benner, have no experience in the role they assume and typically do not have the ability to use discretionary judgment in the healthcare setting (Benner, 1982). In addition to providing clinical case scenarios and foundational hematology education, utilizing preceptorship to teach new NP's has proven helpful. Alencar et al. (2018) proposed that Benner's model is the foundation of preceptorship, as it permits NP's new to specialty practice to progressively expand their knowledge and skillset in the new specialty. Alencar integrated preceptorship into a new NP fellowship that she and her colleagues created and implemented at a healthcare institution in Southern Florida. At the time the article was published, the fellowship was still in its first year. However, anecdotal reports from a fellow who participated in the program suggested that the fellowship's format fostered professional growth and development (Thomassen, 2018).

Hoffmann et al. (2018) proposed an alternative approach to hematology knowledge acquisition with the development of an online oncology learning workshop. This intervention

combined elements of online information modules with clinical mentoring. As the participants were working through each of the five online modules in the workshop, they were concurrently working with a mentor in the clinical setting, permitting them to apply their online learnings to practice (Hoffmann et al., 2018). The ability for NPs in this study to build upon knowledge as they progressed through the online portion of the program is illustrative of the movements that the NP can make between each of Benner's competencies. Utilizing a format of this nature would help provide structure for how NPs entering the hematology specialty are acquiring and applying hematology knowledge to practice. As the NP continues to amass more experience in the hematology field, they will continue to progress through Benner's five levels and eventually become seasoned experts in hematology.

CHAPTER THREE: REVIEW OF LITERATURE

A review of the literature was conducted to better understand current hematology training methods and identify learning gaps that exist among hematology NPs. Factors that contribute to NP knowledge acquisition, self-efficacy, role transition and onboarding experience were also explored in this review. A PRISMA stepwise approach was used to locate and select articles. Search terms used included *oncology, training, onboarding, role transition, hematology, knowledge, nurse practitioner* and *self-efficacy*. Articles selected for further review came from PubMed (870 articles), Google scholar (2,100 articles) and CINHAL (353 articles) databases. Membership to the Oncology Nursing Society (ONS) and American Academy of Nurse Practitioners (AANP) also permitted access to relevant articles that were also considered for review. Since this review began in October 2020, items published from 2014 to late-2020 were included in the search. A PRISMA stepwise approach was used to narrow down findings and select articles that are the most relevant to the PICOT question. Each article's rigor was evaluated based on the criteria included in the PRISMA checklist. Articles were chosen for

review based on how well they met the PRISMA criteria. The literature review ultimately elucidated several common themes, which are as follows.

NP unpreparedness to practice in hematology

Rosenzweig et al. (2012) conducted a descriptive study to identify the educational needs of ONPs during their first year of practice. A needs assessment survey was completed by 104 ONPs. Of the 104 respondents, significant findings were noted in their report of feeling unprepared in areas of oncology-specific procedures, chemotherapy-related competencies and knowledge of basic foundational oncology (Rosenzweig et al., 2012). The findings of this study offer pertinent subject areas of interest to ONPs, and give insight into specific oncology topics that NPs identify as knowledge deficits. However, the educational background and orientation experience of each respondent could potentiate bias and therefore create a limitation to the results of the needs assessment (Rosenzweig et al., 2012). Furthermore, the needs assessment instrument was not validated, posing a threat to the generalizability of the data.

The need for hematology education upon entry into practice was also evaluated by Hwa et al. (2019). This research focused on the implementation of a hematology-based curriculum for NP fellows and asked the question of whether or not APPs self-identified a need for hematology and BMT education prior to practice. A web-based needs assessment created by the Hwa et al. was conducted with 68 APPs across three Mayo Clinic sites in three different states to collect information. Significant findings included the majority of the 68 participants reporting that their formal education contained less than 5% of hematology content across the curriculum, and 90% of them felt unprepared for practice upon completion of their graduate programs (Hwa et al., 2019). Retrospective methods were also used to analyze employment data during the study period. While this data is helpful in understanding turnover rates, the study did not explore this

further, which presents a potential limitation to the findings. Additional limitations include the small sample size, and the fact that the sample came from within the same institution. Thus, it might be difficult to assert that the same educational needs exist across multiple cancer care institutions. However, Hwa's study confirms a need for hematology education, and mirrors the observations made in the preliminary unpublished data collected for this DNP scholarly project which guided formulation of the PICOT question.

Methods of disseminating hematology knowledge

Hoffman et al. (2018) presented an alternative orientation method that used a web-based modular approach to educate new hires. Over 100 NP/mentor dyads across 27 states were recruited for this study and went through a five-module education intervention that presented such topics as how to conduct new patient visits and how to interpret bone marrow pathology. A pre-/post-test questionnaire developed by the study's investigators was used to measure level of knowledge before and after completion of the web-based education. Statistical significance was noted in the level of confidence and competence NPs reported upon completion of the program; NP mentors also affirmed that the participants were competent for practice upon completion (Hoffman et al., 2018). The significance of these findings demonstrates another potential approach that could be utilized for the PICOT population identified. The larger sample size and methods of sample collection also support the strengths of this study. In addition, the web-based module was funded by the renowned National Cancer Institute and used evidence-based practice as its foundation, strengthening the material as accurate and valid. One potential limitation would be the ability to tailor a program of this nature to different practice specialties, though the authors are confident that this could be accomplished (Hoffman et al., 2018).

An alternative approach to hematology education was proposed by Martina et al. (2016). This study highlighted the implementation of a malignant hematology workshop during orientation of registered nurses (RN) entering the oncology specialty. The course, titled Malignant Hematology 101, consists of eight learning modules that include disease-specific information about leukemia, lymphoma, multiple myeloma and other hematological abnormalities. All incoming nurses were expected to complete the Malignant Hematology 101 course within 12 weeks of hire as part of their training; the workshop was given three times over a period of three months, with 28 nurses completing the workshop. A pre-/post-test design was used to assess knowledge of participants. The authors created online knowledge assessments that participants filled out after every two learning modules they completed. Of these participants, 24 strongly agreed that their knowledge of hematological malignancies improved after receiving the intervention. Additionally, participants reported that the information provided in the workshop was helpful in improving their foundation of hematology knowledge (Martina et al., 2016). These findings support the idea that disease-specific information can increase hematology knowledge among new-hire providers. However, the small number of participants and focus on RNs threatens the generalizability of findings and subsequent applicability of the intervention to NPs.

Role of orientation in knowledge acquisition

In addition to educational needs, there is a plethora of research available that addresses the importance of a proper orientation for NPs transitioning into practice. Barnes (2015) conducted a cross-sectional, descriptive study in an effort to explore the relationship between the NP's transition into practice (the dependent variable) and the NP's perception of their experience. Meleis's Transitions Theory was used as the framework for this study, and data was

collected using the Nurse Practitioner Role Transition Scale (NPRTS), a Likert-scale formatted survey. Data analysis identified a statistically significant, positive correlation between having a positive role transition experience and receiving a formal orientation. It was also found that prior experience as a registered nurse had no impact on role transition (Barnes, 2015). This data is helpful to the PICOT question presented in this current DNP scholarly project as it supports how integral a proper orientation is for new hire NPs. However, Barnes' study has limitations, given that the sample was a convenience sample and did not include all practicing NPs (Barnes, 2015).

Langley et al. (2018) had the belief that a "strong" orientation would help develop the specialized skills necessary to the NP entering specialty care. Their study focused on the implementation of a three-phase orientation process for new-hire APPs in the neurocritical care setting; it consisted of learning how to triage patients, fundamentals of critical care, and care of special critical care populations, provided to three NPs and one physician assistant (PA) over a period of six months (Langley et al., 2018). Knowledge checks were developed by the investigators and given to participants at the end of each phase with a passing requirement. These strategies, coupled with mentorship by an experienced APP, led to the finding that the NPs and PA who completed this orientation demonstrated competence in critical care and were able to provide effective care. However, these findings are limited because only three NPs and one PA participated in the orientation. This article was selected for review because it highlights the effectiveness of a more structured orientation in specialty care. However, it is uncertain if a structured three-phase program like this could translate to a hematological setting. The institution of focus for the proposed DNP scholarly project does not currently have the staffing or bandwidth for a program of this nature. Current hiring practices and staff shortages may also interfere with implementing this program successfully. Lastly, the content in the orientation

program was also not validated, and measurement of the participants knowledge gained after orientation was not included in this study (Langley et al., 2018).

NP role transition

The role transition experience for an NP can be both exciting and frightening. There is a wealth of literature that discusses contributing factors to an NP's role transition in practice. Hart and Bowen (2016), for one, explored NP preparedness and readiness to transition into practice. The authors distributed a web-based survey that was completed by 698 MSN-prepared, licensed NPs. Questions were aimed at assessing the strengths/weaknesses of the participants' first year of practice, perceived preparedness to practice after completion of a NP program, and participant interest in post-graduate NP training programs. Analysis of findings was conducted using SPSS statistical software. Forty-eight percent of the participants were found to feel "somewhat prepared" for practice upon completion of their NP schooling. Furthermore, participants felt they needed more training upon hire to a new job. Mentorship and a formal orientation were also identified as crucial factors that influence a successful role transition experience for the NP (Hart & Bowen, 2016). Data analysis found statistical significance (Cronbach alpha of 0.91 and 0.80) for themes of *satisfaction with support* and *feelings of preparedness*, respectively. Results provide insight into training needs of NPs and identify factors that would contribute to a more favorable role transition. However, there was a four-year delay between when this study was conducted and when it was published. This could potentially affect the external validity and applicability of results to more recent NP graduates; training practices could have improved, and training needs of NP graduates may have changed by the time this article was published (Hart & Bowen, 2016).

Faraz (2019) also explored factors that contribute to a successful role transition for the NP. Convenience sampling was used to recruit novice NPs who were at least 18 years old and currently working in the primary care setting for three to 12 months. The survey was distributed online to participants and included quantitative and qualitative components.; 207 surveys were completed and 177 of those met the eligibility criteria for analysis. Quantitative data was analyzed with SPSS statistical software, and qualitative data was analyzed using the Krippendorff content analysis method. Facilitators of a positive role transition included mentorship, autonomy and learning opportunities on the job. Barriers to role transition extracted from the data collected included a lack of respect and support from peers, role ambiguity and employee compensation (Faraz, 2019). The findings of this study offer a deeper understanding of contributing factors to an NP's role transition and give insight on ways in which the NP role transition can be optimized. However, the statistical significance of this study's results is not discussed in the article, rendering it difficult to know the relevance of its findings. In addition, the study was limited to only NPs practicing in primary care, which may affect the applicability of results to NPs working in a specialty setting such as hematology (Faraz, 2019).

Synthesis of Literature Review

It is evident from the literature that a hematology education intervention has the capacity to improve NP knowledge, readiness for practice and facilitate a successful role transition into the specialty. Many NPs who are new to hematology report their advanced practice programs did not include a sufficient amount of hematology education (Hwa et al., 2019). As a result, additional education in subject-specific areas like general oncology and oncological procedures has been identified as a need among many hematology NPs (Rosenzweig et al., 2012). The literature supports online learning modules, lecture and shadowing as effective methods of NP

education. Formal job training upon hire and structured orientations also play an integral role in NP knowledge acquisition and competence development. Receiving a formal orientation is shown to improve the NP's perceived level of readiness to practice, and is proven to foster a smooth role transition for the newly-hired NP (Hart & Bowen, 2016). Lastly, the literature suggests that opportunities for learning on the job contribute to a favorable NP role transition. Current evidence-based recommendations propose elements of job learning, a formal orientation, and mentorship/preceptorship as modalities that facilitate a positive role transition for the NP. However, the strength of the relationship between education, orientation and role transition makes it difficult to deduce which of these variables, if any, plays a more prominent role in knowledge acquisition for NPs. The time constraints set forth by the DNP scholarly project do not permit enough time to explore this relationship, although it would be helpful to do so. Therefore, additional research is necessary to clarify which of these factors would maximize learning for NPs in specialty settings. This DNP scholarly project is a great place to start developing an understanding of this, with the hope that its findings will drive further research to clarify the relationship among these variables.

CHAPTER FOUR: METHODS

Sample and Setting

The sample for this project consisted of NPs who work in the hematology department at a large comprehensive cancer center in Los Angeles County, California. The NPs within this institution are board-certified in family practice, adult-gerontology or acute care, and the majority of them do not have hematology or oncology nursing or NP experience upon hire. Inclusion criteria for participants were as follows: holds a current license as a NP, NP board-certified in family practice, adult/gerontology or adult/gerontology/acute care with a hire date at the medical center that falls within 18 months of the start date of the implementation

period. Eighteen months was chosen because it aligns with Benner's model, which posits that nursing competence is typically achieved in the first two years of practice (Benner, 2004). Nurse practitioners with a hire date more than 18 months from the date of implementation were excluded. Number of years of NP experience and number of years of prior hematology experience as an RN or NP did not affect eligibility to participate in this project. The decision not to exclude these NPs was made to ensure that a sufficient sample was obtained for this project. Demographic data were also collected at the beginning of implementation to assess the following factors: age, gender, number of months working in the hematology APP department, number of years of RN/NP experience, history of previous hematology experience as an RN/NP, NP certification specialty (e.g. family, acute care, etc.) and type of advanced practice nursing degree (MSN or DNP).

Although sample size is not a requirement for an evidence-based quality initiative, the project lead opted to determine the number of subjects needed for statistically significant results. Sample size for this project was dependent on the current hiring and orientation processes within the institution of focus. Providers are hired to the department on a rolling basis, and orientation times vary throughout this institution. As such, participants who met the eligibility requirements were recruited throughout the course of the DNP scholarly project and received the intervention upon recruitment. A convenience sample size of 12 individuals is predicted from institutional data that indicates the hire date of each hematology NP in the department and is inclusive of those NPs who will have been hired within the past 18 months. In an effort to estimate the sample size needed, G-Power statistical software was utilized. Under the assumption that alpha (α) is 0.05, the probability of a type II error (β) is .20, and the effect size is large (.80), the calculated sample size needed for this project was 12 participants.

Instruments

This DNP scholarly project examined how a hematology education module impacts the level of hematology knowledge and perceived level of self-efficacy of the participants. Each of these variables was measured with assessment tools that were administered to participants at baseline and immediately after completion of the intervention. Participant self-efficacy was measured using the Generalized Self-Efficacy Scale (GSES) (see Appendix B). A valid and reliable tool, the GSES was initially created in 1979 by Schwarzer and Jerusalem and later adapted in 32 languages (Schwarzer, 2014). It was selected for this project based on its use in other studies that measured nursing self-efficacy in relation to education. The tool consists of 10 questions with four responses organized on a Likert scale. The scale is numbered 1-4 and a numeric value is assigned to each response in numerical order (e.g., response option 1= 1 point, response option 2= 2 points, etc.). The total number of points possible is 40, and the higher the score, the higher the level of self-efficacy. Schwarzer (2012) asserts the tool to positively correlate with positive emotions, including work satisfaction and optimism. Negative coefficients obtained from prior studies have linked the GSES to feelings of depression, anxiety, stress and burnout. Cronbach's alpha for this scale ranged between .76 and .90, as measured from study samples spanning 23 countries (Schwarzer, 2012).

Participant knowledge was measured using a knowledge test that was created by the project lead (see Appendix C). The test consists of 11 multiple choice questions and one true/false question that were derived from the content presented in the education intervention. Each question has one correct answer and is worth one point. Correct answers were tallied for each participant and their total number of questions answered correctly before and after the intervention were compared. Research Electronic Data Capture (REDCap) software, a secure

web application for survey distribution, was used to disseminate both assessment tools for this project. This application helped simplify data collection while maintaining the anonymity of participants throughout the course of the project.

Intervention

An education module developed by the project lead acted as the intervention for this scholarly project. The module, titled “Understanding Hematologic Malignancies: Clinical Pearls”, contains educational slides covering the following hematology content: leukemia, lymphoma and multiple myeloma. The content was selected based on hematology NP learning needs identified in the literature and within the hematology APP department at the institution of focus. An informal needs assessment distributed to recently hired hematology NPs in October 2020 affirmed that they desired information about hematological malignancies commonly treated at the institution. Therefore, content included in the module addresses the definition, clinical presentation, diagnosis, and staging of leukemias, lymphoma and multiple myeloma. The module was made accessible to participants in a private Microsoft Teams group that would permit them to access and complete it at their convenience. The information presented in the module was derived from educational references and resources that are well-known and recognized within the oncology community. The Leukemia and Lymphoma Society (LLS) also granted the project lead permission to adapt their educational handouts for the purposes of this project. Educational content was created by the project lead rather than using existing online oncology education materials because they did not contain sufficient content that would meet the specific learning needs of the participant population. The APP department supervisor reviewed and approved the implementation of this project and all of the materials utilized during implementation. Should the

intervention prove successful, the APP manager would like to integrate it into current training practices for newly-hired hematology APPs.

Procedure

This DNP project took place over a period of three months, from late January 2022 to late April 2022. Participant recruitment began immediately at the start of the implementation period. The department supervisor assisted with providing a list of staff members who met the eligibility criteria to participate based on their hire date. Email notices were distributed by the project lead to eligible individuals. Those individuals who agreed to participate then met with the project lead to discuss participation requirements and receive instructions for how to access the surveys and module. Additional meeting times were arranged by the project lead as needed for participants who were recruited after the first day of implementation.

Participants completed the baseline knowledge and self-efficacy surveys after meeting with the project lead. Access to the education module was granted to participants upon completion of the baseline surveys. Participants were then able to review the content in the module at their convenience. Upon completion of the module, each participant completed the same knowledge and self-efficacy surveys they received prior to the intervention to re-measure knowledge and self-efficacy levels.

Analysis

Applying a one-tailed design approach, data analysis was done with a Wilcoxon matched pairs signed rank test, also called a Wilcoxon signed rank test. This test allows the investigator to measure a variable among the same group of subjects in two different conditions; it is similar to the paired samples t-test, but it does not make assumptions about the distribution of data like a t-test does. Non-parametric tests like the Wilcoxon test are preferred for analysis of data obtained

from smaller samples where there may be a greater amount of variance in the data (Scheff, 2016). Given the characteristics of this project and its small sample size, the Wilcoxon matched pairs sign test was employed to compare knowledge and self-efficacy scores obtained before and after the intervention.

Data were compiled and illustrated in tables to demonstrate changes in self-efficacy and knowledge from baseline scores for each participant before and after the intervention. Evaluation of individual items on each of the measurement tools was carried out to provide insight to the results obtained through the Wilcoxon matched pairs sign test. Descriptive data were also collected and tabled for the following topics: number of years in nursing, number of years as an NP, type of NP certification held, length of time in hematology at current institution, prior history of hematology/oncology experience and number of years of hematology/oncology experience, if applicable. Since this project intended to establish the feasibility of a new education module, participants were also asked to fill out a satisfaction survey upon completion of the intervention and posttest surveys (Appendix D). The survey intended to assess what participants thought worked well with the intervention, and gather feedback about how it can be improved. This information will be used to modify the intervention as appropriate, with the intent of ensuring it is a sustainable training resource that can be used in the future. Although the literature highlights a relationship between knowledge acquisition, NP role transition and job satisfaction, this scholarly project's aim was to understand the specific role that education plays in improving NP knowledge and self-efficacy.

CHAPTER FIVE: RESULTS

Demographics

Thirteen subjects were initially recruited to participate in this scholarly project. However, only 11 completed the module and all of the pre- and post-test surveys. The two NPs who did not

complete all of the project’s requirements fell off at different points during implementation; one went on to complete the pretest surveys but did not complete the intervention or posttest surveys, while the other participant did not complete any of the surveys or the intervention. Therefore, the data described is inclusive of the 11 subjects who completed all components of this project (Table 1).

This DNP project’s sample was comprised of 11 hematology NPs who met the eligibility criteria to participate. The majority of participants were female (82%), age 36 years or older (45%) and working in the hematology APP department for less than three months (45%). One subject had five or more years of previous hematology experience as an NP. Seven participants (64%) had prior RN experience in hematology, with four of them reporting five or more years of experience.

Table 1: *Participant demographics*

Sample Characteristics (n=11)	Number	%
Sex		
Male	2	18.2
Female	9	81.2
Age		
Under 25 years	0	0
25-30 years	2	18.2
31-35 years	4	36.4
36 years or older	5	45.4
Length of time working in the hematology APP department		
Less than 3 months	5	45.4
3-6 months	2	18.2
7-12 months	2	18.2
13-18 months	2	18.2
Number of years of NP experience		
Less than 1 year	3	27.3
1-2 years	3	27.3
3-5 years	3	27.3

6-10 years	1	9.1
More than 10 years	1	9.1
History of NP experience in hematology		
Yes	1	9.1
No	10	90.9
If yes, how many years of experience? Applies to n= 1 participant		
Less than 1 year	0	0
1-2 years	0	0
3-5 years	0	0
More than 5 years	1/1	100.00
History of RN experience in hematology		
Yes	7	63.6
No	4	36.4
If yes, how many years of experience? Applies to n=7		
Less than 1 year	0	0
1-2 years	1/7	14.3
3-5 years	2/7	28.6
More than 5 years	4/7	57.1
NP certification specialty		
Family practice	6	54.6
Adult-gerontology	5	45.4
Other	0	0
Type of nursing degree		
MSN	10	90.9
DNP	1	9.1

Knowledge

Knowledge posttest scores increased by an average of two and a half points (20.8%) compared to pretest scores (Table 2). Participants scored a mean of seven out of twelve possible points (59.1 %) on the knowledge pretest and a mean of nine and a half out of twelve possible points (78.8%) on the posttest (Figure 1). Pretest scores ranged from 4 to 10 points with a median score of 7 points. Knowledge scores after the intervention ranged from 4 to 12 points with a median score of 10 points (Table 3). Five participants scored 100% on the knowledge

posttest. Overall, data demonstrate that the intervention correlated to increased knowledge among participants. The calculated Wilcoxon test statistic (W) was 5.5, and statistical significance ($p= 0.025$) was established based on a critical W value of 8 at a 0.05 confidence interval. These findings affirm that NP knowledge increased after receiving the intervention, and that the relationship between NP knowledge and the learning module is statistically significant. The number of correct responses to each test question on the pre- and post-tests was also analyzed using the Wilcoxon signed rank test. Results of this analysis also indicate that posttest scores were higher overall when compared to pretest scores. A p-value of 0.005 was obtained for this finding, reinforcing that a statistically significant relationship exists between the learning module and NP knowledge.

Figure 1: *Comparison of participant knowledge scores*

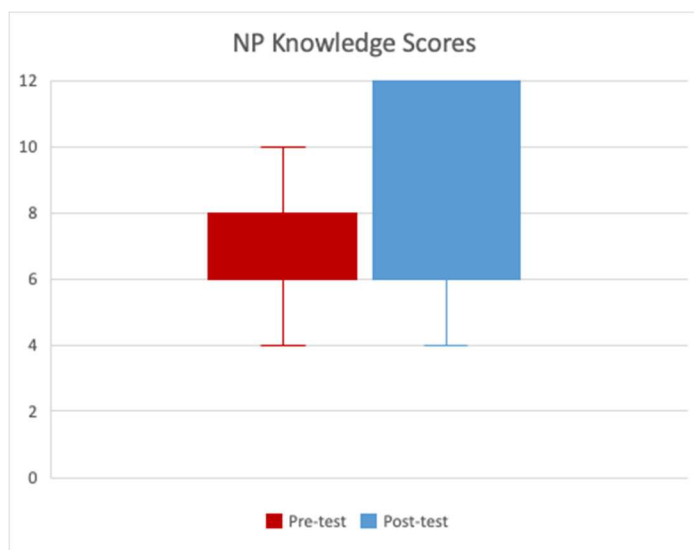


Table 2: *Participant knowledge test scores*

Participant	Pre-Intervention	Post-Intervention
1	6	8
2	7	12
3	8	12
4	6	12
5	10	6
6	9	12
7	6	6
8	7	10
9	7	12
10	8	10
11	4	4
Mean	7.1	9.5
Standard deviation	1.64	2.98

Table 3: *NP pre- and post-test knowledge score percentiles*

	Minimum	25%	50% (median)	75%	Maximum
Pretest	4	6	7	8	10
Posttest	4	7	10	12	12

Self-efficacy

There was not a significant difference between mean self-efficacy pretest and posttest scores (Table 3), with the mean pretest score being 32.6 points and the mean posttest score being 32.3 points (out of 40 possible points) (Figure 2). Interestingly, five of the 11 participants had lower self-efficacy scores after the intervention compared to before the intervention; four of these five individuals had been working in the hematology department between seven and 18 months. Only three participants demonstrated increased self-efficacy on the posttest survey. The remaining three participants had the same self-efficacy score both before and after the intervention. The *W* test statistic for self-efficacy was 13, while the critical *W* value was 5 at a confidence interval of 0.05; the p-value of this finding was .782. Therefore, it cannot be concluded that the intervention had an effect on NP self-efficacy. A sensitivity analysis was also

performed to help determine if the amount of time worked in the hematology department contributed to a lower self-efficacy posttest score, as noted among four of the participants. These participants' scores were excluded and a Wilcoxon signed rank test was performed. In this analysis, the calculated W value was 6 and the critical W value at a 0.05 confidence interval was 0. Therefore, self-efficacy scores among participants were less than or equal to pretest scores. The p-value obtained was 0.392, signifying that self-efficacy was not impacted by the number of months worked in the hematology department.

Figure 2: *Comparison of participant self-efficacy scores*

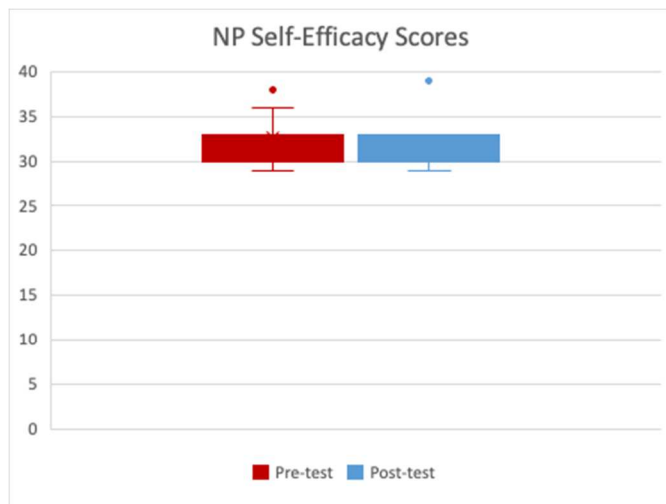


Table 4: Participant self-efficacy scores

Participant	Pre-Intervention	Post-Intervention
1	33	39
2	33	33
3	31	30
4	29	30
5	33	33
6	36	31
7	30	29
8	33	31
9	33	30
10	38	39
11	30	30
Mean	32.6	32.3
Standard Deviation	2.66	1.07

Table 5: NP pre- and post-test self-efficacy score percentiles

	Minimum	25%	50%	75%	Maximum
Pretest	29	30	33	33	38
Posttest	29	30	31	33	39

Participant feedback

Participant feedback was collected in an effort to assess the strengths and weaknesses of the intervention (see Appendix D). All 11 participants either “*strongly agreed*” (54.5%) or “*agreed*” (45.5%) that the learning module was helpful to their practice. Subjects also “*agreed*” (54.5%) or “*strongly agreed*” (45.5%) that the module gave them a greater understanding of the most commonly seen and treated hematological malignancies in their work setting. Eight of the participants (72.3%) also “*strongly agreed*” that they learned something new about hematology. Seven NPs “*strongly agreed*” that the intervention should be integrated into the institution’s orientation for incoming hematology NPs. While all participants found this intervention to be helpful, there were also suggestions for how to improve the module. These include: adding content about other hematologic disease states like myelodysplastic syndrome (MDS), first-line treatments for each condition and information about hematopoietic cell transplant (HCT).

Additionally, three participants suggested that the module be presented either in person or with audio commentary on each slide to help enhance the learning experience.

CHAPTER SIX: DISCUSSION

Strengths

This DNP scholarly project assessed the feasibility of employing a novel education module to improve knowledge and self-efficacy of hematology NPs. Data reveal a positive relationship between the module and NP knowledge, suggesting that the intervention was effective in improving hematology knowledge of the participants. Statistical significance was also established for knowledge, further strengthening this relationship. In addition, participant feedback affirmed that the intervention: 1. was helpful to NP practice, 2. imparted new hematology knowledge on NPs and 3. increased NP understanding of commonly treated hematological malignancies.

Limitations

There are limitations to this DNP scholarly project. For one, convenience sampling does not guarantee a diverse study population. This can threaten the external validity of the results to the general population. In addition, using a single-group pretest/posttest design can make the sample more susceptible to producing results that are from repeated testing rather than the intervention itself (Melnyk & Morrison-Beedy, 2019). This could affect the internal validity of the results and make it difficult to confidently conclude there is a significant relationship between the variables being measured. Going into implementation of this project, there was also concern that each participant's previous work experience could affect the results that are obtained. Four of the seven participants who had prior RN experience in hematology did have a perfect posttest score for knowledge. Additionally, two of the participants with prior RN

experience and a perfect posttest score were also certified adult gerontology-acute care NPs. As a result, they may have received more hematology content in their NP programs, which may have contributed to the perfect posttest scores. Time constraints and sample size may have also limited this project. The three-month implementation period for this project may have contributed to the small sample of participants that was captured. In addition, participant retention was also an unforeseen challenge that ultimately impacted the sample size and statistical significance of results. Participant enrollment occurred throughout the course of the three-month implementation period, which may have affected the amount of time each individual had to review the intervention and take the post-tests. Each of the participants' individual daily workloads may also have limited the time they had to review the module thoroughly. In the future, it may be helpful to present the module in person, which would ensure that all participants receive the information in the same amount of time. The short implementation window for this project may also have contributed to lower knowledge and self-efficacy scores that were seen on the posttest surveys. Measurement of self-efficacy immediately after presenting the module and again at a later time may help capture more accurate results. It would be helpful to investigate each of these factors in greater depth so that the education module and its implementation can be optimized to improve knowledge and self-efficacy outcomes in the future. A post-intervention debriefing session with the participants is one approach that may be taken. Lastly, content validation of the module and knowledge test by an education specialist is another consideration to help improve learning outcomes in the future.

Ethical Considerations

An educational intervention to improve hematology knowledge would benefit patients, NPs and the organization. Van Dusseldorp et al. (2018) found that patients perceive oncology

NPs as empathetic human beings who provide expert care and cure to their patients. In another study by McDonnell et al. (2014), patients viewed NPs as knowledgeable, skilled providers whose involvement in patient care contributed to rapid recognition and prompt care of deteriorating patients. Nurse practitioner-led patient care in the acute care setting is also shown to decrease patient hospital length of stay, decrease mortality rates, improve time-to-treatment for patients and reduce costs associated with patient care. Favorable outcomes of this caliber are founded on NP knowledge of their practice specialty. Although NP knowledge increased overall after completing the learning module, some individual knowledge posttest scores were lower than the pretest scores. Remediation for participants who had lower posttest knowledge scores can be provided to help achieve competency in the content of the module.

To ensure the safety and protection of participants, this DNP project's design and methods were reviewed by the Institutional Review Board (IRB) to determine if their approval was needed to proceed with implementation. In addition, a secure software program was used to access the assessment tools and store the data collected for this project; this also helped maintain the anonymity of participants.

Future Implications

There are opportunities for application of the education module beyond the confines of this scholarly project. The literature supports that foundational hematology education provided during orientation improves nursing knowledge (Martina et al., 2016). This QI effort established that the learning module was capable of increasing NP knowledge; statistical significance of this finding further strengthens the relationship between knowledge and the intervention. Therefore, results help establish the feasibility of adding a learning module to NP training. Moving forward, there are opportunities to expand this module further by adding additional hematology content

based on participant feedback from this project. This module may also be used as a template to develop additional education modules that cover an array of hematology topics that will ultimately help enhance knowledge during NP training.

However, gaps in NP training and preparedness to practice still exist beyond this project. Although this learning module can help instill knowledge in NPs, extensive training is still needed to prepare NPs for practice. Structured NP training programs are not only recognized as facilitators of a favorable NP role transition experience and job satisfaction, but are deemed an essential component of the NP role transition process itself (Bush & Lowery, 2016; Faraz, 2019; Urbanowicz, 2019). Furthermore, the literature affirms that a multi-modal learning approach using online education, preceptorship and mentorship improves knowledge and self-efficacy of NPs (Hoffman et al., 2018; Rambod et al., 2018). Therefore, the development of an extensive NP training program within the institution of focus would be an ideal next step in preparing novice hematology NPs for practice. Key stakeholders in this project have recently expressed an interest in developing and studying the impact of a comprehensive NP residency containing all of these elements, and hope to integrate this project's education module into the learning curriculum. The opportunity to examine the effect of a hematology NP residency program of this nature would help provide a better understanding of how the education module contributes to NP role transition.

Self-efficacy has also been identified in the literature as a contributor to favorable workplace learning and role transition experiences (Grosemans et al., 2020). Although NP self-efficacy remained the same in this project, it could be helpful to explore contributing factors so that education during onboarding may be optimized while ensuring that new NPs have increased self-efficacy. Should the NP residency program prove successful, it would have positive

implications for the NP and the institution. Not only would NP role transition and job satisfaction improve, but it would improve employee turnover and retention rates, and reduce costs associated with hiring and training of new-hires that are incurred by the institution (Aufferman, 2020).

An NP residency program would also provide opportunities for continued measurement of NP knowledge and self-efficacy over an extended period of time. The majority of participants in this scholarly project were hired within three months of the implementation period, and were considered novices to hematology. Benner's novice-to-expert model highlights that nursing competence is not achieved until 2-3 years after entry into practice (Benner, 2004). Therefore, lifelong learning opportunities for NPs are essential to ensure that knowledge acquisition and competency development are ongoing. Measurement of NP knowledge and self-efficacy throughout a comprehensive training program would ensure that learning objectives are met and that NPs are developing competence as hematology providers. The implementation of an NP residency program is an ideal next step to achieve this aim.

CONCLUSION

Hematology is a challenging yet rewarding specialty in need of NPs. A need for more hematology education has been identified in the literature and within the hematology APP department at a local NCI-designated comprehensive cancer center. A hematology education module containing disease-specific information was proposed as a solution to help meet this need. The intervention for this DNP project sought to improve hematology NP knowledge and self-efficacy to practice. Although self-efficacy scores were essentially the same after completing the learning module, the participants did demonstrate increased knowledge of hematological malignancies. Furthermore, a statistically significant relationship between the learning module

and knowledge was established. As a result, it is hoped that this project's outcomes will contribute to current research efforts that aim to improve hematology knowledge acquisition and self-efficacy for novice hematology NPs. Although this cannot completely close the knowledge gap that currently exists within the hematology specialty, it is a promising start with great potential to produce more competent and confident NPs. Furthermore, integrating this module into onboarding practices can improve the role transition experience and job satisfaction of future NPs who join the organization.

APPENDICES

Appendix A: Benner's novice-to-expert model

Novice	Advanced Beginner	Competent	Proficient	Expert
<ul style="list-style-type: none">•No experience with tasks expected to perform as part of job role	<ul style="list-style-type: none">•Actively searches for information to help advance practice•Situations are viewed as complex•Observes colleagues actions for learning•Seeks feedback from others	<ul style="list-style-type: none">•Usually begins at 2-3 year mark•Uses colleagues' actions to learn•Starts setting long-term goals	<ul style="list-style-type: none">•Transitional time between competence and expert•Views situations as a whole•Synthesizes the meaning of situations	<ul style="list-style-type: none">•Integrates own understanding of a situation into their response/action•Adopts a holistic approach to care



Appendix B: Self-efficacy assessment tool

Generalized Self-Efficacy Scale

	Not at all true	Hardly true	Moderately true	Exactly true
1. I can always manage to solve difficult problems if I try hard enough.				
2. If someone opposes me, I can find the means and ways to get what I want.				
3. It is easy for me to stick to my aims and accomplish my goals.				
4. I am confident that I could deal efficiently with unexpected events.				
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.				
6. I can solve most problems if I invest the necessary effort.				
7. I can remain calm when facing difficulties because I can rely on my coping abilities.				
8. When I am confronted with a problem, I can usually find several solutions.				
9. If I am in trouble, I can usually think of a solution.				
10. I can usually handle whatever comes my way.				

Note: Adapted from Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio*. Causal and control beliefs (pp. 35- 37). Windsor, England: NFER-NELSON.

Appendix C: Knowledge assessment tool

Understanding Hematological Malignancies: Knowledge assessment

Section 1: Leukemia

1. A diagnosis of acute myeloid leukemia (AML) is given based on what percentage of myeloblasts (“blasts”) found in the peripheral blood or bone marrow?

- A. 10%
- B. 15%
- C. 20%**
- D. 30%

2. A patient presents with complaint of fevers and fatigue. His lab work shows a low hemoglobin, platelet count of 100,000 and 18% myeloblasts in the bone marrow. You determine he has chronic myeloid leukemia (CML). What phase of CML is this patient in at the time of diagnosis?

- A. Chronic phase
- B. Accelerated phase**
- C. Blast phase

3. You have a 55 y/o male patient who is newly diagnosed with chronic lymphocytic leukemia (CLL) and you want to stage him using the Binet Staging System. On his CBC, you note that his hemoglobin is 11.4 g/dL and platelets are 125,000 μ L. On exam, you do not note any lymphadenopathy. What stage is this patient’s CLL in based on these findings?

- A. Stage A**
- B. Stage B
- C. Stage C

4. Which type of leukemia is the most common among adults?

- A. Acute myeloid leukemia (AML)
- B. Acute lymphoblastic leukemia (ALL)
- C. Chronic myeloid leukemia (CML)
- D. Chronic lymphocytic leukemia (CLL)**

Section 2: Lymphoma

5. 85% of non-Hodgkin lymphomas (NHL) comprise which subtype?

- A. Natural Killer (NK) cell lymphoma
- B. B cell lymphoma**
- C. T cell lymphoma

6. Which of the following is NOT a “B” symptom associated with lymphoma?

- A. Fever
- B. Unintentional weight loss
- C. Chills**
- D. Night sweats

7. A 46 y/o female presents to the clinic with newly diagnosed classic Hodgkin lymphoma (HL). You note the following results on her labs:

CBC with differential:

- Total white blood cell count: 6,400/mmol
- Absolute lymphocyte count: 500/mmol
- Hemoglobin: 9 g/dL
- Platelets: 140,000

CMP all values within normal limits

Using the International Prognostic Score (IPS) system for HL, what would this patient’s prognosis score be?

- A. 4 points
- B. 3 points**
- C. 5 points
- D. 2 points

8. True or False: The majority of lymphoma cases are Non-Hodgkin lymphoma rather than Hodgkin lymphoma. **True**

Section 3: Multiple Myeloma

9. A 65 y/o female presents to clinic with symptoms of fatigue, weakness and generalized joint pains that have been going on for the past 6 months. You suspect multiple myeloma, and order a full diagnostic work-up on her and obtain the following findings:

CBC/CMP: within normal limits

UA: within normal limits

Skeletal survey: no evidence of bony lesions

Serum protein electrophoresis (SPEP): M-spike of 1.5 g/dL

Bone marrow biopsy: bone marrow with 6% circulating plasma cells

Based on these findings, you determine that this patient has:

- A. Multiple Myeloma
- B. Smoldering myeloma
- C. Monoclonal gammopathy of undetermined significance (MGUS)**

10. Which of the following is NOT considered a myeloma defining event (MDE)?

- A. Anemia
- B. Bony lesions
- C. Free light chain ratio more than 100
- D. Phosphorus elevation**

11. What is the most common type of multiple myeloma?

- A. IgA myeloma
- B. IgG myeloma**
- C. IGM myeloma
- D. Light chain myeloma

12. A 58 y/o male patient is recently diagnosed with multiple myeloma. On labs, his beta-2 microglobulin is 6 mg/L and his lactate dehydrogenase (LDH) is elevated at 300. Using the Revised International Staging System (R-ISS), what stage would this patient's myeloma be in?

- A. Stage I
- B. Stage II
- C. Stage III**

Appendix D: Participant feedback survey

Participant Feedback Survey

Thank you for your participation in this intervention! Your feedback about this education module is greatly appreciated. Please assist by answering the following questions:

- 1. I found the “Understanding Hematologic Malignancies” module helpful to my practice.**

Strongly Disagree-----Disagree-----Neither Agree nor Disagree-----Agree-----Strongly Agree

- 2. I feel that the “Understanding Hematologic Malignancies” module helped me better understand the main hematologic cancers that I see in practice.**

Strongly Disagree-----Disagree-----Neither Agree nor Disagree-----Agree-----Strongly Agree

- 3. I think that new nurse practitioners would benefit from taking the “Understanding Hematologic Malignancies” module during their orientation/training.**

Strongly Disagree-----Disagree-----Neither Agree nor Disagree-----Agree-----Strongly Agree

- 4. I learned something new from taking this module.**

Strongly Disagree-----Disagree-----Neither Agree nor Disagree-----Agree-----Strongly Agree

- 5. What did you like about this module?**

- 6. How could this module be improved?**

- 7. Is there anything you would have liked to see in the module that was not included?**

TABLE OF EVIDENCE

Author, Year, Date, Publication	Purpose	Sample & Setting	Methods, Design, Interventions and Measures	Results	Discussion, Interpretation, Limitation of Findings
<p>Barnes, H. (2015). Exploring the factors that influence nurse practitioner role transition. <i>The Journal for Nurse Practitioners</i>, 11(2), 178-183. http://dx.doi.org/10.1016/j.nurpra.2014.11.004</p>	<p>To identify whether or not a relationship exists between role transition to NP, receiving a formal orientation, and number of years of previous work experience.</p>	<p><u>Sample:</u> Convenience sample of 352 participants taken from an NP conference.</p> <p><u>Inclusion criteria:</u> practice directly in patient care in the US, hold a graduate degree for NP practice, speak/read English, working at least 6 months as an NP.</p> <p><u>Demo:</u></p> <ul style="list-style-type: none"> • Primarily female, white, mean age of 47 years. • 6 mos- 23 yrs experience. • 86.6% had MSN as highest degree. • Mainly family practice certified. <p><u>Setting:</u> NP conference.</p>	<p><u>Design:</u></p> <ul style="list-style-type: none"> • Descriptive, cross-sectional survey. <p><u>Methods:</u></p> <ul style="list-style-type: none"> • Participants recruited through flyers and posters provided at NP conference. • A 16-item, 5-point Likert-scale survey Nurse Practitioner Role Transition Scale (NPRTS) was distributed to participants. • Multiple regression analysis performed. <p><u>Variables studied:</u> prior RN experience and formal orientation affecting NP role transition.</p>	<p><u>Results:</u></p> <ul style="list-style-type: none"> • Formal orientation strongly correlated with positive transition into NP role ($r=.29$, $P<.001$). • Moderate transition experience based on mean NPRTS score of 48.9. <p>No significant relationship between role transition and RN experience.</p>	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Large sample • NPRTS tool valid/reliable. • Significant findings noted (strong p-value). <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Focus on RN-NP transition. • Conflicting literature about experience and effect on role transition. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • Could not assess causal relationships among variables. • Role transition measured at one point vs. multiple points. • Results may not be accurate for participants w/ more years of NP practice.

<p>Faraz, A. (2019). Facilitators and barriers to the novice nurse practitioner workforce transition in primary care. <i>Journal of the American Association of Nurse Practitioners</i>, 31(6), 364-370. https://doi:10.1097/JXX.000000000000158</p>	<p>Identify factors that improve and hinder role transition of novice NPs working in the primary care setting.</p>	<p><u>Sample:</u> Convenience sample of 177 NPs with 3-12 mos experience in primary care. Must be 18 years of age or older.</p> <ul style="list-style-type: none"> • 92.9% female. • Age range between 21 and over 50 years (majority were ages 31-40 years). • 86.4% identified as White or Caucasian, 5.1% identified as Black or African American, 3.4% were Hispanic or Latino, 2.8% were Asian, 1.1% American Indian or Alaska Native, 0.6% Native Hawaiian or other Pacific Islander, and 1.1% other. • 65% of participants were family practice NPs. <p><u>Setting:</u> Primary care specialized NPs.</p>	<p><u>Design:</u> Descriptive, cross-sectional. Survey used.</p> <p><u>Methods:</u></p> <ul style="list-style-type: none"> • Participants recruited via email using CCNE’s social media websites, MSN programs and snowball sampling methods. • Survey containing quantitative and qualitative elements was emailed to all participants who agreed to participate in the study. • SPSS software and the Krippendorff content analysis method were used for analysis of data. <p>Survey name/information not given in article.</p>	<ul style="list-style-type: none"> • 293 surveys started, 207 surveys completed, 177 of completed surveys were analyzed because they met the eligibility criteria. • Influencers of positive transition: work-life balance, meaning of work, mentorship, autonomy and learning opportunities. • Barriers to role transition: a lack of respect and/or support from peers, role ambiguity, a heavy workload, and inadequate compensation. <p>Statistical significance identified with autonomy being the most influential factor in achieving successful role transition.</p>	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Statistical significance in autonomy as a factor influencing. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Quantitative results not generalizable to NPs. • Very few validated results obtained. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • Results may not be applicable to NPs working in other specialties. • Autonomy varied in each state; cannot account for effect size. • Work experience of may influence individual expectations and experiences with role transition. <p>Sampling method made it difficult to control and capture accurate number of respondents.</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Hart, A.M. & Bowen, A. (2016). New nurse practitioners' perceptions of preparedness for and transition into practice. <i>The Journal for Nurse Practitioners</i>, 12(8), 545-852. https://dx.doi.org/10.1016/j.nurpra.2016.04.018</p>	<p>Assess new NPs' perceptions of preparedness to practice and their transition into practice.</p>	<p><u>Sample:</u> 698 MSN-prepared NPs. Eligibility criteria included: graduation from an NP program between 2006 and 2011, licensed to practice as an NP in the United States, practicing as an NP in the United States.</p> <ul style="list-style-type: none"> • 94% of sample was female, average age of 42 years. • 86.5% of participants described themselves as non-Hispanic, 90.2% completed an MSN program for NP, 69.4% were FNP-prepared. 	<p><u>Design:</u> Descriptive study.</p> <p><u>Methods:</u> Convenience sampling; e-vites sent to 51,000 subscribers to Fitzgerald Health Education Associates' with one month follow-up after email.</p> <ul style="list-style-type: none"> • Chi-square and non-parametric analyses. • Themes broken down into two sets of questions that participants answered. • NP preparedness used the same questions in subset one with a "hierarchical agglomerative clustering" approach. • Open-ended responses were analyzed using content analysis. 	<ul style="list-style-type: none"> • Statistical significance w/ "satisfaction w/ support (Cronbach's alpha of 0.91), & "feelings of preparedness", (Cronbach's alpha of 0.80). • 43% NPs felt "somewhat prepared" to practice. • NPs prepared most in assessment, pathophysiology, wellness • Least prepared for chronic problems, complex patients, and diagnostic test skills • 24.3% did not have a mentor in first year of practice. • 58% want to participate in a postgrad NP residency • 90% need postgrad mentor or residency 	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Many findings had statistical significance. • Identifies factors that help/ hinder NP role transition. • Identifies ways in which NP role transition can be optimized. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • 4-year gap between completion and study may impact applicability and external validity of results <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • May not be representative of all NPs. • Results might not be applicable to DNP-prepared nurses. <p><u>Opportunities:</u></p> <ul style="list-style-type: none"> • Study formal mentoring and impact on role transition. <p>Study impact of NP residency programs on NP role transition.</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Hoffmann, R. L., Klein, S., Connolly, M., Rosenzweig, M.Q. (2018). Oncology nurse practitioner web education resource (ONc-PoWER): an evaluation of a web-enhanced education resource for nurse practitioners who are new to cancer care. <i>Journal of Advanced Practice Oncology</i>, 9(1), pp 27-37. https://doi.org/10.6004/jadpro.2018.9.1.2</p>	<p>Describes the implementation and evaluation of an oncology-based web curriculum for new oncology nurse practitioners (ONP) entering practice.</p>	<p><u>Sample:</u> 107 dyads (mentor/new oncology NP (ONP)) recruited, 79 dyads completed the course curriculum and the pre-/post-program evaluations.</p> <ul style="list-style-type: none"> • Participants must be new NP's with less than one year of oncology experience. • Required a designated mentor (NP or PA) to participate in the program. • All but 3 ONPs were female. • 96% were Caucasian. • 72% <1 year NP experience. • Certified in adult-gerontology, FNP or acute care. • Mentors NP, PA or MD/DO. <p><u>Setting:</u></p> <ul style="list-style-type: none"> • ONP's workplace. Dyads were recruited over 27 states. 	<p><u>Design:</u> Prospective study</p> <p><u>Methods:</u> Participants recruited online or by word of mouth</p> <ul style="list-style-type: none"> • Participants were screened then given access to ONc-PoWER program. • Pre-/post-training knowledge evals given to ONP's. • Mentors answer yes/no questions regarding ONP clinical activities. • Knowledge check after each module. • Data collection occurred between 2012 and 2016. <p><u>Measures:</u> Impact of ONc-PoWER on ONP cancer knowledge, mentors measure ONP's ability to apply ONc-PoWER skills to practice. Survey information not given in article.</p>	<ul style="list-style-type: none"> • Statistically significant difference in pre-/post-test data measuring ONP's level of cancer knowledge and confidence in their ability to practice. (p-value=.000). • 93-100% of ONPs were able to successfully complete and perform the skills. • Mentors rated program favorably. 	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Sample is diverse and large in size. • Majority of dyads completed the whole program. • Wide access to ONc-PoWER, makes it more available to ONPs across the country. • Statistically significant findings reported. • Participants found web-based platform effective for learning. <p><u>Opportunities:</u></p> <ul style="list-style-type: none"> • ONc-PoWER should include more content on hematology. • Room for program to be adaptable for PA's who practice in oncology.
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Hwa, Y.L., Marshall, A.L., Shelly, J.L., Colborn, L.K., Nowakowski, G.S., Lacy, M.Q. (2019). Assessment of the need for a hematology-specific fellowship curriculum for advanced practice providers using a needs-based survey. <i>Journal of Oncology Practice, 15</i>(7), e593-598. https://doi.org/10.1200/JOP.18.00697</p>	<p>To identify subject areas in hematology and oncology that advanced practice providers (APPs) perceive as necessary for more knowledge/education.</p>	<p><u>Sample:</u> 49 hematology APPs across 3 Mayo Clinic institutions.</p> <ul style="list-style-type: none"> • 34 were NP's, 15 were PA's. • Age range 26-40yrs. • 47 of 49 were women. • 41 of 49 were Caucasian. • Held a MSN or DNP degree. • Experience ranged from no work experience to more than 5 years of experience in hematology-BMT. <p><u>Setting:</u> Mayo Clinic sites in Rochester, MN, Scottsdale, AZ and Jacksonville, FL.</p>	<p><u>Design:</u></p> <ul style="list-style-type: none"> • Prospective design using a needs assessment. • Retrospective: HR data analyzed for hematology NPs employed between 1/1/12 and 8/31/17. <p><u>Methods:</u></p> <ul style="list-style-type: none"> • Workforce data reviewed. • Online Likert-scale survey created w/ focus on education background, training experiences, and perception of training. • Likert scale used to assess helpfulness of learning chosen topics. <p><u>Measures:</u> Perceived readiness to practice in hematology-bone marrow transplant.</p>	<p><u>Retrospective data:</u> 36 new-hire APP's, 10 left during the period of the study.</p> <ul style="list-style-type: none"> • 10 APP's left within first 2 years of service. <p><u>Prospective findings:</u></p> <ul style="list-style-type: none"> • 39% had <5% hematology in their NP program. • 92% say education not sufficient for practice. • 90% say more hematology training could improve practice. • 96% report knowledge affects confidence and job satisfaction. • Active learning most effective. Heme disorders, BMT, palliative care, transfusion med, infectious disease and chemotherapy most important. 	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Identified three significant findings: high turnover rate, majority of APPs receive little-to-no education in hematology, and more than 90% of participants do not feel ready for hematology practice. • Identifies learning needs. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Small sample size • Tool not validated. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • Small sample size. • Findings may not be generalizable to other institutions • Institutional practice guidelines may differ from those in this study. <p>Wide gap in number of years of practice among participating APPs</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Langley, T. M., Dority, J., Fraser, J.F., Hatton, K.W. (2018). A comprehensive onboarding and orientation plan for neurocritical care advanced practice providers. <i>Journal of Neuroscience Nursing</i>, 50(3), 157-160. https://doi.org/10.1097/JNN.0000000000000359</p>	<p>Development of an onboarding process for advanced practice providers (APPs) in a neurocritical care unit.</p>	<p><u>Sample:</u> 12 APPs who were newly hired to the neurocritical care department. Three criteria were established for selection of providers: strong clinical experience, good clinical judgment and clinical commitment.</p>	<p><u>Design:</u> Pilot study</p> <p><u>Methods:</u> Authors created a three-phase orientation process.</p> <ul style="list-style-type: none"> • APPs paired with a proctor/mentor. • Three phase orientation: 1. Assessment/triage through clinical observation for 2-4 weeks. 2. Takes small assignment of patients to manage daily. 3. Full independent practice with minimal supervision of proctor. • Computer-based exam and oral exams created by authors used for evaluation. <p>Remediation if does not pass.</p>	<ul style="list-style-type: none"> • 100% of participants passed phase 1 exam on the first attempt. • 16% (2 participants) failed first attempt of second phase examination, passed on repeat. 33% failure rate (4 NPs) of first attempt taking phase 3 exam. 100% pass rate achieved after an additional 2 weeks of remediation and work with mentor/proctor. 	<p><u>Strengths:</u> Outlines an approach that may be taken to formulate a training curriculum for specialty care.</p> <ul style="list-style-type: none"> • Curriculum improved transition process for APPs new to the neurocritical care department. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • No formal study design. • Results do not support if curriculum is effective in training new APPs. • No validity or reliability of results established. <p><u>Limitations:</u> Exam content not validated.</p> <p><u>Opportunities:</u> Additional research to validate efficacy of program in training providers.</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Martina, K., Ghadimi, L., Incekol, D. (2016). Development of a workshop for malignant hematology nursing education. <i>Clinical Journal of Oncology Nursing</i>, 20(1), p. 98-101. https://doi:10.1188/16.CJON.98-101</p>	<p>Evaluation of effectiveness of an educational workshop about hematological malignancies implemented at a cancer center in Toronto.</p>	<p><u>Sample:</u> 28 hematology nurses.</p> <ul style="list-style-type: none"> All participants were new-hires at Princess Margaret Cancer Center. <p><u>Setting:</u> Prince Margaret Cancer Center. Intervention included during oncology nurse orientation.</p>	<ul style="list-style-type: none"> <u>Design:</u> pre/post-intervention evaluation. <p><u>Methods:</u></p> <ul style="list-style-type: none"> Course titled “MH 101” was given during oncology nurse orientation in 3 different orientation cycles. Content included 8 modules about heme disease processes. Info presented via nurses interviewing patients, lecture & interactive activities. Knowledge activities done every 2 modules created by authors. Post-test evaluations used to assess knowledge <p>Participants also evaluated the quality of the presentations.</p>	<ul style="list-style-type: none"> 24/28 participants “strongly agreed” their knowledge of heme malignancies improved after completing the workshop. 4 “agreed” their knowledge improved. 26/28 rated the workshop as “excellent” quality, 2 rated it as “good” quality. Of 18 course evaluations, 15 strongly agree that workshop should continue for future new-hires 10/18 strongly agree the content presented was useful to practice. 11/18 strongly agree the content gave them a good foundation of hematology. 	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> Positive findings from intervention. <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> Small sample Statistical data not included in this article. <p><u>Opportunities:</u></p> <ul style="list-style-type: none"> Using the program at other local institutions to measure its efficacy. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> Content of knowledge checks not validated.
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Rosenzweig, M., Giblin, J., Mickle, M., Morse, A., Sheehy, P., Sommer, V., and the Bridging the Gap Working Group (2012). Bridging the gap: A descriptive study of knowledge and skill needs in the first year of oncology nurse practitioner practice. <i>Oncology Nursing Forum</i>, 39(2), 195-201. https://doi.org/10.1188/8/12.ONF.195-201</p>	<p>Identify and describe the specific educational needs of nurse practitioners who are entering the oncology practice.</p>	<p><u>Sample:</u> 610 nurse practitioners who identify themselves as oncology-practicing (ONP).</p> <ul style="list-style-type: none"> • 104 respondents. • 103 were female, 1 was male. • The sample was obtained from the Oncology Nursing Society's database. <p><u>Setting:</u> Variable. May be home, work or elsewhere depending on the individual.</p>	<p><u>Design:</u> Cross-sectional, descriptive.</p> <p><u>Methods:</u></p> <ul style="list-style-type: none"> • A designated team of experienced ONPs identified areas of knowledge needed for new oncology NP's. • A 28-item survey was created by the authors and randomly distributed to the sample group via email. <p><u>Measures:</u></p> <ul style="list-style-type: none"> • Perceived level of preparedness of the oncology NP to enter practice. 	<ul style="list-style-type: none"> • Most participants felt they had the essential skills of a NP. • 81% “not all prepared” to perform oncology procedures. • 60% “not all prepared” in chemotherapy. • 49% unprepared in billing practices. • 39% were unprepared to ID or manage oncology emergencies. • Lack of preparedness in end-of-life care (29%), drug toxicities (26%), disease diagnosis/staging (21%), and ordering/interpreting diagnostic tests (20%). • 57% “not at all” or “somewhat” prepared in basic oncology. 	<p><u>Strengths:</u></p> <ul style="list-style-type: none"> • Results help identify areas where there is a need for education. <p><u>Limitations:</u></p> <ul style="list-style-type: none"> • First to assess knowledge needs of oncology NP's new to the specialty. • Survey not validated. • Small sample size • Results might be biased based on onboarding/orientation experience. • Schooling and job experience prior to entry into oncology specialty affect results.
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

REFERENCES

- Alencar, M. C., Butler, E., MacIntyre J. & Wempe E.P. (2018). Nurse practitioner fellowship: Developing a program to address gaps in practice. *Clinical Journal of Oncology Nursing*, 22(2), 142-145. <http://doi.org/10.1188/18.CJON.142-145>
- American Cancer Society (2022). *Cancer Facts and Figures*.
<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2022/2022-cancer-facts-and-figures.pdf>
- American Association of Colleges of Nursing (2006). The essentials of doctoral education for advanced nursing practice.
<https://www.aacnnursing.org/Portals/42/Publications/DNPEssentials.pdf>
- Auffermann, K., O'Keefe, R., Smith, T. & Cohn, T. (2020). Exploring novice nurse practitioner job satisfaction. *Journal of the American Association of Nurse Practitioners, Publish Ahead of Print*. <https://doi.org/10.1097/jxx.0000000000000454>
- Barnes, H. (2015). Exploring the factors that influence nurse practitioner role transition. *The Journal for Nurse Practitioners*, 11(2), 178-183.
<http://dx.doi.org/10.1016/j.nurpra.2014.11.004>
- Benner, P. (1982). From novice to expert. *American Journal of Nursing*, 402-407.
- Benner, P. (2004). Using the Dreyfus Model of skill acquisition to describe and interpret skill acquisition and clinical judgment in nursing practice and education. *The Bulletin of Science, Technology and Society Special Issue: Human expertise in the age of the computer*, 24(3), 188-199.
- Brewer, C. S., Kovner, C. T., Djukic, M., Fatehi, F., Greene, W., Chacko, T. P., & Yang, Y. (2016). Impact of transformational leadership on nurse work outcomes. *Journal of Advanced Practice Nursing*, 72(11), 2879-2893. <https://doi.org/10.1111/jan.13055>

- Bush, C. T. & Lowery, B. (2016). Postgraduate nurse practitioner education: Impact on job satisfaction. *The Journal for Nurse Practitioners*, 12(4), 226-234.
<http://dx.doi.org/10.1016/j.nurpra.2015.11.018>
- Butts, J. B. & Rich, K.L. (2018). *Philosophies and Theories for Advanced Nursing Practice* (3rd ed.). Jones and Bartlett Learning.
- Choi, S.L., Goh, C.F., Adam, M.B.H., & Kowang Tan, O. (2016). Transformational leadership, empowerment, and job satisfaction: The mediating role of employee empowerment. *Human Resources for Health*, 14(73), 1-14. <https://doi.org/10.1186/s12960-016-0171-2>
- Coombs, L., Noonan, K., Barber, F., Barber, D., Thompson Mackey, H., Peterson, M.E., Turner, T., & LeFebvre, K.B. (2020). Oncology nurse practitioner competencies: Defining best practices in the oncology setting. *Clinical Journal of Oncology Nursing*, 24, 296-304.
<https://doi.org/10.1188/20.CJON.296-304>
- Faraz, A. (2019). Facilitators and barriers to the novice nurse practitioner workforce transition in primary care. *Journal of the American Association of Nurse Practitioners*, 31(6), 364-370. <https://doi.org/10.1097/JXX.0000000000000158>
- Grosemans, I., Coertjens, L., & Kyndt, E. (2020). Work-related learning in the transition from higher education to work: The role of the development of self-efficacy and achievement goals. *British Journal of Educational Psychology*, 90, 19-42.
<https://doi:10.1111/bjep.12258>
- Han, R. M., Carter, P., & Champion, J. D. (2018). Relationships among factors affecting advanced practice registered nurses' job satisfaction and intent to leave: A systematic review. *Journal of the American Association of Nurse Practitioners*, 30(2), 101-113.
<https://doi.org/10.1097/JXX.0000000000000006>

- Hart, A.M. & Bowen, A. (2016). New nurse practitioners' perceptions of preparedness for and transition into practice. *The Journal for Nurse Practitioners*, 12(8), 545-852.
<https://dx.doi.org/10.1016/j.nurpra.2016.04.018>
- Hoffmann, R. L., Klein, S., Connolly, M. & Rosenzweig, M.Q. (2018). Oncology nurse practitioner web education resource (ONc-PoWER): An evaluation of a web-enhanced education for nurse practitioners who are new to cancer care. *Journal of Advanced Practice Oncology*, 9(1), 27-37. <https://doi.org/10.6004/jadpro.2018.9.1.2>
- Hwa, Y.L., Marshall, A.L., Shelly, J.L., Colborn, L.K., Nowakowski, G.S. & Lacy, M.Q. (2019). Assessment of the need for a hematology-specific fellowship curriculum for advanced practice providers using a needs-based survey. *Journal of Oncology Practice*, 15(7), e593-598. <https://doi.org/10.1200/JOP.18.00697>
- Langley, T. M., Dority, J., Fraser, J.F. & Hatton, K.W. (2018). A comprehensive onboarding and orientation plan for neurocritical care advanced practice providers. *Journal of Neuroscience Nursing*, 50(3), 157-160. <https://doi.org/10.1097/JNN.0000000000000359>
- Martina, K., Ghadimi, L. & Incekol, D. (2016). Development of a workshop for malignant hematology nursing education. *Clinical Journal of Oncology Nursing*, 20(1), p. 98-101.
<https://doi:10.1188/16.CJON.98-101>
- McDonnell, A., Goodwin, E., Kennedy, F., Hawley, K., Gerrish, K. & Smith, C. (2014). An evaluation of the implementation of advanced nurse practitioner (ANP) roles in an acute hospital setting. *Journal of Advanced Nursing*, 71(4), 789-799.
<https://doi.org/10.1111/jan.12558>
- Melnyk, B. M., Morrison-Beedy, D. (Eds.). (2019). *Intervention research and evidence-based quality improvement* (2nd ed.). Springer Publishing Company.

- Mortier, A.V., Vlerick P., & Clays, E. (2016). Authentic leadership and thriving among nurses: the mediating role of empathy. *Journal of Nursing Management*, 24(3), 357-365. <https://doi.org/10.1111/jonm.12329>.
- Rambod, M., Farkhondeh, S. & Khademian, Z. (2018). The impact of the preceptorship program on self-efficacy and learning outcomes in nursing students. *Iranian Journal of Nursing and Midwifery Research*, 23(6), 444-449. https://doi.org/10.4103/ijnmr.IJNMR_67_17
- Rosenzweig, M., Giblin, J., Mickle, M., Morse, A., Sheehy, P., Sommer, V. & Bridging Gap Working Group. (2012). Bridging the gap: A descriptive study of knowledge and skill needs in the first year of oncology nurse practitioner practice. *Oncology Nursing Forum*, 39(2), 195-201. <https://doi.org/10.1188/12.ONF.195-201>
- Schofield, D. L.& McComiskey, C. A. (2015). Postgraduate nurse practitioner critical care fellowship design, implementation, and outcomes at a tertiary medical center. *The Journal for Nurse Practitioners*, 11(3), e19-e26. <https://doi.org/10.1016/j.nurpra.2014.11.001>
- Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston. *Measures in health psychology: A user's portfolio*. Causal and control beliefs (pp. 35- 37). NFER-Nelson.
- Schwarzer, R. (2012). The general self-efficacy scale (GSE). <http://userpage.fu-berlin.de/~health/engscal.htm>
- Schwarzer, R. (2014). Everything you wanted to know about the general self-efficacy scale. http://userpage.fu-berlin.de/~health/faq_gse.pdf
- Scheff, S.W. (2016). *Fundamental Statistical Principles for the Neurobiologist: A survival guide*. (1st ed.). Elsevier.

Thomassen, A. (2018). Fellowship programs: reflections of an advanced practice nurse fellow. *Clinical Journal of Oncology Nursing*, 22(4), 383-385.

<https://doi.org/10.1188/18.CJON.383-385>

Urbanowicz, J. (2019). APRN transition to practice: program development tips. *The Nurse Practitioner*, 44(12), 50-55. doi: 10.1097/01.NPR.0000605520.88939.d1

U.S. Bureau of Labor Statistics (2021, Mar-31). *Occupational Employment and Wages, May 2020, 29-1171 Nurse Practitioners*. <https://www.bls.gov/oes/current/oes291171.htm>

Van Dusseldorp, L., Groot, M., Adriaansen, M., van Vught, A., Vissers, K. & Peters, J. (2018). What does the nurse practitioner mean to you? A patient-oriented qualitative study in oncological/palliative care. *Journal of Clinical Nursing*, 28, 589-602.

<https://doi.org/10.1111/jocn.14653>

Zaccagnini, M. E., Ward White, K. (2017). *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (3rd ed.). Jones & Bartlett Learning.