

Bridging the Knowledge Gap in Ostomy Management

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Practice Inquiry Project Proposal

March 8, 2021

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List of Abbreviations

ADN	Associated Degree in Nursing
BSN	Bachelor of Science in Nursing
CDSMP	Chronic Care Disease Self-Management Program
CE	Continuing Education
CMS	Centers for Medicare and Medicaid Services
CWOCN	Certified Wound, Ostomy, and Continence Nurse
DNP	Doctor of Nursing Practice
HPH	Hawaii Pacific Health
IRB	Institutional Review Board
MSN	Master of Science in Nursing
OCA	Ostomy Care Associates
PIP	Practice Inquiry Project
PPS	Prospective Payment System
SRC	Scientific Review Board
WOCN Society	Wound, Ostomy, and Continence Nurses Society

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Abstract

Inadequate ostomy patient education leads to poor post-operative adjustment and lower quality of life for ostomates. Many factors contribute to the insufficient preparation of ostomates to manage their stomas after hospital discharge; these factors include shortened hospital length of stays, limited availability of Certified Wound, Ostomy, and Continence Nurses (CWOCNs), and inadequate nursing knowledge, confidence, and skills in ostomy management. Staff nurses are an essential part of ostomate's post-operative adjustment because they are present during every aspect of the care continuum and are able to educate patients to attain their healthcare goals. The purpose of this Practice Inquiry Project (PIP) was to develop a continuing education (CE) ostomy management course and test this new platform by 1) opening the conversation between nurses on ostomy care, 2) establishing mentoring opportunities between the instructors and learners, and 3) exploring nurses' learning and support needs and preferences. The goal was to improve staff nurses' ability to care for ostomy patients by addressing the gap in ostomy knowledge, confidence, and skills. This CE ostomy course evaluated if participants gained a better understanding of ostomy concepts and higher levels of confidence in managing ostomy patients. Shrigley's Theory of Attitude Concept and Science Teaching was integral in the design of this project as it describes the relationship between cognition and behavior in contributing to changes in attitude. A Logic Model was used to plan and evaluate this project. In comparing the results from the pre-tests, post-tests, 2-week post-tests, and surveys; the intervention was successful in teaching registered nurses how to care for ostomy patients.

Acknowledgments

I want to acknowledge and thank Dr. Diane Van Hoose for serving as my committee chair and for her guidance, timeliness, and responsiveness throughout this process. Her valuable feedback was instrumental in the direction and clarity of this project. Much appreciation to Dr. Joyce Norris-Taylor who provided additional guidance and feedback as my second committee member. Mahalo to all the University of Hawaii doctoral staff for their inspiration, leadership, and emphasis on rural health and underserved populations. Lastly, I would like to thank my loving and supportive husband Dustyn Iwamoto who spent countless hours proof-reading numerous pages of this manuscript and encouraging me to never give up on my goals.

Chapter One

Approximately 750,000 to 1 million ostomates live in the United States (Settlemyre, 2017). This number continues to grow each year with an additional 100,000 new ostomy procedures (Settlemyre, 2017). Ostomies are created for a multitude of medical conditions including colorectal and bladder cancer, inflammatory bowel disease, gastrointestinal infections, and trauma (Carmel et al., 2016). The three most common types of ostomies are colostomies, ileostomies, and ileal conduits (Burrell, 2013; Carmel et al., 2016). A stoma is created when a surgeon makes a small incision on the abdomen from which a part of the bowel is pulled through and inverted and then sutured to the skin (Carmel et al., 2016). This results in an incontinent bowel or bladder diversion that stool or urine can exit the body into a collection pouch (Carmel et al., 2016).

Undergoing ostomy surgery can be lifesaving but also life altering physically, emotionally, psychologically, and socially (Grant et al., 2013; Sun et al., 2013). Studies have shown that ostomy education provides ostomates with the knowledge and skills they need to adjust to living with their stomas (Grant et al., 2013; Sun et al., 2013). Unfortunately, many nurses express feeling uncomfortable caring for and educating ostomates. A study conducted by Nieves et al. (2017) found that the lack of ostomy resources and inadequately trained nursing staff negatively affects the quality of ostomy patient education ostomates received.

Evidence-based ostomy education can empower ostomates and caregivers to promote self-management and facilitate healthy coping and adjustment after surgery (Gemmill et al., 2011; Nieves et al., 2017). Ostomy patient education should include teaching regarding their disease, treatment, symptom management, and ostomy management thereby empowering ostomates with the knowledge and skills to care for themselves and minimizes the risk of

complications (Gemmill et al., 2011). Staff nurses are crucial because of their ability to communicate and educate patients how to identify and attain goals (Gemmill et al., 2011). Facilitating nursing competence in ostomy care requires specialized continued education especially where there is limited exposure to ostomy patients in certain care settings (Gemmill et al., 2011).

Problem Statement

Patient education during the preoperative consultation, postoperative recovery, and follow up appointments are important for patient understanding of self-management needs, mastery of skills, and optimized recovery (Gemmill et al., 2011). Multiple factors influence why ostomates receive fragmented ostomy patient education. Faster recovery times from laparoscopic procedures and financial constraints to meet the Center for Medicare and Medicaid Services (CMS) Prospective Payment System (PPS) have decreased hospital length of stay and the amount of time available to provide adequate ostomy patient education (CMS, 2018; Gemmill et al., 2011; Grant et al., 2013; Krouse et al., 2016). Adding to this, shortages of CWOCNs in hospitals and clinics necessitates that the task of teaching ostomates be passed on to staff nurses (Gemmill et al., 2011).

Staff nurses express having little confidence in managing ostomy related issues and providing ostomy education (Gemmill et al., 2011). This is due to many nurses receiving limited exposure and education in ostomy management while in school and in the workplace (Zinmicki & Pieper, 2018; Bagheri et al., 2017). Lack of confidence and experience with ostomies creates a barrier to patient education, patient-nurse communication, and dissemination of critical ostomy self-management information (Nieves et al., 2017). Clinical practice guidelines for the management of and discharge planning of ostomy patients by the Wound, Ostomy, and

Continence Nurses Society (WOCN Society, 2017) are available but little guidance exists for how to educate non-specialized nurses in the management and care of ostomates.

Currently, the Ostomy Care Associate (OCA) Program developed by the WOCN Society (WOCN Society, 2018) is the only program available providing in-depth ostomy education for non-specialized nurses. This program is not intended to prepare participants for the national board certification but rather provides extensive education in the management of ostomy care and ostomy related issues. After completion of this three-month program, participants receive 27.0 nursing contact hours. Implementation of the OCA Program into an institution is a \$2,500 flat rate fee for a three-year license to use the program and \$150 licensing fee for each participant.

The OCA program may not be feasible for some healthcare facilities and clinics to implement due to the financial and time commitments required. This project sought to develop a 4-hour ostomy management course geared towards educating non-specialized nurses how to care for ostomy patients.

Primary research question.

The research question was “Will registered nurses participating in an ostomy continuing education course attain higher levels of knowledge, skills, and confidence in ostomy management?” Nurses recruited participated in a 4-hour didactic lecture going over key elements in ostomy management, such as the anatomy and physiology of the gastrointestinal and urinary tract systems, surgical formation of an ostomy, stomal and peristomal skin assessment, management of complications, and techniques to educate ostomy care to patients. A pre- and post-test were disseminated before and after the course to assess changes in knowledge and skills level and surveys were used to evaluate changes in nursing attitudes towards ostomy care to

determine the effectiveness of the intervention. The post-test and survey were emailed to participants two weeks after the completion of the course to assess knowledge retention.

Goal of the Project

The purpose of this PIP was to develop a CE ostomy management course and test this new platform by 1) opening the conversation between nurses on ostomy care, 2) establish mentoring opportunities between the instructor and learners, and 3) exploring nurses' learning and support needs and preferences. The goal was to improve staff nurses' ability to care for ostomy patients by addressing the gap in ostomy knowledge, confidence, and skills. The target population was focused on registered nurses living in Hawaii who are interested in increasing their proficiency in ostomy management.

Aims and Objectives

The expected outcome of this project developed measurable increase in nursing knowledge, confidence (attitude), and skills in ostomy management. This project developed a 3.75 nursing contact hour CE course. A minimum of 25 registered nurses were recruited to participate and attend the class. Due to the current COVID-19 pandemic, the nursing ostomy CE course will be broadcasted via Zoom. Data analysis will compare the pre-test and survey evaluating knowledge, skills, and confidence perceived by the nurses prior to the start of the class with the results from the post-test and post-survey. A final course evaluation also assessed the efficiency of educating nurses through this modality. Knowledge and confidence retention were re-evaluated with a two-week follow up post-test and survey.

Aim One

The first aim of this project was to develop a nursing ostomy continuing education course.

Objective One. The first objective was to conduct a literature review to determine the best evidence-based practices for ostomy care.

Objective Two. The second objective was to incorporate evidence-based practices for ostomy care into a nursing continuing education course.

Objective Three. The third objective was to recruit registered nurses to participate in the nursing ostomy continuing education course.

Objective Four. The fourth objective was to present the nursing ostomy continuing education course.

Aim Two

The second aim of this project was to determine if registered nurses gained knowledge, skills, and confidence in ostomy management.

Objective One. The first objective was to determine if they gained the understanding of the anatomy and physiology of the gastrointestinal and urinary tract systems, locations of common ostomies, and indications for undergoing an ostomy formation procedure.

Objective Two. The second objective was to determine if they gained the understanding of early and late stomal and peristomal complications and strategies for managing each type of complication.

Objective Three. The third objective was to determine if they gained the understanding of the psychological and emotional factors impacting ostomy patient's postoperative adjustment and recovery.

Objective Four. The fourth objective was to determine if they express increased confidence in caring for ostomy patients and providing ostomy patient education.

Aim Three

The third aim of this project was to determine if a four-hour continuing education ostomy management course motivates registered nurses to change their attitude and approach towards ostomy patients and ostomy care.

Objective One. The first objective was to evaluate if they express increased confidence and that the course positively impacted their nursing practice in the management of ostomy patients.

Significance of the Study

Evidence-based ostomy patient education empowers ostomates and caregivers to promote self-management and facilitate healthy coping after surgery (Gemmill et al., 2011; Nieves et al., 2017). Providing ostomates with the knowledge and understanding of their disease, treatment, symptom management, and self-care empowers them to independently manage their condition (Gemmill et al., 2011). Staff nurses are crucial in their ability to communicate and educate patients to assist with goal identification and attainment (Gemmill et al., 2011). Nursing competence in ostomy management requires specialized continued education especially when staff nurses work in settings with limited exposure to ostomates (Gemmill et al., 2011). Nurses need to be taught how to integrate ostomy patient education into their current practice (Gemmill et al., 2011). This study focuses on teaching nurses the knowledge and skills to care for ostomy patients thereby increasing their confidence caring for ostomates.

Background Learning Needs of Patients

Importance of Identifying and Addressing Learning Needs

Living with an ostomy affects all aspects of life. New ostomy patients must adjust physically, psychologically, socially, and spiritually (Grant et al., 2013; Sun et al., 2013).

Besides learning how to care for their stomas; ostomates may experience stomal and peristomal

skin complications, physical fatigue during recovery, and changes in their diet and clothing to accommodate their stomas (Sun et al., 2013; Sun et al., 2018). Many ostomates express feeling depressed after their surgery and an aversion to their new body image (Sun et al., 2018; Sun et al., 2013). Many ostomates express feeling embarrassed, shocked, and hopeless during their first encounter with their newly formed stoma and some have difficulties looking at, touching, and talking about their ostomies (Ceylan & Vural, 2017). Ostomates may feel uncomfortable in social situations due to the fear of gas, odor, and pouch leakage. This fear can be so severe that it affects their relationships, intimacy, and sexuality (Sun et al., 2013; Sun et al., 2018). Ostomates may also feel resistant to participating in religious practices held prior to surgery due to feeling dirty, disabled, or resentment towards their stoma (Ceylan & Vural, 2017; Sun et al., 2018).

Inadequate ostomy patient education leads patients to feel anxious, doubtful, and helpless when discharged from the hospital without the knowledge and skills to care for themselves at home (Nieves et al., 2017). Smith et al. (2007) found that ostomates who had a difficult time accepting and adjust to their stoma were more likely to report poorer quality of life outcomes. The magnitude to which an ostomy affects the life of an ostomate makes it imperative that ostomy patient education is provided to allow optimal post-operative adjustment and a higher quality of life.

Morbidity and Mortality Rates of Ostomy Patients

Inadequate patient education can lead to higher incidences of stomal and peristomal complications. Peristomal irritant dermatitis is the most common peristomal complication and accounts for 77% of all reported complications (O'Flynn, 2018). Irritant dermatitis develops when urine or stool leaks under the ostomy pouch and breaks down the skin causing skin

irritation and painful erosion (O’Flynn, 2018). The economic impact of caring for peristomal irritant dermatitis is approximately \$133 for mild cases and \$776 for severe cases (Taneja et al., 2017). Peristomal skin complications are also associated with longer hospital stays and a higher incidence of hospital readmissions with healthcare expenses accumulating to approximately \$80,000 per patient (Taneja et al., 2017).

Most cases of irritant dermatitis and other peristomal complications are preventable if patients are taught the skills and information necessary for proper ostomy management. The comprehensive discharge guideline by Prinz et al. (2015) instructs clinicians to teach the following:

Basic skills such as emptying and changing the pouching system, providing information about ostomy management (e.g., diet/fluid guidelines, signs of potential complications, factors to consider regarding medications, and management of gas and odor), instructions about how to order supplies, manufacturers, assisting with transitions of care, and providing information about resources for support and assistance. (p. 79)

Ostomates equip with this knowledge can manage their stomas and mitigate preventable complications from occurring. Patient knowledge allows them to be self-sufficient in their personal care of their ostomy and promotes proactive self-management in addressing issues before they become a problem.

Conceptual Foundation of Ostomy Education for Patients and Nurses

Dorothea Orem’s Self-Care Theory has three inter-related theoretical bases: theory of nursing systems, self-care theory, and self-care deficit theory (Menezes et al., 2013). Self-care is defined as the “practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being” (Nursing Theories, 2012). The theory of self-care

deficit explains the importance of nurses in supporting and educating patients' incapable or with limited resources for effective self-care (Menezes et al., 2013; Nursing Theories, 2012). This theory illustrates why ostomy patient education provided by nurses is essential for ostomates to develop the skills and knowledge to adjust postoperatively. Currently, the gap in nursing knowledge, confidence, and skills in ostomy management hinders nurses' abilities to properly educate ostomates.

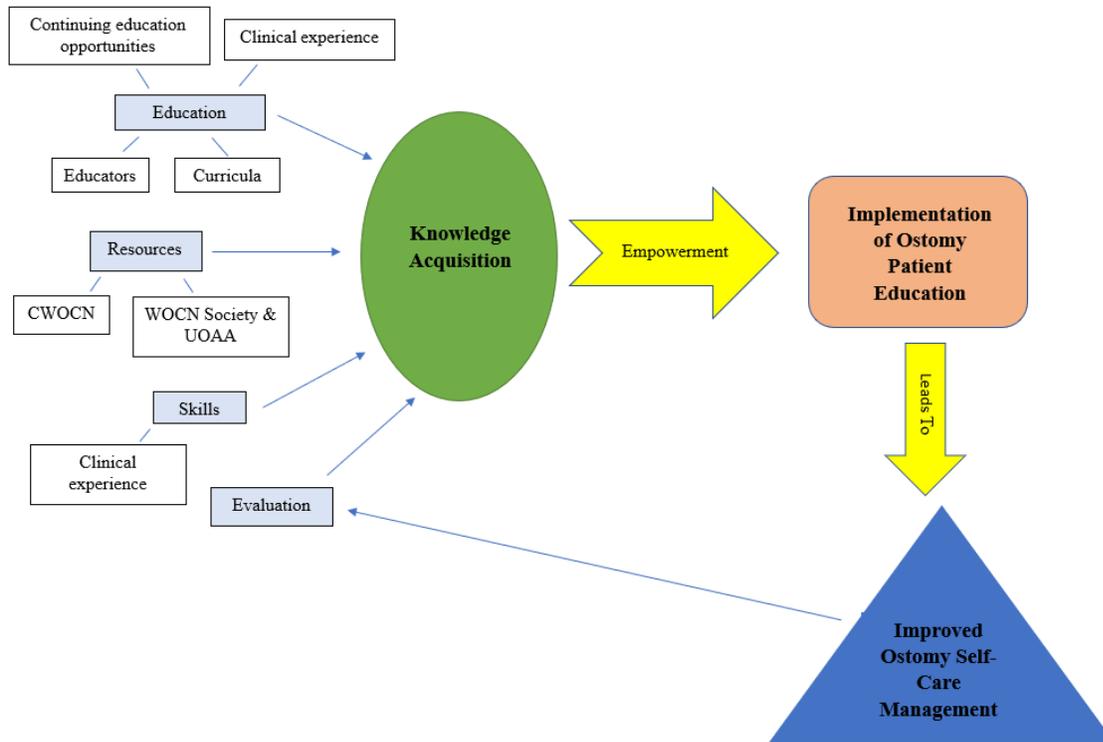
Lorig's Self-Efficacy Theory is central to the Chronic Care Disease Self-Management Program (CDSMP) which hypothesizes that people with comorbidities can benefit from a common intervention (Lorig, 2015). The Self-efficacy Theory states that patients' confidence to achieve their desired behavior determines their success (Lorig, 2015). Lack of patient's knowledge to care for their own chronic condition leads to a downward spiral, further problem development, and heightened frustration and discouragement of disease management. The CDSMP breaks the cycle of uncontrolled and worsening symptom by providing patients with the knowledge and skills necessary for self-management (Lorig, 2015). Self-efficacy can be facilitated through mastering skills, modeling behaviors, reinterpreting information, and social persuasion (Lorig, 2015). Four barriers to patients attaining self-management include: practitioners not following guidelines because of time constraints, poor coordination of care or care planning, absence of evaluation to ensure best outcomes, and patients receiving inadequate training to manage their chronic illness (The Chronic Care Model, 2018).

Orem's and Lorig's theories are both vital in understanding the importance of ostomy patient education to facilitate self-care management and self-efficacy for successful postoperative adjustment and improved quality of life outcomes for ostomates (See Figure 1). Increasing nursing knowledge, confidence, and skills in managing and educating ostomates

enables patients to care for themselves in the community. This study focuses on teaching nurses the knowledge and skill to provide ostomy patient education.

Figure 1

Concept Map of how Orem’s Self-Care Theory and of Lorig’s Self-Efficacy Theory Guide the Ostomy Self-Care Teaching Model



Chapter Two

Review of Literature

A review of literature was made to uncover current understandings and gaps in knowledge related to nursing competency in ostomy management and to determine the best evidence-based practices for ostomy care.

Methods of Literature Review

An online literature search of CINAHL and MEDLINE databases was undertaken for English language sources of academic, peer-reviewed journal articles published between January 2010 through June 2020. The search terms used in the databases were “nursing ostomy knowledge,” “nursing curriculum AND ostomy management,” “nurse attitudes towards ostomy” and “nurse confidence in ostomy care.” Out of the 51 results, 10 articles met inclusion criteria discussing how nursing knowledge, skills, and confidence affects their ability to deliver effective ostomy management. Exclusion criteria were articles that did not discuss effects of nursing ostomy education on knowledge and confidence outcomes.

Results of Review of Literature

Role of Nurses in Ostomy Management and Patient Education

Ostomates depend on their staff nurses for physical and emotional support after their surgery (Burrell, 2013). Staff nurses spend the most amount of time with patients in the postoperative period and their verbal and non-verbal communication and attitudes towards the newly formed stoma can influence patient outcomes and postoperative adjustment (Burrell, 2013; Walker & Lachman, 2013). Limited research has been conducted evaluating staff nurses’ attitudes towards ostomates and their stomas (Burrell, 2013).

Nursing Students' Exposure to Ostomy Concepts

The studies by Zimnicki and Pieper (2018) and Findik et al. (2019) evaluated nursing students' knowledge, confidence, and skill level in ostomy management. Ostomy management and hands-on experience should be incorporated into baccalaureate nursing curriculum to equip future nurses with the knowledge and skills to care for ostomates. Exposure to ostomy education depends on each school's curriculum but most only provide a brief overview of the specialty care needed (Zimnicki & Pieper, 2018). Hands-on experience also varies depending upon the units and patients assigned to nursing students during their rotations (Zimnicki & Pieper, 2018). Zimnicki and Pieper's study (2018) brought to light that most nursing students have a low level of knowledge and understanding of ostomy management. They found that close to half of nursing students surveyed reported no clinical experience caring for an ostomate and that most of their exposure occurred during their skills simulation labs. Students' confidence levels were positively associated with participating in an ostomy care course (Zimnicki & Pieper, 2018). Findik et al. (2019) also found a positive association between nursing students' skill level and ostomy knowledge.

Need for Ostomy Training in the Nursing Workforce

Despite the common perception of staff nurses providing majority of the care for ostomy patients in the pre-operative, post-operative, and follow-up periods; there is little research supporting the current proficiency and competency of nurses managing stomal and peristomal issues (Recalla et al., 2013). Bagheri et al. (2017); Cross et al. (2014); Duruk and Ucar (2013); Gemmill et al. (2011); Li et al. (2019); and Millard et al., (2020) all found similar gaps in nursing knowledge in ostomy management, lack of confidence in nurses' ability to care for ostomy related issues, and perception that it is not the staff nurses' responsibility to educate ostomates.

These studies recommended more training opportunities for staff nurses to learn the key concepts of ostomy management and skills development. Nursing education in ostomy management would increase knowledge and confidence caring for ostomates and reinforce ostomy care and education is a nursing responsibility (Duruk & Ucar, 2013).

Clinical Practice Guidelines - Benchmarks

The WOCN Society provides clinical practice guidelines for healthcare providers in the management of fecal and urinary ostomies and in the discharge planning of patients with new ostomies (Prinz et al., 2015; WOCN Society, 2017). Important concepts in ostomy management include an understanding of the anatomy and physiology of the gastrointestinal and urinary systems, understanding how different stomas are formed and function, identification of common stomal and peristomal complications, and understanding how to manage different ostomy-related issues (WOCN Society, 2017). Healthcare providers should also be aware of the misconceptions surrounding ostomy patients and the psychological and social impact an ostomy has upon patients' self-image and how staff nurses' behaviors and patient education can either positively or negatively affect postoperative adjustment (WOCN Society, 2017).

Although these clinical practice guidelines exist, there is a disparity between best practice and current practice due to the lack of non-specialized nursing knowledge in ostomy care and the limited access to and availability of CWOCNs (Walker & Lachman, 2013). Gaps in nursing knowledge and the lack of confidence in caring for ostomates has been noted in multiple studies (Bagheri et al., 2017; Cross et al., 2014; Duruk & Ucar, 2013; Gemmill et al., 2011; Li et al., 2019; Millard et al., 2020). When staff nurses are knowledgeable and confident in performing ostomy care, they are better prepared to educate ostomates (Millard et al., 2020).

Strengths and Weaknesses of the Research Findings

The research findings in several of the journal articles in this literature review contain cogent points which add evidence and relevance in helping to address the research question posed earlier. By integrating these research findings into this project; a sharper focus of the literature review results into constructing the ostomy education materials becomes possible. This provided insight into the relationship between the limited exposure to ostomy content in nursing baccalaureate programs which leads to under-prepared nurses in the workforce when they encounter an ostomy patient. Another strength is that the common theme of nurses needing further ostomy education was found throughout different care settings from oncology medical-surgical units, home health care services, and skilled nursing facilities.

The literature search conducted found a lack of randomized control trials. All but one of the studies included in the literature review were cross-sectional, quasi-experimental studies evaluating ostomy management in relation to nursing knowledge, skills, and confidence. The study by Recalla et al., (2013) was a systematic review which synthesized studies evaluating the assessment and management of ostomies.

Gaps and Limitations

This literature review revealed that there is limited research supporting a modality recommended to educate nurses in ostomy care. The literature review supported the need for further continued education for nurses but did not specify whether didactic versus hands-on or a combination of both would best increase nursing knowledge, skills, and confidence. These studies also did not specify if remote learning via video conferencing or pre-recorded educational material are viable methods to teach continued ostomy education. This project's goal was to develop an ostomy continued education program for registered nurses and assess if knowledge, skills, and confidence levels increase after completion of the course.

Theoretical Framework

Shrigley's Theory of Attitude Concept and Science Teaching (1983) states that behaviors can be influenced by both attitudes and cognition. By increasing nursing knowledge, the hope is to change the attitudes and perception of ostomy care and therefore effectively improve nursing practice.

Shrigley's Theory of Attitude Concept and Science Teaching (1983) states that there are five elements of attitude:

1. Attitudes are learned; cognition is involved.
2. Attitudes predict behavior.
3. The social influence of others affect attitudes.
4. Attitudes are a readiness to respond.
5. Attitudes are evaluative, emotion is involved.

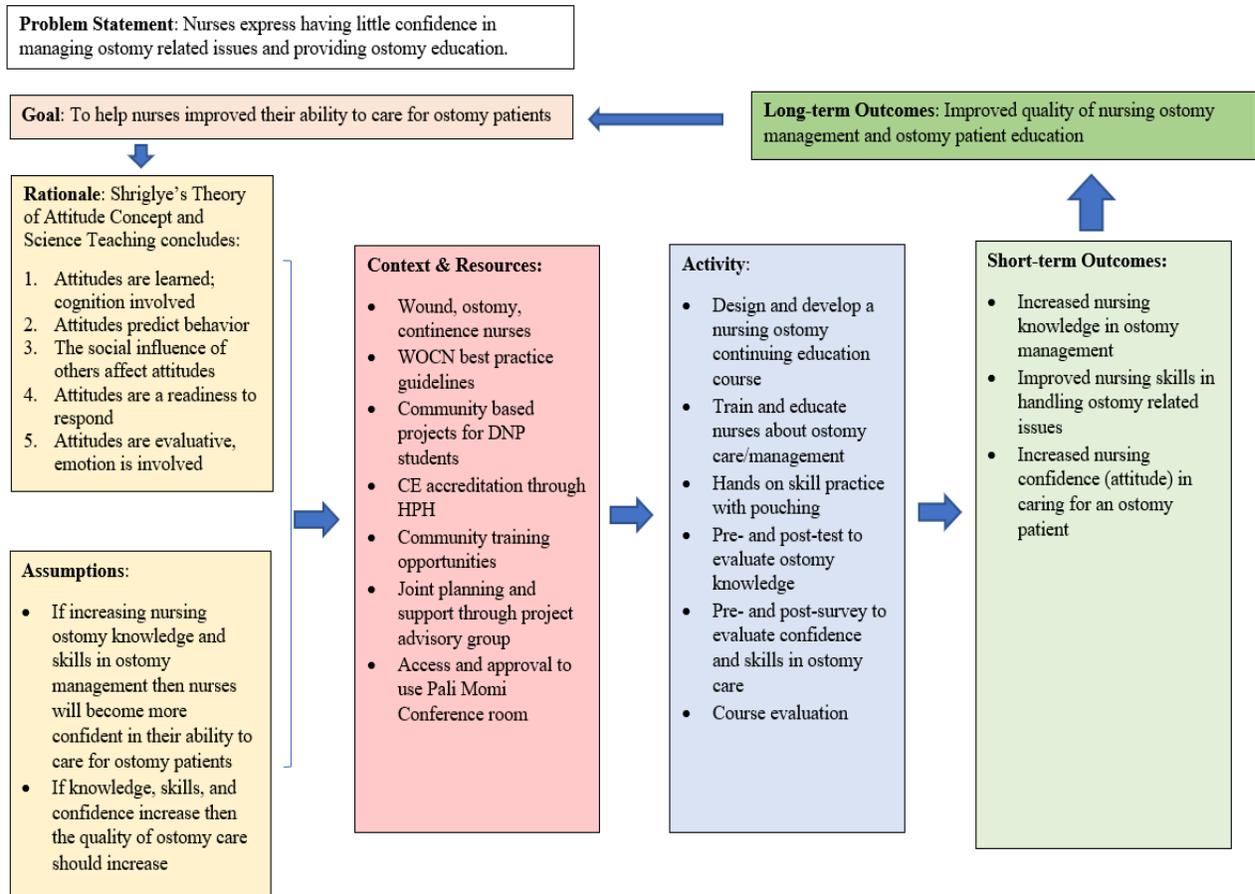
Shrigley's Theory states that behaviors are influenced by both attitudes and cognition. To effectively influence behavioral change on the parts of staff nurses, attitude must first be changed towards a positive perception of ostomy care and confidence in their ability to manage ostomy related issues (Cox & Carpenter, 1989). This is facilitated through implementing an ostomy education course because lack of familiarity of concepts and skills can manifest in the quality of ostomy care nurses provide and in the quality of ostomy patient education.

Logic Model Planning and Evaluation Tool

A Logic Model was used to graphically depict how the input of resources leads to activities to produce short and long-term outcomes (Melle, 2016). These steps are discussed in further detail later in the paper. The Logic Model in Figure 2 applies to this project.

Figure 2

Logic Model Planning and Evaluation Tool for Nursing Ostomy Care Education



Conclusion

Ostomy patients are unprepared to manage their ostomies after being discharged from the hospital due to limitations in the knowledge, skills, and confidence of nursing staff to provide adequate ostomy patient education. Adding to this problem, is the limited availability of CWOCNs and the misconception that ostomy education is not a part of staff nurses' responsibilities. The goal of this project was to develop a certified education ostomy course for nurses to help increase their knowledge, skills, and confidence providing ostomy care. The long-term goal was to improve the overall quality of nursing management of ostomy patients.

Chapter Three

Project Design, Setting, and Participants

The design of this study was a quasi-experimental project comparing nursing knowledge, skills, and confidence in ostomy management measured which utilizing a demographics questionnaire, knowledge pre- and post-tests, and pre- and post- confidence surveys. The nursing ostomy management class was a four-hour continuing education course broadcasted live over Zoom on the 7th of November 2020. The target population was registered nurses practicing in the State of Hawaii. Exclusion criteria included individuals who were-certified nursing assistants, medical assistants, and licensed practicing nurses.

Methodology

According to Shrigley's Theory of Attitude Concept and Science Teaching (1983) attitude is developed through a learned process and influences the behaviors and responses an individual has towards a subject. Shrigley's theory also states that attitudes can be evaluated. This nursing ostomy education course aimed to provide up-to-date evidence-based practice information and perspective to registered nurses to positively change their attitudes towards ostomy care. The information included in the course was guided by the 2017 WOCN Society's "Clinical Guideline: Management of the Adult with a Fecal or Urinary Ostomy.\\" and Carmel et al's (2016) "Core Curriculum: Ostomy Management." The course agenda can be found in Appendix A. After the completion of the course, participants were re-evaluated on their ostomy knowledge and perceived confidence and attitudes towards ostomy care.

Aims and Objectives

Aim One. The first aim of this project was to develop a nursing ostomy continuing education course.

Objective One. The first objective-was to conduct a literature review to determine the best evidence-based practices for ostomy care.

Objective Two. The second objective was to incorporate evidence-based practices for ostomy care into a nursing continuing education course.

Objective Three. The third objective was to recruit registered nurses to participate in the nursing ostomy continuing education course.

Objective Four. The fourth objective was to present the nursing ostomy continuing education course.

Aim Two. The second aim of this project was to determine if registered nurses gained knowledge, skills, and confidence in ostomy management.

Objective One. The first objective was to determine if they gained the understanding of the anatomy and physiology of the gastrointestinal and urinary tract systems, locations of common ostomies, and indications for undergoing an ostomy formation procedure.

Objective Two. The second objective was to determine if they gained the understanding of early and late stomal and peristomal complications and strategies for managing each type of complication.

Objective Three. The third objective was to determine if they gained the understanding of the psychological and emotional factors impacting ostomy patient's postoperative adjustment and recovery.

Objective Four. The fourth objective was to determine if they express increased confidence in caring for ostomy patients and providing ostomy patient education.

Aim Three. The third aim of this project was to determine if a four-hour continuing education ostomy management course motivates registered nurses to change their attitude and approach towards ostomy patients and ostomy care.

Objective One. The first objective was to evaluate if they express increased confidence and that the course positively impacted their nursing practice in the management of ostomy patients.

Participant Recruitment

Study participants were recruited through distribution of fliers at different acute care facilities in Hawaii (See Appendix D). Incentive for participation, \$10 was mailed to each participant after receipt of the two-week follow up post-test and survey as compensation for their time in the study.

Evaluation of the Project

A pre-test and survey were completed by participants during the registration process for the ostomy CE course. A post-test, post-survey, and course evaluation were emailed to participants after the completion of the course to measure if the project meets the aims and objectives. The knowledge post-test and post-survey were emailed to participants a second time, two weeks after the completion of the course to assess retention of knowledge and confidence.

The ostomy knowledge pre- and post-test and confidence pre- and post-survey used are a modified version of the Survey of Ostomy Care questionnaire developed by Gemmill et al. (2011) and a questionnaire developed by Cross et al. (2014). Gemmill et al. (2011) questionnaire and knowledge test are available through the City of Hope's Pain and Palliative Care Resource Center which serves as a community resource to disseminate information and educational materials to improve the quality of pain management and end of life care (City of Hope Pain &

Palliative Care Resource Center, 2019). The questionnaire developed by Gemmill et al. (2011) was content validated by three advanced practice nurses and was used to evaluate nurses working on a surgical oncology unit and an intensive care unit. Permission to use the Cross et al. (2014) questionnaire was received, (see Appendix C). The contents of Cross et al.'s (2014) questionnaire were validated by skin resource nurses, research nurses, and a panel of CWOCNs within their facility to check for the readability and comprehension and inclusivity of topics to meet the study's objectives.

See Appendix B for the Bridging the Knowledge Gap in Ostomy Care Survey used for the knowledge pre- and post-test and pre- and post-survey. This knowledge test and survey is a mixture of quantitative and qualitative questions. Demographic information was gathered such as the highest nursing degree obtained, number of ostomy patients cared for in the last 6 months, and whether they received any prior ostomy training in school or in the facility in which they work. The ostomy knowledge pre- and post-test consists of 15 multiple choice and true/false questions to assess the knowledge level prior to and after the course. A 5-point Likert Scale (1 = Strongly Disagree; 5 = Strongly Agree) survey was used to evaluate nursing confidence and attitudes towards ostomy care. One open ended question was added at the end of the survey asking for any further comments or suggestions for improvement of the course.

Data Analysis

Graphs were used to describe the demographic data. The knowledge pre- and post-test results ~~was~~ statistically analyzed. The Likert scale pre- and post-survey results were presented to display the results for each question. The pre- and post-survey comments and suggestions were analyzed for common themes.

Project Budget

Access to the WOCN Society's "Clinical Guideline: Management of the Adult Patient with a Fecal or Urinary Ostomy" booklet was purchased for \$99 at the author's expense. Development of the nursing ostomy education course added no additional cost to this project. Posters used to advertise the course were printed and distributed by the author with an approximate cost of \$30. The University of Hawaii at Hilo assisted with coordinating and hosting the Zoom conference for the nursing ostomy CE course. Use of Pali Momi Medical Center's Ewa Conference Room was approved by the hospital's management and no charge was incurred for the generous use of the room. The Ewa Conference Room was the location the researcher chose to conduct the live Zoom broadcast because of the audiovisual capabilities of that room. The expense of the continuing education accreditation of the nursing ostomy course was also generously covered by the Hawaii Pacific Health (HPH) continuing education department. The project was implemented in the facility in which this author works. Each participant was mailed \$10 as compensation for their time and participation in the study after receipt of the final two-week follow up post-test and survey; estimated expense for participant compensation was \$250. The total budget for this project was estimated to be \$379.

Project Timeline

The proposed timeline for this project was to submit the proposal to Scientific Review Committee (SRC) by September 2020. Once SRC approval was obtained, the PIP Proposal Defense was scheduled. After the PIP Proposal has been defended and is approved, then the PIP Proposal was submitted to the UH Office of Research Compliance for Institutional Review Board (IRB) by September 2020. Posters advertising the nursing ostomy education course were distributed to different acute care facilities after IRB approval is obtained. The scheduled date to use Pali Momi's Ewa Conference Room was November 7, 2020, which was the presentation date

for the nursing ostomy education course. The Pre-test and pre-survey were emailed to participants and collected prior to the start of the class. The post-tests, course evaluation, and post-survey were emailed to participants after the end of the class. A two-week follow up post-test and survey were emailed to participants on November 21, 2020. Data analysis was completed after all surveys are collected.

Protection of Human Subjects

Participants' personal information was protected during this study through the omission of names and identifiable data on questionnaires and surveys. All questionnaires and evaluation forms were anonymous for each participants' protection. Data from the knowledge tests and surveys and demographic information were securely stored on a password protected and encrypted file server only accessible by this author. This project was submitted for UH IRB approval prior to starting. Consent for the study was presented to participants prior to registering for the course and included with the recruitment flyers (See Appendix E). A letter of endorsement from Pali Momi's director of patient services was sought and obtained prior to beginning the project (see Appendix F).

Chapter Four

Data Collection Process

The IRB approval for exempt status was granted on September 24, 2020. The researcher then developed the nursing ostomy CE course “The Dirty Misconceptions of Ostomies: Bridging the Knowledge Gap.” Recruitment flyers were printed and distributed to acute care facilities throughout Hawaii. Registration for the online course opened on October 5, 2020 and closed on November 5, 2020 with the goal of recruiting a sample size of 25 participants. A total of 27 people signed up for the online course; of these 25 attended the class.

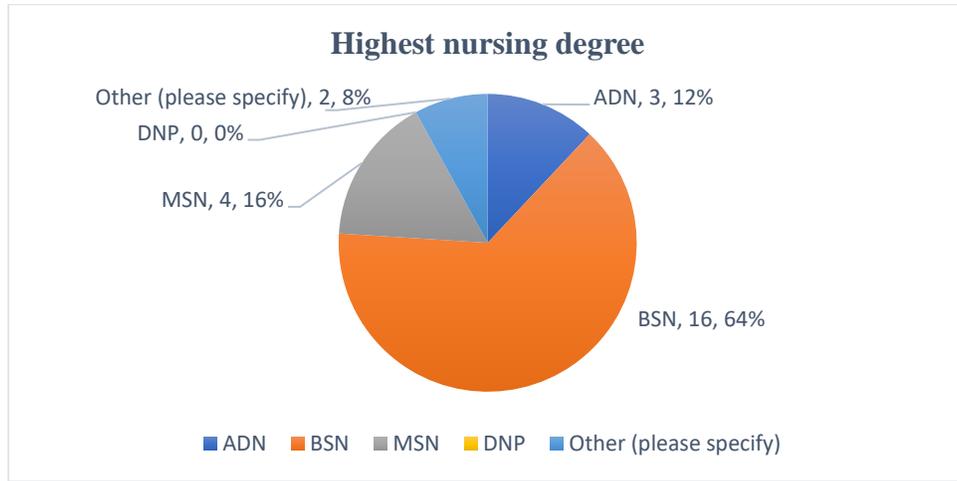
Participants who registered for the course were sent a pre-test and survey one week prior to the course offering. The 4-hour online CE course was presented on November 7, 2020. Following the completion of the course, participants were sent a post-test, post-survey, and course evaluation. Two weeks following the completion of the class, participants were sent a 2-week follow up post-test and survey.

Demographic Information of Study’s Participants

The demographic information of the 25 participants is as followed. Sixteen participants had their Bachelor of Science in Nursing (BSN) as their highest nursing degree, four had their Master of Science in Nursing (MSN), and three had their Associate Nursing Degree (ADN). Two participants answered Other as their highest nursing degree but did not specify which other degree they held. No participants held a Doctor of Nursing Practice (DNP degree in this study. See Graph 1 below.

Graph 1

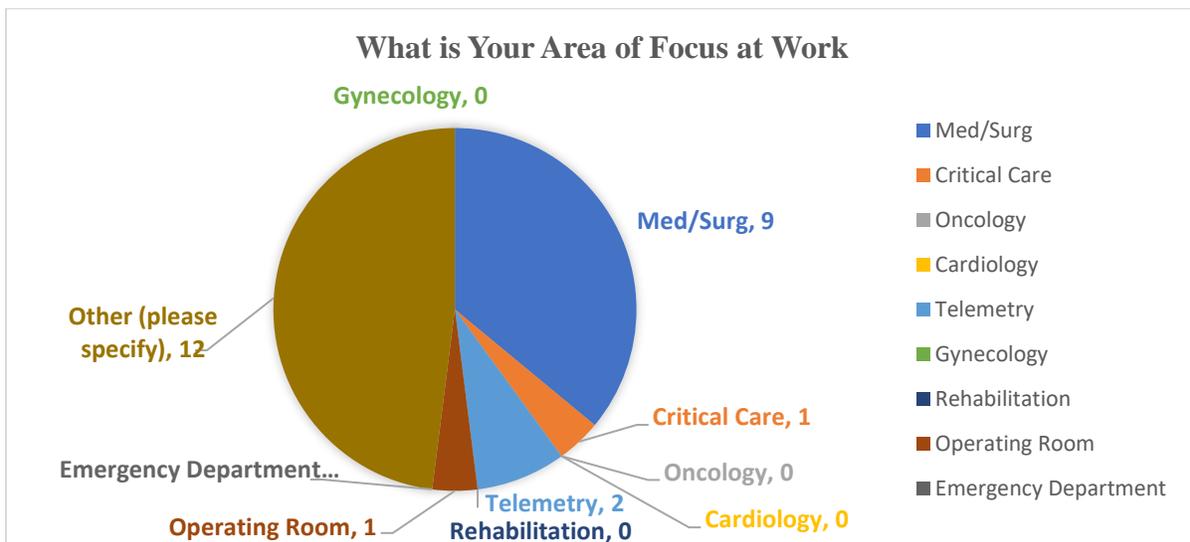
Highest Nursing Degree



The participants of this study worked in different areas of focuses. Nine participants primarily worked on medical/surgical units. Two participants worked on telemetry units. One participant worked in critical care. One participant worked in the operating room. Twelve participants answered “other” to this demographic question, but no specifications were made in the text box. See Graph 2 below.

Graph 2

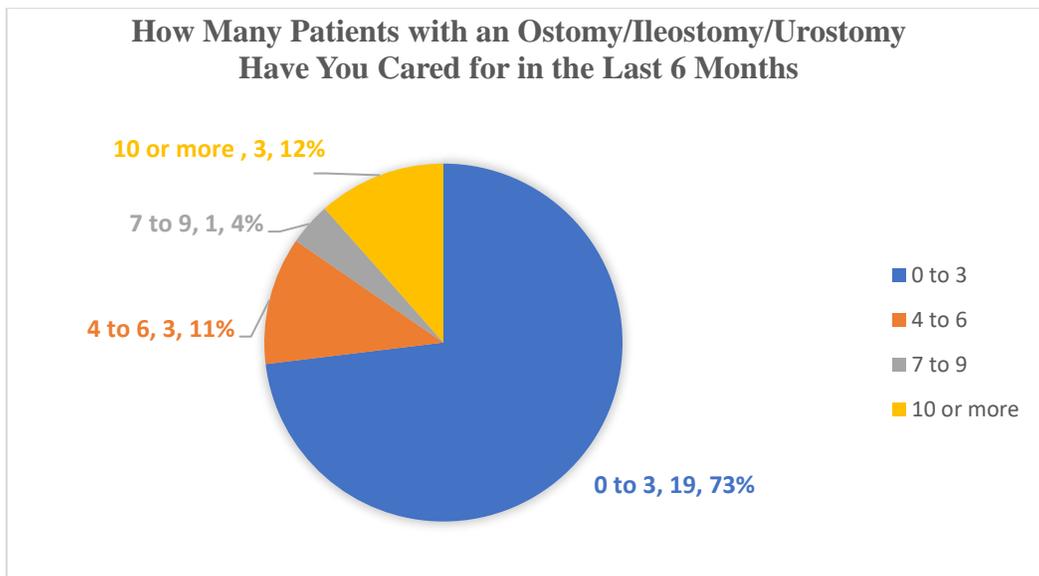
What is Your Area of Focus at Work



According to the demographic question “how many patients an ostomy/ileostomy/urostomy have you cared for in the last 6 months,” nineteen participants (73%) reported taking care of zero to three ostomy patients in the past six months. Three participants (11%) reported caring for four to six ostomy patients in the last six months. One participant (4%) reported caring for seven to nine ostomy patients in the last six months. Three participants (12%) reported caring for ten or more ostomy patients in the last six months. See Graph 3 below.

Graph 3

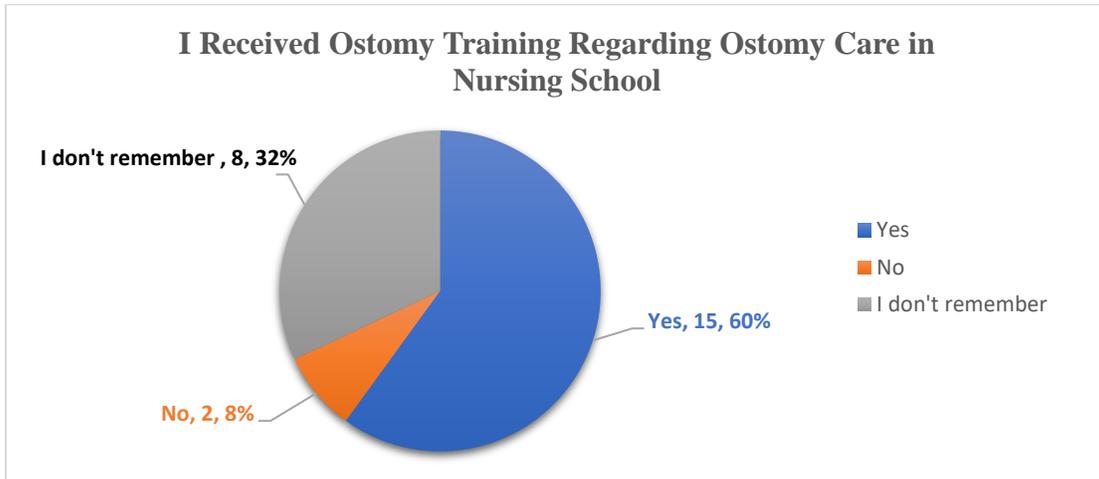
How Many Patients with an Ostomy/Ileostomy/Urostomy Have You Cared for in the Last 6 Months



When asked whether participants received ostomy training regarding ostomy care in nursing school, fifteen participants (66%) reported receiving ostomy training while in nursing school. Two participants (8%) reported not receiving any ostomy training while in nursing school. Eight participants (32%) did not recall if they received ostomy training regarding ostomy care while in nursing school. See Graph 4 below.

Graph 4

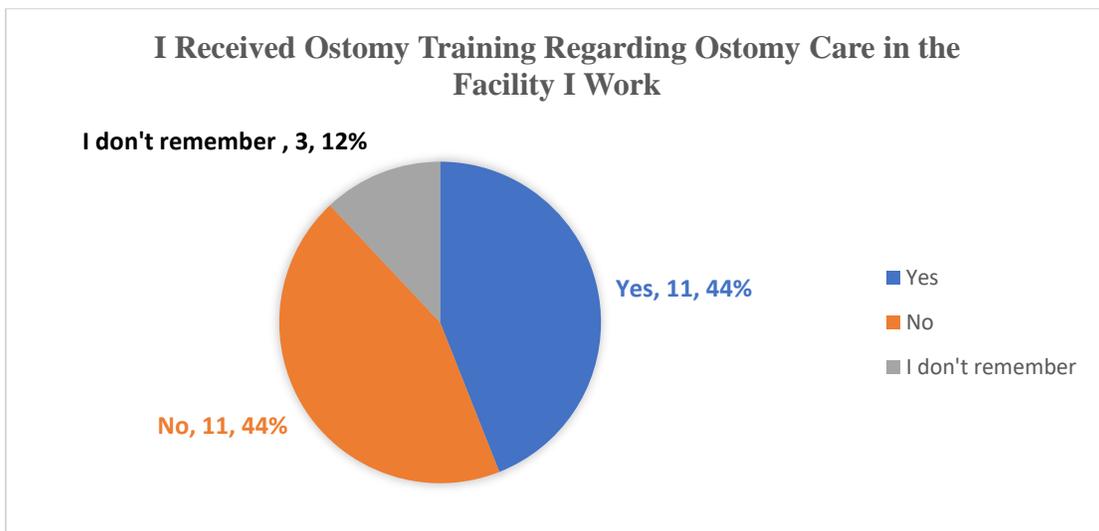
I Received ostomy Training Regarding Ostomy Care in Nursing School



When asked whether participants received ostomy training regarding ostomy care in the facility they work in, eleven participants (44%) reported receiving ostomy training in the facility they work in, eleven participants (44%) reported not receiving ostomy training in the facility they work in, and three participants (12%) reporting not remembering if they received any ostomy training in their facility. See Graph 5 below.

Graph 5

I Received Ostomy Training Regarding Ostomy Care in the Facility I Work



Results - Objective Presentation of Data

Aim One

The first aim of this project was to develop a nursing ostomy continuing education course. The objectives were to conduct a literature review to determine the best evidence-based practices for ostomy care, incorporate best practices into a nursing CE course, recruit registered nurses to participate in the CE course, and present the nursing ostomy CE course to the recruited registered nurses.

A literature review was conducted of CINAHL and MEDLINE databases for English language sources of academic, peer-reviewed journal articles published between January 2010 through June 2020. 51 articles were found of these only 10 met inclusion criteria discussing how nursing knowledge, skills, and confidence affects their ability to deliver effective ostomy management. The literature review was incorporated with the WOCN's (2017) "Clinical Guidelines: Management of the Adult Patient with a Fecal or Urinary Ostomy" and Carmel et al (2016) "Core Curriculum: Ostomy Management" to create the online nursing ostomy CE course. The content of the course was reviewed by a CWOCN and content was revised until mutual satisfaction between the CWOCN and researcher was achieved. See Appendix A for the 4-hour ostomy CE course agenda and timeline. The course incorporated didactic lecture, images, videos, a hands-on practicum, an interactive group discussion, and a game-based learning platform. These different learning modalities were included to address different learning styles.

Didactic Lecture, Images, and Videos. The didactic lecture material was developed following guidelines from the WOCN's (2017) "Clinical Guidelines: Management of the Adult Patient with a Fecal or Urinary Ostomy" and the WOCN's "Core Curriculum: Ostomy Management" (Carmel et al., 2016). Images were used to visually enhance learner's understanding. All images included in the presentation were vetted by HPH's CE department to

be used for the course and did not include any product or other company information to meet CE accreditation criteria. See Appendix G for examples of the PowerPoint slides with picture images.

Videos obtained through a universally accessible platform (YouTube) were included in the lecture and covered topics such as *Crusting around an ostomy stoma*, *6 things I wish someone had told me before ostomy surgery*, *Mental health with an ostomy*, and *How to dress with an ostomy* (Hooper, 2014; Shield Healthcare, 2015 July 8; Shield Healthcare, 2018 February 22; Shield Healthcare, 2018 June 15). All videos were vetted by HPH's CE department to be used for the presentation and did not include any product or other company information to meet CE accreditation criteria.

Virtual Hand-on Practicum. A hands-on practicum was conducted virtually due to COVID-19 restrictions. Prior to the course start date, each participant was mailed a stoma model, ostomy pouch, and an ostomy measuring guide to be used during the virtual hands-on practicum. This presenter used a webcam to demonstrate the proper application of an ostomy pouch in real time; the class was able to follow and place their ostomy pouches onto their stoma models during the demonstration.

Interactive Game-Based Learning Platform. Kahoot, an online game-based interactive learning platform was used to reinforce learning after different sections during the didactic lecture. Participants logged into the Kahoot game by entering a unique pin number and creating an anonymous username. Multiple choice questions related to each respective section of the presentation was displayed on each participant's computer screen, tablet, or smart phone device. Participants gained points for answering questions correctly as well as how fast they

answered each question. See Appendix H for an example of the Kahoot online game-based interactive learning platform.

Interactive Group Discussion. Utilizing the breakout room feature on Zoom, participants were divided into groups of three and asked to discuss a case study. Each group was tasked to develop a plan of how they would approach educating a new ostomy patient. After 10 minutes, the class was brought back together and each group presented how they would educate a new ostomy patient, challenges they expected to encounter, and the different components they would include in the discharge teaching. See Appendix I for the case study used for the interactive group discussion.

Recruitment and Presentation of the Nursing Ostomy CE Course. Recruitment flyers (see Appendix D) were distributed to different acute care facilities throughout Hawaii. Registration for the online course opened on October 5, 2020 and closed on November 5, 2020 with the goal of recruiting a sample size of 25 participants. A total of 27 people signed up for the online course; of these 25 attended the class. The 4-hour nursing ostomy CE course was presented virtually through Zoom on November 7, 2020. The course was broadcasted from Pali Momi Medical Center's Ewa Conference Room.

Aim Two

The second aim of this project was to determine if registered nurses gained knowledge, skills, and confidence in ostomy management. Objectives one, two, and three were to determine if participants gained an understanding of 1) the anatomy and physiology of the gastrointestinal and urinary tract systems, locations of common ostomies, and indications for undergoing an ostomy formation procedure 2) early and late stomal and peristomal complications and strategies for managing each type of complication and 3) the psychological and emotional factors

impacting ostomy patient’s postoperative adjustment and recovery. The average total score of the ostomy knowledge pre- and post-tests showed an overall improvement in understanding of ostomy management. The average total scores for the ostomy knowledge post-test and the 2-week post-test remained relatively stable. See Figure 3:

Figure 3

Average Test Scores

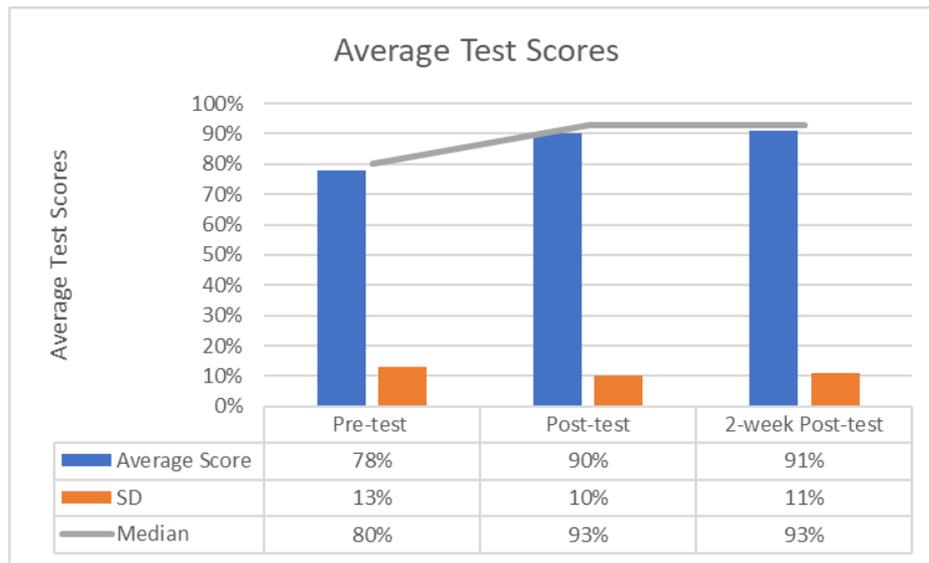


Table 1 provides a comparison of the percentage of correctly answered questions for each individual question on the pre-test, post-test, and 2-week post-test. An increase in the percentage of correctly answered questions increased between the pre- and post-tests. The scores between the post-test and 2-week post-test remained relatively the same or slightly improved. The percentage of correctly answered questions can be viewed in Table 1 below.

Table 1*Average Test Score Breakdown by Question*

	Test Questions	Pre-test	Post-test	2-Week Post-test
1	When assessing a new post-operative patient with a new fecal diversion (e.g., colostomy, ileostomy) the nurse should obtain the following information except:	43%	83%	86%
2	Pain management in the post-operative period is important to:	75%	78%	86%
3	Assessment of a newly created stoma includes the following	96%	100%	100%
4	The height of the stoma above skin level should be:	88%	100%	93%
5	The amount and type of output from a newly created fecal stoma is related to	88%	94%	93%
6	The skin around the stoma should be	92%	100%	93%
7	The solid skin barrier (wafer) should be cut to fit at the base of the stoma	88%	89%	93%
8	Initially to make sure the patient ostomy appliance fits properly; the stoma should be measured	43%	78%	93%
9	If the wafer is cut too small	75%	78%	86%
10	You would expect the fecal output from an ileostomy to be	46%	61%	57%
11	Colostomy output depends on the location, the more distal to the small intestine the thicker and less frequent the output	92%	94%	93%
12	Which of the following should be a priority when developing a teaching plan for an elderly person with an ostomy?	58%	100%	93%
13	When teaching a patient who only speaks Spanish and has no family available; which of the following interventions would be the best approach?	100%	100%	100%
14	Prior to discharging a patient home from the hospital with an ostomy, it is important to teach which of the following	96%	100%	100%
15	Which of the following stoma symptoms must be addressed with the physician immediately?	96%	94%	100%

The fourth objective of aim two was to determine if participants expressed an increase in confidence caring for ostomy patients and providing ostomy patient education. Participants'

confidence was measured by comparing the survey results sent with the pre-test, post-test, and 2-week follow up post-test. The survey asked participants to rate on a 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree) how they felt towards different questions e.g. “I feel confident that I have the background knowledge and experience in ostomy care to sufficiently care for my patients at this time.” Confidence scores are shown in Table 2 below.

Table 2*Confidence Scores*

	Survey Question	Confidence Scores		
		Pre-Survey	Post-Survey	2-Week Post-Survey
1.	I feel confident that I have the background knowledge and experience in ostomy care to sufficiently care for my patients at this time.	65.45%	85.56%	85.71%
2.	I feel confident that I can assess my patient’s ostomy sufficiently well enough to care for my patient with an ostomy at this time.	64.55%	87.78%	87.14%
3.	I feel confident that I know enough about the different types of appliances for the various ostomies and conditions to adequately select the proper ones for my patient at this time.	60.00%	83.33%	82.86%
4.	I feel confident that I have the skills to size, fit, and apply an ostomy appliance at this time	62.73%	87.78%	87.14%
5.	I feel confident that I can teach my patients sufficiently well enough to care for themselves at home at this time	58.18%	81.11%	82.86%
6.	I feel confident that I can advise my patients on community resources for supplies, education, and support sufficiently well enough at this time	54.55%	78.89%	80.00%
7.	Patients are well prepared to care for themselves at home at the time they leave the hospital	68.18%	78.89%	74.29%
8.	Patients are well informed about what to expect regarding their condition, expected changes, and care at home at the time they leave the hospital.	68.18%	78.89%	74.29%
9.	I feel that patients will get adequate follow up care and teaching after they leave the hospital	65.71%	82.22%	82.86%
10.	Ostomy care is unpleasant, making me at times reluctant to do it.	73.64%	80.00%	87.14%
11.	Ostomy supplies are easy to order in my facility	66.36%	78.89%	77.14%
12.	I am concerned I may do something incorrectly	61.82%	80.00%	78.57%

13.	I am concerned I may harm my patient’s stoma	68.18%	80.00%	83.08%
14.	If I am unsure about any aspect of ostomy care, there is someone available who can answer my questions.	76.36%	87.78%	88.57%
15.	If I am unsure about any aspect of ostomy care, there is someone available who can answer my questions.	76.36%	87.78%	88.57%
16.	I have the proper patient teaching materials (booklets, pamphlets, videos, etc.) to teach my patients/family about ostomy care	65.45%	73.33%	68.57%
17.	I have enough time during my shift to teach ostomy care to my patient/family	57.27%	65.56%	61.43%

Aim Three

The third aim of this project was to determine if a four-hour ostomy CE course can motivate registered nurses to change their attitude and approach towards ostomy patients and ostomy care. The objective of this aim was to evaluate if the registered nurses participating in the course expressed increased confidence and that the course positively impacted their nursing practice in the management of ostomy patients. The course evaluation sent to the participants after the completion of the class was used to evaluate if this aim was achieved. The course evaluation for “The Dirty Misconceptions of Ostomies: Bridging the Knowledge Gap” nursing ostomy CE course is depicted in Table 3 below.

Table 3

Ostomy CE Course Evaluations

Course Evaluation Questions	Answers	
Will this CE activity impact your competence, performance, and practice?	Yes: 24	No: 0
Was there commercial bias in the presentation of this topic?	No: 24	Yes: 0
I was adequately informed of potential faculty conflicts of interest.	No: 0	Yes: 24

<p>List an example of how you will apply this learning to your practice.</p>	<ul style="list-style-type: none"> • Include info that I learned. • I will be able to teach my patients better about ostomy care. • I have the confidence to change ostomy pouches. • I work inpatient emphasizes on gastrointestinal patients. • Help answer questions and be able to change and teach ostomy care. • It's a good review on colostomy and ileostomy care. • Correct techniques when helping change ostomy bag with patients. • This was an excellent learning presentation. It's been a long time since I took care of an ostomy. • I can teach my patient about best practices for changing out their ostomy bags and tips on emptying it as well as answer their most frequently asked questions and address any concerns they might have. • Pt education • I will approach ostomy care with confidence with my next patient, instead of deferring to another nurse. • Education with patients and families • Will use this information when building out Epic screens for nurses. • Educating patients on how to care for ostomies. • I will be better able to care for patients with ostomies when I have them. • Assess and care for the ostomy and the skin as I learned from this conference. • As a clinician, I need to update my practice by assisting staff on dealing with dirty misconceptions in caring with ostomy patients. • Better understanding of the patients' perspective. • I have a better understanding of stoma assessment after explanations and pictures from the class. • I will apply this knowledge to my practice by teaching ostomy care to patients. • When we receive ostomy patients in Endoscopy, I will be able to provide correct wound care and placement of ostomy equipment.
<p>List one example of how this learning impacts your role on the healthcare team.</p>	<ul style="list-style-type: none"> • Provided me with information to give patient education who are ostomates. • I will be more confident in providing ostomy care. • More confident in doing patient education. • Teaching my patients. • More confidence in approaching patients with ostomies. • Helps with clinical review during audits.

	<ul style="list-style-type: none"> • Understand how patients with ostomies may feel and help with their care. • Better understanding of what is out new on ostomies. • It helps my patients mentally and physically prepare themselves for caring for this new way of life that will affect them on a daily basis. Starting the transition in the hospital will greatly assist a smoother transition home when they will have to start caring for it themselves 24/7. • Ostomy complications to notify physicians of. • As a medical surgical floor, I encounter ostomies every once in a while, and this presentation made me more comfortable with the care for ostomates. • Increased comfort level in caring for patients. • Improves my knowledge and understanding with assessments for ostomies. • Help to erase the stigma behind patients with ostomies. • Much better understanding of ostomies and patients who have them. • Will be a better resource for my colleague with this knowledge to improve the outcome of the patient. • That this is a multidisciplinary approach and clinicians need to make sure that the team is activated to assist with patient education in preparation with dealing/caring with his/her colostomy management. • New learning about urostomies. • I feel like I am able to apply an ostomy bag better after this class. • I will be a resource on ostomy care. • This will help me educate my coworkers and patients about their ostomies.
<p>Other comments</p>	<ul style="list-style-type: none"> • Once we figured out the Kahoot game it was fun to play! • Great job, Jaryn! I appreciate the time and effort you spent on the preparation and the presentation. Best of luck on your future education endeavors! • Excellent and informative class, highly recommend it to all nurses. • Thank you for a very informative presentation. • The title and objectives did not specify that the scope of this presentation will be on adults with ostomies/diversions; suggest this be considered for future ostomy-related presentations. • The instructor was great! She had awesome communication via email and even sent ostomy supplies for participants to use remotely, which was great for hands on learning. I feel she did a great job engaging participants by also utilizing

	<p>interactive games to reinforce participants learning knowledge from the presentation. Information presented was pertinent and concise and speaker did a great job communicating to the class. Really enjoyed her presentation.</p> <ul style="list-style-type: none">• This was a great educational class!
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Chapter Five

Explanation of How the Theoretic Framework Guided Outcome Evaluation

Shrigley's Theory of Attitude Concept and Science Teaching (1983) was used as the theoretical framework for this project. Shrigley's theory states that behaviors can be influenced by both attitudes and cognition. The nursing ostomy CE course was designed to increase nurses' knowledge (cognition) and confidence (attitude) to effectively changes nursing practice (behaviors) working with ostomates. This chapter discusses how the results are linked to the goals, aims, and objective of the project and the limitation of this study, implications for practice, and future recommendations.

Discussion of Data Linked to Specific Aims and Objectives

Aim One

The first aim of this project was to develop a nursing ostomy continuing education course.

Objective One. The first objective was to conduct a literature review to determine the best evidence-based practices for ostomy care. The literature review found that most ostomates were under-prepared to manage their stomas on their own due to inadequate ostomy patient education. Limitations in nursing knowledge, skills, and confidence in ostomy management occurs from limited exposure to ostomy related concepts in nursing school and in the workplace (Bagheri et al., 2017; Cross et al., 2014; Duruk & Ucar, 2013; Gemmill et al., 2011; Li et al., 2019; Millard et al., 2020; Zimmicki & Pieper, 2018). These limitations contribute to the lack of ostomy patient education ostomates receive leading to poorer quality of life outcomes and poor post-operative adjustment (Smith et al., 2007).

Objective Two. The second objective was to incorporate evidence-based practices for ostomy care into a nursing continuing education course. The concepts of the literature review were incorporated with clinical practice guidelines provided by the WOCN Society to create the nursing ostomy CE course. See Appendix A for the agenda and timeline of the 4-hour ostomy CE course. The content of the presentation was validated by a CWOCN and all images and videos were vetted by HPH's CE department to meet CE accreditation criteria.

Objective Three. The third objective was to recruit registered nurses to participate in the nursing ostomy continuing education course. A recruitment flyer was distributed to different acute care facilities in Hawaii. 27 people registered for the course but only 25 attended the class. The goal of recruiting a minimum of 25 participants for this study was met.

Objective Four. The fourth objective was to present the nursing ostomy continuing education course. The nursing ostomy CE course "The Dirty Misconceptions of Ostomies: Bridging the Knowledge Gap" was live broadcasted over Zoom on November 7, 2020 from 8:00am to 12:00pm.

Aim Two

The second aim of this project was to determine if registered nurses gained knowledge, skills, and confidence in ostomy management after participating in the nursing ostomy education course.

Objective One. The first objective was to determine if the participants of the nursing ostomy education course gained an understanding of the anatomy and physiology of the gastrointestinal and urinary tract systems, locations of common ostomies, and indications for

undergoing an ostomy formation procedure. Results from the pre-test, post-test, and 2-week post-test indicate an increase in knowledge in ostomy management. The mean test scores for the pre-test, post-test, and 2-week post-test were 78%, 90%, and 91%, respectively. The mean test scores show an increase in knowledge after the class when comparing scores between the pre-test and post-test. The 90% and 91% mean scores between the post-test and 2-week post-test indicates possible knowledge retention 2 week after the completion of the course. The improvement in test scores indicate an increase in understanding and knowledge of ostomy management.

Objective Two. The second objective was to determine if participants gained an understanding of early and late stomal and peristomal complications and strategies for managing each type of complication. Results from the pre-test, post-test, and 2-week post-test shows improved mean test scores. For example, participants' scores for question nine "If the wafer is cut too small" improved from the pre-test (75%), post-test (78%), and 2-week post-test (86%).

Objective Three. The third objective was to determine if they gained the understanding of the psychological and emotional factors impacting ostomy patient's postoperative adjustment and recovery. Results from the pre-test, post-test, and 2-week post-test shows improved mean test scores. For example, participants' scores for question one "When assessing a new post-operative patient with a new fecal diversion (e.g., colostomy, ileostomy) the nurse should obtain the following information except" improved from the pre-test (43%), post-test (83%), and 2-week post-test (86%).

Objective Four. The fourth objective was to determine if participants of the nursing ostomy education course expressed increased confidence in caring for ostomy patients and providing ostomy patient education. Participant's confidence was assessed by comparing

confidence scores through the survey disseminated with the pre-test, post-test, and 2-week post-test. Participants' confidence in caring for ostomy patients increased from the pre-test, post-test, and 2-week post-test, as seen in Table 2.

Aim Three

The third aim of this project was to determine if a four-hour continuing education ostomy management course would motivate registered nurses to change their attitude and approach towards ostomy patients and ostomy care.

Objective One. The first objective was to evaluate if registered nurses expressed an increase in confidence and a positive impacted upon their nursing practice in the management of ostomy patients after participating in the nursing ostomy education course. The overwhelming positive response towards the nursing ostomy continuing education course supports a positive change in attitude towards ostomy patients and the care they need. The individual responses to the course evaluation question "List an example of how you will apply this learning to your practice" and "List one example of how this learning impacts your role on the healthcare team" can be seen in Table 3.

Outcomes Evaluation

The researcher was able to speak to several of the participants after the completion of the course and gained personal feedback on the nursing ostomy CE course. Participants were overall satisfied with the content of the class and enjoyed the different learning approaches used to teach and reinforce learning. Recommendations for improvements in the future include improving upon technical difficulties that occurred while launching the Kahoot online interactive game platform. Several participants mentioned that more CE offerings are needed related to gastrointestinal issues and wound care.

Implications for Practice

The impact of the nursing ostomy continuing education course was that participants gained more knowledge and skills in ostomy management and therefore acquired increased confidence in caring for ostomates. Participants felt better prepared to address different issues related to ostomies, better able to educate patients and their family how to manage their ostomies, and more aware of the patient's perspective living with an ostomy.

This CE offering was advertised in different acute care facilities throughout Hawaii and requests were made to offer this course again in the future. The online format of the CE offering allowed increased availability of the course content to registered nurses on the neighbor islands and increased access to continuing education in ostomy care.

Project Limitations

Because of the restriction imposed due to the COVID-19 pandemic, in-person offerings of this course were not allowed. This is a limitation of the study because one intention of the project was to increase the skills of the registered nurses in caring for ostomy patients, particularly increasing the skills in addressing complex pouching situations. Although a stoma model, ostomy pouch, and stoma measuring guide was sent to each participant to practice during the virtual class, the researcher and instructor of this project would have preferred to be able to provide more hands-on guidance in-person during this portion of the class but was limited to virtually demonstrating and explaining pouching techniques via real-time web video recordings.

Conclusion and Recommendations

In comparing the results from the pre-tests, post-tests, 2-week post-tests, and surveys; the intervention was successful in teaching registered nurses how to care for ostomy patients. Specifically, participants were better able to understand the anatomy and physiology of the

gastrointestinal and urinary tract systems, locations of different ostomies, and indications for undergoing an ostomy forming procedures. Participants were also able to better identify early and late stomal and peristomal complications and strategies for managing each type of complication. Participants also expressed increased confidence in caring for and providing patient education regarding ostomy management. It is recommended that nursing ostomy knowledge and competence be facilitated through specialized continuing education courses especially when there is limited exposure to ostomy patients in certain care setting (Gemmill et al., 2011). Therefore, future offerings of an ostomy related continuing education course should be available to registered nurses to maintain knowledge, skill, and confidence caring for ostomates.

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Appendix A

Agenda and Timeline of 4-hour Ostomy CE Course

Time per Section	Topic	Topic Section Details
15:00	Introduction	<ul style="list-style-type: none"> • Introduction of speaker • CE education verbiage and how to claim CE credits. • Review CE course objectives • Introduction to ostomy definitions • Prevalence of ostomates in the U.S. • Indications for surgery • 3 most common ostomies • Purpose of pouching system • Temporary vs Permanent ostomies • <i>6 Things I Wish I Knew Before Ostomy Surgery</i> [video]
25:00	Review of A&P and stoma construction	<ul style="list-style-type: none"> • Overview of GI tract structures and function • Review of typical ileostomies and colostomies creation within the GI system and expected stool consistency depending on placement of the ostomy. • Overview of the urinary tract system structures and function • Review of how ileal conduits/urostomies are created. • 3 stoma construction types: end stoma, loop stoma, end-loop stoma • Kahoot! Interactive game (6 questions)
15:00	Continent diversions	<ul style="list-style-type: none"> • Definition of a continent diversion and types • Ileal pouch anal anastomosis (IPAA) brief overview and IPAA management tips • Continent ileostomy (Kock Pouch) brief overview and intermittent self-catheterization tips • Indiana Pouch brief overview and management tips • Neobladder brief overview and management tips
5-minute break		
35:00	Ostomy appliances	<ul style="list-style-type: none"> • Unnecessary and bad practices • When to empty an ostomy pouch • Positions for patients to empty their ostomy pouches. • Basic ostomy management tips • 2 types of ostomy pouches: one-piece vs two-piece pouches • Ostomy pouch features: drainage options, transparent vs opaque, pediatric vs adult pouches, flat and convex skin barriers • Convexity

		<ul style="list-style-type: none"> • Ostomy accessories: stoma paste, stoma rings, stoma powder, liquid skin barrier, stoma belt, and drainage collector containers. • <i>Crusting technique</i> [video] • Changing an ostomy pouch steps • Hands-on virtual practicum 15:00
30:00	Stoma complications	<ul style="list-style-type: none"> • Characteristics of a normal stoma • Prevalence of stoma complications • Mucocutaneous separation: definition, risk factors, assessment, management • Stomal necrosis: definition, risk factors, assessment, management • Stomal retraction: definition, risk factors, assessment, management • Stomal stenosis: definitions, risk factors, assessment, management • Prolapsed stoma: definition, risk factors, assessment, management • Parastomal hernia: definition, risk factors, assessment, management • Stoma trauma: types of trauma, risk factors, management, when to notify the surgeon. • Kahoot! Interactive game (8 questions)
35:00	Peristomal complications	<ul style="list-style-type: none"> • Characteristics of normal peristomal skin • Prevalence of peristomal skin complications • Peristomal MASD: review of the 3 different types, causes, presentations/assessment, management. • Peristomal mechanical skin damage: review of the 2 different types, definitions, risk factors, presentations/assessment, management • Peristomal fungal/Candidiasis infection: presentation, causes, risk factors, management. • Allergic contact dermatitis: definition, presentation, risk factors, assessment, management • Peristomal folliculitis: definition, presentation, risk factors, management • Peristomal granulomas: presentation, causes, management. • Kahoot! Interactive game (7 questions)
30:00	Post-op management and Long-term ostomy support needs	<ul style="list-style-type: none"> • <i>Body image after ostomy surgery</i> [video] • Living with an ostomy affect physical, psychological, social, and spiritual wellbeing. • Common long-term support needs and concerns living with an ostomy.

		<ul style="list-style-type: none"> • Age based ostomy teaching following Erikson’s developmental stages. • 4 phases of psychological adaption • <i>Mental health with an Ostomy: Anxiety, Depression, & PTSD</i> [video] • Cultural and spiritual considerations • Sexuality and intimacy concerns • How to tell someone you have an ostomy by creating a short universal script
5-minute break		
45:00	Post-op education	<ul style="list-style-type: none"> • Components of ostomy post-op education and importance of patient ostomy education • Factors for fragmented delivery of ostomy patient education • Importance of involving family and caregivers in teaching sessions. • Review of pouching principles • When to seek medical attention • Living with an ostomy considerations: bathing/showering/swimming, clothing, activity restrictions, traveling, medications, dietary considerations, ileostomies and food blockages, management of gas and odor, ordering supplies • <i>Dressing with an ostomy</i> [video] • Community resources • Break out Case study. <p>Break out discussion 7 minutes. Group discussion and presentation 5 minutes = 13 minutes</p>
5:00	Closing summary and questions	
Total: 240 min		

Appendix B

Bridging the Knowledge Gap in Ostomy Care Survey

Demographic information: (Please circle one answer per question)

1. Highest nursing degree:
 - a. ADN
 - b. BSN
 - c. MSN
 - d. DNP
 - e. Other (specify) _____
2. What is your primary area of practice?
 - a. Adult
 - b. Pediatric
 - c. Both
3. What is your primary area of focus?
 - a. Medical/Surgical
 - b. Critical Care
 - c. Oncology
 - d. Cardiology
 - e. Telemetry
 - f. Gynecology
 - g. Rehabilitation
 - h. Operating room
 - i. Emergency department
 - j. Other (specify) _____

Ostomy Background (Please circle one answer per question)

1. How many patients with ostomies/ileostomies/urostomies have you cared for in the last 6 months?
 - a. 0-3 ostomates
 - b. 4-6 ostomates
 - c. 7-9 ostomates
 - d. 10 or more ostomates
2. I received ostomy training regarding ostomy care in nursing school.
 - a. Yes
 - b. No
 - c. I don't remember.
3. I received ostomy training regarding ostomy care in the facility I work in.
 - a. Yes
 - b. No
 - c. I don't remember.

Knowledge Questions (Pre- and Post- Test)**Please circle one answer per question**

1. When assessing a new post-operative patient with a new fecal diversion (e.g., colostomy, ileostomy) the nurse should obtain the following information except:
 - a. Procedure, pathology, and expected outcomes
 - b. Stoma location
 - c. Mucocutaneous separation
 - d. Presence of Jackson Pratt drain
2. Pain management in the post-operative period is important to:
 - a. Assist in patient mobilization and hasten bowel function
 - b. Assist in pouch change procedure
 - c. Stop patient from being noncompliant
3. Assessment of a newly created stoma includes the following:
 - a. Stoma edema
 - b. Color of the mucosa
 - c. Height of the stoma
 - d. All of the above
4. The height of the stoma above skin level should be:
 - a. 5-10 cm
 - b. Greater than 4 cm
 - c. At skin level
 - d. 1-3 cm
5. The amount and type of output from a newly created fecal stoma is related to:
 - a. The time of day
 - b. The amount of parenteral fluids
 - c. The location in the intestinal tract
 - d. Fluid and electrolyte absorption
6. The skin around the stoma should be:
 - a. Denuded because of the shaving and surgical scrub
 - b. Pale as compared to the rest of the abdomen
 - c. Erythematous because of the presence of the pouch adhesive
 - d. Intact and healthy
7. The sold skin barrier (wafer) should be cut to fit at the base of the stoma.
 - a. True
 - b. False
8. Initially to make sure the patient ostomy appliance fits properly; the stoma should be measured:
 - a. Daily
 - b. Every other day
 - c. At least weekly
 - d. Bimonthly
9. If the wafer is cut too small,

- a. The stoma could be traumatized
 - b. Leakage is more likely
 - c. The peristomal skin could easily break down
 - d. None of the above
10. You would expect the fecal output from an ileostomy to be
- a. Formed stool
 - b. Semi-solid stool
 - c. Semi-liquid to very soft stool
 - d. A continuous soft to watery effluent
11. Colostomy output depends on the location, the more distal to the small intestine the thicker and less frequent the output.
- a. True
 - b. False
12. Which of the following should be a priority when developing a teaching plan for an elderly person with an ostomy?
- a. Provide a video and education booklet
 - b. Arrange for an ostomy visitor
 - c. Schedule short teaching sessions
 - d. Use a flip chart for the surgical procedure
13. When teaching a patient who only speaks Spanish and has no family available; which of the following interventions would be the best approach?
- a. Show a video
 - b. Arrange a UOA visitor
 - c. Arrange to use the services of an interpreter
 - d. Provide an education booklet
14. Prior to discharging a patient home from the hospital with an ostomy, it is important to teach which of the following
- a. When and how to empty the pouch
 - b. How to open and close the clamp
 - c. How to order supplies
 - d. When to call the physician or WOC nurse
 - e. Community resources
 - f. How to change the wafer and pouch
 - g. All of the above
15. Which of the following stoma symptoms must be addressed with the physician immediately?
- a. Bleeding during cleaning
 - b. Post-operative edema
 - c. Dark purplish color and decreased output

Confidence Questions

Please answer the following questions on a scale of 1-5 according to the scale given below

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. I feel confident that I have the background knowledge and experience in ostomy care to sufficiently care for my patients at this time.				
1	2	3	4	5
2. I feel confident that I can assess my patient's ostomy sufficiently well enough to care for my patient with an ostomy at this time.				
1	2	3	4	5
3. I feel confident that I know enough about the different types of appliances for the various ostomies and patients' condition to adequately select the proper ones for my patient at this time.				
1	2	3	4	5
4. I feel confident that I have the skills to size, fit, and apply an ostomy appliance at this time.				
1	2	3	4	5
5. I feel confident that I can teach my patients sufficiently well enough to care for themselves at home at this time.				
1	2	3	4	5
6. I feel confident that I can advise my patients on community resources for supplies, education, and support sufficiently well enough at this time.				
1	2	3	4	5
7. Patients are well prepared to care for themselves at home at the time they leave the hospital.				
1	2	3	4	5
8. Patients are well informed about what to expect regarding their condition, expected changes, and care at home at the time they leave the hospital.				
1	2	3	4	5
9. I feel that patients will get adequate follow-up care and teaching after they leave the hospital.				
1	2	3	4	5

Attitude Questions

Please answer the following questions on a scale of 1-5 according to the scale given below

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

1. Ostomy care is unpleasant, making me at time reluctant to do it.

1	2	3	4	5
---	---	---	---	---

2. Ostomy supplies are easy to order in my facility.

1	2	3	4	5
---	---	---	---	---

3. I am concerned I may do something incorrectly.

1	2	3	4	5
---	---	---	---	---

4. I am concerned I may harm my patient's stoma.

1	2	3	4	5
---	---	---	---	---

5. If I am unsure about any aspect of ostomy care, there is someone available who can answer my questions.

1	2	3	4	5
---	---	---	---	---

6. I have the proper patient teaching materials (booklets, pamphlets, videos, etc.) to teach my patients/family about ostomy care.

1	2	3	4	5
---	---	---	---	---

7. I have enough time during my shift to teach ostomy care to my patient/family.

1	2	3	4	5
---	---	---	---	---

Further comments or suggestions for improvements?

Appendix C

8/16/2020

University of Hawaii Mail - Staff Nurse Skills, Knowledge, and Barriers Study - Request for permission to use questionnaire



Jaryn Lau <jarynlau@hawaii.edu>

Staff Nurse Skills, Knowledge, and Barriers Study - Request for permission to use questionnaire

4 messages

Jaryn Lau <jarynlau@hawaii.edu>
To: hcross914@gmail.com

Sun, Feb 23, 2020 at 11:45 AM

Dear Dr. Heidi Huddleston Cross RN MSN FNP-BC CWOCN,

My name is Jaryn Iwamoto and I am in the Family Nurse Practitioner DNP program at the University of Hawaii at Hilo.

As the CWOCN coordinator at my hospital, I am preparing a one-day ostomy care class for staff nurses as a part of my DNP dissertation. During my literature review, I read your article "*Staff Nurse Confidence in Their Skills and Knowledge and Barriers to Caring for Patients with Ostomies*" and wanted to ask permission if I could use the questionnaire as a part of my study.

My proposed dissertation is a quality improvement project developing an ostomy education course for staff nurses in Hawaii and assessing nurses' knowledge, skills, and confidence prior to and after participation in the course. In addition to your questionnaire, I wanted to include a qualitative component by adding a comment box under each section.

Please let me know if the above is agreeable with you.

Sincerely,
Jaryn Iwamoto RN BSN CWOCN
808-222-8202

Heidi Cross <hcross914@gmail.com>
To: Jaryn Lau <jarynlau@hawaii.edu>

Sun, Feb 23, 2020 at 3:30 PM

Sorry I did not previously reply.

I would be happy to share my tool but must admit that it may need some further validating prior to use. I did content validation of course, but if I were to use it again would do some further validating.

I will send it under separate cover when I get to my laptop.

Coincidentally, I am across the island from you at Kona. We are here for about a month's stay, relaxing and visiting my daughter, who is an NP at a clinic here in Kona.

Congratulations on going for your DNP and good luck with your practice! I love WOCN nursing!

Best
Heidi
Sent from my iPhone

On Feb 23, 2020, at 11:45 AM, Jaryn Lau <jarynlau@hawaii.edu> wrote:

[Quoted text hidden]

Jaryn Lau <jarynlau@hawaii.edu>
To: Heidi Cross <hcross914@gmail.com>

Sun, Feb 23, 2020 at 5:57 PM

Thank you so much! I appreciate the research you've done in our field.

And that is quite a coincidence that you are visiting Hawaii.

8/16/2020 University of Hawaii Mail - Staff Nurse Skills, Knowledge, and Barriers Study - Request for permission to use questionnaire

Have a great time with your daughter in Kona.

Mahalo,
Jaryn
[Quoted text hidden]

Heidi Cross <hcross914@gmail.com>
To: Jaryn Lau <jarynlau@hawaii.edu>

Mon, Feb 24, 2020 at 4:43 PM

Here is a copy

Heidi H. Cross, MSN, RN, FNP-BC, CWON, CSWS

2072 West Lake Road
Skaneateles, NY 13152
315 246-9058

[Quoted text hidden]

 **Ostomy Survey Cross.docx**
14K

Appendix D



PaliMomi.org

The Dirty Misconceptions of Ostomies: Bridging the Knowledge Gap

Date: November 7, 2020
Time: 0800-1200
Location: PMMC Ewa Conference Room
Registration Fee: None

Activity Description: This offering consists of a 4-hour didactic lecture presented simultaneously as a live class with limited seating and webcast. Live class offerings will be available on a first-come, first-serve basis.

Course Objectives

- Identify common gastrointestinal and urinary continent and incontinent diversions
- Identify the different types of fecal and urinary surgical procedures and stoma formations
- Recognize early and late Stomal and Peristomal complications and strategies for management
- Relate how the psychological and emotional factors impact ostomates' postoperative adjustment



Registration Information:

Please register online at <https://www.hawaii-pacific-health.org/health-wellness/continuing-education/3444>

Additional Information: This education activity is part of a research study assessing changes in nursing knowledge, skills, and confidence in ostomy management.

Contact Jaryn Iwamoto via email jarynlau@hawaii.edu



In support of improving patient care, this activity has been planned and implemented by the University of Hawai'i at Hilo and Hawai'i Pacific Health. Hawai'i Pacific Health is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

Hawai'i Pacific Health designates this live activity for 3.75 contact hours for nurses.

Appendix E



University of Hawai'i

Consent to Participate in a Research Project

Diane Van Hoose (Principal Investigator), Jaryn Iwamoto (Student Investigator)

Project title: Bridging the Knowledge Gap in Ostomy Management

Aloha! My name is Jaryn Iwamoto and you are invited to take part in a research study. I am a graduate student at the University of Hawai'i at Hilo in the College of Nursing. As part of the requirements for earning my graduate degree, I am doing a research project.

What am I being asked to do?

If you participate in this project, you will be asked to fill out three sets of surveys (pre-test/survey, post-test/survey, and two-week follow up post-test/survey).

Taking part in this study is your choice.

Your participation in this project is completely voluntary. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you.

If you decide not to participate in this research study, please simply do not take the pre- and post-tests/surveys. You will still be allowed to participate and receive the 3.75 nursing contact hours for completion of the course.

Why is this study being done?

The purpose of this Practice Inquiry Project (PIP) is to develop a continuing education ostomy management course and test this new platform by 1) opening the conversation between nurses on ostomy care, 2) establishing mentoring opportunities between the instructors and learners, and 3) exploring nurses' learning and support needs and preferences.

What will happen if I decide to take part in this study?

The pre-test/survey are 37 multiple choice questions. It will take 15 minutes.

The post-test/survey are 31 multiple choice questions and 1 open-ended question. It will take 15 minutes.

The two-week follow up post-test/survey are 31 multiple choice questions and 1 open-ended question. It will take 15 minutes.

The survey questions will include questions like, "I feel confident that I have the background knowledge and experience in ostomy care to sufficiently care for my patients at this time?" "I feel confident that I can assess my patient's ostomy sufficiently well enough to care for my patient with an ostomy at this time?" "I feel confident that I have the skills to size, fit, and apply an ostomy appliance at this time?" The survey is accessed on a website to which I will provide you a link.

What are the risks and benefits of taking part in this study?

I believe there is little risk to you for participating in this research project. You may become stressed or uncomfortable answering any of the survey questions. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop taking the survey or you can withdraw from the project altogether.

Confidentiality and Privacy:

I will not ask you for any personal information, such as your name or address. Please do not include any personal information in your survey responses. I will keep all study data securely stored in a password protected and encrypted file server. Only my University of Hawai'i advisor



University of Hawai'i
Consent to Participate in a Research Project
Diane Van Hoose (Principal Investigator), Jaryn Iwamoto (Student Investigator)
Project title: Bridging the Knowledge Gap in Ostomy Management

and I will have access to the information. Other agencies that have legal permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study.

Compensation:

You will receive 3.75 nursing contact hours for participating in the course; there is no registration fee attached to this continuing education course offering. Upon returning the two-week post-test and survey, five names will be randomly selected for a \$25 VISA gift card for your time and effort in participating in this research project.

Future Research Studies:

Even after removing identifiers, the data from this study will not be used or distributed for future research studies.

Questions: If you have any questions about this study, please email me at jarynlau@hawaii.edu. You may also contact my faculty advisor, Diane Van Hoose, at diane@hawaii.edu. You may contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu to discuss problems, concerns, and questions, obtain information, or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit <http://go.hawaii.edu/jRd> for more information on your rights as a research participant.

To Access the Survey: Please go to the following web page: <https://www.surveymonkey.com/r/MR6Z7YH>. You should find a link and instructions for completing the survey. Going to the first page of the survey implies your consent to participate in this study.

Please print or save a copy of this page for your reference.

Mahalo!

Appendix F



June 9, 2020

RE: Letter of Endorsement at Pali Momi Medical Center

Jaryn Iwamoto has described her proposed research to me, titled, "Bridging the Knowledge Gap in Ostomy Management."

As Director of Patient Services, I approve of this research to occur at our facility.

Sincerely,

A handwritten signature in black ink, appearing to read "Robyn Kalahiki".

Robyn Kalahiki
Director of Patient Services

Appendix G

Living With An Ostomy
- Medications



- Medications:
 - May affect the color, odor, or consistency of urine/stool depending on the medication taken
 - Discuss medications with healthcare team/pharmacist
- Ileostomy/Transverse colostomies::
 - Avoid laxatives → dehydration
 - Enteric coated and extended-release meds may not be fully absorbed
 - Speak with healthcare team/pharmacist to change formulation for better absorption

Normal Stoma

- Color: pink/red
- Moist
- Round/Oval
- Budded above skin level 1-3 cm
- Location: flat/smooth abdominal surface, below belt line
- Peristomal skin intact - no skin breakdown



Appendix H

Kahoot! Interactive game-based learning platform



Ileostomy output is expected to be?



Ileostomy output is expected to be?

18

Transverse Colostomy
Right Colostomy
Ileostomy
Jejunostomy
Left Colostomy

0 Answers

▲ Pasty stool

◆ Semi-solid stool

● Dark green, viscous, mushy

■ Formed stool

The diagram shows a human torso with the large intestine highlighted. Red circles indicate the locations for Transverse Colostomy, Right Colostomy, Left Colostomy, and Ileostomy. A Jejunostomy is also indicated in the small intestine. The number '18' is in a purple circle on the left, and '0 Answers' is on the right. Below the diagram are four colored buttons: red with a triangle, blue with a diamond, yellow with a circle, and green with a square.

Ileostomy output is expected to be?

Next

0 0 ✓ 0 0

Show media

End game

▲ Pasty stool	✕	◆ Semi-solid stool	✕
● Dark green, viscous, mushy	✓	■ Formed stool	✕

Appendix I



Break Out
Session

Case
Scenario

Discharge Education

- Vanessa is a 48-year-old female
- Admitted 4 days ago for a perforated bowel and underwent emergent surgery
 - S/P descending colostomy
- Concerned about how she will function at work as an elementary school teacher
- Lives at home with husband and 23-year-old daughter
- Enjoys paddle boarding on the weekends and exploring new restaurants as a “foodie”

