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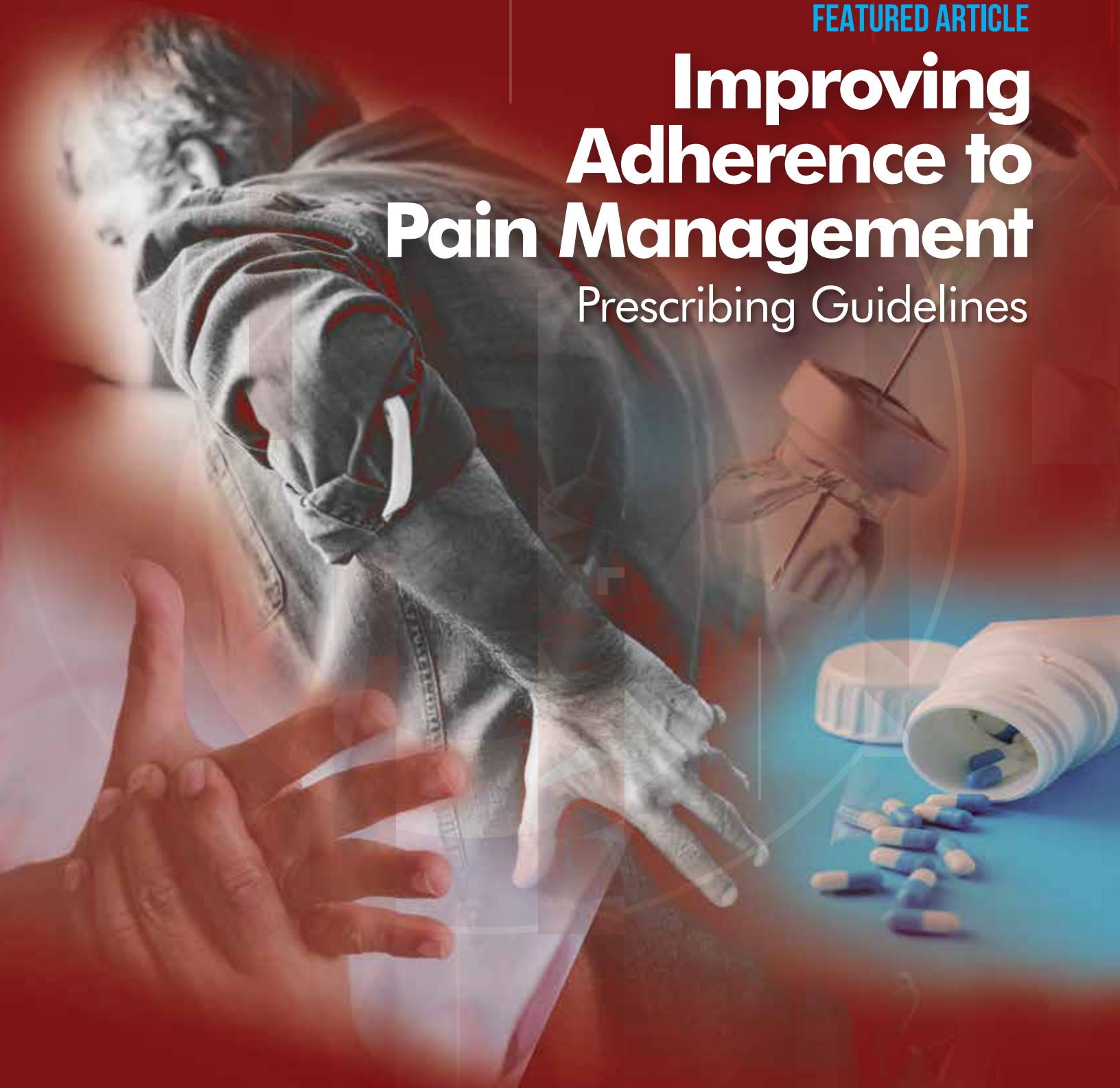

FEATURED ARTICLE

Improving Adherence to Pain Management

Prescribing Guidelines

The Editorial Board and members of the Editorial staff of the
INTERNATIONAL FORUM for NURSING and HEALTHCARE,
UPINHF official journal for nursing and healthcare practices, education and research

Congratulates the 2022 International Awardees

Healthcare Professional Excellence Awardee

GERARDO DIZON LEGASPI
MD

BS Biology (cum laude) 1983
MD College of Medicine 1987
Outstanding Graduate in Clinical Clerkship

Neurosurgical Training:
Section of Neurosurgery,
Philippine General Hospital 1993

International Masters Degree
Neurovascular Diseases, Paris SUD
Mahidol University 2003

Nurse Awardee

LORRAINE S. EVANGELISTA
BSN, MN, PhD, RN, FAHA, FAAN

For her work, research and investigation on the relationship between Obesity and Chronic Heart Failure

"Lorraine is a world-renowned researcher who's highly respected for her expertise in cardiovascular nursing, specially patients with heart failure. She has designed and tested effective intervention using cutting-edge technology and adopting and tailoring to provide information most relevant to patients who struggle with this debilitating condition. She was the first to test home-based walking program (particularly meaningful at this time of the pandemic) on death and hospitalizations. The integration of this program in heart-failure clinics around the world represents a substantial contribution to cardiology."

Josefina A. Tuazon, BSN, MN, DrPH, RN
Professor and Former Dean, UP College of Nursing
2019 UPINHF International Nurse

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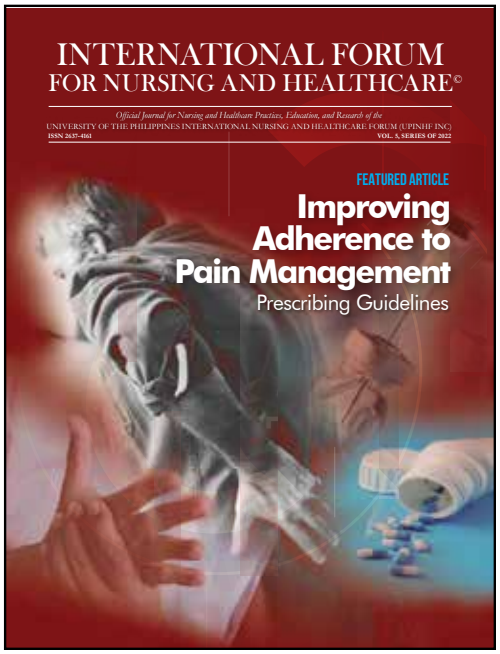
OUR COVER

By Nelson C. Borrero, UP Law '73
Editorial Consultant



The cover of this edition reflects the context of the featured Article: **"Improving Adherence to Pain Management Prescribing Guidelines."** Its essence is timely and very relevant to the occurring crisis in the United States and the world today.

"Pain" is an unpleasant feeling of discomfort. It could be a simple tingle, a prick or ache, but some are constant, which is chronic, and others could be excruciating. Chronic pain is a major health problem that statistics show a large percentage of the U.S. population is affected. Indeed pain affects patients' daily activities as well as their quality of life. It is that degree of unpleasantness that drives people to myriads of remedies, *viz*., pallatives like the over-the-counter pain relievers to prescriptive pain killers such as analgesics and opiods, including those that are obtained illegally like Fentanyl and narcotics.

To the extent pain becomes unbearable, is the extent more drugs are used and oftentimes abused. I once had a "Sciatic" pain. A tablet of **Aleve** gave me some relief. But the pain came back, so I took two pills, then three, then more during the day. When the pain became constant, I tried **Motrin**, but a doctor friend warned against it, until my RN wife insisted on a physical therapy. I did, for three months at a hospital including a "hilot" in the Philippines. The pain dissipated and disappeared. The point of my experience is that when pain becomes excruciating, the remedy becomes prone to abuse.

Today there is an opiod epidemic that many deaths, in the tens of thousands, have occurred because of overdose, which brings us to the featured article which speaks of *prescribing guidelines* in the management of pain.

ABOUT UPINHF

The University of the Philippines International and Healthcare Forum (UPINHF) is a global healthcare-centered organization. UPINHF Inc. is a non-stock and non profit corporation registered under the laws of the State of California, U.S.A. It is also an educational, charitable and a public benefit entity, granted tax-exempt status under Section 501 (c) 3, Internal Revenue Code (IRC) and the California Revenue and Taxation Code (R&TC), Section 2730d, (c) (l). UPINHF is an approved Continuing Education Units (CEU) provider by the California Board of Registered Nursing (BRN). The Organization is the publisher of the *"International Forum for Nursing and Healthcare"* (IFNAH), official journal for nursing and healthcare practices, education and research. This peer-reviewed publication, formerly called: *"The Nursing Journal"* is published annually and is officially assigned the International Standard Number: ISSN 2637 – 4161 by the U.S. ISSN Center at the Library of Congress. Effective February 2, 2021, the IFNAH journal is granted Certificate of Registration (No. TX 8-9547-181) by the U.S. Copyright Office. The Organization also publishes a Quarterly News Brief known as *"The Forum."* Both publications can be accessed worldwide through its web: www.UPINHF. Org.

UPINHF is a chapter of UPAA and recognized as a U.P. alumni organization by the U.P. Board of Regents. The Organization as an entity is committed to, and its members are dedicated to support their beloved alma mater, UPCN and PGH.

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EDITORIAL

Resilience and the Vision to See Around Nursing Corners

An Editorial by: *Dr. Minerva S. Guttman, EdD, APN, RN*

Since Florence Nightingale, the roles and responsibilities of a nurse have evolved because of societal changes, governmental policies, pandemics, and wars. The external pressures are often accompanied by work force shortages, burnout, fatigue, and mental health issues that have existed for many decades. Nurses worldwide are not only confronted with responsibilities from their ever-evolving nursing roles in the workplace, but also, care giving for their aging and sick family members. In addition, the pandemic has intensified these issues in the past three years with surge after surge of Covid-19 variants.

Government policies and societal factors have also contributed to the current changes in nursing and the healthcare system. Based on reports of experts and 2021 surveys, the healthcare field will see dramatic changes in nursing. According to the American Hospital Association's Health Care Talent Scan, the healthcare workforce declined 3.5% from 16.49 million to 15.92 million between February 2020 and February 2021. Sadly, despite the increased need, thirty-two percent of RNs indicated that they might leave their current jobs within the next year because of insufficient staffing levels, according to a McKinsey& Company survey. There will be a 30% increased caregiver demand in the next decade for home health aides, surgeons, mental health providers, social workers, pharmacists, nurses, technicians, and paramedics, resulting from the pandemic resignations and the aging population.

Other shifts in nursing roles include the increase in out-patient sites, hospital-at-home, and hospice care. Technology has also changed nursing roles and responsibilities and the need for certain supporting jobs for the RN, including medical assistants and transcriptionists. The extension of our lifespan is also forcing us to consider retiring later from our jobs and increasing our roles as mentors to the younger nurses who are inexperienced in nursing care. The nursing role will continue to evolve, and we have no idea what are the unknown jobs that will appear in the horizon.

How will nurses and the nursing profession cope with these changes? What is being done about these changes in nursing roles and responsibilities? Nursing shortages have been a recurring issue. For many years, the solutions to this problem have been mostly quick-

fixes and short-term, including importing foreign nurses to fill vacant positions. This time, however, the ANA is on to something different. On September 1, 2021, the American Nurses Association (ANA) called on the Health Resources and Services Administration (HRSA) Secretary Xavier Becerra to declare a national staffing crisis, advocating a governmental approach to solving the plight. Among the ANA proposed solutions are: Involving key stakeholders to develop strategies and remove barriers to APRN Practice, increasing COVID-19 vaccinations and providing additional resources for recruitment and retention incentives for nurses and including appropriate payment for nursing services. The proposal included separating the care provided by nurses from the "room and board" category of hospital charges to the salary category. For a change, this is a concrete indication of the value of the nurse as a professional member of the healthcare team.

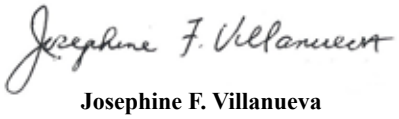
If implemented, these strategies are a good start. However, I think the most crucial factor in embracing the changes in the nursing jobs and keep them from quitting is the resilience of the individual nurses. They must be supported to rely on their inner strength to cope and not give up altogether. According to the Oxford dictionary, "Resilience is the capacity to recover quickly from difficulties; toughness." Resilience has been the reason many nurses in the past difficulties and shortages stayed on the job. It is a major factor why during the pandemic many nurses did not quit their jobs.

Resilience is an inborn characteristic that is honed during nursing education and the practice experiences of the individual nurse. It may also be something emulated from mentors and other healthcare heroes. It may also be the realization of professional goals of providing quality care to achieve positive patient outcomes.

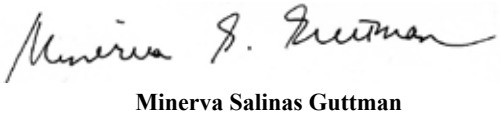
The resilience of the nurse and the nursing profession, together with government, professional and family support, will prepare the nurse for whatever future changes arise in nursing roles and jobs. These shifts will also drive the need for new knowledge, skills, and competencies to support the new roles. As healthcare evolves, so new roles will be needed to meet the changing needs of patients and institutions. These changing needs will not only affect healthcare systems, but also the educational institutions who will prepare doctors, nurses, and other healthcare providers.

Nurses must rely on their resilience and personal coping strength. How do you as an individual nurse prepare for jobs that are new to healthcare or do not even exist yet? How do you shift gears from a chaotic, overwhelming role to one that better matches your own professional goals? Is quitting your job or changing your profession the solution to your frustration or should you adapt yourself and the profession to a changing world?

I urge you not to abandon your nursing profession. Call on your resilience and inner strength to cope with changes. Look for evolving roles and prepare for them through peer discussions, mentoring, mental health, and family support. It will also take the interprofessional collaboration of education, practice, and research to prepare the nurse. As you have coped with changes in the past, remind yourself that "you can do this," because you have done it before and as Nietzsche famously said, "what does not kill me makes me stronger." Your patients need you and your vision, education, experience, and the resilience that has prepared you for any changes that come along. Don't give up, get better!



Josephine F. Villanueva
BSN, MA, RN-BC, NE-BC
Chairman, Editorial Board



Minerva Salinas Guttman
EdD, APN, RN
Editor-In-Chief, Editorial Board

UPINHF
University of the Philippines
International Nursing and Healthcare Forum

UPINHF President's Message

Greetings to All!

Established in 2017, UPINHF has maintained its momentum these past five years. We continue to stay focused to the purposes that led to its creation, supporting our alma mater, supporting UP healthcare alumni as health care professionals, and helping others in times of calamity and disaster.

The IFNAH Journal is emblematic of this focus. The Journal continues to showcase the work of nursing healthcare professionals. We thank the authors of studies, research, and anecdotes for contributing and sharing in this renowned publication. We look forward to the 2023 IFNAH Journal edition, which will be a commemorative issue for the 75th Anniversary of the U.P. College of Nursing.

The Editorial Board reflects our commitment to U.P. excellence and integrity.We are thankful for the leadership of Josephine Villanueva and Dr. Minerva Guttman, and all the others who help referee and edit each issue.

UPINHF's endeavors reflect unity of spirit and teamwork. We are mindful in supporting one another for the benefit of those around us, the community and the world.

See for yourself,¬ please download or get a hard copy, read this year's 2022 IFNAH Journal issue,and participate in UPINHF's upcoming virtual events and projects!

Best Regards to All,

Gloria Smitka, GN, BSN, MAN, RN
President, UPINHF

Call For Manuscripts

Submission Deadline: May 15, 2023

The INTERNATIONAL FORUM FOR NURSING AND HEALTHCARE (IFNAH), a peer-reviewed publication, is the official journal for nursing and healthcare practice, education, and research of the UNIVERSITY OF THE PHILIPPINES INTERNATIONAL NURSING AND HEALTHCARE FORUM (UPINHF INC). The IFNAH Editorial Board is currently accepting manuscript submissions. All submitted articles must be original, not under consideration for publication elsewhere, and have not been published before.

Please e-mail your queries regarding the manuscript submission guidelines to ifnahjournal@upinhf.org and please cc chairman.ifnahjournal@upinhf.org); include your full name in the subject line and your phone number in the body of your e-mail.

Manuscripts MUST be submitted electronically as an e-mail attached MS-Word compatible document to the Editor-in-Chief (E-mail Address: ifnahjournal@upinhf.org) and the Chairman, Editorial Board (E-mail Address: chairman.ifnahjournal@upinhf.org)

The Magnificence of UPCN ‘67

By Gerrie Barangan Korten

We are the magnificent UPCN ´67.

As a coalesced body of dynamic, energetic and accomplished women, we cast modesty and humility aside and gloriously regale the world with our accomplished lives, having survived all odds that life has strewn our way and call ourselves , triumphantly, and rightfully, « magnificent ».

Retired, except for tough, enduring Connie and Ely who continue to work, we display our trophies, certificates of awards, letters of appreciation, post graduate diplomas, framed pictures of bounteous and successful progeny, souvenirs of grand milestones - with pride and satisfaction - on mantels and walls of our homes.

The magnificent UPCN‘67- a bustle of celebrated deans, nurse administrators, a nursing school president, widely bibliographed academicians, government health agent officer, nurse practitioners, head nurses, nursing supervisors, home health care givers, and a family health consultant; a well regarded pediatrician; businesswomen; writers, artists, and a gourmet chef ; beloved mothers, grandmothers, aunts, ninangs, mentors, patrons; world travelers, and trailblazers- is a collection of boundless talents, energy, determination, intellect, charm and joie de vivre.

The late Dean Julita Sotejo had admonished us to reach to the top of what we could accomplish, always wearing lipstick, understating the prime fact that a presentable and confident mien always reaches excellence! “Be the best of what you are!”, she prodded. “ Shoot for the stars!”.

The College of Nursing curriculum rounded up sound arts and sciences undergraduate studies , emphasizing humanity, integrity, intellect and justice in all the theoretical and clinical aspects of nursing. This compréhensive program completely revolutionized the old perception of nursing and diminished the perspective that being a nurse was a « hand maiden’s occupation ».

Every one of the Magnificent ´67 is like all the UPCN graduates who had passed through the college halls in Diliman and Padre Faure. Handpicked and chosen for individual myriad admirable qualities and favorable intellectual capacitiesl, every UPCN graduate is, indeed, magnificent.

Magnificent’67 , a microcosm of every UPCN graduate, is a tight group of loyal and fiercely dedicated, beautiful and stalwart women who move in such an agreeable united front, giving back generously to a mutiplex of projects that the College of Nursing needs to reach optimal conditions and prepare more magnificent UPCN graduates in the future.

Among each other, we raise each other up, praise, cajole, admire and respect one another, with pure equanimity and in a spirit of unsullied sisterhood. We joyously celebrate each other’´s adventurous lives as well as embrace each other in grief and solemn prayers when we lose our fallen sisters.

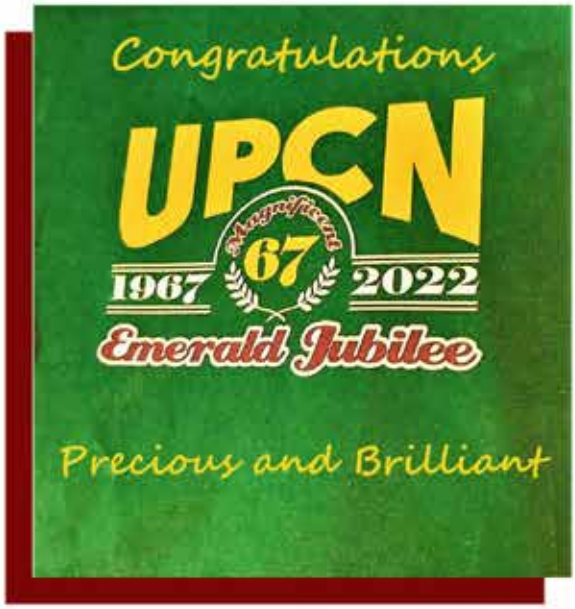
Magnificent ‘67, is captained heartily, in full blooded sincerity and devotion by the effervescent Merle. She ensures the continuity of our magnificence with zeal and unqualified dedication.

The magnificence is burnished to a glitter by the unqualified humor, expertise, and professional guidance of Deans Cecile and Remy; the able and expert support of Jopie, Connie, Godie, Linda, Arni, and Nene; the quiet and strong participation of Ledda, Elsa, Carmel, Florence, Ely, Terry, Edna, Precy, Elsie, Ella, Glo, and Heidi; the bouyant cooperation of Miles, Fe, Lita, Gerrie, Ruth, and Jane; and the sharp medical advise of Riz.

We remember, with warm affection, our magnificent sisters who have passed on and had left their legacy in the profession as well as with their healthy successful families: Malou, Ermine, Letty, and Toots.

The magnificence of a kind and caring heart, bright- eyed optimism, an alacrity to contribute God given talent and energy for a common good is the essence of every UP College of Nursing graduate.

We , UPCN ´67, heartily celebrate our emerald year milestone with pride and gratitude in all our resplendent magnificence.



UPCN Golden Jubilee - 1998
visit with Dean J. V. Sotejo

Creating an Academic-Practice Partnership is Key during a Pandemic

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Abstract

Background: In 2020,most student nurses training in hospitals were halted because of challenges to meet new organizational mandates. Instituting an academic-practice partnership could benefit both hospitals and students to provide mandatory fit testing for students.

Methods: Two hundred twenty-five student nurses were fit tested with an N95 mask using a quantitative method that guarantees 95% of particles are filtered.

Results: All 225 students passed, 85% (192) were fitted with the standard 3M-1860 or 3M-1860s, 10%(22) were properly fitted for the Halyard 46727 or 46827, and 5%(11) with the 3M Aura 9210+.

Discussion: Providing a fit test for 225 students in a short period of time is a daunting task for any organization. However, when resources are shared, tasks can be managed better and completed to satisfy both institutional needs.

Conclusion: Students are valuable, and they can help hospitals meet patient needs during critical times such as in a pandemic.

Key Words: N95 Fit testing, PortaCount®, filtering facepiece respirator, NIOSH approved, Quantitative method

Introduction

Academic-practice partnerships serve as a way for nurses with common goals to collaborate and meet the needs of the nursing workforce (Robertson, et al., 2021). During the COVID-19 pandemic, many academic institutions were shutdown with limited face to face classroom interactions,and students were not allowed to participate in the clinical settings due to the urgent responses needed to accommodate patients (Ulenaers, et al., 2021). Hospitals were stretched with their own staffing needs and personal protective equipment (PPE) such as the N95 masks, which became a scarce and precious commodity for their own healthcare workers (HCWs) (WHO, 2021). Stricter measures were taken in healthcare settings to reduce visitations, increase vigilance with donning and doffing personal protective equipment (PPE), and promote an increase in vaccinations among HCWs (Biswas et al., 2021; Marks et al., 2021).As the pandemic progressed and nursing students continued to be restricted in clinical placements, a paradox was created with a decrease in the nursing workforce requiring the hiring of travel nurses to supplement depleted hospital staffing (Simpson et al., 2021; Longyear et al., 2020). One way to alleviate this issue was to increase clinical placements for nursing students by allowing them to return to the clinical setting. However, the largest barrier was the lack of a properly fitted N95 mask and the limited resources of hospitals who were striving to meet the needs of their own HCWs (BJC, Health care, 2021).

Background

Wearing masks, gloves, and shields/goggles has become standard practice when caring for all patients regardless of Covid-19 exposure (CDC, 2021a; WHO, 2021). During the second wave of increased infections within the pandemic, students were also required to wear a N95 mask when caring for covid positive patients (CDC, 2021c). However, students did not have the opportunity to be fitted for these special N95 masks within a hospital system that was already strained for necessary resources to protect their own current HCWs. Discussions between a large private university-based school of nursing and its affiliated health care systems allowed students to safely return to various clinical settings. A plan was created so students could return to the clinical setting with the hospital providing the fit testing equipment and training, and the school of nursing providing the space and staff support. This plan aligned

the goals between both organizations for students returning to the clinical setting, avoiding delays in graduation, and entering the work force quickly.

Hospitals require HCWs to use masks that are 95-100% effective, filtering out at least 95% of very small (0.3-micron) particles (OSHA, 2016).All HCWs including students should be tested for a properly fitted N95 approved mask and trained on their use and limitations (CDC, 2021b; USDOL, OSHA).The CDC provides a website that lists the approved masks to be used when caring for infected patients in a hospital setting (CDC, 2021b &c). Additionally, hospitals require all HCWs with direct patient care to be fitted for an N95 or N99 mask each year as part of their routine protocol. The most common type of fit testing utilized in a hospital setting is the qualitative approach; however, the quantitative method may be more accurate (Regli et al., 2020).

Types of Fit tests for the N95 mask

The qualitative fit testing method is normally used for half-mask respirators like the N95, which cover only the user's mouth and nose. Qualitative fit tests operate on a pass/fail basis and do not measure the actual amount of leakage (Regli et al., 2020). Instead, they rely only on the user's sense of taste or smell, or the person's reaction to an irritant, to detect leakage. The mask fails the test if the wearer can detect any leakage of the test substance (CDC, 2018). Notably, the only criterion for passing is whether the user can detect the smells or irritants (Qualitative, 2020). Because of the nature of this test, many HCWs could have a false positive result based upon their verbal or behavioral response but may not be fully protected. For example, a HCW can expedite the procedure by stating that they do not smell or taste the substance so they can conclude the test when in fact they may have smelled, tasted, or felt the substance on their oral or nasal mucosa. So, the tester must trust the HCWs. However, with the quantitative method, the machine will determine a pass or fail result with a true breath sample.

The PortaCount® Pro Respirator Fit Tester uses a quantitative approach which is more reliable and detects particles within the face mask. Quantitative fit testing is the most accurate form of respirator fit testing, a data-driven approach to determining the fit of a respirator on an individual's face (CDC, 2018). The PortaCount® Pro fit tester is based on a miniature, continuous-flow Condensation Nucleus Counter (CNC), also known as a Condensation Particle Counter (CPC) (PortaCount® Respirator Fit Tests 8030). A CNC takes particles that are too small to be easily detected, grows them to a larger, easily detectable size, and then counts them. Since the microscopic particles in the air cannot pass through the class filters used on the respirator, any particles that get into the respirator must have come in through a leak (PortaCount® Respirator Fit Tests 8030). This device measures respirator fit by comparing the concentration of microscopic particles outside the respirator to the concentration of particles that have leaked into the respirator. The ratio of these two concentrations is called a fit factor. A fit factor of 100 means that the air inside the respirator is 100 times as clean as the air outside (fit factor = Outside concentration/inside concentration) (PortaCount® Respirator Fit Tests 8030).

The purpose of this paper is to describe an academic-practice partnership between a private university-based school of nursing and its affiliated health care systems by demonstrating how the quantitative fit testing procedure was implemented to ease the burden on clinical partners. In addition, lessons learned and tips for avoiding factors that may result in a failed test when using a PortaCount® Fit Tester device were also described.

Methods

The school of nursing aligned with the department of Environmental, Health and Safety to test 225 undergraduate students prior to and during the first weeks of clinical training in the Fall of 2021.Announcements were made, and emails were sent to inform all students that they must wear a N95 mask in the clinical setting and that a mandatory fit-test was available. A large quiet room in the simulation hospital was used and two PortaCount® Pro Respirator Fit Tester machines ran simultaneously to perform independent fit testing for all students. A specifically OSHA trained technician was assigned to provide all fit testing and was assisted by several designated simulation nurse educators. Five different Niosh approved N95 respirators (3M 1860, 3M1860s, Halyard 46727 regular and Halyard 46827small, & 3MAura 9210+) were used for testing (Laboratory, NIOSH, 2021). The machine provided the results for the students with a pass overall fit factor of 100, and students with a failed mask test were refitted with a different mask and the procedures were repeated. The PortaCount® software generated fittest reports which were given to each student (table 1). In most institutions, the results are considered acceptable for one year. Therefore, some students that participated in this project were near graduation and employment was expected within the same year, hence these students may not require a new fit test.

Results

Two hundred and twenty-five undergraduate students were properly fitted with a N95 half face respirator. Fifteen percent(33) of these students were exposed to more than one type of mask to find the correct fit. One hundred and ninety-two students (85%) passed the N95 fit test procedure using the standard 3M-1860 or 3M-1860s. Twenty-two (10%) students were properly fitted for the Halyard 46727-regular or small 46827 mask. While eleven (5%) students did not pass the fit test for these standard (3M 1860, 3M 1860s, Halyard 46727 regular and Halyard 46827small) masks, however, they passed the fit test with the 3M Aura -9210+. The sampled air in the mask for each of the required categories registered more than 200% which suggest that the mask is a perfect fit (table 1). For three students with beards, the machine failed with all mask types because it sampled more than 5% of the particles within the mask. Regardless of their beard length, those masked failed because the beards were too thick, and the mask did not make a tight seal (pic 1). These students shaved their beards and were retested and passed with the standard 3M-1860 N95 mask. Additionally, only three graduate students were fit tested (passed 3M 1860) because most of them are employed in a healthcare setting that require annual fit testing.

Discussion

Although it was a daunting task to provide fit testing for 225 students in a short period of time, working with clinical partners made this mission possible. Health care facilities have an obligation

to keep HCWs safe by providing proper PPE when working with patients who are contagious. This safeguard should also include students who are valuable assets and will soon become part of the organization's work force. While the quantitative fit test method is easier and more accurate when compared to the qualitative method, failures may occur due to several intrinsic and extrinsic factors. In some cases, the students' mask failed the fit test process if they had recently drunk coffee, soda, smoked a cigarette, or had a menthol candy or gum prior to the test. Residual particles from these common food/drink and smoke items are sampled by the machine and registers as failed. Students were asked to rinse their mouth with water and wait a few minutes before retesting. Additionally, some students may have had a lunch that caused excessive burping or hiccups which resulted in a failed test due to particles generating from within the individual being tested. Therefore, technicians/specialists performing the test must be aware of these nuances and provide safeguards to minimize errors or failures prior to the test by asking a few screening questions.

Regardless of the factors that may contribute to a failed test, organizations and departments must remain vigilant in giving an N95 fit test for all healthcare providers including students. Continued high demand on hospital's PPE resources may allow student nurses to fall through the cracks due to a lack of testing. Although hospital personnel provide students with the necessary PPE, they cannot ensure students are properly fitted for the provided mask and creating a partnership may prove beneficial. Annually, all HCWs that provide direct patient care must be fit-tested for their N95 mask regardless of their work location or shift. Unfortunately, student nurses may sometimes be overlooked in the need for fit testing. Also, students and other HCWs may wear counterfeit or unapproved PPE due to comfort and style and may disregard the importance of safety (CDC, 2021C; Giannis, 2020). Hence it is important that all HCWs including students don and doff the appropriate PPE and understand the importance of preventing the spread of this disease. Even as we enter a post-Covid-19 phase, ensuring that all HCWs, including students are fit tested, is essential for protecting workers and patients. Promoting safe preventive practices in health care personnel is key in the maintenance of patient services even with the most unforeseen circumstances. Educated nurses that practices optimal PPE safety when providing routine care are our best resources for future pandemics.

Conclusion

FIT TEST REPORT
9/10/2021

ID NUMBER	C12061323		
LAST NAME		**CUSTOM1**	
FIRST NAME		**CUSTOM2**	
COMPANY		**CUSTOM3**	
LOCATION		**CUSTOM4**	
TEST DATE	8/31/2021 10:15	**PORTACOUNT S/N**	8038111605
DUE DATE	8/31/2022	**N95 COMPANION**	Y
RESPIRATOR	3M 1860 N95 [100]	**PROTOCOL**	OSHA FAST-FILTERING FACE
MANUFACTURER	3M	**PASS LEVEL**	100
MODEL	1860		
MASK STYLE	N95	**APPROVAL**	84A-0006
MASK SIZE	REGULAR	**EFFICIENCY<99%**	True

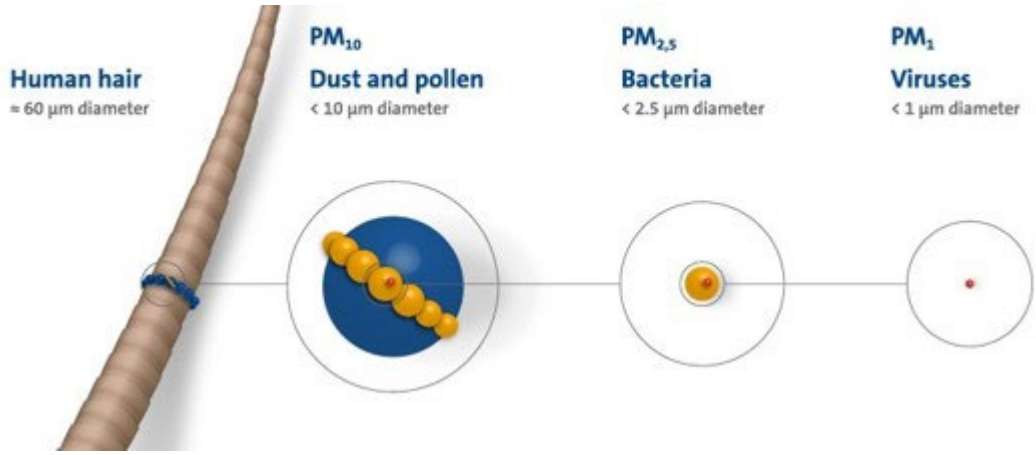
EXERCISE	DURATION (sec.)	FIT FACTOR	PASS
BENDING OVER	50	200+	Y
TALKING	30	200+	Y
HEAD SIDE TO SIDE	30	200+	Y
HEAD UP AND DOWN	30	200+	Y
OVERALL FF		200+	Y

FIT TEST OPERATOR _____ **DATE** _____

NAME _____ **DATE** _____

Note:

Pic 1



While the Covid-19 virus continues to mutate, this collaborative partnership for sharing resources can drive sustainable changes for future situations with limited resources. Unfortunately, this virus may have compounded the nursing shortage by halting training for many students, and it may be necessary for both schools of nursing and health care organizations to identify opportunities to thwart these limitations through a collaborative partnership. As nursing students resume their clinical training in hospitals, ensuring a proper N95 mask fit will provide another layer of safety and protection for students, patients, and the community.

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Addressing the Elephant in the Room: Structural Racism and Health Disparities in the Philippines

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Introduction

The popular English idiom, "the elephant in the room," refers to something so obvious that no one seems to notice or wants to address it because of the potential for social, political, or personal shame or danger (Merriam-Webster, n.d.). Furthermore, people refuse to acknowledge this obvious issue and ignore it because doing so would involve taking responsibility for a problem or risk they would rather not face. This idiom can also refer to a universal truth everyone knows; however, nobody wants to bring it up for fear of offending others or embarrassment(Roberts, 2020).

Structural racism is at the intersection of the social determinants of health and health disparities because it causes unequal opportunities for education, employment, income, wealth accumulation, residential quality, and healthcare(Bailey et al., 2017). One's socioeconomic status is directly related to one's health. Negative consequences on health can be traced back to the intricate web formed by structural racism's interplay with ethnic identity, social determinants, and material well-being(Churchwell et al., 2020). Structural racism and health disparities are even more pronounced in developing countries like the Philippines where the power of the majority is concentrated in the hands of the few, and the health of the underprivileged is not prioritized(Crear-Perry et al., 2021).People from historically oppressed groups suffer the most from the physical and mental health consequences of racism, which include chronic discrimination, constant stress, and depression(Lin et al., 2021).

This advisory is a call to action to bring attention to this injustice and identify strategies and solutions to eliminate structural racism and health disparities in the Philippines. Despite what some may believe, we have confidence that addressing structural racism is both possible and rewarding and is crucial for reducing health disparities.

Structural Racism and Health Disparities in the Philippines

Recent reports show that providing citizens in the Philippines with even the most fundamental of medical care services remains a significant obstacle. This is largely because medical facilities are either unavailable or unevenly distributed across the country. There is also a significant gap in the availability of primary care facilities within 30 minutes for at least 50% of the population(Flores et al., 2021). Intuitively, the wealthy have better access to private sector health care than the poor. Manila's new hospitals are among the best in Southeast Asia, yet, the hospital population has barely grown in 20 years. While 20%-30% of the population has access, 70-80 million poor Filipinos do not. Many people rarely or never see a doctor(Flores et al., 2021).

A recent study also revealed that approximately 13% of Filipinos are of indigenous descent, numbering anywhere from 10-15 million (Duante et al., 2022). However, the country's high infant and maternal mortality rates and high fertility rates show that this population has substantially lower health outcomes (Dela Rosa et al., 2022). This creates problems for those who have especially limited access to this basic care or for those living in generally poor health conditions. Although 77.1% of indigenous peoples in the Philippines were aware of the national health insurance program, 46.2% were not members, suggesting that their financially dependent children were not adequately covered (Duante et al., 2022). Likewise, children from indigenous communities are particularly susceptible to the health risks associated with the COVID-19 pandemic.

Clearly, structural racism leads to health disparities which cause "differential access to the goods, services, and opportunities of society by race" and shapes social values and power structures, keeping people in their place(Cogburn, 2019). Equality is, at its core, a concept of fairness. It is a recognition of the fact that not everyone has the same starting point. There have been times when "equity" has been used interchangeably with "equality," but achieving true equity takes much more time and thought. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable disparities and historical and contemporary injustices to help eliminate health and healthcare disparities(Penman-Aguilar et al., 2016). Adjustment methods are necessary for appropriate solutions because these methods and strategies consider unequal burdens and existing inequities.

Using the Socio-Ecological Model to Promote Public Health

Due to their immense potential to improve health and save lives, effective health promotion frameworks have been at the forefront of public health research and practice. The Socio-Ecological Model demonstrates how a multi-level approach can highlight the most important societal and ecological influences on health-related behavior(Javed et al., 2022). Due to the complex interplay between various factors and how each influence the other, it is important to act on multiple levels such as public policy (such as local, state, and federal legislation), the environment (such as cultural norms and the physical environment), organizations (such as communities), individuals (such as members of one's family or one's social network), and one's internal factors (such as one's own physical and mental health, risk factors, behavior, and genetics).Therefore, the framework can be used as a basis for public health research and the development of interventions for health promotion and betterment, as well as for critically assessing and understanding the range of factors that increase risks for health disparities(Jilani et al., 2021).

Many causes of health disparities lie in systemic or societal factors that are difficult to change unilaterally. Therefore, initiatives to eliminate disparities and advance health equity must consider the complex interplay of multiple influencing factors(Jilani et al., 2021). For example, critical influences, such as the physical environment, access to health care services, and psychological experiences based on socio-environmental factors, are interconnected with factors like race/ethnicity and socioeconomic status (e.g., discrimination, victimization, stress). Equally contributing to health disparities are socioeconomic status, geographical location, environmental factors, and social and cultural norms and practices(Javed et al., 2022). Likewise, many discoveries that have led to better population health result from investments in biological, social, and behavioral sciences, which have significantly increased knowledge of disease genesis, prevention, detection, and treatment. Therefore, affecting population health improvements requires understanding the injuries and diseases that cause health burdens and the risks associated with injury and disease.

Using a Multi-level Approach to Reduce Structural Racism and Health Disparities

Scientific and medical advancements have not benefited everyone equally, and efforts to reduce economic and racial/ethnic disparities have not always been successful(Penman-Aguilar et al., 2016). The underlying mechanisms for these differences are complex and multifaceted. Similarly, many approaches to improving minority health and health disparities have fallen short due to their narrow focus on a single factor or factor at the individual level. Therefore, it is crucial to systematically plan and evaluate the effectiveness of multi-level interventions in these populations(Williams et al., 2019). Healthcare providers, researchers, community leaders, and health policymakers will benefit because they can construct more efficient and effective methods, discover multi-level causal elements that contribute to intervention efficacy, and understand the dynamic interactions between these elements within and across intervention levels(Vaughan et al., 2020).

Recognizing the level(s) of intervention needed and developing them in light of current data and behavioral theory are the foundations of effective interventions. However, treatments that target multiple aspects of the socioecological context tend to be more sustainable and effective over the long term(Johnson-Agbakwu et al., 2022). Also, although policy interventions can affect at any level, policies require implementation at the individual, interpersonal, organizational, and environmental levels. Therefore, clinicians and researchers should consider the interplay of all levels of the socioecological framework when thinking of ways to increase the adoption of best practices and the execution of disease prevention interventions to enhance clinical decisions and promote health(Javed et al., 2022).

Finally, expanding research into health problems that cause the highest disease burden, like cardiovascular disease, is widely acknowledged as crucial to enhancing developing countries' health and development status. In 2013, the World Health Organization warned that it would be difficult to achieve health goals unless developing countries became research producers(Roberts, 2020). Therefore, maximum effort should be made to conduct this research in developing nations like the Philippines to better define the issues that need to be addressed, propose culturally congruent and cost-effective individual and collective interventions, investigate their implementation, and examine the barriers that prevent the implementation of recommended strategies(Johnson-Agbakwu et al., 2022).

Sadly, many low-income countries like the Philippines still lack the health research capacity necessary to produce a local evidence base that can be used to inform policy and advance public health(Dela Rosa et al., 2022). Thus, despite years of international cooperation and investment, developing countries' health problems will remain a persistent challenge.

A Call to Action

As the largest and arguably the most patient-centered sector of the health workforce, nurses and public health researchers must take the lead in combating structural racism and health disparities. The first step of effective leadership is to continue one's education and that of one's peers, students, workers, patients, and communities. There are various ways to get involved in politics and shape policy. Sometimes the smallest of changes can make the most significant difference. For example, there is a strong connection between local sustainability and preparedness and larger health system, hospital, or university concerns(Lucyk, 2020). In addition, It is essential to think back on past events and draw lessons from both triumphs and failures to improve the odds of success for future capacity building. This exercise would encourage conversation and thought, possibly leading to new ideas, and provide a uniform perspective for reviewing previous capacity-building efforts(Johnson-Agbakwu et al., 2022).

Primary preventive measures are urgently needed in the Philippines as part of a larger public health policy package(De Vero et al., 2021). Health agencies at all levels, national, regional, and local, must coordinate their efforts to make public policy(Jilani et al., 2021). To meet the growing demand for information and motivation among residents to adopt more preventative health practices, health clinics and community

health workers in rural areas will need to increase their health education efforts. More training and programs to supervise and monitor community health workers will increase the community's trust and reliance on their abilities to provide basic healthcare and referrals. More funding from the Philippine Department of Health and other multi-level initiatives and programs is necessary to remove local health promotion barriers(Williams et al., 2019). Likewise, the Philippines needs to strengthen its secondary and tertiary care disease management initiatives. Chronic disease management is crucial to maintaining a healthy population and controlling healthcare costs(De Vero et al., 2021). However, this will not be easy without a strong primary care infrastructure.

In conclusion, we must give structural racism and health disparities our undivided attention, investigate its adverse effects on social determinants and individual health and well-being, and respond appropriately. The Philippine government can and should go further upstream and identify structural racism as a historical driving factor of health disparities(Vaughan et al., 2020). To ensure that everyone in our society is treated fairly by the law and the criminal justice system and has access to affordable, high-quality health care, we must eradicate structural racism and health disparities and focus on reducing health risk factors(Dela Rosa et al., 2022). Healthcare providers, researchers, community partners, and health policy leaders in the Philippines must identify effective and inclusive strategies and solutions and work together to eliminate structural racism and health disparities(Neely et al., 2020). To eliminate these negative outcomes and implement effective programs to promote health for all people, we need to improve the scientific understanding of structural racism and its consequences on health(Roberts, 2020).Intractable disparities will continue to perpetuate without policy makers' deliberate allocation of opportunities, resources, and support, as well as public health professionals' questioning, researching, analyzing, and reporting critical information.

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Improving Adherence To Pain Management Prescribing Guidelines

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Abstract

Both chronic pain and Substance Use Disorder remain a national health problem.

The purpose of this study is to increase adherence by APN, PA and Resident providers to the National Pain Strategies guidelines by using an evidence based educational program on prescribing to adult patients with chronic pain on a Clinical Decision Unit (CDU), measured by use of the New Jersey Prescription Drug Monitoring Report (NJPDMR), Opioid Risk Tool,(ORT) and decreased opioid only prescribing. Seventeen Advanced Practice Nurse and Resident prescribers participated in the project. First, 33 charts of patients with chronic pain were retrospectively reviewed for prescribers' use of the NJPDMR, ORT, and analgesic use. After IRB approval, an educational workshop on chronic pain guidelines, prescribing and mentoring was given to the participating prescribers. After 1 month, another 33 patient charts were retrospectively reviewed for the same participating prescribers' use of NJPDMP, ORT, and analgesic use. The results show that there was a statistically significant increase between the pre and post educational intervention groups in the use of the National Pain Strategies ORT and decreased opioid only guidelines. There was no difference in the use of the NJPDMR.

Introduction to Problem

There are about 50.2 million adults with chronic pain in the United States (NHIS, 2019). However, many healthcare providers (HCP) are not adequately prepared in pain management prescribing practices to manage an individual's chronic pain effectively. Physician Assistants (PAs) and Resident prescribers did not routinely follow pain management guidelines. Furthermore, the President's commission on combating drug addiction and opioid crisis report (2019) estimated fewer than 20% of the over one million health providers licensed to prescribe controlled substances have adequate education on opioid safety.

The literature supports the need for more advanced knowledge and proficiency in prescribing if we are to lead the cultural transformation in the perception and treatment of people with pain (CDC, 2017; NIH, 2017). A gap analysis has revealed a knowledge gap in the education of HCPs of safe and effective pain treatment. Moreover, the risks associated with poor pain management are many making consumers a vulnerable population (NIH, 2017; CDC, 2017). The National Institute of Health (NIH) found that practitioners often utilize pharmacological approaches that alone are not optimally effective. Pharmacological approaches may have significant unintended adverse consequences such as addiction and medication misuse for which many HCPs lack the skills and knowledge needed to identify and manage adverse effects (NIH, 2019).

Due to the high abuse potential of scheduled II medications and fear of sanctions by the Drug Enforcement Agency (DEA) many HCPs are hesitant to prescribe opioids. Providers are at risk for fines, imprisonment, and license revocation if they fail to comply with the directive. Writing prescriptions for opioids require detailed documentation, record keeping, medical agreement/contracts, and routine follow-ups, in addition to monitoring for aberrant behavior, morbidity and mortality, which are very time-consuming.

Background of the Problem

The widespread prevalence of chronic pain (11%-40%) validates the necessity for medical and nursing education to identify chronic pain as a common and severe condition (NIH, 2016). Most medical and nursing education curriculums have yet to give it adequate attention.

Opioids have historically been the first line treatment in the management of moderate to severe pain and the health care system incentivizes a speedy response to a complex physical and behavioral health care need (NIH, 2017). Opioid medications may produce suboptimal outcomes and debilitating side effects, including respiratory depression potentially leading to mortality from misuse and abuse.

Chronic or persistent pain is a multifactorial condition that can impair a person's general health, functioning, and wellbeing. Chronic pain has physiological, psychological, and social dimensions and is associated with anxiety and depression, which often leads to exacerbation of pain, resulting in employment, social, and physical impairment (NIH 2017).

Opioids muffle the perception of pain and calm the emotional response to pain, by decreasing the number of pain signals sent by the central nervous system. Opioids trigger the brains' reward system by drenching the route with dopamine. Dopamine is the chemical accountable for euphoric effects and feeling of self-indulgence. Due to the action of opioids, these medications can easily become habit-forming leading to misuse, abuse, and addiction.

In the last few decades, the dramatic increase in opioid use and prescribing is largely because of aggressive pharmaceutical promotion and marketing and the misinterpretation of regulatory standards regarding pain management by prescribers (NIH, 2016). In 2001, The Joint Commission (TJC) issued pain standards. These standards required healthcare

organizations to address pain, improve pain awareness, and treat actively. In response to these aggressive demands and required treatments, there was an identified and justly documented increase in opioid use to treat acute and chronic pain (Broglio & Cole, 2014; NIH, 2017; CDC, 2016). Although the number of opioids prescribed was increased, the reported pain intensity by Americans remained unchanged (CDC, 2019).

To make pain a significantly more important factor in diagnosis, the Veteran's Association (VA) began to document pain as the 5th vital sign (Mularski et al., 2006). However, pain does not have an objective measurement, unlike traditional vital signs, such as temperature, pulse, respiration, and blood pressure. For patients with normal level of cognitive functioning, pain was documented on a quantitative Likert scale 0-10 scale, with 0 being no pain and 10 being the worse imaginable pain. Prescribers medicate patients in pain based on a subjective pain intensity score, so if a patient says they have a "10" pain intensity score, they receive more opioids. In some patients where the number of opioids was increased to address perceived pain, the pain intensity may not be reduced.

Opioids are but one medication option for the treatment of chronic or acute pain. Alternate methods of treating pain have been practiced in China and India for centuries, such as acupuncture, mindfulness, and biofeedback but these integrative health modalities were inconsistently used in the United States (NIH, 2017). Reimbursement from insurance carriers was minimal for behavioral health modalities and the pharmaceutical companies took full advantage of the situation. Today, Americans are more cognizant of the numerous serious adverse effects of opioids, such as tolerance, misuse, abuse, and addiction and embrace integrative pain management modalities, although reimbursement from insurance carriers remains problematic.

On March 23, 2010, the Patient Protection and Affordable care Act (PPACA) was signed into regulation. This was the most extensive healthcare transformation legislation in the United States since the enactment of Medicare and Medicaid in 1965. The PPACA, Section 4305 requires the United States Department of Health and Human Services (HHS) to partner with the Institute of Medicine (IOM) to develop strategies to improve pain symptoms in patients with acute and chronic pain in the United States. Healthy People 2020 pain relief objectives include to increase the safe and effective treatment of pain, prevent acute pain from becoming chronic pain, and to have cost-effective interventions (NIH, 2017).

On March 15, 2016, the CDC announced recommendations for prescribing opioids for chronic pain. The CDC, state laws and regulations and federal agencies, such as the Drug Enforcement Administration (DEA) focus on reducing opioid prescribing for all patients except for active cancer treatment, palliative care, or end of life. Many patients with chronic pain are now required to decrease or discontinue opioid medication previously prescribed by their primary care provider (PCP), without their input or justifiable cause.

With the opioid epidemic in full bloom, there were changes in federal legislation. The Comprehensive Addiction and Recovery Act (CARA) were made law on July 22, 2016. This law expanded the roles of Advance Practice Nurse Practitioners (APNs) and Physician Assistants (PAs). APNs and PAs can now prescribe buprenorphine. Buprenorphine is an opioid-partial agonist used for addiction. With the current climate of concern over opioid use and abuse, clear-cut guidelines have been established to guide the prescribing clinician in treating the patient for pain or referring the patient for addiction treatment (NIH, 2017).

Significance of the problem

The United States continues to have an opioid epidemic. The CDC (2021) reports that estimated overdose deaths increased from 56,064 in 2020 to 76,673 in 2021. Additionally, the opioid epidemic cost the U.S. economy at least $631 billion dollars during the years of 2015 to 2018 (Society of Actuaries, 2019). Although the United States is only 4.4% of the world's population it consumes 80% of the world's source of opioids (Stone, et al., 2017)).

According to the National Center for Drug Abuse Statistics (2021), "Opioids are a factor in 7 out of 10 overdose deaths and drug overdoses have killed almost a million people since 1999". Prescription opioids remain the primary culprit to the prevalence, responsible for over a third of all opioid overdose deaths (CDC, 2019). Prescribed opioids in morphine milligram equivalents (MME) triple the amount prescribed in 1999 (CDC, 2017). This makes opioid overdoses one of the leading causes of death in the nation. Additionally, the prescribing, overprescribing and overuse of opioids (such as hydrocodone, oxycodone, morphine, and hydromorphone), have been recognized a public health priority (Health and Human Services, 2013). In the United States this increase in opioid prescribing and use by patients has resulted in an increase in opioid misuse, diversion, abuse, and addiction and accidental overdose over the past 30 years.

Pain, treated with opioids is one of the foremost public health issues that affects approximately 100 million adults in the United States, costs society approximately $560-$635 billion dollars annually, and reduces quality of life for those affected (NIH, 2017). According to the National Institute of Drug Abuse (NIDA, 2017), one third of the United States population is affected by chronic pain, which is the second leading cause of disability.

A study conducted by McHugh and Weiss found 61% of patients with chronic neck and back who were on chronic opioid therapy scored higher for risk of anxiety and were more likely to misuse opioids to alleviate physical or emotional distress compared to a matched cohort of people with chronic neck or back pain not on opioid therapy (NIDA, 2017).

More than 100 million Americans struggled from persistent pain, more than diabetes, heart disease, and cancer combined (IOM, 2021). Chronic pain is associated with decreased functioning including social activities and activities of daily living. SAMHSA (2020) reports 46.3 million people aged 12 or older (14.5%) had a substance use disorder. The CDC (2021) reports drug overdose fatalities are greater than 100,000 yearly. Opioid Use Disorders (OUD) continues to rise along with patients overdosing on prescribed opioids

The Institute of Medicine (IOM) report (first published in 2011) entitled "Relieving Pain in America: A Blueprint for Transforming, Prevention, Care, Education and Research", stated pain is a substantial public health problem that is costly to our society. Today, the US Department of Health and Human Services ((HHS) Healthy People 2030 continue to have their goals to reduce chronic pain

and decreased misuse of prescription opioids.

Fatalities from drug overdoses exceeded homicides by 306.7% in January 2021 (Drug Abuse Statistics, 2021). Deaths from motor vehicle accidents and suicides combined were 84.5% as many as overdosed fatalities in 2021 (Drug Abuse Statistic, 2021).

Purpose Statement

The purpose of this Evidence Based Practice (EBP) project is to increase adherence by APN, PA and Resident providers to the National Pain Strategies guidelines by using an evidence-based educational program on prescribing to adult patients with chronic pain on a Clinical Decision Unit (CDU) over 3 months, measured by use of the New Jersey Prescription Drug Monitoring Program (NJPDMR), Opioid Risk Tool (ORT), and decreased opioid only prescribing.

Clinical Question

In adult patients with chronic pain on a Clinical Decision Unit (CDU), does an evidence-based educational program on prescribing based on the National Pain Strategies guidelines compared to no education on prescribing increase adherence to the National Pain Strategies over 3 months measured by use of the NJPDMR, ORT, and decreased opioid only prescribing?

Literature Review

Tournebize et al., (2015) conducted a systematic review to evaluate physicians' prescribing practices with opioids and their compliance with pain management guidelines for patients with chronic non-cancer pain.

Common themes of the guidelines across studies were identified for prescribing opioids for chronic persistent non-cancer pain. The studies also measured the percent of compliance with the expected usual practice by prescribers based on the national guideline

This systematic review found 98% of physician's prescribed opioids when other non-opioids or other pain management modalities have failed. Physicians (70%) assessed functional capacity prior to initiating opioid therapy. Physicians communicated benefits (76%) and risks (84%) of opioid therapy. Only 47% of prescribers assessed pain with a pain intensity scale and adverse effects, such as nausea, vomiting, constipation, pruritus, and urinary retention. The majority

(73%) of physicians continued opioid therapy even though they have been ineffective in reducing pain intensity or increase functional level.

The authors concluded there were numerous gaps in knowledge and practice associated with prescribing opioids for patients with chronic non-cancer pain. Clinical practice guidelines pertaining to the physicians' area of practice was necessary.

Donaldson et al. (2017) conducted a pre- and post-educational intervention study to determine the effect of a brief one-on-one educational session for 30 prescribers of the drug oxycodone in the Emergency Department (ED) of a tertiary metropolitan ED in Melbourne, Australia. The aim of the study was to improve prescribing practices related to oxycodone, due to the increase in the number of prescriptions written and to minimize harm.

The educational session was presented by the study investigator (physician or pharmacist champion of the ED). A brief one- on- one power-point educational session was presented before the clinical shift began. The educational presentation was based on the Australian and international government agencies. Prescribers were educated on potential harms (such as misuse, abuse, dependence, and addiction), safe prescribing, and educating the patient about the drug, including adverse effects, in addition to the best pain management principles.

To evaluate the impact of the educational intervention, 80 patients who spoke English, were prescribed and self–administered oxycodone were selected from the electronic medical record (EMR). The patients received a phone call within a week of their ED visit to ask permission for a brief interview on their ED experience related to oxycodone. Patients were asked if they received written information pertaining to oxycodone, follow up instructions, and if they followed up with their general practitioner (GP). Patient were also asked if they were informed of side effects (such as nausea, vomiting, constipation, and sedation,) and if non-opioid analgesics and other pain management interventions (physical therapy, ice, heat, exercise) were advised.

The brief educational intervention resulted in over twice as many patients receiving information on oxycodone (10% -22%, P=0.04). Follow up instructions increased from 61% to 94% (P<0.01). ED prescriber to GP collaboration increased the most (15% to 88%, P<0.01. Additionally, the amount of oxycodone prescribed decreased 50% (100mg to 50 mg P=0.04) and advising other pain management modalities (ice, physical therapy, etc.) increased from 49% to 85%.

Recall bias was a limitation of the study since patients had to recall the events of the prior week. The sample size was small. Another limitation of the study was that it was conducted at one facility, so it could not be generalized to all facilities.

Lee et al. (2018) conducted a retrospective study to evaluate the impact of education on prescribing practices for patients having breast or melanoma procedures. The aim of the study was to decrease opioid prescribing for cancer patients undergoing breast or melanoma procedures. The study also investigated the significance of an educational workshop, on prescribing guidelines on the number of opioids prescribed after surgery.

The sample consisted of 847 patients, who had surgery for the breast or melanoma and received a prescription for an opioid. Due to non-randomization, a time-series analysis (form of quasi-experimental) design was utilized to equate the average amount of opioids prescribed before and after the educational sessions. Although the average number of opioids prescribed for patients undergoing a simple mastectomy or wide excision melanoma, before the education was less, it was not statistically significant. Immediately following the educational intervention, there was a dramatic drop of 37%, equal to 13 tablets of 5mg oxycodone (P=0.3). The decrease in opioid prescribing continued to decrease but again, it was not statistically significant.

The same was true for patients who had a lumpectomy or breast biopsy; there was a non- statistically significant decrease of the amount of opioid prescribed before education. This number instantly decreased by 42%, comparable to 12 pills of oxycodone 5 mg (p= 0.7), after the in-service. The decrease in opioids continued but not statistically significant.

An evaluation was documented on the number of opioid refills before and after the intervention. The authors revealed that the quantity of opioids prescribed was mainly due to prior practices. The authors endorsed standardized patient instructions.

Ganen et al. (2015) conducted a descriptive retrospective study to evaluate prescribing habits of prescribers in two emergency departments, for patients with chronic pain. The study took place in two tertiary military hospitals in San Antonio, Texas. Outpatient records with ICD-9 codes for chronic pain were examined. Data was collected on providers' gender, name of opioid, number of pills prescribed. In addition to the number of refills, military rank, and provider type (physician, physician assistant, or nurse practitioner). The study took place from June 2009 until June 2012.

Opioids were calculated to morphine equivalents (ME) utilizing a conversion chart. In the three -year time span 1,322 prescriptions were written of which 34% (n=443) were for an opioid. Each provider was assigned a randomization number. The prescribed opioids were: 189 (43%) oxycodone; 133 (30 %) hydrocodone-acetaminophen; 42 (9.5%) tramadol; 68 (15%) other and 11 (2.5%) codeine. The mean number of pills prescribed was 20. Although oxycodone was the most prescribed opioid, tramadol was the greatest number of pills prescribed per prescription (23 oxycodone vs. forty-two tramadol).

Wilcoxon test was used for non-parametric continuous variables. Most of the clinicians were male (81%), physicians (79%), whereas 18% were physician assistants (PAs). Most physicians (77%) were more likely to prescribe a non -opioid medication than PA's (45%), p<0.0001. Provider experience and gender did not affect prescribing an opioid vs. non-opioid medication (p=0.4). Military providers wrote more prescriptions for non-opioids medications than civilian providers. PAs prescribed more opioids than physicians (55% vs. 23%), which is common in teaching medical centers.

The purpose of the descriptive study by Duenas et al. (2017) was to evaluate physician usage of clinical practice guidelines for people with chronic pain in Spain and how this was affected by their training and attitudes. The study was done through an online survey from Survey Monkey. A convenience sample of 257 physicians completed the voluntary survey.

More than three-fourths (76.3%) of the physicians surveyed desired more ed-

ucation on treating patients with chronic pain. Additionally, 68.5% of the surveyed physicians, claimed to use journals and the Internet for continued education.

Most physicians (52.5%) claimed to be satisfied/very satisfied treating patients with chronic pain. On the other hand, 43% of surveyed physicians rated their satisfaction "medium". Reasons for dissatisfaction are time restrictions and poor collaboration with other healthcare personnel.

The average weekly census of patients with chronic pain treated by the physicians was 29 (SD=29). The majority of physicians (74.2%) assessed pain using a pain intensity scale. Patients were referred to other specialists, mainly for interventional procedures (51%) and unsuccessful treatment (40%). Almost half of the surveyed physicians failed to use clinical practice guidelines on a routine basis. The study also states that the physicians who received less training on pain, had chronic pain, and had limited knowledge on pain also had the greatest negativity towards patients with chronic pain, in addition to less adherence to clinical practice guidelines. This study showed older physicians (50-62 years complied with clinical practice guidelines more often than younger (25-39 years) physicians.

Areas for improvement include expand collaboration with other physician groups; utilizing multimodal therapy; increase time allotted for patients with chronic pain; and increase verbal/written instructions for patient/and care giver. This study is relevant to this evidence-based project for those reasons.

Liebschutz, et al. (2017) conducted a cluster-randomized clinical trial. The purpose of the study was to measure the effect of a multicomponent intervention, Transforming Opioid Prescribing in Primary Care (TOPCARE).

The sample consisted of 985 patients on long-term opioid therapy for chronic pain and fifty-three opioid prescribers (28 randomized to control group and 25 to intervention group). One or more clinical champions were at each of the four sites. Clinical champions trialed the intervention to verify its effectiveness, and to be a liaison to practice administrators, facilitated study team, and was co-authors of study article.

The study was conducted in four primary care practices, from January 2014 to March 2016 in Boston Massachusetts. The 985 patients had a mean age of 54.7 (SD (11.5), 52% (519) male 47% (466) female. Subjects were randomized using random-number generators in SAS software, version 9.3. Prescribers were cognizant of the study but unaware of the assumptions, goals, or conclusions. All PCCs had an orientation session.

The intervention group consisted of four components. Initially, these patients were seen by a nurse care manager who would perform a detailed pain assessment, which included screening patients for opioid misuse, abuse, and addiction. A pill count and urine drug test (UDT) were performed, additionally, the nurse manager reviewed results of the prescription drug-monitoring program.

Next, was a web-based data entry of refill dates, results of UDT and opioid agreement. This was followed by a 1:1 educational session for the PCC by an expert on opioid prescribing. There were also discussions on proper monitoring, challenging patients, and risk assessment.

The last component also included the control group. All PCCs were given online access to electronic decision tools, which included opioid risk tools and UDT ordering and explanation.

Adherence to opioid prescribing strategies and whether patients were coming in early for opioid refills were monitored. Opioid reduction and discontinuation were also monitored.

At the end of the study, the intervention group was more compliant with opioid prescribing strategies (65.9% vs. 37.8% P<. 001). The intervention group also had a greater reduction in opioid consumption (10% or opioid discontinuation). Surprisingly, there was no difference in early refill dates for both groups (20.7% vs. 20.1%). This study was relevant due to the positive outcomes of opioid reduction after an educational intervention on different components of opioid prescribing strategies, such as utilizing on-line electronic tools-PDMP, ORT, and urine drug screen

The Joint Commission (2001) revised its original pain assessment and management standards in 2016. This was after the CDC released their recommendations for minimal opioids for patients with chronic pain. These recommendations include having non-pharmacological treatment and educational resources and programs available. Many of the CDC recommendations coincide with the Joint Commission's standards. The aim of the Joint Commission accreditation program promoted patient safety and improve the quality of care. The Joint Commission (2017) revised its standards again on August 29, 2017, for pain assessment and management for hospitals. This expert review requires hospitals to have revisions in place for its accreditation program. The standards were effective. January 1, 2018. Some of the most pertinent issues are safe opioid prescribing and actively involving medical staff (nurse practitioners, physicians, and residents) to minimize risk related to opioids.

In 2018 the R3 Report started. This data displays the requirement, along with the rational, and widespread reference list for the rationale for the new requirements. There are major revisions to the Leadership chapter (LD). 04.03.13), "The hospital has a leader or leadership team that is responsible for pain management and safe opioid prescribing." This involves safe and effective screening strategies utilizing opioid risk assessment tools, prescriber education, and patient and family education. Pain assessment and pain management including safe opioid prescribing is identified as an organizational priority for the hospital. Prescribers should have access to the Prescription Drug Monitoring Program database, addiction professionals, and proper referrals for patients with substance use disorders. To meet these standards hospitals are required to have equipment available to properly monitor patients who are at increased risk of unfavorable events or harmful consequences, such as patients on high dose opioid therapy with a past medical history of obstructive sleep apnea or other respiratory conditions.

Another Standard P.C.01.02.07 (Provision of care, treatment, and Service, PC) state, "The hospital assesses and manages the patient's pain and minimizes the risks associated with treatment." This involves a patient-centered approach and moving away from medicating totally by a number and focusing on measurable and obtainable patient goals and patient function. This also involves a multimodal approach using different classes of medications and other interventions (such as aromatherapy, meditation, physical therapy) to provide an optimal pain management treatment plan. Education is

to be provided to all prescribers on safe use of opioids and other treatment options. Patients should be involved in their care and the care should be collaborative with other disciplines.

A systematic review of 11 RCTs by Zoubi et al., (2018) examined interventions designed to improve prescribers' adherence to clinical practice guidelines for patients with musculoskeletal conditions. Only randomized controlled trials written in English that examined the effectiveness of adherence to clinical practice guidelines utilizing knowledge translation for patients with musculoskeletal conditions were included.

The study addressed the question of the amount of influence educational interventions have on adherence to clinical practice guidelines and outcomes for musculoskeletal professionals. Educational strategies included interactive conferences and multifaceted interventions.

Limitations of the study were clearly addressed. The majority of the studies were in western countries, and they had to be printed in English. Consequently, generalizability was compromised. Some studies had small sample size due to availability of participants.

The National Pain Strategy was developed to answer the 2011 Institute of Medicine, transformation in pain care. It is a proposal for decreasing chronic pain experienced by many Americans. Pain care is a principal concern for public health due to its utilization of public funds.

There are six major objectives of the strategy: professional education and training; public education and communications; disparities; prevention and care; service and payment; and population research. The chief shareholder agencies were comprised of: Agency for Healthcare research and Quality (AHRQ); Office of the Assistant Secretary for Financial Resource (ASFR); Office of Assistant Secretary for Planning and Evaluation (ASPE); Center for Disease Control and Prevention (CDC); Center for Medicare and Medicaid Services (CMS); Food and Drug Administration (FDA); Indian Health Service (HIS); Na-

Table I Pre and Post Educational Intervention NJPDMR

Crosstab

			NJPDMR-Reviewed and documented		
			Yes	No	Total
Pre and Post groups	Pre-	Count	1	32	33
		% within Pre and Post groups	3.0%	97.0%	100.0%
		% within NJPDMR-Reviewed and documented	16.7%	53.3%	50.0%
		% of Total	1.5%	48.5%	50.0%
	Post	Count	5	28	33
		% within Pre and Post groups	15.2%	84.8%	100.0%
		% within NJPDMR-Reviewed and documented	83.3%	46.7%	50.0%
		% of Total	7.6%	42.4%	50.0%

Fisher Exact Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Fisher's Exact Test				.197	.098
Linear-by-Linear Association	2.889	1	.089		
N of Valid Cases	66				

. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.00. b computed for 2x2

tional Institute of Health (NIH); Office of the Secretary (OS); Office of the Surgeon General (OSG); and Substance Abuse and Mental health Services Administration (SAMHSA).

The report recognized major issues to improve pain care. Due to the opioid epidemic in the US, safe use of opioids is a major concern. In addition, moving away from an opioid only treatment plan for chronic pain was another strategy used.

A major stakeholder, the CDC issued guidelines that focused on chronic pain management in 2016, although acute and acute on chronic are included in their recommendations, which makes the situation more complex. The report recommended a multimodal treatment plan. Multimodal analgesia referred to the use of several drugs from different pharmacological classes with the purpose of lowering opioids. For example, giving acetaminophen 500mg around the clock and oxycodone 5mg Q4-6H PRN following a surgical procedure. The report also recommended multidisciplinary prescriber education on pain management by utilization of a bio psychosocial mechanism.

Summary

Chronic pain is a major public health problem that affects a patient's daily activities as well as their quality of life. Chronic pain also results in an economic and social burden for the country. The increased use of opioids to treat chronic pain for patients of all ages has related to the inadvertent consequence of misuse and abuse resulting in morbidity and mortality (Broglio & Cole, 2014). Safe opioid prescribing and minimizing risks associated with pain interventions remains an organizational priority (TJC, 2017).

Effective pain management incorporates assessment and treatment strategies congruent with national standards, state regulations, and organizational policies. Due to the present opioid epidemic, funding and additional resources for chronic pain management are limited. Nonetheless, healthcare providers must also institute effective prescribing practices that keep patients safe from pre-

Pearson's Chi-square test (Pre-Post Educational Intervention Opioid Risk Tool (ORT) Table II) is statistically significant; p-value =.000.

Table II

Crosstab

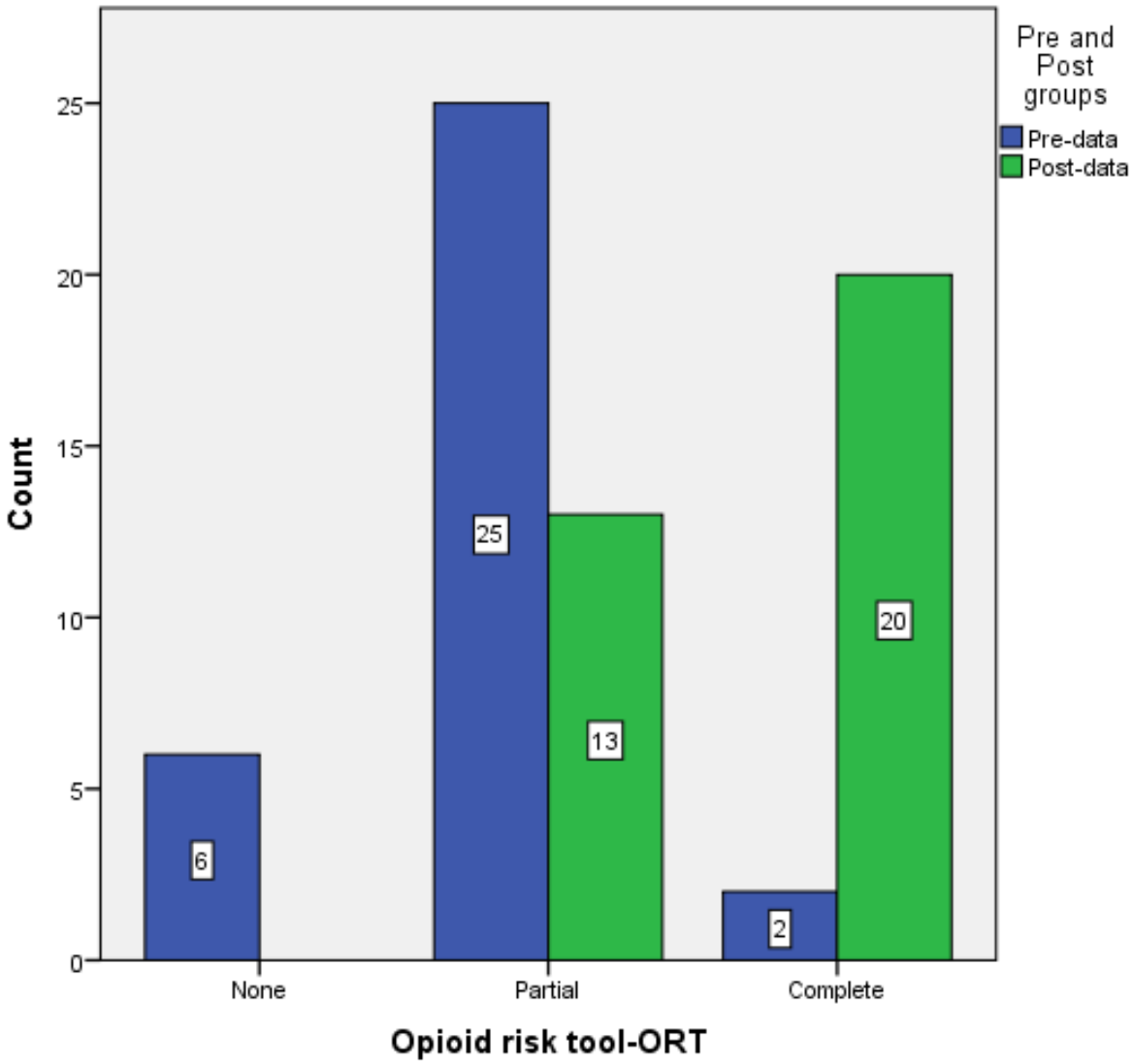
			Opioid risk tool-ORT			
			None	Partial	Complete	Total
Pre and Post groups	Pre	Count	6	25	2	33
		% within Pre and Post groups	18.2%	75.8%	6.1%	100.0%
		% within Opioid risk tool-ORT	100.0%	65.8%	9.1%	50.0%
		% of Total	9.1%	37.9%	3.0%	50.0%
	Post	Count	0	13	20	33
		% within Pre and Post groups	0.0%	39.4%	60.6%	100.0%
		% within Opioid risk tool-ORT	0.0%	34.2%	90.9%	50.0%
		% of Total	0.0%	19.7%	30.3%	50.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.517[a]	2	.000
Likelihood Ratio	29.267	2	.000
Linear-by-Linear Association	23.518	1	.000
N of Valid Cases	66		

a.2 cells (33%) have expected count < 5. The minimum expected count is 3.00

Figure 1- illustrates the use of the ORT pre and post educational intervention



scription misuse, abuse, and addiction. The scientific evidence in this literature review strongly supports the positive impact of an educational intervention as a strategy to change prescribing practices for patients with chronic pain by adherence to the guidelines in the National Pain Strategies.

METHODOLOGY

The educational intervention consisting of a 1- hour in-person workshop and two repeated zoom presentations were given to 17 APN and Resident prescribers. The Workshop also consisted of case studies of patients with chronic pain including discussion of treatment plans and 4 (10) minute sessions before the shift to reinforce information from the workshop, answer questions, or review cases.

The medical records of thirty-three patients with chronic pain were retrospectively collected before and after an educational intervention to assess use of the NJPDMP and ORT in prescribing opioid and analgesics for chronic pain management and change of prescribing practices.

Descriptive Statistics (frequencies, percentages) was used to describe demographic data. Data from the EHR Data Collection Tool: use of the NJPDMP; use of ORT; and analgesic use (Appendix C) was measured before and after an educational program. Pearson's Chi Square test or the Fisher's Exact test was used to determine the significant difference between the two independent variables. Due to the data being a yes or no answer on the usage of the New Jersey Prescription Drug Monitoring Program, the Fisher's Exact Test was used to determine the level of significance. Pearson's Chi Square test was used for the dichotomous data for the Opioid Risk Tool and analgesic usage.

Results

Demographics

Seventeen prescribers, 9 Advance Practice Nurses and 8 Resident prescribers participated in the study and received the educational intervention. Demographic data collected included: job title, gender, age (in ranges), educational level, certification status, and job status. Age

Pearson Chi-square test was statistically significant; p=<0.000 (Pre-Post Educational Intervention of Analgesic use - Table III) There is a statistically significant difference between the 2 groups at p= .000level for not prescribing opioids only.

Table III: Pre-Post Educational Intervention for Analgesic Use

Crosstab

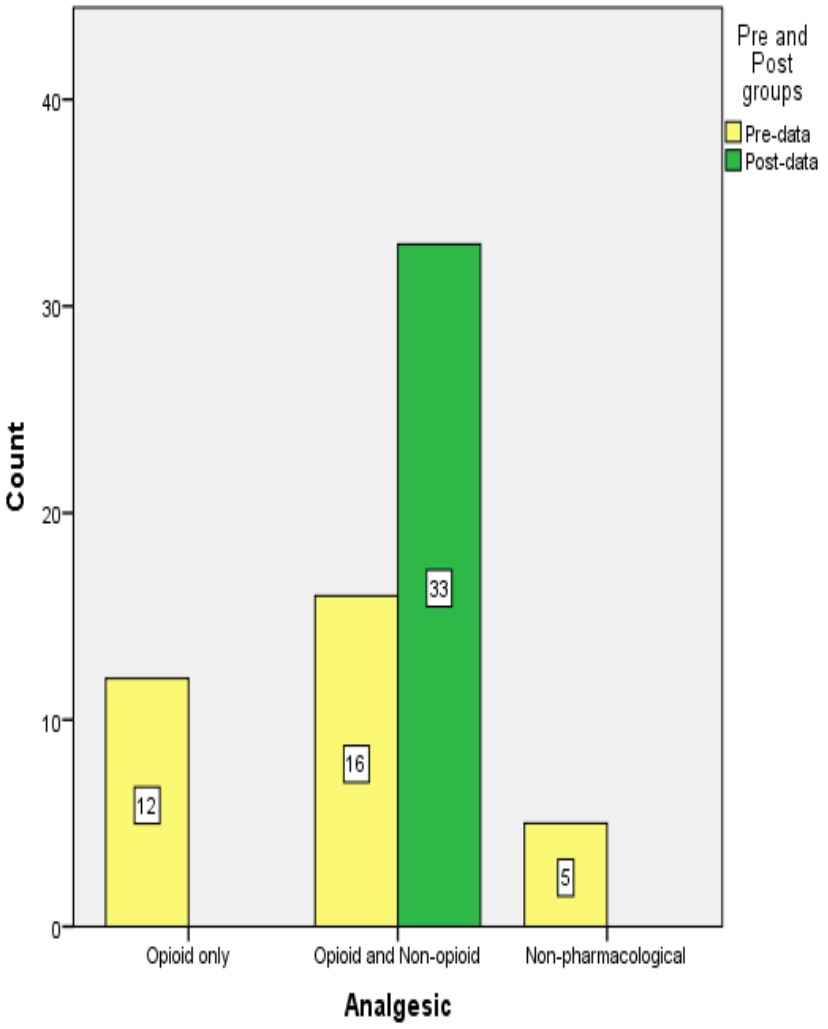
			Analgesic			
			Opioid only	Opioid and Non-opioid	Non-pharmacological	Total
Pre and Post groups	Pre-data	Count	12	16	5	33
		% within Pre and Post groups	36.4%	48.5%	15.2%	100.0%
		% within Analgesic	100.0%	32.7%	100.0%	50.0%
		% of Total	18.2%	24.2%	7.6%	50.0%
	Post-data	Count	0	33	0	33
		% within Pre and Post groups	0.0%	100.0%	0.0%	100.0%
		% within Analgesic	0.0%	67.3%	0.0%	50.0%
		% of Total	0.0%	50.0%	0.0%	50.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	14.667[a]	1	.000		
Continuity Correction[b]	12.324	1	.000		
N of Valid Cases	66				

Figure 2.

This table clearly shows the improvement after the educational intervention



of prescribers were as follows: 8 (47%) 25-35 years of age, 3 (18%) participants were 35-50 years of age, 5 (29% were 51-65 years of age and 1 (06%) participant were older than 66. All the residents and 1 APN (53%) had a Doctorate degree, and 8 (47%) APNs held a master's degree. Fifty-three percent were nationally certified, 15 (88%) worked full time, 1 (06%) part time and 1 (06%) per diem.

Data collected for this evidence-based project consisted of prescribing practices for patients with chronic pain reviewing electronic medical records (EMR) before and after an educational program on prescribing guidelines. Charts were obtained from the Nurse Manager of the Clinical Decision Unit (CDU). Outcomes were evaluated by comparing the number of the use of the NJPDMP, ORT and decrease in opioid only prescribing, before and at least 1 month after the educational intervention. A total of sixty-six charts were reviewed, 33 before the educational intervention and 33 after the educational intervention.

After the data collection of the prescribing practices of thirty-three pre- education charts, clinicians were educated on pain management guidelines.

The Fisher's Exact test was used to test the significance of the difference between pre and post educational groups in the analysis of contingency tables. Fisher's Exact test was not statistically significant for the pre and post Educational Intervention with NJPDMR, p= .197 (Table I).

Discussion

The NIH (2020) and the clinicians in this study identified a lack of knowledge on prescribing opioids for patients with chronic pain. This study consisted of an educational program for 17 APN and resident prescribers based on the National Pain Strategies guidelines to improve adherence to pain management prescribing guidelines. Prescribing practice data was analyzed before and after the educational session from retrospective chart reviews of patients with chronic pain on the CDU. There was a statistically significance difference in the ORT and analgesic use before and after the educational workshop but there was no significant difference between the 2 groups on the usage of the NJPDMP.

Limitations

Although clinicians stated that they lacked knowledge on prescribing for patients with chronic pain, this was not measured. The NIH (2011) reports bias and stigma exist with pain care for special populations of racial and ethnic populations. Individual bias on caring for patients with chronic pain was also not identified. Another limitation was the research was conducted on one unit. This unit was closed for renovations and the CDU patients were transferred to other units due to the surge in COVID-19 patients status.

Other limitations of this study include a small, convenience sample of charts for data collection and Clinicians were not available due to staffing shortages, workloads, and illness for the educational sessions. Additionally, the patient's pain location, intensity score, functional level and duration of chronic pain were ignored in this study.

Recommendations and Implications

The data from this study have resulted in a positive change in prescribing practices. The NIH (2011) recommends use of the prescription drug-monitoring program to increase adherence to guidelines. Having the NJPDMP integrated into the EMR may increase compliance. The data on this project resulted in a decrease in opioid only prescribing but

not an increase in non-pharmacological interventions. Reimbursement from insurance carriers remains problematic for integrative pain management modalities and other treatments such as aromatherapy does not require an order.

The prevalence of chronic pain remains high, at the same time the research on the benefits of opioids for chronic pain is still sparse. The disabling effect and resulting decrease in quality of life (QOL) is a persuasive motive for prescribing opioids, which may lead to substance use disorder (misuse, abuse, and addiction). Both chronic pain and substance use disorder remains a national health problem. Clinicians need to be educated on screening tools and guidelines to enhance safe and effective opioid prescribing for patients with chronic pain.

Further research is needed with a randomized controlled trial and larger sample size to improve the strength of evidence and provide a more varied perspective. Additionally, variables such as diversity in race/ethnicity, the number of opioids prescribed in Morphine Milligram Equivalents (MME) and other treatments trialed should be addressed and tied to the patient's outcome (pain intensity score and functional level) of chronic pain management.

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Congratulations to all 2022 Jubilarians, especially the Golden Jubilarians — Class of 1972!

Shown during the mini-reunion cruise of Western Europe are, from left in large photo, Alma Lastimosa Lopez, Edna 'Saki' Sacdalan, Luzviminda 'Ching' Torres Brennan, Georgiana 'Giana' Paras-Ladia, Evangelina 'Lily' Lim Arapeles and Rhodora 'Dors' Maligalig, and in her favorite Mickey sweatshirt, Floridian Josefina 'Jo' Casuela. Living it up, having fun, enjoying each other's company. It's great to be Golden!

Effectiveness of Care Bundles for Central Line Insertion and Maintenance in Reducing Neonatal Infection: A Systematic Review

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Abstract

Background and Purpose: Central line associated bloodstream infections (CLABSI) are a leading cause of nosocomial infections among premature and critically unstable neonates. PICO question guiding the study: Among neonates in NICUs requiring insertion of central venous catheters, how effective is the use of care bundles in reducing CLABSI rates as compared to not using them?

Methodology: Systematic review of peer-reviewed research journal articles with full text published in the English language between January 2016 - May 2022 using CINAHL, Medline and Cochrane databases. Three articles from the total results of 693 met the criteria for inclusion: use of care bundle for central line insertion including chlorhexidine gluconate swab,neonatal population (less than 28 days) in NICU.

Results: Significant reduction in CLABSI rates per 1000 days of line after implementation of care bundles as compared to pre-intervention phase. Care bundles used varied; consisted of hand hygiene, site selection, sterile insertion procedures, closed needleless intravascular systems, specialized insertion and maintenance teams,insertion and maintenance checklists, chlorhexidine use for skin antisepsis and hub disinfection, dressing change protocols, staff education and training. CLABSI higher in lower gestational age, lower birth weight, longer catheter dwell time and low resource settings. 80% of CLABSI caused by gram-negative pathogens, Klebsiella pneumoniae and Actinetobacterbaumannii.

Conclusion: Organizational commitment to instituting staff education, training and monitoring of compliance with care bundles for central line insertion and maintenance proved to be cost effective strategies by reducing CLABSI, NICU length of stay and neonatal morbidity and mortality.

Key Words:

Care Bundles, Central venous lines, Neonatal infection, Systemic revew, Chlorhexidine gluconate

Background

The risk of infection have devastating effects on neonates with sources

Table 1: Search Keywords

Keywords	Results
Neonates AND CLABSI AND Chlorhexidine	11
Neonates AND central lines associated bloodstream infection AND chlorhexidine	21
Neonates AND central venous catheter AND chlorhexidine	22
Neonates AND CLABSI AND alcohol swabs	0
Neonates AND central lines associated bloodstream infection AND alcohol swabs	1
Neonates AND central venous catheter AND alcohol swabs	1
Neonates AND CLABSI AND care bundle	27
Neonates AND central lines associated bloodstream infection AND care bundle	46
Neonates AND central venous catheter AND care bundle	46
NICU AND CLABSI AND Chlorhexidine	10
NICU AND central lines associated bloodstream infection AND chlorhexidine	13
NICU AND central venous catheter AND chlorhexidine	19
NICU AND CLABSI AND alcohol swabs	0
NICU AND central lines associated bloodstream infection AND alcohol swabs	0
NICU AND central venous catheter AND alcohol swabs	0
NICU AND CLABSI AND care bundle	32
NICU AND central lines associated bloodstream infection AND care bundle	44
NICU AND central venous catheter AND care bundle	38

Infant AND CLABSI AND Chlorhexidine	18
Infant AND central lines associated bloodstream infection AND chlorhexidine	30
Infant AND central venous catheter AND chlorhexidine	62
Infant AND CLABSI AND alcohol swabs	0
Infant AND central lines associated bloodstream infection AND alcohol swabs	2
Infant AND central venous catheter AND alcohol swabs	2
Infant AND CLABSI AND care bundle	55
Infant AND central lines associated bloodstream infection AND care bundle	80
Infant AND central venous catheter AND care bundle	93
TOTAL ARTICLES	**683**

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	**Exclusion Criteria**
English Language with full text	Non-English; abstracts or posters
Neonatal Population< 28 days In NICU	Adult and pediatric population >one year
Care Bundle	No care bundle
Peer Reviewed empirical articles	Non-empirical
Published between 2016-2022	Use of antibiotics
CHG swabs	CHGbath or dressings

originating perinatally, during delivery, or after delivery (Gill et al., 2011; Lee at al., 2014; Steenbock, 2018). Infections developing after delivery are the cause of nosocomial infections due to an immature immune system or from medical interventions intended to improve patient outcomes (Nanou et al., 2015; Steenbock, 2018). One common intervention is the use of central venous catheters (CVC) that pose significant risks of nosocomial infection. However, the benefits of central line access outweigh the risks (Nanou et al., 2015; Schulman et al., 2011; Steenbock, 2018).

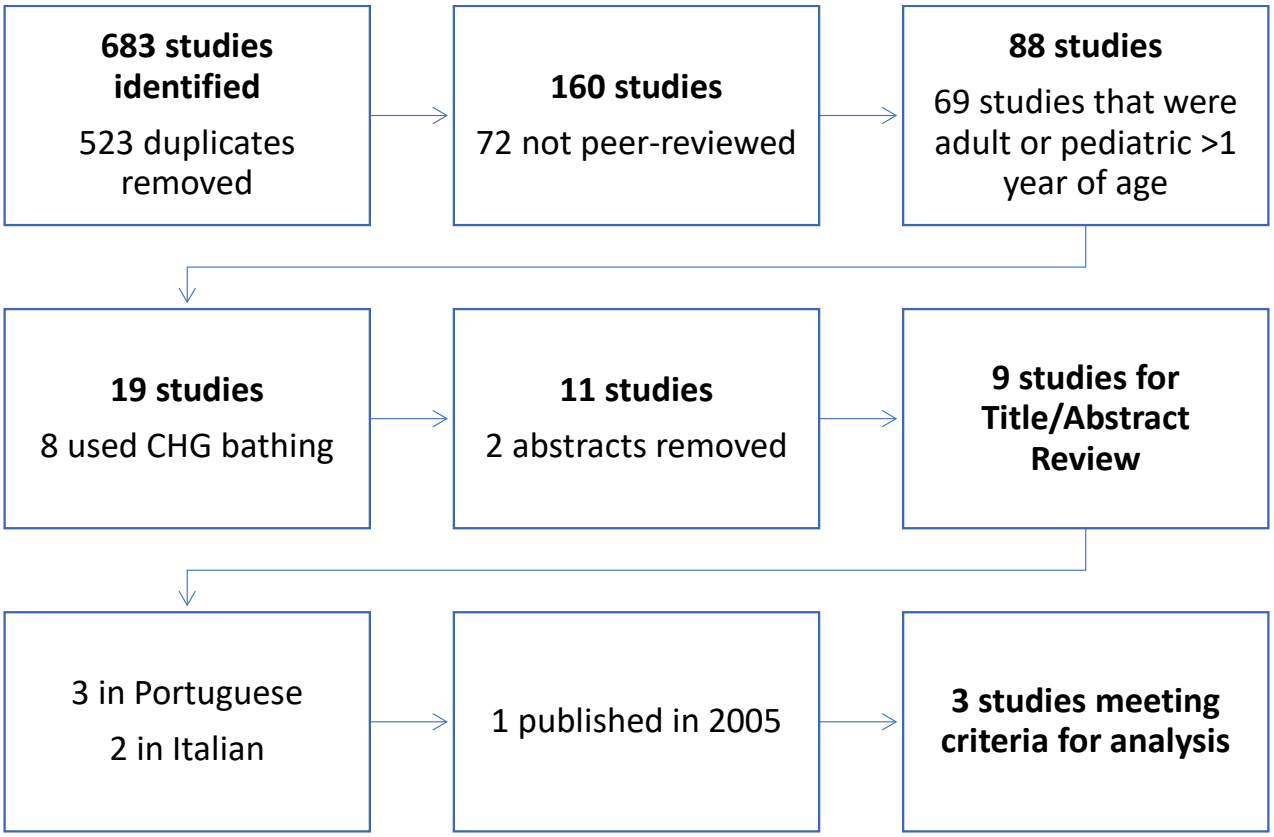
In the Neonatal Intensive Care Unit/ NICU, sources of CLABSI are attributed to the insertion and maintenance of central lines (Steenbock, 2018). The most common sources of CLABSI in neonates are from skin flora and hub care contamination (Cho & Cho, 2019; O'Grady et al., 2002; Steenbock, 2018). Insertion contamination results from skin flora and improper or inadequate skin antisepsis (Cho & Cho, 2019; O'Grady et al., 2002; Steenbock, 2018). Maintenance contamination can result from bacteria migration through the hub during line access or bacteria from another infection source (Cho & Cho, 2019; O'Grady et al., 2002; Steenbock, 2018).

Central line associated bloodstream infections (CLABSI) are a leading cause of nosocomial infections among premature and critically unstable neonates (Cho & Cho, 2019). The long-term outcomes for neonates who develop CLABSI include a higher mortality rate, poor growth and neurodevelopmental outcomes, as well as increased length of stay and medical costs (Cho & Cho, 2019). In addition, chronic lung disease, hearing and vision impairments, and cerebral palsy can all be complications as a result of treatment of CLABSI (Ishaikh et al., 2013; Liljedahl et al., 2004; Steenbock, 2018). CLABSI treatments increase healthcare costsup to $45,000 and specifically $16,800 more in neonates, as well as from resulting longer hospital stay (Cho & Cho, 2019; Donovan et al., 2013; Zimlichman et al., 2013).

In development of the PICO question to investigate the research evidence, the following background and foreground questions were considered: 1) What are sources of CLABSIs in neonates?; 2) What are the existing guidelines or recommendations for central line care in neonates?; 3) Are there risks involved in changing existing practices with central line care and neonates?; 4)What difference exists in the antisepsis provided by chlorhexidine gluconate (CHG) and alcohol?; and 5) What factors contribute to higher incidence of CLABSIs in NICUs? (Steenbock, 2018).

The significance of researching effectiveness of care bundles in reducing CLABSI rates in NICUs adds to the potential of practice implementation in vulnerable populations. Multiple studies have found that neonates fare the worst when diagnosed with a CLABSI in comparison to other ages or populations (Balain et al., 2015; Bannatyne et al., 2018; Caeymaex et al., 2020; Cho &

Table 3: Selection of Articles



Cho, 2019; Geldenhuys et al., 2017; Ishaikh et al., 2013; Liljedahl et al., 2004; Schmid et al., 2018; Steenbock, 2018; Taylor et al., 2015; Ting et al., 2013). Long term complications of CLABSI can include chronic lung disease, bronchopulmonary dysplasia, hearing and vision impairments, and severe developmental delays, in addition to increasing cost and burden on the healthcare infrastructure by lengthening hospital admission and treatment course (Balain et al., 2015; Cho & Cho, 2019; Ishaikh et al., 2013; Liljedahl et al., 2004; Steenbock, 2018; Taylor et al., 2015; Ting et al., 2013). Identifying cost-effective interventions that are relatively simple to implement but have significant improvement in patient outcomes is worth evaluating to promote neonatal and population health (Bannatyne et al., 2018; Donovan et al., 2013; Dumpa et al., 2016; Geldenhuys et al., 2017; Sannoh et al., 2010; Zimlichman et al., 2013).

Study Purpose

Structured care bundles have been utilized to reduce CLABSI in adult and pediatric settings. Care bundles are clusters of evidenced-based practices that most commonly include insertion and maintenance checklists, skin preparation and dressing protocols, and specialized education and training for staff (Dumpa et al., 2016; Payne et al., 2018; Sannoh et al., 2010; Ting et al., 2013).This systematic review is guided by the PICO question: Among neonates in NICUs requiring insertion of central venous catheters, how effective is the use of care bundles in reducing CLABSI rates as compared to not using them?

Methods

Search strategy

A systematic search was conducted using Proquest of CINAHL and Medline databases as well as the Cochrane library. Keywords used reflected the patient population, intervention, and outcomes, which included neonates, NICU, infant, central line associated bloodstream infection, CLABSI, central venous catheter, chlorhexidine, alcohol swabs, and care bundles in a Boolean search (Table 1). Only peer-reviewed, full text journal articles published in English specific to neonates were included (Table 2). This study follows the PRISMA (Page et al., 2021) guidelines for systematic review.

Study Selection

The initial search yielded a total of 683 articles published between January 2016-May 2022. Ineligible studies were excluded including 523 duplicates, 72 not peer-reviewed, 69 that were adult or pediatric populations greater than 1 year of age, 8 that used CHD bathing or bath wipes, and 2 abstracts. Of the remaining 9 studies, title and abstract screening revealed five that were published in a language other than English and one from 2005 (Table 3). The three remaining studies were selected for a full text review and analysis of findings; studies included Bannatyne et al. (2018), Geldenhuys et al. (2017), and Schmid et al. (2018) (Table 4).

Results

Table 4 provides a summary of this study results. In a quantitative study using a retrospective cohort analysis design, Bannatyne et al. (2018) studied the effect of a care bundle in neonates requiring central line insertion in the NICU at Canberra Hospital from January 2011 to December 2016. Pre-intervention strategies included retrospective data collection from pathology and medical record systems evaluating clinical characteristics, CVC use, central line days, and hospital admission and length of stay. The central line care bundle introduced in January 2014 involved an 11-step approach to reducing CLABSI. These interventions included strict adherence of insertion and maintenance checklists, medical and nursing staff education, use of an exclusive central line cart, checklist enforcement, a "STOP" sign placed outside rooms during the procedure, maximal barrier precautions during procedures, two scrubbed individuals at procedures and insertion performed by senior medical personnel, use of X-ray to verify catheter position, reinforcement and celebration of success, and regular data collection and presentation to the staff. The results of the study conclude that patient demographics in baseline and intervention group did not vary, however CLABSI rates decreased from 39 during the pre-intervention period to 18 after interventions were implemented. CLABSI rates were expressed in rate per 1000 central line days, equivalent to a decrease from 8.8/1000 days pre-intervention to 4.9/1000 days post-intervention, representing a reduction in CLABSI by 44.3%. In addition, compliance with maintenance and insertion checklists by nurses and doctors' pre-intervention was 29.5% compared to 97.7% post-intervention.

Geldenhuys et al. (2017) performed a quantitative study using a retrospective case-control design. The study took place in the NICU in Tygerberg Hospital, a public-sector teaching hospital in Cape Town, South Africa from August 2012 to July 2014. Study participants included neonates randomly selected for control groups requiring umbilical venous catheters (UVC), Broviac catheters, CVCs, or peripherally inserted central catheters (PICC) insertion. Umbilical arterial catheters were excluded from the study. Interventions included the implementation of central line insertion and maintenance bundles that included hand hygiene, optimal catheter-site selection, maximum barrier precautions during insertion, CHG skin antisepsis, daily review of line necessity, sterile line access, use of closed needleless catheter systems, and maintenance of a clean, dry, and intact dressing. Results found that of the 706 central lines inserted, CLABSI occurred 19 times. CLABSI incidence was expressed in rate per 1000-line days, translating to 5.9/1000 days post-intervention. Prior to the intervention, CLABSI rates were not collected at this facility and this data surveillance is the first of its kind in the public sector hospital in South Africa, using these findings as a baseline. CLABSI occurrence was found to be higher in lower gestational age, lower birth weight, longer catheter dwell time, and patients requiring surgery. Broviac and CVC placement in the surgical setting had an 8-fold risk of developing a CLABSI within 7 to 20 days of origin, suggesting maintenance line origin. Eighty percent of neonates that developed CLABSI were premature, 50% of whom required surgery. Gram-negative pathogens,Klebsiella pneumoniae and Actinetobacterbaumannii caused most CLABSI. CLABSI rates of 5.9/1000 days post intervention in this hospital is higher than those in high-income care settings, indicating a direct correlation between resource availability and decreased CLABSI incidence.

In a systematic review performed by Schmid et al. (2018), analysis of 27 retrospective and prospective cohort stud-

Table 4: Literature Table

Citation	Study Design and Time Period	Setting, Population/ Sample	Variables and Outcomes	Findings
Bannatyne et al., (2018)	Quantitative Retrospective cohort analysis January 2011 to December 2016.	Setting NICU at Canberra Hospital, Australia. Population Neonatal and preterm infants 28 to 39 weeks gestation weighing between 1695 and 4400 grams with central line nsertion. Sample Size 737 neonates (406 baseline, 331 at intervention)	Outcome: CLABSI rates per 1,000 central line days pre and post care bundle intervention Independent Variables/ Intervention Introduction of a CVC using care bundle in January 2014 • Strict adherence of insertion and maintenance checklists • Medical and nursing staff education • Use of an exclusive central line cart • Checklist enforcement • A "STOP" sign placed outside rooms during procedures • Maximal barrier precautions during procedures • Two scrubbed individuals • Insertion performed by senior medical personnel • Use of X-Ray for position confirmation • Reinforcement and celebration of success • Regular data collection Controlled Variable Pre-intervention practices prior to January 2014	Patient demographics showed no difference in baseline and intervention groups. Prior to intervention: 39 CLABSI reported translating to 8.8 per 1000 days. Compliance of maintenance and insertion checklists by nurses and doctors were 29.5%. Post intervention: 18 CLABSI reported translating to 4.9 per 1000 days. Compliance of maintenance and insertion checklists by nurses and doctors were 97.7%.
Geldenhuys et al., (2017)	Quantitative Retrospective Case-Control August 2012 to July 2014	Setting: Tygerberg Public Teaching Hospital providing neonatal care in Cape Town, South Africa Population: Neonatal and preterm infants 27 to 39 weeks gestation weighing 960 to 2838 grams requiring UVC, CVC, Broviac, or PICC. Sample Size: 706 central lines inserted in 530 neonates	Outcome: CLABSI incidence per 1000 central line days post intervention Independent Variable: Implementation of central line insertion and maintenance bundles. • Hand hygiene • Optimal catheter-site selection • Maximum barrier precautions during insertion • Chlorhexidine skin antisepsis • Daily review of line necessity • Sterile line access • Use of closed needleless catheter systems • Maintenance of a clean, dry, and intact dressing Controlled Variable: Umbilical arterial line maintenance and pre-intervention practices.	Post-intervention NICU CLABSI occurred 19 times, at a rate of 5.9/1000 days. Broviac and CVC lines had an 8-fold risk of CLABSI within 7 to 20 days of insertion in surgical setting where care bundle was not implemented. NICU CLABSI rate post-intervention higher than high-income settings, which can be directly correlated to available resources. availability of resources NICU CLABSI rates higher in lower gestational age (80% were premature), lower birth weight, patients requiring surgery, and a catheter dwell time greater than 4 days. Gram-negative pathogens,*Klebsiella pneumoniae* and *Acinetobacter baumanniicaused* the most CLABSI

Citation	Study Design and Time Period	Setting, Population/ Sample	Variables and Outcomes	Findings
Schmid et al., (2018)	Systematic Review Retrospective and Prospective Cohort Studies Research published between 2002 and 2016. Included studies' surveillance period are 1993 to 2014.	Setting: A total of 249 NICUs located in the United States, Australia, Greece, Austria, Canada, Germany, and China. Population: Neonatal and preterm infants with varying prematurity and birthweights from 499 to 4400 grams requiring CVC placement in NICUs. Sample Size: 27 studies with sample sizes ranging from 29 to 6790 neonatal patients	Outcome: Incidence of confirmed blood stream infections per 1000 treatment days or incidents per 100 patients pre and post intervention of care bundle. Independent Variable/ Intervention: Preventive care bundles • Blood culture diagnostic requirement of 1 mL-1 study • Clear prevention goals-7 studies • Multidisciplinary team intervention of bundles-16 studies • Feedback of surveillance to treatment team-18 studies • Hand hygiene-27 studies • Criteria for insertion and maintenance of CVC-17 studies • Skin Antisepsis-17 studies • Maximum barrier precautions-17 studies • Staff empowerment-5 studies • Compliance checklist and goals-20 studies • Dressing changes-21 studies • Change in infusion system-13 studies • Pre-filled flush syringes-3 studies • Hub care disinfection-19 studies • CVC trolley/cart-13 studies • Specialized teams-17 studies Controlled Variable: Pre-intervention strategies in reduction of CLABSI	17 studies showed a significant reduction in CLABSI rates probability post intervention of at 83% in comparison to 25% prior to intervention. 6 studies showed a reduction in CLABSI rates from 11.6 to 16.7/1000 days to 0 to 5.2/1000 days after intervention. 4 studies showed an insignificant reduction in CLABSI rates. Findings showed a benefit of instituting preventive bundles to reduce CLABSI rates in NICUs. Many studies use varying concentrations of CHG for skin antisepsis with unclear long-term consequences of systemic exposure as well as increased risk for skin irritation in neonates. At this time, a recommendation cannot be made in regard to CHG use as skin antisepsis for neonates.

ies identified reduction of CLABSI rates in a total of 249 NICUs located in the United States, Australia, Greece, Austria, Canada, Germany, and China. Research was published between 2002 and 2016 with surveillance periods ranging from 1993 to 2014 in newborns requiring CVC placement in NICUs. Independent variables included preventive care bundles. While care bundles varied among studies, all 27 studies included hand hygiene;21 studies included dressing changes;20 studies included compliance checklists with goals;19 studies included hub care disinfection;18 studies included feedback of surveillance to the treatment team;17 studies included criteria for insertion and maintenance of CVCs, skin antisepsis, maximum barrier precautions during insertion, and specialized treatment teams;16 studies included a multidisciplinary team for the intervention of bundles;13 studies changed infusion systems and utilized a dedicated CVC cart;7 studies included clear prevention goals;5 studies included staff empowerment;3 studies used pre-filled flush syringes;and 1 study included blood culture diagnostic requirements of at least 1 milliliter. Seventeen studies found a significant reduction in CLABSI rates after care bundles were implemented by 83% compared to 25% prior to intervention. Pre-intervention CLABSI rates varied from 11.6 to 16.7 per 1000 days compared to 0 to 5.2 per 1000 days post-intervention in 8 studies. Only 2 studies showed an insignificant reduction in CLABSI rates after preventive care bundles were implemented. Overall, 92.5% of studies found a reduction in CLABSI rates in NICUs. It should be noted however that many studies used varying concentrations of CHG for skin antisepsis with unclear long-term consequences of systemic exposure as well as increased risk for skin irritation in neonates. Therefore, a recommendation cannot be made regarding CHG use as skin antisepsis for neonates.

Discussion

All studies reviewed found a decrease incidence of CLABSI after implementation of care bundles, however interventions included in care bundles varied across studies. Schmid et al. (2018) found in a systematic review that studies with an interventional focus on hand hygiene, dressing change protocols, compliance checklists, specialized insertion and maintenance teams,and hub care disinfection with CHG within a care bundle were most effective in reduction of CLABSI. Bannatyne et al. (2018) found reduction in CLABSI after care bundle implementation including staff education and compliance checklists but did not include use of CHG for hub care disinfection. Bannatyne et al. (2018) did use a compliance checklist that included skin antisepsis with CHG0.5%. Geldenhuys et al. (2017)found decreased CLABSI after implementing care bundle interventions including hand hygiene, site selection, sterile precautions during insertion, CHG skin antisepsis, maintenance checklists, and closed needleless intravascular systems decreased in CLABSI in lower- and middle-income hospital settings. The study described use of CHG skin antisepsis but not specific to hub care disinfectant (Geldenhuys et al., 2017).

The findings overall provide evidence that supports the use of care bundles as effective method in reducing CLABSI rates in NICUs. Despite the varying interventions among the care bundles, most common were compliance checklists, hand hygiene, and skin or hub care disinfection with CHG (Bannatyne et al., 2018;Geldenhuys et al., 2017; Schmid et al., 2018). Providing comprehensive and ongoing staff education on use of care bundles and monitoring compliance are critical to prevention of CLABSI. Although the studies did not include comparative effectiveness of dedicated staff for line insertion and maintenance, NICUs should weigh the feasibility and cost effectiveness of utilizing dedicated staff. Institutional commitment to training and adherence to care bundle checklists by staff was a consistent finding of the studies reviewed.

The introduction of care bundles in the NICU can provide the opportunity for better outcomes in reducing the incidence of CLABSI which will also contribute to decreasing morbidity and mortality among neonates, thus improving outcomes (Balain et al., 2015;Bannatyne et al., 2018; Cho & Cho, 2019;Ishaikh et al., 2013;Liljedahl et al., 2004; Schmid et al., 2018; Steenbock, 2018; Taylor et al., 2015; Ting et al., 2013). In addition, the reduction of CLABSI rates aids in reducing healthcare costs as CLABSIs are classified as a healthcare acquired infection (HAI), further increasing costly hospital stays and interventions at the expense of the healthcare organization (Donovan et al., 2013;Dumpa et al., 2016;Sannoh et al., 2010; Schmid et al., 2018; Steenbock, 2018;Zimlichman et al., 2013).

Limitations

This systematic review had a very small sample of three studies although one study was a systematic review. Follow-up studies should be done using larger samples in NICUs, globally. The use of CHG in neonates has been met with controversy in the past, especially among extremely low birth weight (ELBW) infants who are at the highest risk for CLABSI (Hocevar et al., 2014). The use of CHG as skin antisepsis was linked to system toxicity and localized contact dermatitis resulting in burns, which led to the CDC recommendation of avoiding use of CHG in ELBW (Hocevar et al., 2014; Sannoh et al., 2010; Schmid et al., 2018; Steenbock, 2018). There has been limited findings on systemic toxicity associated with the use of CHG as a hub care disinfectant that may be a safer alternative in reducing the risk of CLABSI in neonates (Sannoh et al., 2010). None of the studies noted the concentration of CGHG used or used as a hub disinfectant. Seventeen studies reported 2% CHG/70% isopropyl alcohol swab as the preferred concentration in reducing CLABSI (Schmid et al., 2018).

Conclusion

In conclusion, this systematic review provided evidence in the effectiveness of care bundles in reducing CLABSI rates in the NICU. The impact that care bundles had were primarily due to the collaborative and multi-modal approach in interventions included within the care bundles. Hand hygiene has long been proven as an effective method in reducing the spread of infection and was a constant among all three studies reviewed (Bannaytne etal., 2018; Geldenhuys et al., 2017; Schmid et al., 2018). In addition, compliance checklists during insertion and maintenance proved to be effective in all three studies analyzed identifying potential risks and improving accountability from all healthcare team members responsible for the CVC care in the neonates. Hospitals in lower- to middle-income countries and communities can benefit from the implementation of a care bundle in reducing and preventing CLABSI among neonates because it is cost-effective.

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--- The Editorial Board

Decolonizing Health Consequences of Colonialism among Micronesians in the US

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Abstract

The purpose of this article is to increase awareness of the postcolonial vulnerability of the people of Micronesia in the U.S. that can be traced back to its colonial history. Decolonial thought is used to analyze the impact of policies and differential power relations between the Micronesians and the U.S. since the period of Trusteeship by the U.S. to the signing of the Compact of Free Association agreement after the three nations, the Federated States of Micronesia, Republic of Palau and the Republic of the Marshall Islands gained their sovereignty. Unpacking the continuity of oppression and disenfranchisement of this population since after World War II sheds light on their current plight as migrants in the U.S. and the destructive nature of colonialism on both the material well-being and selfhood of the people.

Keywords:

Postcolonialism, Decolonial thought, Micronesian health, Pacific Islander health, Hawaii health disparities

Introduction

This paper examines Micronesia's colonial history and its impact on the current health and social inequities affecting those who migrated to the U.S., particularly in Hawaii which is their major destination. Decolonized thought is applied to establish the link between social inequities of the past and the current state of this vulnerable group.

The term, Micronesian is often used to refer to any or all of the subgroups residing in a cluster of atolls forming low-lying coral islands in the Pacific, known as Micronesia. Micronesia is three times the size of California, strategically located between the U.S. west coast and Australia, about 3,000 miles southwest of Hawaii (see Figure 1).Micronesians comprise of people from the Federated States of Micronesia (Chuukese and Kosrae), the Republic of the Marshall Islands (Marshallese), and the Republic of Palau (Palauans). As free nations, these three nations entered into the Compact of Free Association (COFA), an international agreement, establishing and governing their relationships with the U.S. Since the COFA agreements were signed, large migrations of Micronesians to the U.S. have continued where they are often referred to as COFA migrants. The 2010 U.S. census does not have a box for Micronesian; instead, it designates four subgroups including Native Hawaiian, Samoan, Gua-

Figure 1. Map of Micronesia

Reprinted with permission from: Hawaii Appleseed Center for Law and Economic Justice. Reference: (2011). Hawaii Appleseed Center for Law and Economic Justice. Broken promises, shattered lives: The case for justice for Micronesians in Hawaii(p.5). Author.

manian or Chamorro, and "Other Pacific Islander."

According to the Government Accountability Office/GAO (2020), between 2009 to 2018, the number of Compact of Free Association migrants in the U.S. and its territories increased by 68% from 56,000 to 94,000 with 50% living in the U.S. mainland and 49% in other jurisdictions (Hawaii 26%, Guam 20% and the Commonwealth of the Northern Marianas Island 3%). Of the U.S. states, Hawaii has the largest majority of Micronesians (30%) followed by California, Washington and Arkansas (GAO, 2020; U.S. Census Bureau, 2010).

Overall, Comact of Free Association residents have a per capita income of only about U.S.$3,200- 3,600. The median per capita income of people 15 years and older in COFA countries is U.S.$19,874 or one-third less than their U.S. counterpart of U.S.$29,822 (GAO, 2020). Imports exceed exports, which are comprised mainly of agricultural products (coconuts, tomatoes, melons, taro, breadfruit, pigs, chickens), some craft items, and tuna. People generally fish and farm, but they recently have become dependent upon imports. Climate change has caused the sea level to rise and threatens the existence of life on the Micronesian atolls (Keim, 2010).

Storlazzi et al (2018) reported that about half of the households in two islands in Micronesia reported loss of their primary dietary staple and sources of calories (breadfruit, banana, and giant swamp taro). Between one to two-thirds of homes reported salination and some reported complete failure of their water well (James et al., 2010). Most atolls will be uninhabitable by the mid-21st century because of sea-level rise exacerbating wave-driven flooding(Campbell, 2014, 2015; Storlazzi et al., 2018).

Mass emigration of Micronesians from their home lands will continue because of contaminated water and soil from nuclear testing resulting in loss of livelihood (fishing and agriculture), environmental damage from climate change and limited employment opportunities. Loss of arable and habitable lands created overcrowding and overburdened urban infrastructure. Because of marginal health and educational services back home, many Micronesians emigrate to access better health care, education and join families who have resettled abroad (Blair, 2015; GAO, 2020).

Framework for analysis

Postcolonialism examines the cultural legacy and human consequences of control and exploitation of colonized people and their lands. It uses critical theory analysis of how the epistemic and material power relations set in motion during colonial times shape the present world (Grosfoguel, 2007). Colonialism involves the historical, social, political and cultural narratives surrounding the relationships between the colonizer and the colonized used to sustain the postcolonial identity of a decolonized people (Meghji, & Niang 2021). The latter is derived from the colonizer's generation of cultural (epistemic) knowledge that is used to subjugate the colonized people embedded in cultural identities that perpetuate an inferior state of being. Postcolonial identity of the colonized people is based on the cultural interactions between different identities based on cultural, national, ethnic, racial, gender and class, which are assigned varying degrees of social power by the colonial society (Said, 2014).

According to Fanon (1963) colonialism is a total project ruling every aspect of colonized peoples and their reality. It is destructive in nature, imposing a subjugating colonial identity and systematic denial of all attributes of humanity. This process of dehumanization using physical and mental violence inculcates a servile mentality upon the natives. The colonists use the power of knowledge to perpetuate separation between them and others (Foucault, 2020).

Postcolonialism aims to disempower the intellectual and linguistic, social and economic realities that colonists have created. The coloniality of knowledge refers to how Western global dominance is partly epistemic involving erasure (epistemicide) or devaluation of 'other' ways and forms of knowing and knowledge (Grosfoguel, 2007). Decolonial thought critiques how colonial epistemic and material domination shape the present world. It involves reflexive critiques on the link between historical relationships between the colonists and the colonized with social inequalities in contemporary society (Mignolo& Walsh, 2018). Understanding the reproduction of colonial knowledge (epistemology) is prerequisite to social justice (Wynter, 2003).

Micronesian colonial history

Micronesians were ruled by a succession of colonial powers for over four centuries. According to Hawaii's Appleseed Center for Law and Economic Justice (2011), in 1947 following World War II, the islands of Micronesia became part of the UN Trust Territory of the Pacific Islands, administered by the USA that became responsible for promoting its economic, political and social development with the goal of eventual self-determination. Between 1946 and 1958, the U.S. conducted 67 nuclear tests in the Marshall Islands resulting in the destruction of resource-rich islands and horrific health effects that continue to plague the population today. The nuclear tests and their fallout had the largest impact on four northern atolls: Enewetak, Bikini, Rongelap, and Utrok, with payloads up to 1,000 times greater than the bomb dropped at Hiroshima (US. Department of Energy, 1994). Faden (1996) asserts that the U.S. government intentionally tested bombs in these islands to test not only the bombs, but also their effects on humans. A week after testing bombs, residents were moved to neighboring islands so that they could study the effects of radiation on humans, including laboratory studies and bone marrow biopsies. Consent was not obtained and the residents were not informed that an experiment was conducted.

Within hours of exposure to radiation, approximately two-thirds of the Rongelap people felt nauseated and one-tenth of the group had vomiting and diarrhea, skin lesions and epilation (Faden, 1996; Naval Medical Research Institute & U.S. Naval Radiological Defense Laboratory, 1955). Cronkite et al. (1955) summarized that with "the exception of the skin lesions and epilation, there were no further symptoms, including neutropenia, infections or hemorrhage...although a few individuals were markedly neutropenic [along with some infections] and platelet counts fell in 20% of the group" (Naval Medical Research Institute & U.S. Naval Radiological Defense Laboratory, 1955). The report concluded, "While it is true these people do not live the way that Westerners do, civilized people, it is nonetheless also true that they are more like us than mice."

These bombs left craters some of

which were about 246 feet deep and almost a mile across. Traces of the explosions were found far away in Japan, India, Australia, Europe and the U.S. The fallout material from the blast contained incinerated coral coated with radioactive plutonium, americium, bismuth and cesium. The particulate was blown into the air, inhaled, absorbed and ingested by residents; children mistook them for snow. For about four years after the bombings, the radioactive dust was collected and dumped into a crater left by a bomb, and then covered with a concrete dome. Unfortunately, the dome is cracking and radioactive waste is leaking; dead fish are found on nearby beaches along with destruction of sea life. Soil samples still show external gamma radiation levels on many islands (Maveric et al., 2019).

Rather than promote the islands' self-sufficiency, the US government deliberately fostered economic dependency in the Trust Territory to maintain strategic control over this geographic region. The 1963 Report by the U. S. Survey Mission to the Trust Territory of the Pacific Islands, more commonly known as the Solomon Report, outlines a political strategy to ensure that after the trusts were dissolved the islands would be permanently politically bound to the U.S. The report has been cited as a demonstration of America's strategic colonialism in the Pacific (Hawaii's Appleseed Center for Law and Economic Justice, 2011).

In 1961, a UN Visiting Mission strongly criticized the US for failing to fulfill its responsibilities and the U.S. came under pressure to help the trustees move toward self-government. The Compact of Free Association (COFA)comprised a series of treaties signed when three of these nations ended their trusteeships, and became independent nations: the Republic of the Marshall Islands in 1986; Federated States of Micronesia in 1986; and the Republic of Palau in 1994 (Hawaii's Appleseed Center for Law and Economic Justice, 2011).

The Compact of Free Association agreements form the basis of a special, long-term political relationship between these nations and the U.S. According to their provisions, the U.S. assumes control over the foreign affairs, airspace and waters of COFA nations. In the Federated States of Micronesia alone, this means control of more than one million square miles of the Pacific. In the Marshall Islands, the U.S. Army leases eleven islands and operates the Ronald Reagan Ballistic Missile Defense Test Site (RTS) at Kwajalein, that provides a Major Range Test Facility Base (MRTFB), and supports developing and testing of missiles and missile interceptors, as well as the U.S. Strategic Command surveillance and National Aeronautics and Space Administration operations (McElfish et al., 2019). The value of RTSto the MRTFB is based upon its strategic geographical location, unique instrumentation and unsurpassed capability to support ballistic missile testing and space operations. It remains the premiere U.S. offensive and defensive missile testing ground, supporting major missile systems, space operations, surveillance and object identification. In return for these military privileges, the U.S. is required to aid the economic development of COFA nations and provide for their national security (Hawaii's Appleseed Center for Law and Economic Justice, 2011).

In addition, Compact of Free Association citizens are considered as non-immigrants who are able to enter the United States to live, work, or study without visa, labor certification or length of stay requirements. As non-immigrants, they have no pathway towards U.S. citizenship and unable to vote unless they become naturalized by marrying U.S. citizens (McElfish et al., 2019; U.S. Citizenship and Immigration Services, 2019).COFA migrants are able to serve in the U.S. military and many do. In fact, there is a greater proportion of the citizens of the Federated States of Micronesia and the Republic of Palau compared to their total population who are in the U.S. military compared to that of Americans. The first compact provided for economic assistance and free travel for their citizens to the U.S. This Compact of Free Association was implemented between 1986 and 2003.At the time, the people were eligible for federally funded health care benefits through Medicaid, but became the only group excluded after passage of the Personal Responsibility and Work Opportunity Act in 1996. This was perceived by many as a betrayal (McElfish, et al., 2015) because in Micronesia, people keep their word. A renewed interest in the COFA region is taking place in the world due to the tensions from China's engagement with COFA nations. The agreement is to be renegotiated in 2023 (Congressional Research Office, 2020)

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COFA Migrants in the US

Socioeconomic status

Compact of Free Association migrants are disproportionately younger with significantly fewer older adults (DBED & TREAD, 2019; GAO, 2020) with slightly more women (52%) than men (48%) (READ, 2018).Because of this age distribution, there are few numbers of elders who can assist with child rearing, household chores, and provide guidance for the youth. High numbers of children have stressed already underfunded high schools in low-income neighborhoods where they live. Teens are unable to negotiate conflict, get little help from older adults, and end up with legal issues.

Eighty-eight percent of Compact of Free Association migrants>5 years of age speak a language "other than English" at home, 12% speak English "well" and 69% speak English "less than very well" (READ, 2018; DBED&TREAD, 2019). The imbalance between high demand for interpreters, and limited availability of trained interpreters who speak the various languages of Micronesia, resulted in limited access to interpreters and translated materials in schools, hospitals, and courts. This often results in delays in social services provision and in some cases critical errors.

About one quarter of Compact of Free Association migrants 25 years and older have not graduated from high school (GAO, 2020). Many children are in special programs due to low English skills, poor educational foundation, and lack understanding of cultural expectations between home and school (Timmerman, 2018). COFA students contributed to almost one-third of chronic absenteeism that has been attributed to compulsory school being new to them (Matsuda, 2016). Learning English at the same time as learning new material is difficult; students get labelled as incompetent, and many end up in special education classes instead of regular English classes (Hawaii Advisory Committee, 2019).

Fifty-two percent of Compact of Free Association migrants in Hawaii live below the poverty line (DBED&TREAD, 2019) with the Marshallese having the lowest wage, highest unemployment (47%), and lowest per capita income of

$5,963. The percentage of Marshallese living in poverty is eight times more than that of the state (READ, 2018). More COFA workers are employed in occupations with lower socioeconomic status and wages such as food preparation and serving, building and ground maintenance, wholesale and retail trade, waste management and agriculture (DBED&TREAD, 2019). Feware employed in professional/scientific/technical services, education, health care and pubic administration. (Hawaii Budget & Policy Center, 2020). COFA workers are less likely to drive alone to work, and more likely to take public transportation (DBED&TREAD, 2019).

Although Compact of Free Association migrants have a state identification cards and I-94 documents that can be verified for employment, many employers also require a passport and other documents that are not necessary, to avoid employing them (Hawaii Advisory Committee, 2019) despite the fact that doing so constitutes a violation of the Immigration and Nationality Act's antidiscrimination provision (Civil Right Commission, 2019).

Housing

Poor housing, crowded environments, segregation, and large families characterize Compact of Free Association households with an average size almost double the average of Hawaiian families (DBED&TREAD, 2019). Marshallese have on average of 16 people living in each owned home and 97% of Marshallese families have children living at home (READ, 2018). In Hawaii, overcrowded housing is the most common reason for homelessness (Omori et al., 2007).COFA migrants encounter discrimination in housing because landlords refuse to translate lease contracts, raise rents at the last minute, enter the homes unannounced, and neglect making repairs on rented properties. Some COFA tenants have reported no electricity, broken windows, damaged and leaking plumbing, and doors without locks. Often no receipt is provided for rental payment and late fees are charged even when tenants have paid on time(Hawaii Advisory Committee, 2019).

Food Insecurity

Forty-four percent of people who report as "Other Pacific Islander" in Hawaii are experiencing food insecurity (University of Hawai'i and Mānoa, 2020). Access to federal benefits has been stopped since 1996 with the implementation of the Personal Responsibility and Work Opportunity Act that excluded Compact of Free Association migrants from federal benefits including Supplemental Nutrition Assistance Program, Temporary Assistance for Needy Families, (GAO, 2020).In 2014, the state of Hawaii decided that non- pregnant, nonaged, blind and disabled COFA migrants are ineligible for state Medicaid benefits (Morey et al., 2020).

Cultural Barriers

Micronesian cultural traditions emphasize the role of families in providing a sense of security and love for its young members. Outward expressions of affection are expected and respect for elders and those in power and control is valued. Children learn at a young age to defer to elders and be quiet in the presence of those with more wisdom. The social and community contexts of Compact of Free Association migrants are affected by the loss of culture, and exposure to stresses of discrimination and violence.

In Micronesian culture less value is placed on individual privacy and more on the desire to stay with others, which is reflected in their large household size. There may be tension between individuals, especially the young, due to the absence of elders to guide them. In health care, their value of respect for elders or persons of authority is demonstrated by their tendency to agree to procedures and treatments despite not understanding them.

Micronesians explain disease by personal understandings, thinking of "who" caused the condition rather than "what." Traditionally, natural and spiritual forces are used to explain health and healing in Indigenous culture (Hezel, 2013).Marshallese persons often do not seek health care services until a disease reaches a crisis stage (McElfish et al., 2015). Marshallese mothers in the U.S. have low birth-weight babies at higher rates than the general population (McElfish et al., 2016).

Some providers described patients not understanding the healthcare system, and not understanding history and culture. Effective communication gets lost and health issues that are extremely private are revealed despite privacy laws. This has led to patient and family confusion, frustration, and misunderstanding. Providers become frustrated with low health literacy, ineffective communication, and cultural differences. Inequitable coverage results in damaged relationships, discriminatory stereotypes, lower standards of care, and in some cases, denial of service (Inada et al., 2019). A cycle of negative experiences can perpetuate misunderstandings between patients and providers.

In addition to direct clinical services, residents may require health, housing, education, social services and in some cases legal services. Lack of appropriate language services coupled with literacy and cultural issues may affect their ability to efficiently navigate the healthcare system. Housing issues, overcrowding, and homelessness may worsen existing health status and complicate efforts to care for citizens from Micronesia (Riklon et al., 2010).

Psychological Issues

The historical trauma caused by nuclear testing and forced relocation that resulted in loss of their homes, livelihood, and culture has impacted Compact of Free Association migrants' behavior and psychology. The experience historical trauma is transmitted through generations, and effects tend to be cumulative (Pacquaio, 2019). The psychosocial outcomes include depression, anxiety, anger, shame, grief, and social isolation (Mortazavi, et al., 2020). Native Hawaiians and other Pacific Islanders have higher rates of suicide, depression, post-traumatic stress disorder, sleep disturbances, substance use, interpersonal violence, and adverse childhood experiences. Native Hawaiian and other Pacific Islander high-school students have higher rates of substance use, sexual activity, weapons use, physical altercations, and suicidal ideation. The effects of these stressors are cumulative (Ye & Reyes-Salvail, 2014).

Healthcare Access

Twenty-seven percent of Compact of Free Association migrants in the U.S. have no health insurance coverage (GAO, 2020). Initially, COFA migrants were eligible for Medicaid under federal guidelines. However, The Personal Responsibility and Work Opportunity

Act of 1966 deemed them ineligible for federal Medicaid coverage including Supplemental Security Income, Children's Health Insurance Program, Temporary Assistance for Needy Families, Supplemental Nutrition Assistance Programand Social Services Block Grants regardless of how long they lived in the U.S.(GAO, 2020). The state of Hawaii continued to provide coverage through its state Medicaid Program,Med-QUEST until 2009 but because of economic reasons, it disqualified only COFA migrants from its Medicaid rolls and placed them in a new program, Basic Health Hawaii with significantly reduced benefits. A class action was filed on behalf of COFA migrants and an injunction stayed this decision until the U.S. Supreme sided with the state in 2014.The state later announced that non-pregnant, non-aged, blind or disabled were no longer eligible for Medicaid (Morey et al., 2020). Since the Affordable Care Act was already approved in 2010, COFA migrants were directed to enroll in subsidized privately purchased insurance available on the ACA exchange.

Hawaii state felt the economic burden of providing health, educational and housing benefits for a growing number of Compact of Free Association migrants amidst cuts in federal support. Morey et al (2020) attributed this shortfall to the undercounting of Native Hawaiian and Pacific Islanders and the lack of data on the different Pacific Islander groups in the Census resulting in inaccurate estimates for funding. Some Pacific Islander groups are also ineligible to vote hence politically disenfranchised (Morey at al., 2020). The perception of COFA migrants as a burden to Hawaii is widespread and has resulted in blatant discrimination against this group. One in four COFA migrants experience discrimination at work, 1:10 in medical and social services, and 1:13 in public accommodation (Hawaii Advisory Committee, 2019). In schools children are bullied and ridiculed because they do not speak English properly. Classmates may not want to sit next to Micronesians because they are "dirty", forcing some students to take public transportation rather than taking the school bus (Hagiwara et al., 2019; Hawaii Advisory Committee, 2019).

Since the Affordable Care Act market exchange was implemented, Medicaid-funded hospitalization and emergency department visits declined in this group by 31% and 19%, respectively attributed to higher rates of uninsured (Halliday & Akee, 2020). The ACA market place was found to be a poor substitute for Medicaid for COFA migrants because of complex communication challenges around eligibility, administrative burden of enrollment, new out-of-pocket costs for care and limited enrollment window that create more disadvantages for vulnerable COFA migrants (Ng Kamstra, Molina & Halliday, 2021).

Health Disparities

The severity of illness for Micronesians is significantly higher for cardiac and infectious diseases; they have higher rates of hospitalization for cancer, endocrine disorders and substance abuse. Micronesians have higher burden of hospitalization and are hospitalized significantly younger compared to other major ethnic groups in all disease categories (Hagiwara et al., 2016). Nuclear testing in the Marshall Islands and radiation fall out caused a higher incidence of cancers, reduced crop production with subsequent dependence on U.S. subsidies of refined, processed foods (e. g., canned meat and white rice) that contributed to increased prevalence of obesity, diabetes and hypertension (Hagiwara et al., 2016).

The population has increased incidence of cardiovascular disease, diabetes, high blood pressure, obesity, cancer and mental health issues including violence and suicide. Ischemic heart disease is the leading cause of deaths annually, followed by diabetes and cerebrovascular disease, all of which are non-communicable diseases (Kocher, 2017). There is a rising prevalence of cardiometabolic syndrome (e. g., hypertension, obesity, and hyperlipidemia) and cardiovascular diseases (e. g., diabetes and heart disease) in both adults and youth (Kaholokua et al., 2013). Many deaths are deemed premature (<age 60 years) and preventable (The World Bank, 2014).

The top ten countries with the highest rates of diabetes in the world are inhabited by Pacific Islanders. Fifty-two percent of adult males in Tonga are estimated to be obese; in Kiribati, Federated States of Micronesia, Tonga and Samoa adult female obesity is estimated to be 50% or more (The World Bank, 2014). According to McElfish et al (2016), rates of diabetes are documented at more than 400 % the national average. The prevalence of type 2 diabetes among the Marshallese is among the highest of any population group in the world, with prevalence ranging from 25% to 50% for Marshallese adults compared with 8.3% for the U.S. population and 4% worldwide. The nuclear explosions and relocation of Marshall Islanders has permanently altered their traditional diet and lifestyle, a contributor to these serious health effects (McElfish et al., 2016).

Native Hawaiian and Pacific Islanders are likely to develop breast cancer at an earlier age than women of other ethnic groups. They are also more likely to be diagnosed at a later stage, more likely to have markers of more aggressive cancer, and more likely to die from the disease compared to other ethnic groups (Braun, et al., 2005). In the Republic of the Marshall Islands, cancer is the second leading cause of death, possibly as a consequence of previous nuclear testing in the area. The risk is estimated to be 9% above the natural baseline (Kroon et al., 2004). The 5-year survival rate following diagnosis from all types of cancer is 47% for Native Hawaiians/ Pacific Islanders, which is 8% lower than for "all races combined" (Office of Minority Health & Health Equity, 2021).

Communicable diseases, particularly hepatitis B, tuberculosis, and Hansen's disease are found at higher rates among the Marshallese than in the general population (McElfish et al., 2016). The residents of the Compact of Free Association nations bring significant burdens of infectious and chronic disease to the U.S. For example, in 2008, it was estimated that COFA migrants accounted for 17% of all new tuberculosis cases and 94% of all new Hansen's disease cases (Riklon et al., 2010).

Conclusion

The plight of the Micronesian people back in their home country and in the U.S. is a result of policies and relationships established during colonization that are clearly more advantageous to its more powerful and wealthy partner, the U.S. Their lack of control over nuclear testing conducted in their lands has started a downward spiral towards poverty and poor health. The Compact of Free Association agreements did not create responsibility and accountability for the U.S. to clean up the environmental

disaster created by nuclear testing. The U.S. has continued to occupy cleaner and safer areas in Micronesia where Americans occupy and live under the same standards available in mainland U.S. In contrast, Micronesians have been pushed to live in overcrowded settlements with inadequate infrastructure. In the island of Kwajalein, Micronesians who work there are not allowed to live there – they are exclusively for Americans only(Morey et al., 2020). They go home by ferry boat to an overcrowded island with poor sanitation and living facilities.

The promise of unlimited stay in the U.S. is marred by their status as non-immigrant without a pathway to citizenship and access to Medicaid benefits available to other immigrant groups despite the fact that they pay taxes. While the federal government has earmarked funds for states and territories for COFA migrants, the demand will always exceed available funds as more migrants enter the U.S. already saddled by health and multiple social problems.

Their forced reliance on imported processed food because of destruction and nuclear contamination of their water and soil, has created high incidence of diabetes, cardiac disorders, cancer, infections and need for renal dialysis. Many of the cancers from radiation have not yet surfaced and are predicted to occur along with other immunosuppressed disorders, increasing the trajectory of these migrants needing expensive chemotherapy and long-term treatments (Palafox & Lim, 2020).

The spiralling cost of healthcare in the U.S. remains uncontained. The environmental destruction and oppression of Micronesians will grow worse as the U.S. government tightens healthcare costs disregarding the needs of vulnerable populations whose health trajectories were predetermined by their colonial experiences of adversity. As a trustee and COFA partner, the U.S. has failed to build the economic, educational and health infrastructure that would have enhanced self-sufficiency of the Micronesians. Instead, it created a population with so many vulnerabilities (poor health, poverty, lack of adequate housing, low educational achievement and literacy, and objects of discrimination). Micronesians require long term commitment, advocacy and sustained support to address the social determinants of health that began in their home land affecting several generations to come.

Micronesian colonial history must be known broadly and be a part of the school curricula to develop empathy and compassion from outsiders who can remind the U.S. government of its moral obligation to improve their life conditions- the terms of the trusteeship they signed for. Cultural competence development of healthcare providers must integrate their history in order to understand why they have excess burden of disease and death and become burdensome to healthcare even at a young age. Integration of Micronesians in the new society is a must for its future generations to succeed. This integration must start with recognition of the unfair conditions of the COFA agreements and the subsequent policies excluding a vulnerable group from many privileges that have been extended to other immigrants (citizenship, right to vote and eligibility for Medicaid benefits). Social justice in reallocation of material resources and goodwill is possible when their vulnerability is linked with colonial history using decolonized criticism. Indeed, social justice is more possible once epistemic justice is established.

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Interprofessional Simulation Experiences for Undergraduate Nursing Students Using Role-Playing

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Abstract

Interprofessional education (IPE) in nursing is increasingly emphasized in nursing student learning. To introduce and reinforce the concept of IPE, nursing course simulation sessions incorporating the IPE through a role-playing were administered. The purpose of this qualitative descriptive research study was to describe IPE simulation-based learning and to explore nursing students' perception of learning experience through role-playing in simulation.

The following themes emerged from the IPE simulation experience: *feeling lost; self-confidence; better team communication; and stepping up the game with teamwork.*

Although the students were at first unsure how to perform in their assigned roles, as the students participated in more IPE role-playing simulations, the students felt they were getting better at communicating and working together as a team. They also felt their self-confidence also increased as they participated in more IPE sessions.

Introduction

The complex health care needs of today's society require an effective collaborative teamwork consisting of multidisciplinary health care professionals. Achieving interprofessional (IP) competencies of values and ethics, roles and responsibilities, interprofessional communication, and teamwork are critical for successful collaborative practice (National League of Nursing, 2016). The ability of the health care team to communicate, cooperate, and share knowledge and skills is important to deliver safe, quality health care. Because of this, there is a high emphasis placed on nursing students' IP competency. The interprofessional education (IPE) had been identified by accreditation agencies and professional organizations as essential in nursing education (Decker, et al. 2015); and interprofessional simulation plays a critical role in preparing nursing students achieve the IP competencies (Labrague, et al., 2018).

This study utilized the qualitative data collected during IPE simulation immersive experiences in a prelicensure BSN nursing course. This particular nursing course (NURS 234) was assigned to any nursing students who failed a nursing course. The students who were mandated to take this course as a result of the nursing course failure came from different levels of nursing program, ranging from first semester junior to last semester senior levels.

Review of literature

Traditionally, learners of health care education are taught exclusively within their own specific professions; due to this, learners often form own stereotyped ideas about the roles of other health care team members (Fagan, 2010). These ideas and beliefs can lead to territorial behaviors within the health care team causing conflict and ineffectiveness in providing quality patient care. As early as 1972, the Institute of Medicine (IOM) recognized that the existing educational institutions were not preparing health professionals for effective team work (Interprofessional Education Collaborative Expert Panel, 2011, Interprofessional Education Collaboration, 2016). Further, IOM (2009, p.37) wrote that "academic institutions and health care organizations need to make a real commitment to interprofessional education that develops and sustains collaborative skills, both before and after licensure."

While the IPE is widely regarded as a valuable educational addition to health professions, educators are challenged by how to effectively bridge interprofessional practice in own professions' education (Engum & Jeffries, 2012). Simulation-enhanced IPE is one of the strategies to incorporate IPE in nursing education, and such occurs when participants from two or more professions are engaged in a simulated health care experience in order to achieve shared or linked objectives and outcomes (Decker, et al. 2015).

Many research studies to date have examined interprofessional education with simulation scenarios involving: physical therapy, theater and nursing students (Swift & Stosberg, 2015); medical students, medical residents, and nursing students (Baker, et al. 2008); medical students and nursing students (Wang, et al. 2016; Liaw, Siau, Zhou & Lau, 2014); physical therapy and nursing students (Zhang, 2013); respiratory therapy and nursing students (Fagan, Lackie, Bafield & Pendergast, 2010); and, nursing faculty playing patient roles to teach nursing students (Trail Ross, Otto & Stewart Helton, 2017)..

This present study used an IPE role-playing strategy to observe the student learning in simulation. Role-playing is not a new learning strategy, and it is acknowledged to be an effective tool in nursing education (Harder, Ross & Paul, 2013). The role-playing strategy incorporates nursing students assuming various roles; and to simulation experience, the role-playing is a large part of such experience (Yua & Kang, 2017).

Theoretical framework

Situated learning theory (SLT) illuminated social and cultural learning processes (Lave & Wenger, 1991). Many researchers and educators in the health professions embraced this theory, as learning in practice occurs through co-participation, with a shared repertoire of communal learning resources, while accommodating complexity and facilitating change(Barr, 2013). According to the SLT, the meaning of learning activities that transpire is a constantly negotiated

and renegotiated interpretation of those held by all the participants, with "community of practice," the context in which such learning occurs; and successful community of practice is based on mutual engagement, joint enterprise, and a shared repertoire of resources (Wenger, 1998). Situated learning provides essential and helpful concept of community of practice relevant in the IPE, especially for the humanistic health professions which emphasizes experience-based learning (O'Brien & Battista, 2020).

Purpose

The purpose of this qualitative descriptive research study was to describe IPE simulation-based learning and to explore nursing students' perception of learning experience through role-playing in simulation.

Research design and methodology

Methods and procedures

This study is educational research with a qualitative approach using data collected from the IPE simulation experience sessions utilizing role-playing. The study focus was to explore undergraduate student nurses' perceptions of learning experience with the role-playing simulation sessions emphasizing the IPE.

Participants and setting

At a mid-sized, Catholic university, undergraduate nursing students (in their 3rd or 4th year of Bachelors Science of Nursing program) who registered for the nursing course were invited to participate in this study. Students who were registered for this course but did not consent to the study or participate in the simulation sessions were excluded from the study. After obtaining signed consents from students (n=18), the simulation sessions utilizing the IPE were initiated. The authors were present during each simulation experience for the data collection.

Data Collection

The IPE sessions were provided a total of four times, each with specific written scenarios (dementia, delirium, congested heart failure, chronic obstructive pulmonary disease, and others). Participating nursing students role-played variety of roles such as physicians, physical therapists, geriatric nurse practitioners, social workers, unlicensed assistive personnel (UAP), primary and secondary nurses, and family members.

Each IPE simulation session had a group of four to five students participating with their assigned roles and each group was given different scenarios per session. The students were not assigned to the same group or roles each time. The session also included debriefing sessions lasting about 45 minutes. The students completed clinical simulation evaluation forms which graded (via 5 point Likert scale) components of: purpose/objective, support, problem solving, debriefing, fidelity, active learning, diverse ways of learning, high expectations, collaboration, and satisfaction. The participants were also asked to complete a structured survey form, a debriefing tool consisting of six questions: *what feelings arose for you during the simulation experience; what challenges did you encounter in your role (name role); how do you feel when communicating with IPE team; what do you think went well in this simulation; what would you do differently if this simulation was repeated;* and, *identify three concepts in this situation you plan to use in your healthcare career.* This debriefing tool was adapted from Gasper and Dillon (2012) and was given permission to modify for this research study. This completion of the tool after each simulation experience assisted in gathering additional qualitative data. To assure confidentiality, the authors were the only persons with access to the data to analyze.

Data Analysis and Results

Data analysis involved content analysis of the transcripts (from completed clinical simulation evaluation forms and debriefing tools), and field notes (observation of IPE simulation and debriefing sessions). Each transcript was read line by line several times; emerging themes were then fully discussed and then were agreed upon by the authors. This process produced a thick, rich description of what was happening with respect to student learning (Wolf, 2012). The following four main themes emerged: feeling lost, self-confidence, better team communication, and stepping up the game with teamwork (see Table 1).

1) Feeling lost

As IPE role-playing simulation sessions began, many nursing students felt unsure as to what to do:

"I felt lost on what to do how to get his BP and HR down fast enough (in secondary nurse role)."

"Really didn't know what to say in my role because I didn't want to go over my abilities as a UAP."

2) Self-confidence

With more simulation experience, the students felt more confident during subsequent IPE simulation lab sessions:

"I felt more confident this time than any other previous sim labs."

"Better now that I've had many practices."

3) Better team communication

When working together as a team in caring for patients (using specific scenarios), the students felt their communication skills were getting better:

"I was comfortable communicating with the interprofessional team."

"Communication between us went well, we gave each other space and room to talk."

4) Stepping up the game with teamwork

As their communication improved, the teamwork got better to handle situations given in scenarios during the sessions:

"The whole sim lab went well. I thought this group worked together well and we handled everything professionally."

"We all jumped in right away, worked as a team, we were able to jump in together and help one another."

Discussion

Many simulation research studies pointed to the benefits of role-playing for student learning during simulation (Trail Ross, Otto & Stewart Helton, 2017; Wang, et al. 2016;Swift & Stosberg, 2015; Liaw, Siau, Zhou & Lau, 2014). In particular, the learning strategy such as simulation and role-playing is useful when applying the IPE core competencies (National League of Nursing, 2016).

According to Zaudke,Chestnut, Paolo and Shrader (2016), exposures to IPE and collaborative practice are associated with statistically significant improvements in students' interprofessional behaviors related to communication and teamwork. Using an integrative review method, another study findings (Labrague, et al.,

Table 1. Themes from the IPE simulation immersive experiences

Emerged themes	Examples of qualitative data
1) *Feeling lost*	"I felt lost on what to do how to get his BP and HR down fast enough (in secondary nurse role)." "(Playing a role of physician) – did not know how to help without overstepping the nurses, they did look in control but not fast enough." "Really didn't know what to say in my role because I didn't want to go over my abilities as a UAP." "I honestly didn't know what to say as the social worker."
2) *Self-confidence*	"I felt more confident this time than any other previous sim labs." "Better now that I've had many practices." "I felt like this simulation was the most successful simulation. I felt like we worked well together."
3) *Better team communication*	"I was comfortable communicating with the interprofessional team." "Great communication between the team." "Communication between us went well, we gave each other space and room to talk." "It felt good with all helping each other and respecting one another."
4) *Stepping up the game with teamwork*	"The whole sim lab went well. I thought this group worked together well and we handled everything professionally." "Nurses and physicians worked well!" "We all jumped in right away, worked as a team, we were able to jump in together and help one another." "We worked well and felt heard with others." "We all worked great as a team, tried our best to help the patient and the patient's pain level decreased."

2018) revealed five essential themes: interprofessional communication, appreciation of interprofessional team roles, interprofessional teamwork or collaboration, self-confidence or self-efficacy, and positive attitudes or readiness toward interprofessional learning.

Similarly, in this study,two core IPE concepts of communication and teamwork emerged as themes. As they participated in more IP role-playing simulations,the students felt they were getting better at communicating with one another; and their abilities to work together as a team were enhanced. They also felt their self-confidence also increased as they participated in more IPE sessions.

However, in the beginning when the students started to use role-playing in the IP simulations, many students who were assigned roles weren't sure how to perform in their assigned roles. It is important to point out that because these students had failed at least one nursing course, many verbalized being fearful when participating in simulation activities and other class assignments related to this course. Since another course failure could result in being dismissed from the nursing program, they were apprehensive with having to take this particular nursing course, which was in remediation of their previous failure. This could have added to their "feeling lost." But perhaps this also speaks to the students being ill-prepared to take on their IP assigned roles; and just defining and explaining to the students about various roles prior to the sessions were probably not enough.

Harder, Ross and Paul (2013) also pointed this out in their findings and stated that to ensure students achieve maximum benefit from role-playing simulation, roles should be clearly identified and adequately explained at the outset of the simulation sessions. Further,in their study, they found there were inconsisten-

cies in the methods instructors used to assign roles to their students. Some students were assigned to specific roles but others were not at all assigned, which led to confusion among their students. Due to the uncertainty, they were often unsure about who was responsible for which aspects of patient care in the simulation sessions.

In this study, unlike the study findings by Harder, Ross and Paul (2013), the simulation coordinator was the one who assigned roles to the students and prepared scenarios for each simulation session for consistency. She also developed students' assigned roles based on the objectives of the simulation scenarios, which is recommended and supported by the International Nursing Association for Clinical Simulation and Learning (INACSL Board of Directors, 2011).

Limitations and recommendations

The limitation of this study relates to the study design of qualitative approach with a small sample size, which challenges generalizability, applicability, and transferability of the study findings. As Labrague (2018) pointed out, most of studies on IPE simulation in undergraduate nursing program were non-RCT research studies. In order to generate a higher level of evidence which can inform policy makers, hospital administrators, and nursing administrators, the utilization of RCTs as a form of research design for simulation studies would be essential. In addition to the RCT study design, it is also recommended to include larger sample size with more robust method and more reliable assessment to further examine the impact of interprofessional simulation experiences to adequately prepare nursing students for future collaborative practice.

Conclusion

Encouraging nursing students to step out of their student roles to appreciate the focus of interdisciplinary healthcare roles;and to understand teamwork and collaboration of the diverse disciplines involved in improving patient outcomes were the main focus of nursing student learning objectives for the IPE simulation activities. The role-playing strategy was incorporated in this study using a qualitative approach to explore perception of the students who participated in the IPE simulations. The resulting themes seemed to indicate that although the students felt lost and unsure about their assigned roles in the beginning, as the students had more practice incorporating IPE in simulation sessions, they felt their self-confidence, communication, and teamwork improved.

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Evaluating Undergraduate Nursing Students' Assessment Skills Using Simulation in a "Round Robin" Pedagogical Strategy

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Abstract:

Opportunities to practice basic assessment skills are needed to help students gain confidence and competence in their individual clinical performance. A training module was created using simulation to provide students with a three-prong approach to improve and evaluate assessment skills.

Methods

Two hundred and seven first semester nursing students participated in a "round robin" simulation session where they engaged in assessment activities as the nurse, patient, and evaluator. Assessment information in the nurse role was compared to students that attended the training in the early versus the late groups.

Results

Findings from students who attended simulation training early in the semester showed a significant difference $\chi 2$ (7, N=12) = 12.33, $p<0.028$ in physical assessment and patient education $\chi 2$ (1, N=2) = 2.00, $p<0.05$ total items when compared to the late group sessions.

Conclusion

Simulation training may allow instructors to develop modules that will improve assessment skills among student nurses and help fill proficiency gaps between education and practice.

Key Words: Assessment, Simulation, Skills training, Round-robin, Competency, Repeated practice

Introduction

Nurses play a pivotal role in caring for patients by identifying abnormalities or changes within the patient's condition while in a hospital or medical setting. They must understand the pathology of many diseases, actions of medications, be familiar with advances in technology, know their scope of practice, and practice therapeutic communication (ANA, 2018). Prudent nurses should stay abreast of the science of nursing while using the best evidence in nursing to guide practice. While these concepts are used to train future nurses, the broad nature of nursing practice increases anxiety among students and new graduate nurses (Wu et al., 2015; Bianchi et al., 2016). Hence, creating a proficiency gap in skill performance between education and practice that results in frustration for both new graduates and the hiring organizations (Bianchi et al., 2016). Novice nurses continue to feel unprepared during the transition to their professional role due to sensitivity issues in the workplace related to mentors and management (Hezaveh et al., 2014). Hezaveh and colleagues reported that some of these issues in the workplace were related to novice nurses feeling unprepared to perform basic nursing procedures, had problems communicating with patients or colleagues, and had some difficulties managing conflicts. Though differences in practice acquisition among new nurses continue to be debated world-wide, there is still no true consensus on the standards of competence between countries (Heaslip& Scammell, 2012; Yanhua& Watson, 2011). However, the new essentials from the American Association of Colleges of Nursing (AACN) propose to fill these gaps by providing guidelines to address and improve competencies taught in undergraduate and graduate programs (AACN, 2021).

Background

Despite the ambiguity surrounding assessment competencies, most nursing programs have incorporated a tool or method to assess basic skills (Bianchi et al., 2016). Subsequently, during the clinical phase in these programs, students must gain an enormous amount of knowledge in a short period of time creating additional physical and cognitive stressors. While the largest gains in assessment skills are seen in the first semester, students continue to feel unprepared to practice these skills after completing an arduous program (Wu et al., 2015). Students in this study implied that the Students Clinical Assessment Tool (SCAT) should reflect different levels of proficiency in clinical competence although the scale included the nursing standards. These students also stated that the checklist and preceptor's report were perceived as poor predictors of competence since these tools created great variability in assessing skills. Though the Amalgamated Student Assessment in Practice (ASAP) model can be used to identify specific areas of practice deficiencies, educators must also be prepared to implement targeted support for students in identified deficient areas (Zasadny& Bull, 2015).

Due to many unforeseen challenges on university campuses and advances in technology, nurse educators may struggle to move from traditional models of

teaching to strategies that sustain and enhance student engagement (Ghasemi et al., 2020). One important determinant of student success is their ability to engage in academic related learning activities. Ghasemi et al., (2020) suggested that most nursing schools have adopted a variety of teaching strategies that include the use of smart technologies, but there is no data that evaluate the effectiveness of an educational intervention on the academic engagement of nursing students.

However, simulation technology has been used for several decades in nursing programs to fill these systemic gaps between education and practice, and many researchers have shown significant improvements in skills using simulation (Oermann et al., 2016).

Simulation

Critical thinking, communication, and clinical judgment skills are some of the key components' simulation experts suggest that hands-on experience for adult learners will gain in a safe environment (Oermann et al., 2016). Strickland et al., (2017) also claim that the use of human patient simulation can support the development of clinical judgement skills among nursing students. While traditional methods of assessing skills in nursing schools are still common, new approaches in simulation training can also be valuable to identifying proficiency gaps (Arrogante, et al., 2021). These approaches may include open skills/simulation labs, virtual simulation on a computer- based format, or immersing the student into a virtual reality environment to assess critical thinking and decision-making skills. Texeira et al., (2014) reported that filmed assessment of skills in a group of nursing students showed similar results for students who were observed in real time or using a traditional method. Although there are challenges with various assessment tools and trainers, Oermann et al., (2016) suggest that simulation-based assessment could complement standardized tests to determine student's readiness for practice. While there are no hands-on components of the national certification examination (RN-NCLEX) for undergraduate students, scenario-based case studies may represent the future practice to prepare competent practitioners.

To improve our curriculum in the first semester, an assessment component was added to the required simulation course to provide students with a three-prong experience, and faculty with a tool to evaluate students 'assessment skills. Hence, the purpose of this study was to evaluate student's assessment skills (physical assessment, communication, and critical thinking) using a "round robin" strategy where students exchanged roles and performed a variety of basic nursing skills. Additionally, this study sought to answer the following research questions:

1. Can a "round robin" pedagogical approach using simulation improve student nurses' overall assessment skills?
2. Can assessment skills be evaluated using students and instructors in real-time?
3. Are there significant improvements in assessment skill performance for students in the nurse role between groups based upon the timing of their participation in simulation within the semester?

Method

Two hundred and seven students from first semester cohorts enrolled in both an accelerated or traditional option baccalaureate nursing program, participated in a two-and-a-half-hour "round robin" simulated session during a 14-week semester. In the first four-weeks of the semester, students attended simulation training and performed a variety of skills to become familiar with many basic nursing procedures and the simulated environment. Each week a group of nine students were regularly scheduled to attend a full day of simulation. Assessment skills were performed at the beginning of the simulation day using a round-robin approach, and students participated in three different roles. Students who attended simulation in the second four-week period were considered the early group, and students attending simulation in the last four weeks of the semester were placed in the late group. Three different exam rooms in an outpatient clinic setting were designed to run nine-students through three scenarios simultaneously. In these sessions, three different scenarios (asthma, post knee surgery and type II diabetes [Intake form Fig-1]) ran consecutively allowing the students to participate in three different roles (as the nurse, standardized patient, and evaluator) (Pic-1), with appropriate time allotted for each role. A checklist of various basic nursing skills was used to assess the student in the nurse role ability to complete simple tasks that matched their level of training (table 1). The checklist was divided into four different sections to assess the nurses' initial interaction with the patient, the performance of a head-to-toe physical assessment, communication skills related to medical knowledge and providing the patient with education about their medical problem (table 1). Every room was equipped with tools and instruments needed to complete the assessment. A timekeeper monitored the flow of each session and provided a start and stop time along with a two-minute warning prior to stopping each session. Ten minutes were given to each session to allow participants to change roles and become acquainted with their next assignment. All students were briefed before the start of the simulation and provided index cards with information related to their role as the patient. Student/peer evaluators were also given time to review the scoring tool before the encounter began.

Patient information was collected on an electronic intake form by the student in the nurse role. These students were expected to complete this form while the patient was still in their presence (Fig 1). The clinical instructor and one student completed the same electronic evaluation form to capture the completion of various skills during the nurse performance of the patient assessment (table 1).The student's performance in the nurse role was scored using a 0, 1, and 2 scale: (0 = tasks were not completed, 1 = partially completed and 2 = completed correctly), and the mean scores for all students were compared in each category between the early and late groups. These electronic forms used a checklist to capture the completion of each skill listed under four major sections/categories (initial assessment, physical assessment, nurse communication and patient education), (table 1). All students were debriefed at the end of the round-robin exercise to ascertain their perspective of the experience and to provide feedback related to their performance and the scenario. The briefing and debriefing sessions were led by experienced simulation nurse educators and faculty in a large debriefing room. The faculty members or clinical instructors that scored the student nurse performance were also part of the debriefing exercise and provided additional insight

Fig-1 Student form for patient information

Date: Today's date	Patient Name: Rebecca Johnstenson
Chief Complaint: Asthma	Time of Arrival: 15 minutes ago

Patient Intake Information:

This is an 18-year-old female college student with a history of asthma and frequent visits to the health clinic due to attacks induced by over exertion during physical activities (playing sports). She weighs 115lbs and 5'6" tall and lives in the university dorm. She is a freshman in the undergraduate physical therapy program and she's attending school on a swimming scholarship.

Please complete this portion of the form before the client leave this patient care area.

Name_____

Gender_____ Age_____ Race_____ Weight _____ Height _____

Religion_____

Major Support: _____ Support Phone: _____

Medical Diagnosis & pathophysiology _____

_____

Allergies: _____ Immunizations: _____

Primary Physician _____

Assessment:

V/S: B/P: _____ P: _____ RR: _____

Pedal pulses_____

Neuro: _____

Resp: _____ CV: _____ GI: _____ GU: _____

Skin _____

Last known Glucose _____

Pain level & location _____

Medications _____

Education/ teaching _____

NUR-304
Scenario #1Asthma

about the students' performance or the scenario if necessary.

Data collection and analysis

Electronic data collection forms with prefilled tabs were used to simulate a true electronic medical record along with areas that required free text to confirm that students could type the correct information regarding the patient's medical condition (Fig-1). The checklist (table 1) data forms were created in Qualtrics®, exported to an excel spreadsheet and imported into SPSS. The student's collected information was divided into two groups (early vs-late) and Chi-square analysis were used to compare these variables among the entire groups using SPSS-26 statistical software (IBM©) (International Business Machines [IBM] Corporation, 2019) with a significance level set at 0.05.

Results

The result of this study suggests that a "round robin" pedagogy approach using simulation can improve student nurses' overall assessment skills, and student assessment skills can be evaluated in real-time using an observational method. When the total scores for each section were combined, there were significant differences $\chi 2$ (7, N=12) = 12.33, p<0.028 in physical assessment and patient education $\chi 2$ (1, N=2) = 2.00, p<0.05 between the early and late groups (table 2). For the two hundred and seven students mean scores in the initial assessment section, only two of the nine items (pain and taking an apical pulse) showed significant differences between the early and late groups. Few students asked the patient about pain in the early group, while most students in the late group inquired about the patient's pain which was significantly different $\chi 2$ (1, N=207) = 2.88, p<0.0). Some students did not take an apical pulse in the early groups which were significantly $\chi 2$ (1, N=207) = 0.89, p<0.02 different than the students in the late groups (table 2). In the physical assessment section, more than half (60%) of the 12-items showed a significant difference between the two groups. More students in the late groups assessed the patient's level of awareness of self, place, time, and situation which were significantly χ 2 (1, N=207) = 2.25, P<0.04 different than the early groups (table 2). Many students in the early groups did not assess at least one cranial nerve and their scores were significantly χ 2 (1, N=207) =7.44, P<0.01 different than the late groups (table 2). Early group students also had difficulty or omitted the assessment of the patient's pupils resulting in significantly χ 2 (1, N=207) = 2.04, P<0.05 different scores than students in the late groups.

Although both groups of students performed a fair physical assessment, however, students in the early groups' scores for checking the patient's extremity strength were significantly different χ 2 (1, N=207) = 8.16, P<0.02. Identifying dehydration with a skin turgor test also showed significantly χ 2 (1, N=207) = 12.6, P<0.01 different scores between the two groups (table 2). Additionally, many students in the early groups failed to check the patient's capillary refill and scores differed significantly χ 2 (1, N=207) = 8.43, P<0.05 between the two groups. In the early groups, students admitted to feeling uncomfortable asking questions related to assessing the genitourinary system in their patients and the scores were significantly χ 2 (1, N=207) = 225, P<0.01 different between the groups (table 2). These students also stated that they felt awkward checking for pedal pulses on their healthy classmates and these scores were also significant between the groups χ 2 (1, N=207) =6.38, P<0.04. For all groups, students communicated well with the patients by explaining or clarifying any questions related to their medical condition, medications, and recommendations for follow up care, and there were no significant differences between the scores of the early and late groups. However, in the last assessment section, there were significant differences between the group scores for student nurses providing both verbal χ 2 (1, N=207) = 5.97, P<0.05 and written χ 2 (1, N=207) = 6.18, P<0.06 patient education (table 2). Overall, these results may imply that incorporating an additional simulation component to assess students basic nursing skills in the first semester improved performance in the late groups and provided faculty with an evaluation tool.

Discussion

A round-robin teaching strategy allowed students to participate in different roles which may have helped them identify areas for self-improvement. Because students performed physical assessments on their peers, this method could have reduced normal anxiety typically seen when caring for hospitalized patients resulting in better scores in the late groups. Arrogante et al., (2021) concur that using simulation among undergraduate nursing students can improve competency acquisition and be a practical tool in the learning process. Additionally, peer evaluations allowed students to observe others performing various basic nursing skills while reviewing their own performance of the same skills. Feedback from students during debriefing revealed that they were actively engaged as they reflected on their performance and the simulation experience. Ghasemi and colleagues (2020) suggest that students' success may depend upon their ability to be engaged in academic and clinical settings. Although studies have shown that students perform poorly through direct observation by instructors, however, participants in this study were more receptive to this process because they received immediate and positive feedback from their instructors.

While our study showed positive results using a round-robin pedagogical strategy for assessing first semester students' basic nursing skills, this process can be challenging to implement in nursing programs due to a lack of resources or time to perform such complex training (East et al., 2014). Faculty and students in nursing programs are faced with many competing factors such as demanding course work, clinical hours, study time and class preparation which make it difficult to focus on skill assessment or provide an environment for deliberate practice (Weaver & Jones, 2021). Students are guided through a maze of courses each semester and are expected to use the knowledge gained from previous courses to successfully progress to the next semester.

Using assessment checklists and peer evaluations as standard practice among nursing programs may prove to be difficult to implement due to faculty shortages and biases (Wu et al., 2016; East et al., 2014). Though specifically trained simulation nurse specialists were available to assist all faculty in simulation and skill training, this is not the norm throughout many nursing programs. These nurse specialists assist with the design, and implementation of simulation training in

all undergraduate programs. They also work solely for the simulation hospital and have dedicated time to support both faculty and students. Having designated nurses for simulation training is not standard practice, this methodology can be beneficial to provide students and faculty a safe place to practice skills and develop clinical training modules. Egilsdottir et al., (2019) suggest that revitalizing physical assessment training in undergraduate nursing education is needed to prepare students for a demanding work environment. Creating a good relationship between faculty members and clinical preceptors to align skills taught with current clinical practice are also beneficial and prepare students for practice (Egilsdottir, et al., 2019).

Additionally, using specifically trained simulation educators can provide more support to students that scored poorly in various assessment sections to improve in identified deficient areas. This method can also assist the onboarding process of new clinical instructors and standardize the training process for each course and across the curriculum. Although our study showed significant improvements between the early and late group's assessment skills, simulation alone may not have been the sole contributor to these changes. Because these students were taking additional courses throughout the semester along with a full clinical day in a hospital setting, these other variables could have also been major contributors to the student's overall improvement in assessment skills and confidence.

Table 1. A checklist for instructors and student evaluators to collect performance information on each listed assessment item

Section-1*(9-items)*	**Complete**	**Incomplete**	**Not performed**
Review intake form	O	O	O
Introduce self	O	O	O
Ask patient name	O	O	O
Reason for visit	O	O	O
Perform hand hygiene	O	O	O
Assess Pain	O	O	O
Vitals (B/P)	O	O	O
(HR)	O	O	O
(RR)	O	O	O
Section-2*(12-items)*	O	O	O
Check Pt orientation	O	O	O
Check 1-cranial nerve	O	O	O
Assess PERRLA	O	O	O
Auscultate pulmonary	O	O	O
Auscultate cardiac	O	O	O
Auscultate GI	O	O	O
Check equal strength	O	O	O
Check radial pulse	O	O	O
Assess skin turgor	O	O	O
Check capillary refill	O	O	O
Assess GU	O	O	O
Assess pedal pulse	O	O	O
Section-3(3-items)	O	O	O
ID medical diagnosis	O	O	O
ID Medication	O	O	O
Make recommendation	O	O	O
Section-4(2-items)	O	O	O
Verbal information	O	O	O
Written information	O	O	O

Limitations

Some limitations of this study were related to students being observed in real-time by their instructors and peers which could have increased anxiety and resulted in students forgetting to perform some basic skills that they would have performed under less stressful conditions. Students also had to be mindful of the patient in their presence while completing tasks such as charting which created an awkward silence at times. Although adequate time was given to change roles, some students were very hesitant to start the assessment due to anxiety related to performing items in order or completing all tasks. Some students reported having too much time to complete the basic tasks while others complained of too little time. In undergraduate programs, most training is focused on preparing nurses to work in hospital based or acute-care setting, and this study used a primary care setting which may not have aligned with the overarching goal of preparing students to work in an acute care setting.

Future Implications

Although the greatest demand for nurses is in a hospital setting, students in undergraduate programs should be exposed to other settings as well. While most primary care facilities are not large enough or equipped to have undergraduate nurses trained in their facility, a simulation environment may be a useful source to provide such an experience. If students can learn to hone their assessment skills in a non-threatening environment, then they may be poised to exert those skills appropriately when the time arise.

Table 2. Frequency analysis and Pearson's Chi-square test were performed to compare instructors' evaluations of individual items and total items for student performance in the nurse role between early and late groups using a significance level set at 0.05*.

			Initial assessment				
Section-1(9-item)	n	Early	Late	Value	df	Sig. 2 tailed	Exact Sig. 2 tailed
Review intake form	207	1.97/0.36	1.98/0.12	1.80	1	1.00	1.00
Introduce self	207	1.93/0.32	1.98/0.19	3.11	1	0.07	0.07
Ask patient name	207	1.97/0.21	1.98/0.27	3.69	1	0.50	0.50
Reason for visit	207	1.98/0.98	2.00/0.14	9.88	1	0.10	0.10
Perform hand hygiene	207	1.95/0.20	1.99/0.06	0.48	1	0.14	0.14
Assess Pain	207	1.54/0.83	1.99/0.06	2.88	1	0.01	0.01*
Vitals (B/P)	207	1.98/0.20	1.99/0.07	0.14	1	1.00	1.00
(HR)	207	1.95/0.20	1.99/0.06	0.89	1	0.02	0.02*
(RR	207	2.00/0.84	1.99/0.06	1.45	1	1.00	1.00
Total items	9	1.91/0.14	1.98/0.06	12.3	8	0.25	0.25
			Physical assessment				
Section-2 (12-item)	n	Early	Late	Value	df	Sig. 2 tailed	Exact Sig. 2 tailed
Orientation	207	1.74/0.64	1.99/0.07	2.25	1	0.05	0.04*
Cranial Nerve-1	207	1.00/0.94	1.99/0.09	7.44	1	0.013	0.013*
PERRLA	207	1.28/0.65	1.99/0.07	2.04	1	0.05	0.05*
Pulmonary	207	1.95/0.20	1.99/0.10	0.89	1	0.075	0.075
Cardiac	207	196/0.20	2.00/0.08	0.40	1	0.055	0.055
GI	207	1.96/0.20	2.00/0.06	0.46	1	0.045	0.085
Equal Strength	207	1.98/0.14	2.00/0.04	8.16	1	0.019	0.019*
Radial pulse	207	1.97/0.20	1.99/0.08	0.89	1	1.00	0.957
Turgor	207	1.95/0.06	2.00/0.06	12.6	1	0.005	0.005*
Capillary refill	207	1.96/0.24	2.00/0.20	8.43	1	0.045	0.045*
GU	207	1.94/0.86	1.99/0.68	12.4	1	0.005	0.005*
Pedal pulse	207	1.95/0.20	1.99/0.80	6.38	1	0.043	0.043*
Total items	12	1.80/0.32	1.99/0.05	9.25	7	0.028	0.028*
			Communication				
Section-3 (3-item)	n	Early	Late	Value	df	Sig. 2 tailed	Exact Sig. 2 tailed
Medical diagnosis	207	1.98/0.23	1.99/0.07	6.4	1	0.06	0.06
Medication	207	1.99/0.22	1.99/0.70	5.98	1	0.09	0.09
Recommendation	207	1.96/0.27	1.98/0.06	4.57	1	0.40	0.35
Total items	3	1.97/0.15	1.99/0.05	3.00	1	0.32	0.33
			Patient Education				
Section4 (2-item)	n			Value	df	Sig. 2 tailed	Exact Sig. 2 tailed
Verbal information	207	1.94/0.22	1.99/0.2	5.97	1	0.054	0.054*
Written information	207	1.95/0.21	2.00/0.80	6.18	1	0.048	0.048*
Total items	2	1.94/0.07	1.99/0.07	2.00	1	0.05	0.05*

Conclusion

To help students hone their assessment skills within the first semester is crucial and using a "round robin" simulation exercise could attenuate, or compliment required training courses in an undergraduate nursing program. While students learn in all aspects of their training, simulation experts agree that simulation is a valuable tool for healthcare education and can be used to determine clinical competencies. Furthermore, information from this study may help providers determine the effectiveness of simulation in assessing student nurses' assessment skills during the first semester using a similar instructional approach. Hence, simulation may be used to help fill proficiency gaps and improve student competencies for many basic nursing skills and provide faculty an evaluative tool.

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Encouraging Nursing Research and Initiatives on Climate Change and Health

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Introduction

Exposure to hazards brought by climate change has been found to impact health (IPCC, WHO in De Blois et al., 2015). Intense heat is associated with death from heat stroke. Failed local agriculture can contribute to malnutrition. Lack of safe water and food contributes to water and food-borne diseases. Storms, floods, droughts and wildfires contribute to injuries, drowning, and burns. Furthermore, forced migration may lead to undernutrition, infectious diseases and mental health problems. Though climate change is a global phenomenon, most of the studies have been conducted in high-income countries. Relatively fewer were from low-middle income countries which have greater vulnerability (Leyva et al., 2017; Sharpe & Davison, 2021). The purpose of this perspective paper is to examine the health impact of climate change and propose actions for further nursing research.

Examining the drivers of climate change gives insight to possible solutions as root causes are being identified. All these drivers contribute to greenhouse gas emissions, leading to global warming, and climate change. The Johns Hopkins Program on Sustainability identifies these drivers as population, energy, land, food, and water use (Schwartz and Parker, 2017). The world population gives insight on the magnitude of resources that are needed to sustain humanity's lifestyle. The needed energy (especially from fossil fuels) to produce these resources is known to emit greenhouse gases. Our food choices can also contribute to these emissions. Rice production and the cattle industry are known to produce global-warming gases from methane (USEPA,2020). The production and transportation of food from the farms to the households also require energy. As there are more people in the world today, the need for water also rises making it challenging for water-scarce areas. Land use, more specifically urbanization, has resulted in ecosystem degradation and species and biodiversity losses. These consumption patterns contribute to climate change, environmental changes (i.e. extreme weather events), and eventually health problems.

Climate change as a risk amplifier of existing public health issues

Globally, many countries are experiencing challenges brought by the aging population, increasing non communicable diseases, and the prevailing infectious diseases. The vulnerabilities to these global health issues have been known to include the social determinants of health, other health systems issues such as leadership and governance, health workforce, health information systems, essential medical products and technology, service delivery and financing (WHO, 2021). All these pre-existing issues are made more challenging in the presence of climate change. For example, the delivery of primary care services for hypertension would be more difficult than usual during a typhoon or a flood. During extreme weather events, availability and accessibility of health services may be hampered, especially in the absence of concrete preparedness and risk management plans. Other known vulnerable groups are further strained such as pregnant women, children, persons with disability and chronic illnesses, older persons and many others. Those who live in poverty may not have the adequate resources to prepare for an incoming disaster.

Potential research areas for nursing scholars

Numerous studies have substantiated the additional risk of climate change in increasing morbidity and mortality (Leyva et al, 2017; Rocque et al., 2021). However, nursing has an important role in examining factors that influence these adverse health outcomes. Human responses to climate stressors offer several points of interventions for nurses. Before clients get sick or die, one relevant concept is that of resilience. Resilience is hard to define, with some scholars suggesting that it may not even be possible to come up with a single definition. Some definitions in the literature indicate that it is a stress-coping ability. Others say that it is a process of resistance, recovery and rebound (Szanton & Gill, 2020). Resistance is demonstrated when there is no change in status after facing a challenge. Recovery involves a decline after facing a challenge and eventually returning to baseline. Rebound on the other hand, involves achieving a higher state after experiencing a challenge when compared to a baseline. Factors that contribute to resilience are found at various levels---from cellular, physiological, individual, family, community and society.

Despite the increase in climate change and health studies in the recent past, research agenda suggest its inclusion as an area of continuing research. Rocque and colleagues (2021) conducted an overview of systematic reviews on the health

impact of climate change. Their study echoed the results of previous studies that climate stressors influence the risk for adverse cardiovascular, respiratory, and infectious disease outcomes. They added that more research is needed to provide explanations on these relationships as well as potential solutions to address individual to system-level factors.

Examining the views of health professionals on climate change and health is another area of research. Across the globe, there has been many competing priorities in terms of public health issues. More recently, a significant proportion of effort has been directed to the COVID19 pandemic. Addressing climate change may not be the top priority of health professionals, or in some cases, the relationship between climate change and health remains unclear. Kotch and colleagues (2021) examined the views of health professionals on climate change and they found that despite the high levels of interest and commitment, time constraints is the most widely reported barrier to their involvement. Health workers may be faced with a number of competing priorities with patient care that climate change interventions are given the least priority. Future research might be needed to determine the feasible actions of nurses given the resources and potential barriers.

Boyland and colleagues (2021) suggested the integration of climate change into nursing curricula at all levels. The purpose of the curricular integration is to equip students with necessary competencies to address the drivers of climate change as well as its health impacts. Curricular integration would also involve reviewing the program and course outcomes to identify areas where climate action is relevant. Courses involving environmental health offers an excellent point for integration. Further research in this area can be conducted to determine competencies of students on climate action or their adoption of climate-friendly lifestyle. Qualitative improvement projects may explore a nursing school's impact on climate change (Yang et al., 2019).

Building community resilience remains to be a predominant narrative in the climate change discourse. Though there are many definitions of community resilience, a common theme is that it is the ability of communities to withstand adversities or challenges. Connerton and colleagues (2019) suggest increasing awareness, strengthening social connections and other community assets in mitigating mental health effects. Furthermore, green hospitals are another area of research. Green hospitals are those that are able to provide health services with the least amount of adverse environmental impact through efficient use of resources, reduced transportation cost , sustainable building design, and provision of health food (Dillon & Kaur, 2015.) More research is needed to identify ways to reduce the carbon footprint from the health sector.

Key action areas for researchers

The problem of climate change and health is multi-sectoral and multidisciplinary in nature. Initiating research on the topic would involve identifying the major players towards climate action. There are two areas of intervention, first is addressing the drivers, and the second one on the health impacts. Addressing the drivers of climate change requires research on efficient use of energy, water, land, and food resources. This would entail working with politicians, sustainability advocates, environmental experts, and the general public. Participatory action research provides an excellent opportunity to engage all major stakeholders in translating research findings into action and policy.

Addressing the health impacts of climate change requires research that promote personal and community resilience. In terms of heat stress, this will include the adoption of heat protective behaviors. The effectiveness of mitigation and adaptations strategies for typhoons and floods also require further evidence. Mixed methods studies would allow a better understanding of the experience with climate stressors and quantifying these for generalizability.

Research Priorities and Nursing Initiatives on Climate Change and Health in the Philippines

Majority of the researches mentioned earlier have been done outside the Philippines. These studies can be replicated or enhanced to capture the nuances of the local context. Getting insights from the National Unified Health Research Agenda of the Philippines, the priorities are aimed at promoting health resiliency. Researches are encouraged in terms of preventing accidents and injuries, which includes those that are amplified by climate change. Studies on the health impact of climate change and designing interventions to address these is also a priority. Furthermore, researchers on the environmental threats to health such as air pollution, coal mining, and the likes are also being encouraged. Another area which is commonplace among nurses is disaster risk reduction and management.

Efforts to engage nurses in the conversation about climate change and health have been initiated in the Philippines. In 2018 and 2020, two international conferences (Filipino Nurses Global Summit) have tackled the issue of planetary health. These conferences were jointly organized by the Philippine Nurses Association of America, Philippine Nurses Association, Association of Deans of the Philippine Colleges of Nursing, and the Commission on Filipino Overseas. As a result, a memorandum of agreement was signed by these organizations to show the commitment of Filipino nurses towards climate action. In 2021, the Philippine Nursing Research Society Inc. Annual Conference focused on encouraging research on this area of interest.

Conclusion

Climate change is known to be associated with adverse health outcomes. Nursing provides an important scientific lens in understanding the human response to climate stressors. Nurse researchers are encouraged to collaborate with other disciplines to work on plausible solutions towards climate action.

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Sleep, Dietary Intake, Physical Activity, and Resilience among Filipino Adults during the COVID-19 Pandemic

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Abstract

Introduction: Resilience is thought to mitigate adverse health outcomes brought by changes in sleep, diet and physical activity patterns of adults during the COVID19 pandemic. Studies have shown the relationship of resilience and healthy behaviors, but few have been conducted among Filipino adults within the context of a pandemic.

Purpose: This study aimed to examine the relationship of dietary intake, sleep, physical activity, and resilience among Filipino adults aged 18-59 years.

Methodology: A cross-sectional study was conducted using a convenience sample of 319 Filipino adults. Data gathered from an online survey were analyzed with descriptive statistics, Mann-Whitney, Kruskal-Wallis, and Spearman Correlation tests.

Findings: The respondents were mostly female, 18-31 years old, with income above the poverty line, poor sleep, insufficient fiber intake, high salt/fat diet, inactive and with resilience skewed to higher scores. The findings showed that better sleep, higher physical activity levels, and dietary fiber intake increases with resilience.

Conclusion: Practicing healthy behaviors are important considerations in building resilience during the pandemic.

Clinical Relevance: Strategies including strengthening health education and information dissemination; implementing policies and health promotion programs; and improving accessibility, affordability, and availability of resources, may influence practice of healthy behaviors that promote resilience.

Introduction

The coronavirus disease of 2019 (COVID-19) pandemic affected people worldwide and forced cities to conduct several lock-downs, build quarantine facilities and implement new policies to contain the spread of the virus. As of May 24, 2022, there were 3,689,132 confirmed cases of COVID-19 with 60,455 deaths in the Philippines (World Health Organization [WHO], 2020). Over the course of the pandemic, the government implemented quarantine restrictions in densely populated areas of the country such as the National Capital Region (NCR) and neighboring provinces (Center for Strategic & International studies, 2021). Quarantine or stay-at-home orders is often associated with interruptions of daily routines and free movement (Husain et al., 2020; Lopez-Moreno et al., 2020; Scarmozzino & Visioli, 2020). This led to various changes in lifestyle such as diet, sleep, and physical activity that may result to adverse health outcomes such as obesity, cardiometabolic diseases and mental health problems (Husain et al., 2020; Ruiz et al., 2021; Scarmozzino & Visioli, 2020). Vulnerable groups such as those with lower education, children, adolescents, and single people reported high levels of stress, anxiety and depression (Tee et al., 2020). This highlighted the importance of resilience in individuals as they may face many challenges during the pandemic.

Resilience, as defined by multiple studies, is a dynamic process influenced by a multitude of factors that determines an individual's ability to cope and bounce back from adversity (Ferreira et al., 2020; Krause, 2020; San Román-Mata et al., 2020). Performing physical activity, having quality sleep, and proper nutrition are some of the healthy behaviors that people need to achieve a healthy life. Physical activity is defined as any bodily movement by the skeletal muscles that necessitates energy consumption. It is a fundamental behavioral component of physical fitness which includes activities such as walking, wheeling, sports, and activities done in leisure time, ranging from moderate to vigorous intensity physical activity which improves an individual's overall health (WHO, n.d.). Studies suggest that individuals who performed moderate-level physical activity or vigorous physical activity had higher resilience and it served as a protective psychological factor for the person's well-being during the pandemic (Bottolfs et al., 2020; Dunston et. al., 2020).

Sleep is a fundamental physiological function needed to survive and to function well in performing daily activities. The quality of the environment and underlying factors determine the quality and quantity of a person's sleep. Moreover, having adequate sleep enhances biological processes such as energy expenditure and hormonal regulation, and

psychological processes such as attention and memory (Bottolfs et al., 2020). Lower quality of sleep results in decreased overall resilience (Arbinaga, 2018; Wang et al.,2020). A healthy diet is also associated with resilience. Several studies indicated that those with better quality of diet and/or adherence to dietary recommendations were more resilient compared to those who have an unhealthy or inadequate diet (Lutz et al., 2017). During the COVID-19 pandemic, more people had sedentary lifestyle and unhealthy diet which led to weight gain (Górnicka et al., 2020).

Studies have shown the relationship of resilience and healthy behaviors, but few have been conducted among Filipino adults within the context of a pandemic (Gornicka et al., 2020; Weaver et al., 2021). Hence, The purpose of this study is to examine the relationship of dietary intake, sleep, physical activity, and resilience among Filipinos aged 18-59 years as input to developing health promotion interventions. It specifically aims to describe the sociodemographic characteristics, lifestyle behaviors, specifically dietary intake, sleep, physical activity; and resilience of Filipino adults and examine their relationships.

Methods

This is a cross-sectional study involving a convenience sample of Filipino adults aged 18-59 years old, with internet access, and residing in the Philippines during the pandemic. Sample size was determined through the analysis of the effect sizes of correlational hypothesis using G* Power at 0.8 power and 0.05 level of significance. The computed sample size was 301 respondents. An online questionnaire was made readily accessible to the target respondents through the means of social media platforms.

Different standardized tools were used to collect data. The Pittsburgh Sleep Quality Index (PSQI) is a standardized tool measuring sleep quality within the previous month. The PSQI has a Cronbach's alpha of 0.83. It has 19 questions with a global score ranging from 0-21, with lower scores indicating better sleep quality and higher scores indicating poorer sleep quality. Those with a global score of 0-5 were categorized as good sleepers, while those with scores of 6-21 were categorized as bad sleepers. The International Physical Activity Questionnaire (IPAQ) - Short Form assesses physical activity done across a comprehensive set of domains based on one's last 7-day recall of physical activity. Participants will be categorized based on their level of physical activity into (1) inactive, (2) minimally active, and (3) health-enhancing physical activity (HEPA) active. IPAQ has a Cronbach's alpha of 0.8. The PhilPEN (Philippine Package of Non-communicable Disease Interventions) Screening Form adapted different guidelines from WHO to assess nutritional status divided into (1) dietary fiber intake, and (2) high fat and high salt consumption. The Connor-Davidson Resilience Scale (CD-RISC) is a self-rating standardized tool for measuring resilience with reference to the previous month. In this study, the CD-RISC-10, with 10 questions scored with the total of 0-40, was used. This tool has a Cronbach's alpha of 0.87. These were compiled into one survey questionnaire for participant's use. The questionnaire started with a section for consent.

Prior to data collection, the researchers obtained ethical clearance from the University of the Philippines Manila Research Ethics Board (UPM-REB) to ensure all ethical standards were met. After getting clearance, pretesting of the questionnaire and pilot study were performed and revisions were made accordingly.

Results

The number of females (n = 319, 66.8%) who joined the study was larger than the number of males (n = 319, 33.2%). Out of the 319 participants, 77.1% were aged 18 to 31 years old, 9.7% were 32 to 45 years old, and 13.2% were 46 to 59 years old. The family income of most participants (n = 319, 85.9%) was above the poverty line. Out of the 319 participants, 40.1% were from Luzon (excluding NCR), 30.7% were from NCR, 17.9% were from Mindanao, and 11.3% were from the Visayas region.

Based on the PSQI, 40.4% reported good sleep while 59.6% experienced bad sleep. The 34.2% of the participants with insufficient fruit and vegetable intake. This was almost the same with the 33.2% of participants with sufficient fruit and vegetable intake and 32.6% with either insufficient fruit or vegetable intake. Around 77.7% of participants have a high fat and salt diet. In terms of physical activity, inactive physical activity got the most number of the respondents among the categories with 43.9% of the respondents, while 31.3% were minimally active and 24.8% engaged in a health-enhancing activity. The 319 participants have a mean resilience score of 27 in the CD-Risc-10 tool, mean sleep score of 6 in the PSQI, and mean physical activity score of 3042.

Discussion

Our findings showed all three health behaviors (sleep, physical activity, and high dietary fiber intake) were consistently associated with better resilience; however, no significant difference was found between adults with either high or low salt and fat consumption.

Sleep played an important role in resilience, especially during crisis situations such as the COVID-19 pandemic. This study revealed that Filipino adults with better quality of sleep have higher CD-RISC scores which is congruent to most of the studies done on the relationship between sleep and resilience (Arbinaga, 2018; Grossman et al., 2021; Wang et al., 2020). The bi-directional relationship can be explained by sleep and resilience influencing the individual's brain functioning. Resilience and sleep shared similar neuronal brain pathways with the person's ability to adapt particularly in response to potent stressors and emotion processing (Cloonan et al., 2021). Thus, poor sleep negatively affects the ability of the brain to process emotions and recover from stressors.

Furthermore, the effects of the COVID-19 pandemic have resulted in significant behavioral changes due to different measures imposed by governments of different countries to prevent the spread of the virus. Some of these behavioral changes include alterations in the timing of daily activities such as daily wake time, daily light exposure, and mealtimes, which could have negatively impacted the body's sleep regulation and pattern (Cloonan et al., 2021). Factors that may have affected the sleep quality of individuals during the lockdown periods include the increased exposure to blue light on electronic screens before going to sleep (Kaur et al., 2020). Hence, the overall resilience of the individual is also affected. Disrupted sleep and insomnia can lead to depression, anxiety, and suicidal behaviors, which have been exacerbated by the COVID-19 pandemic (Murray et al., 2020; Simpson & Manber,

Table 1

Profile of respondents

Variables	Frequency	Percentage
Age Categories		
18 - 31	246	77.1
32 - 45	31	9.7
46 - 59	42	13.2
Sex		
Males	106	33.2
Females	213	66.8
Family Income		
Above	274	85.9
Below	45	14.1
Location		
Luzon (except NCR)	128	40.1
NCR	98	30.7
Visayas	36	11.3
Mindanao	57	17.9
Sleep		
Good	129	40.4
Bad	190	59.6
Dietary Fiber Intake		
Both insufficient	109	34.2
Either insufficient	104	32.6
Both sufficient	106	33.2
Salt Fat Consumption		
High	248	77.7
Low	71	22.3
Physical Activity		
Inactive	140	43.9
Minimally Active	100	31.3
HEPA Active	79	24.8
	Mean	SD
Resilience	27.13	6.75
Sleep	6.42	2.64
Physical Activity	3042.12	4358.38

n = 319

As shown in Table 2, there was a weak positive correlation between Filipino adults' sleep status and resilience (r = .214, p = .00) which indicated that Filipino adults with better sleep quality had higher resilience. The table also showed a positive correlation between Filipino adults' level of physical activity and resilience (r = .169, p = .002) This signified that Filipino adults with higher levels of physical activity have higher resilience.

Table 2

Correlation Between Sleep and Resilience, and Physical Activity and Resilience

Variable	Resilience
	r
Sleep	.214*
Physical Activity	.169*

*The spearman's rho value is at significant value with $p < 0.05$

Table 3 showed the comparison of resilience across different categories of physical activity, dietary fiber intake, and salt and fat intake. Results showed a significant difference in the resilience scores of the respondents across different levels of physical activity ($H = 12.320$, $p = 0.002$). Based on pairwise comparisons, a significant difference in resilience scores was found between those who are inactive and HEPA active ($p = .001$), and between those inactive and minimally active ($p = .017$). The table also showed the corresponding mean resilience scores for each category under dietary intake. Results showed that there was a significant difference in the resilience scores of the respondents across different categories of fruit and vegetable intake ($H = 6.145$, $p = .046$). Pairwise comparisons revealed a significant difference between the resilience scores of those with insufficient fruit and vegetable intake and sufficient fruit and vegetable intake ($p = .015$). Furthermore, it revealed that there was no significant difference in the resilience scores of the respondents between those with high and low salt and fat consumption ($U = 10012.00$, $p = .078$)

Table 3

Resilience Scores of Filipino Adults with Different Physical Activity Level and Dietary Intake

Variable	Resilience	
	N	Mean (SD)
Physical Activity		
Inactive	140	25.5643 (7.03)*
Minimally Active	100	27.9500 (6.16)*
HEPA Active	79	28.8734 (6.41)*
Dietary Intake		
Dietary Fiber		
Both sufficient	109	28.1509 (7.26)*
Both insufficient	104	27.4038 (6.20)
Either insufficient	106	25.8807 (6.60)*
Salt and Fat Intake		
High	248	26.7581 (6.84)
Low	71	28.4366 (6.28)

*The mean differences are at significant level with $p < 0.05$

2020). Other variables that were found to be associated with the sleep-resilience relationship include fear of COVID-19, loneliness, and safety (Arbinaga, 2018; de los Santos et al., 2021; Grossman et al., 2021; Krishnan et al., 2020).

This study was also consistent with other studies that have found associations between resilience and dietary fiber intake (Begdache et al., 2017; Lutz et al., 2016; Whatnall et al., 2019). People who have higher resilience were able to deliberate over their food choices thus selecting food options which contain more fruits and vegetables. Moreover, Glabska et al. (2020) performed a systematic review of 61 studies which explained the positive association of dietary fiber intake and resilience since a higher total intake of fruits and vegetables may influence higher levels of optimism and reduce psychological distress, which resulted in a better state of mental well-being.

However, results showed no difference in resilience with Filipino adults who have different salt and fat dietary intake. High-fat and high-salt food intake is linked with poor resilience as nutrients with more saturated fats and salt can have pro-inflammatory effects that can lead to impairment of proper functioning such as memory impairments, and poor resilience (Spencer et al., 2017).

Eating healthy foods during the pandemic proved to be difficult as either the physical access by people to the markets are limited, or the food supply is inadequate either in quantity, quality, or both (Ducusin, 2020; Husain et al., 2020; Scarmozzino & Visioli, 2020). The imposed enhanced community quarantine led to the restrictions of people from leaving their own homes, which led to the provision of goods by the government that are mostly processed and packed foods, or advanced stocking up on non-perishable and ready-to-eat foods. Other studies showed similar results where the participants had a lower frequency of fruit and vegetable intake over the course of the pandemic (Di Renzo et al., 2020; Husain, et al., 2020; Janssen et al., 2021; Scarmozzino & Visioli, 2020) despite it being important to support the body's immune system (Husain et al., 2020, Scarmozzino & Visioli, 2020).

Meanwhile, physical activity levels increase with resilience. This is aligned with the results of several studies where they found that physical activity levels have a positive and direct relationship with resilience scores (Carriedo et al., 2020; Dunston et al., 2019;; San Román-Mata et al., 2020). Among the recent studies on the relationship of physical activity and resilience found, only one study showed that physical activity, specifically moderate physical activity, was not associated with resilience (Dunston et al., 2020). This can be linked to the effect of physical activity in increasing dopamine levels and dopamine receptors in the brain that are responsible for feelings of joy causing higher resilience and fewer negative emotions (American Psychological Association, 2020; Zach et. al., 2021). This also causes opioid release in the brain and decreases brain activity that regulates pain, mood and affective states that leads to an addiction to exercise through repetition of physical activity causing a cycle to generate dopamine release (Saanijoki et al., 2018).

Dopamine release in the brain was found to increase a person's motivation to achieve a goal such as engagement in physical activity (Grogan et al., 2020). However, Kaur et al. (2020) found that the motivation to undergo physical activity for fitness was reduced due to unavailability of gyms, activity centers and other places for physical activity during the COVID-19 pandemic. Inverse association of physical activity levels with mood and anxiety levels, where lack of physical activity is associated with higher perceived anxiety levels and higher perceived worse mood may further decrease motivation for physical activity during the COVID-19 pandemic (López-Bueno et al., 2020). The pandemic also caused a great reduction in the physical activity levels of Filipinos and an increase in sitting time on the weekend due to quarantine protocols that restrict people's engagement in recreational activities outside their homes (Cruz et al., 2022; Husain et al., 2020). Nevertheless, a study by Albelwi et al. (2019) found that self-paced exercise is seen by many people as a consumable reward similar to food and money. People who exercise at home during the COVID-19 lockdown have an opportunity to do self-paced exercises which can generate rewarding feelings that increase their motivation to further engage in physical activity.

Resilience is a dynamic characteristic that influences a positive health-seeking attitude, that can be developed over time, and strengthened at multiple levels with aid from intentional individual strategies and support (Liu et al., 2017; Rink et al., 2021; San Román-Mata et al., 2020). To prevent potential long-term sleep, physical and mental health issues, and to build resilience, it is vital to address pandemic-related sleep disruptions and insomnia, inactive lifestyles, and poor dietary intake through appropriate and timely evidence-based interventions to improve psychological, physical, and emotional and overall resilience outcomes.

There might be particular ways people can engage and adopt in their lifestyle to promote better physical and mental health, and resilience (Maenhout et al., 2020; Rink et al., 2021). Alternatively, focusing on any of the four healthy behaviors investigated in this study, and optimally more than one, could also be a way to enhance one's resilience (Rink et al., 2021). Supporting the Health 2020 action of the World Health Organization (2020), these findings suggest the need to address these problems at a systemic level, and to advocate for affordable, accessible, and available options and services since strengthening resilience is linked with the development of supportive environments that influences people to healthily manage and take control of their own lives, despite the situation (Ong et al. 2020).

A few methodological limitations could have affected the generalizability and validity of the study. Although the desired sample size was based on related literature (sample size basis), the sample size and characteristics of participants may not be enough to generalize the whole population of the Philippines. There was also an unequal representation of participants based on their sociodemographic profile which may also affect the results of the study. Although the invitation was posted on social media websites to widen the reach and increase the variability of participants, the use of a convenience sampling method may have led to a selection bias. Other conditions not included like comorbidities may also be an important factor affecting the relationships.

Conclusion

Healthy behaviors were positively correlated with resilience as evidenced by the findings of this study and related literature. Practicing healthy behaviors

is an important consideration in building resilience during the pandemic.

Extensive implementations of health programs, education and policies allow improved accessibility, affordability, and availability of health resources that influence the health-decision making behaviors of Filipinos. Our findings suggest using a primary care perspective to establish practicing healthy behaviors with or without a crisis, and to prevent long-term deleterious effects on the health of Filipinos. Improving sleep quality, assuming active lifestyles, and incorporating a healthy diet are behaviors that are linked to improved quality of life, and better resilience outcomes. Moreover, it is also connected to slow degeneration effects of aging, and better health outcomes. Engaging in particular health behaviors and increasing the total number of behaviors practiced is an auspicious proposal for increasing an individual's resilience and current pandemic, well-being strategies to enhance resilience are important for further exploration.

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COLLEGE OF NURSING
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Relevance and Effectiveness of the UP College of Nursing Bachelor of Science in Nursing Competency and Value-Based Curriculum towards an Outcome-Based Curriculum

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ABSTRACT

Background: Competency-based education is the foundation of nursing institutions to produce nurses with a range of skills, knowledge, and attitude. Although successfully passing the licensure examination is a parameter to assess the effectiveness of competency-based curriculum, the ultimate measure is the appraisal of graduate nurses in the workplace.

Objective: To determine the perceived relevance and effectiveness, applicability, and degree of confidence of the UP College of Nursing (UPCN) Bachelor of Science in Nursing (BSN) competency and value-based curriculum in the workplace.

Methods: Utilizing a descriptive, cross-sectional design, 37 graduate nurses of the UPCN and are employed in the Philippine General Hospital (PGH) were recruited. Consenting respondents answered a three-part questionnaire assessing perceived relevance and effectiveness, applicability, and degree of confidence of the competencies integrated into the curriculum. Descriptive statistics summarized gathered data.

Results: The mean relevance and effectiveness item scores ranged from 4.34 (SD=2.45) to 4.88 (SD=0.88),indicating high perceived relevance and effectiveness of the competencies in the BSN curriculum. Similarly, the mean applicability item scores ranged from 4.72 (SD=1.65) to 4.22 (SD=3.03), denoting high perceived applicability of the competencies. The mean confidence item scores ranged from 2.76 (SD=1.82) to 2.14 (SD=2.43), denoting moderate to high levels of confidence in the competencies.

Conclusion: This study showed that the graduate nurses of the competency-based education BSN curriculum of the UPCN has high perceived relevance and effectiveness, high applicability, and moderate to high degree of confidence with the competencies taught in the curriculum

Keywords: Competency Evaluation; Competency-Based Curriculum; Effectiveness; Nursing Competencies; Relevance

INTRODUCTION

Nowadays, nursing education in the Philippines is highly influenced by the demand and supply of Registered Nurses locally and internationally (Lorenzo, Galvez-Tan, Icamina, & Javier, 2007). Preparing nurses, therefore, has been geared towards competent nurses who can address the demands of the local and global healthcare industries. Nonetheless, the quantity of nursing graduates produced by nursing schools does not guarantee the quality of graduate nurses who pass the nursing licensure examination. A graduate student's competencies are reflected in the results of the licensure examination hence, the adaptation of competency-based education (CBE).

Competency-based education is defined as an outcome-based approach to education that incorporates modes of instructional delivery and assessment efforts designed to evaluate mastery of learning by students through their demonstration of the knowledge, attitudes, values, skills, and behaviors required for the degree being sought (Gervais, 2016). Competency-based education is individualized thus, it varies according to the point of entry, learning method, and rate of completion among individual learners (Gervais, 2016). It is the foundation of every nursing institution to generate graduate nurses who possess a range of skills, knowledge, and attitude which will facilitate successful completion of tasks in the workplace (Fukada, 2018).

Competency assessment is outcome-oriented and directed towards assessing the terminal competencies set by the curriculum. The assessment techniques for developing competencies are congruent with the curriculum's framework and should address the skills, cognitive, and affective domains of learning. Redman (1999) also noted that competency-based education is equally effective in both didactic and self-learning approaches, making it applicable in both practice and educational settings.

Albeit the advantages of competency-based education, Frenk et al. (2010) noted that curricular insufficiency is among the identified challenges in the health sciences education, and this does not exclude the nursing education. Challenges in the competencies, teamwork, technical support, hospital care as primary healthcare, and leadership are also other challenges in the health sciences education. Curriculum and competency were also linked to this challenge (Frenk et al., 2010).

The competency-based curriculum of the University of the Philippines College of Nursing (UPCN)is highly effective in educating students,if the parameter of evaluation is the successful passing of

the nursing licensure examination. Since its foundation, the UPCN has always garnered a 100.00% passing rate in the nursing licensure examination administered by the Board of Nursing of the Professional Regulation Commission (PRC). Despite this, the ultimate measure to evaluate the effectiveness of the curriculum is the assessment of graduates in the workplace, a feat not yet conducted by the UPCN. Although the nursing school has several successful graduates who are leaders in the nursing field, a study assessing the usefulness of the competencies inculcated during the baccalaureate years has not yet been conducted. Hence, this study determined the perceived relevance and effectiveness, applicability, and degree of confidence of the UPCN Bachelor of Science in Nursing (BSN) competency and value-based curriculum in the workplace.

METHODS

Research Design

The study utilized a descriptive, cross-sectional research design grounded on Kirkpatrick's Four Levels of Learning Evaluation framework (1999)(Figure 1) to collect relevant data for assessing clinical competencies in the nursing curriculum. As illustrated, the third Level (behavior) of the evaluation framework was the evaluation of workplace application of the knowledge and skills acquired during the nurse's baccalaureate years. Meanwhile, Level 4 (results) was appraised to determine the significance of their baccalaureate training in their workplace. The first (reaction) and second (learning) levels were no longer evaluated since the respondents were already Registered Nurses hence, completing the terminal competencies of a beginning nurse.

Sample and Setting

The target population are all UPCN graduates from year 2008 to 2014 and are employed in the Philippine General Hospital (PGH) for at least 1 year. This study imposed no exclusion criteria to gather as rich data as possible. Total enumeration was conducted hence, all respondents who met the eligibility criteria were included (Polit & Beck, 2017).

This study was conducted in the Philippine General Hospital (PGH), a tertiary-level, state-owned hospital with 1,500 bed capacity. It is designated as the National University Hospital which caters to different medical, paramedical, diagnostic, pharmaceutical, and laboratory services.

Research Instruments

This study utilized a three-part questionnaire assessing the professional competencies of the respondents in three areas: perceived relevance and effectiveness, perceived applicability, andperceived degree of confidence. The questionnaire comprised 24 items derived from the terminal competencies expected from a senior nursing student which mirrored the expectations from a beginning nurse (UPCN, 2006). The portions assessing relevance and effectiveness and applicability were answered on a 5-point Likert scale, while the section for degree of confidence was completed using a 3-point Likert scale. As a scalar questionnaire, with higher values denote higher relevance and effectiveness, applicability, and confidence. For easier interpretation, scores were categorized. For relevance and effectiveness and applicability, scores are interpreted as low (scores between 1.00 and 1.79), moderately low (scores between 1.80 and 2.59), moderate (scores between 2.60 and 3.39), moderately high (scores between 3.40 and 4.19), and high (scores between

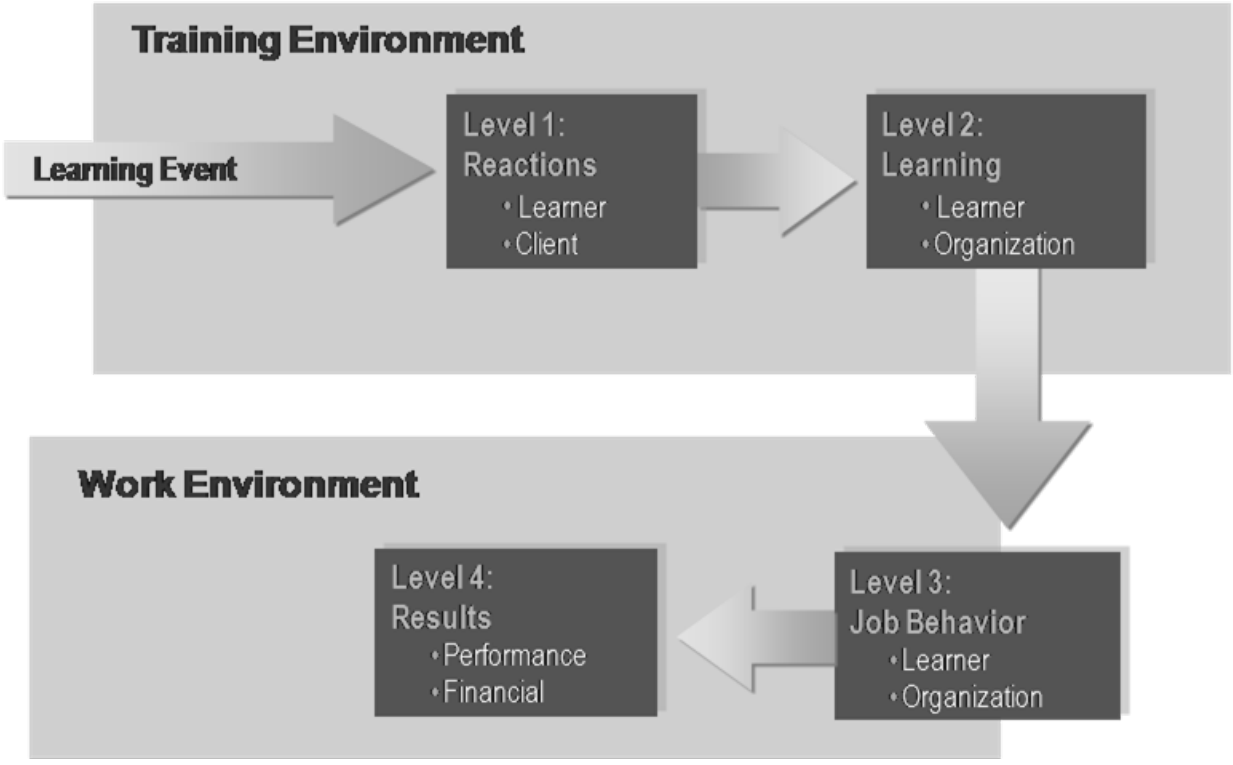

Figure 1. Kirkpatrick's Four Levels of Learning Evaluation Framework (1999)

Table 1.
Descriptive Statistics for the Items of Perceived Relevance and Effectiveness of the Competencies (n=37)

	Items	Mean	SD	Rank
1.	Assesses accurately with clients their total condition including resources.	4.76	1.58	4
2.	Identifies nursing diagnosis/ problems.	4.74	1.66	5
3.	Formulates a plan of care for the group of clients assigned.	4.83	1.21	2
4.	Implements plan of care utilizing appropriate and available interventions including discharge plan.	4.88	0.88	1
5.	Evaluates systematically and continuously the progress of the client's condition and outcomes of care.	4.72	1.72	6
6.	Applies bioethical principles, core values and standards of nursing care while rendering care to clients.	4.63	2.08	9
7.	Utilizes evidence-based interventions.	4.42	2.33	20
8.	Monitors recording and reporting of clients' progress through the Kardex, and other pertinent records.	4.72	1.64	7
9.	Updates the records using the prescribed forms daily.	4.48	2.22	15
10.	Utilizes management process in patient/unit management and personnel development.	4.49	2.17	14
11.	Maintains/monitors adequate personnel on duty, stock of drugs, supplies, as well as adequate functional equipment.	4.43	2.23	19
12.	Collaborates with other members of the health team in the planning/implementation of health-related activities.	4.69	1.69	8
13.	Demonstrates respect for team members and others through clear and effective communication skills.	4.83	1.21	3
14.	Interprets with clarity the nursing components of such interventions, programs/projects.	4.60	1.99	11
15.	Initiates bedside conferences, nursing rounds, health projects, research based on identified problems or health care issues.	4.62	1.98	10
16.	Recommends/implements strategies/approaches in the solution of health and/or administrative problems/conflicts.	4.47	2.31	16
17.	Demonstrates support of agency policies, goals and programs related to nursing.	4.47	2.18	17
18.	Supervises other nursing personnel, auxiliary workers/students when called for, in the provision of nursing services.	4.34	2.45	24
19.	Initiates/ invites/ participates/ conducts seminars, workshops, other educational programs including bioethical updates to enhance growth and professionalism.	4.42	2.09	21
20.	Evaluates nursing practices, techniques, trends through standards of care.	4.39	2.53	23
21.	Recommends the needed changes or modifications based on evaluation outcome.	4.51	2.16	13
22.	Evaluates own nursing performance based on standards, feedback, bioethical principles and core values.	4.53	2.26	12
23.	Continuously updates self through attendance in continuing education programs in nursing/related fields and/or formal graduate education programs.	4.40	2.31	22
24.	Initiates research activities related to nursing care and health.	4.46	2.33	18

[a]Interpretation:
1.00 – 1.79 = Low 1.80 – 2.59 = Moderately Low 2.60 – 3.39 = Moderate 3.40 – 4.19 = Moderately High 4.20 – 5.00 = High

4.20 and 5.00). On the other hand, scores in the degree of confidence questionnaire were categorized as low (scores between 1.00 and 1.66), moderate (scores between 1.67 and 2.34), and high (scores between 2.35 and 3.00). The questionnaire initially underwent face and content validation by a panel of content experts in nursing administration. .

Data Collection Procedure and Ethical Considerations

Ethical clearance from the UPM Research Ethics Board (UPM-REB) was initially sought. Institutional approval from the PGH was also secured. Afterwards, the researchers coordinated with the nursing service department of the PGH to acquire a list of employed nurses who graduated from the UPCN from 2008 to 2014. The survey questionnaire was converted to an online survey using SurveyMonkey platform. The survey link, which included the informed consent form and the survey questionnaire, was distributed to the identified respondents. The informed consent form provided full disclosure about the study's background before requesting respondents to proceed, should they agree to participate. Using their personal devices (e.g., laptops, computer, mobile devices), consenting respondents completed the online survey at their most convenient time, which took approximately 15 minutes to complete. All forms inquired no personal identification of the respondents; instead, code numbers were used. The risk of inconvenience was minimized by conducting the study at the most convenient time for the respondents. In contrast, the risk of breach in confidentiality was limited by instituting appropriate data de-identification, data safety and security, and data storage and disposal measures. There were no direct benefits to the respondents; however, the results may contribute to the enhancement of the competency-based curriculum towards outcome-based curriculum of the UPCN which may help improve competency development among nursing students as they transition to a beginning level nurse.

Data Analysis

Statistical analyses were performed using STATA Statistical Software, Version 13, College Station, TX: StataCorp LP. Descriptive statistics included mean and standard deviation to summarize and describe the perceived relevance and effectiveness, perceived applicability, and perceived degree of confidence of the competencies.

RESULTS

Perceived Relevance and Effectiveness

The descriptive statistics for the perceived relevance and effectiveness of the competencies are presented in Table 1. As presented, the mean item scores ranged from 4.34 (SD=2.45) to 4.88 (SD=0.88), denoting high perceived relevance and effectiveness of the competencies in the BSN curriculum in relation to the nursing work in the Philippine General Hospital. Among the different competencies, respondents reported that assessing patients ($\bar{x}$=4.76, SD=1.58), identifying nursing diagnosis or problems ($\bar{x}$=4.74, SD=1.66), and formulating ($\bar{x}$=4.83, SD=1.21) and implementing plan of care ($\bar{x}$=4.88, SD=0.88) while maintaining respect for team healthcare team through effective communication skills ($\bar{x}$=4.83, SD=1.21) were the most relevant and effective. Although it had a high mean score, supervising other nursing personnel and auxiliary workers or students in providing nursing care ($\bar{x}$=4.34, SD=2.45) ranked last.

Perceived Applicability

Table 2 illustrates the descriptive statistics for the perceived applicability of the competencies among the respondents. Perhaps the mean item scores ranged from 4.72 (SD=1.65) to 4.22 (SD=3.03), denoting high perceived applicability of the competencies. Results also indicated that the competencies with the highest mean applicability scores were assessing patients ($\bar{x}$=4.73, SD=1.65); implementing plan of care ($\bar{x}$=4.73, SD=1.63); evaluating nursing performance ($\bar{x}$=4.73, SD=2.73); initiating seminars, workshops, and other educational programs ($\bar{x}$=4.73, SD=2.47); and, monitoring and reporting patient's progress ($\bar{x}$=4.72, SD=1.64). Although these competencies had high mean scores, the lowest ranked competencies were applying bioethical principles ($\bar{x}$=4.22, SD=2.62) and initiating research activities ($\bar{x}$=4.22, SD=3.03).

Degree of Confidence

The descriptive statistics of perceived degree of confidence of the competencies is depicted in Table 3. The mean item scores ranged from 2.76 (SD=1.82) to 2.14 (SD=2.43), denoting moderate to high levels of confidence. Interestingly, results showed that the items with the highest mean degree of confidence scores were assessing patient conditions ($\bar{x}$=2.76, SD=1.82), collaborating with other healthcare team members ($\bar{x}$=2.71, SD=2.00), respecting other team healthcare team members ($\bar{x}$=2.68, SD=1.88), updating patient records ($\bar{x}$=2.64, SD=1.99), and interpreting clarity of nursing components ($\bar{x}$=2.64, SD=1.89). In contrary, respondents had moderate confidence in applying bioethical principles ($\bar{x}$=2.26, SD=2.11) and initiating research activities ($\bar{x}$=2.14, SD=2.43) and even ranked last among the competencies.

DISCUSSION

This study assessed and determined the perceived relevance and effectiveness, applicability, and degree of confidence of the UPCN Bachelor of Science in Nursing (BSN) competency and value-based curriculum in the workplace. Interestingly, across the three areas of assessment – perceived relevance and effectiveness, applicability, and degree of confidence – the competency indicators with the highest mean scores consistently focused on assessment, implementation, and evaluation of nursing care which are the most basic nursing skills. According to Salem, Aboshaiqah, Mubaraki, & Pandaan (2018), the core competencies in nursing are clustered into 7 domains: patient-centered care, professionalism, communication, leadership, safety, research, and teaching and learning. Consistent with the nursing process, results indicated that the graduate nurses had nurtured their patient-centered care competency through following a systematic guide of proper assessment, diagnosis of nursing problems, planning and implementation of appropriate intervention, and evaluation of patient response (Salem, Aboshaiqah, Mubaraki, & Pandaan, 2018; Toney-Butler & Thayer, 2019). These findings also followed those of Karami, Farokhzadian, & Foroughameri (2017) wherein nurses had good competencies in clinical care. The graduate nurses also gained sufficient confidence in clarifying the different components of nursing interventions to ensure safe and quality patient care (Oldland, Botti,

Table 2.
Descriptive Statistics for the Items of Perceived Applicability of the Competencies (n=37)

	Items	Mean	SD	Rank
1.	Assesses accurately with clients their total condition including resources.	4.73	1.65	1
2.	Identifies nursing diagnosis/ problems.	4.56	2.18	9
3.	Formulates a plan of care for the group of clients assigned.	4.60	2.02	7
4.	Implements plan of care utilizing appropriate and available interventions including discharge plan.	4.73	1.63	2
5.	Evaluates systematically and continuously the progress of the client's condition and outcomes of care.	4.48	2.39	14
6.	Applies bioethical principles, core values and standards of nursing care while rendering care to clients.	4.22	2.62	23
7.	Utilizes evidence-based interventions.	4.37	2.27	16
8.	Monitors recording and reporting of clients' progress through the Kardex, and other pertinent records.	4.72	1.64	5
9.	Updates the records using the prescribed forms daily.	4.55	2.14	11
10.	Utilizes management process in patient/unit management and personnel development.	4.28	2.36	21
11.	Maintains/monitors adequate personnel on duty, stock of drugs, supplies, and adequate functional equipment.	4.30	2.76	20
12.	Collaborates with other members of the health team in the planning/implementation of health-related activities.	4.49	2.38	13
13.	Demonstrates respect for team members and others through clear and effective communication skills.	4.64	1.93	6
14.	Interprets with clarity the nursing components of such interventions, programs/projects.	4.37	2.73	17
15.	Initiates bedside conferences, nursing rounds, health projects, research based on identified problems or health care issues.	4.36	2.50	18
16.	Recommends/implements strategies/approaches in the solution of health and/or administrative problems/conflicts.	4.50	2.30	12
17.	Demonstrates support of agency policies, goals and programs related to nursing.	4.28	2.35	22
18.	Supervises other nursing personnel, auxiliary workers/students when called for, in the provision of nursing services.	4.35	2.09	19
19.	Initiates/ invites/ participates/ conducts seminars, workshops, other educational programs including bioethical updates to enhance growth and professionalism.	4.73	2.47	3
20.	Evaluates nursing practices, techniques, trends through standards of care.	4.56	2.27	10
21.	Recommends the needed changes or modifications based on evaluation outcome.	4.60	2.51	8
22.	Evaluates own nursing performance based on standards, feedback, bioethical principles and core values.	4.73	2.73	4
23.	Continuously updates self through attendance in continuing education programs in nursing/related fields and/or formal graduate education programs.	4.48	2.17	15
24.	Initiates research activities related to nursing care and health.	4.22	3.03	24

[a]Interpretation:
1.00 – 1.79 = Low 1.80 – 2.59 = Moderately Low 2.60 – 3.39 = Moderate3.40 – 4.19 = Moderately High 4.20 – 5.00 = High

Hutchinson, & Redley, 2020). These results may be attributed to the ability of competency-based education to facilitate the achievement of necessary core competencies in nursing (Wu, Wang, Wu, & Guo, 2014) thus, these should be adopted in the development of an outcomes-based education curriculum if such educational system will be implemented.

On a separate note, another competency highlighted in the result are respect, effective collaboration, and efficient communication with healthcare team members. According to Matsutani et al. (2010) and Fukada (2018), one component of nursing competency is the ability to build supportive interpersonal relationships and engage in efficient communication. Salem, Aboshaiqah, Mubaraki, & Pandaan (2018) posited that professionalism, which encompasses respect and collaboration, and communication are two of the most important core competencies in nursing. The current results may be attributed to the competency-based and value-based education of the UPCN which is able to provide

Table 3.

Descriptive Statistics for the Items of Perceived Degree of Confidence of the Competencies (n=37)

	Items	Mean	SD	Rank
1.	Assesses accurately with clients their total condition including resources.	2.76	1.82	1
2.	Identifies nursing diagnosis/ problems.	2.55	2.07	8
3.	Formulates a plan of care for the group of clients assigned.	2.51	2.15	12
4.	Implements plan of care utilizing appropriate and available interventions including discharge plan.	2.59	2.08	6
5.	Evaluates systematically and continuously the progress of the client's condition and outcomes of care.	2.44	2.11	15
6.	Applies bioethical principles, core values and standards of nursing care while rendering care to clients.	2.26	2.11	23
7.	Utilizes evidence-based interventions.	2.37	2.02	18
8.	Monitors recording and reporting of clients' progress through the Kardex, and other pertinent records.	2.59	2.08	7
9.	Updates the records using the prescribed forms daily.	2.64	1.99	4
10.	Utilizes management process in patient/unit management and personnel development.	2.47	2.14	13
11.	Maintains/monitors adequate personnel on duty, stock of drugs, supplies, and adequate functional equipment.	2.39	2.15	17
12.	Collaborates with other members of the health team in the planning/implementation of health-related activities.	2.71	2.00	2
13.	Demonstrates respect for team members and others through clear and effective communication skills.	2.68	1.88	3
14.	Interprets with clarity the nursing components of such interventions, programs/projects.	2.64	1.89	5
15.	Initiates bedside conferences, nursing rounds, health projects, research based on identified problems or health care issues.	2.53	2.14	9
16.	Recommends/implements strategies/approaches in the solution of health and/or administrative problems/conflicts.	2.27	1.93	22
17.	Demonstrates support of agency policies, goals and programs related to nursing.	2.35	2.10	19
18.	Supervises other nursing personnel, auxiliary workers/students when called for, in the provision of nursing services.	2.32	2.02	21
19.	Initiates/ invites/ participates/ conducts seminars, workshops, other educational programs including bioethical updates to enhance growth and professionalism.	2.45	2.18	14
20.	Evaluates nursing practices, techniques, trends through standards of care.	2.40	2.21	16
21.	Recommends the needed changes or modifications based on evaluation outcome.	2.33	2.05	20
22.	Evaluates own nursing performance based on standards, feedback, bioethical principles, and core values.	2.52	2.11	11
23.	Continuously updates self through attendance in continuing education programs in nursing/related fields and/or formal graduate education programs.	2.53	2.14	10
24.	Initiates research activities related to nursing care and health.	2.14	2.43	24

[a]Interpretation:

1.00 – 1.66 = Low 1.67 – 2.34 = Moderate 2.35 – 3.00 = High

first-hand experience in providing direct patient care thus, allowing active collaboration with other healthcare team members and building the graduate student's rapport and communication skills. It is also worth emphasizing that respect to other healthcare professional is another important study result, indicating that the graduate nurses recognized and regarded the capacity and competency of their fellow healthcare professionals to provide the best quality patient care with shared-decision making (Salem, Aboshaiqah, Mubaraki, & Pandaan, 2018).

Another key result of this study was the high mean score for supervising other nursing personnel and auxiliary workers or students in providing nursing care. Although results indicated a high mean score, this competency ranked last among the indicators for perceived relevance and effectiveness, possibly denoting that the graduate nurses did not have sufficient exposure to such competency task. This result is important to highlight cognizant the usual workload of nurses in the Philippines, particularly in the Philippine General Hospital where the nurse-patient ratio commonly ranges from 1:10 to 1:20 nurse-patient (Tejero, 2010). Hence, graduate nurses were able to multitask their leadership roles and direct healthcare provider responsibilities despite the heavy and overwhelming workload.

Finally, results indicated that bioethics and research were two competency indicators which had the lowest mean applicability and confidence scores. These results are consistent with previous studies, showing low to adequate competency in the areas of bioethics and research (Bazrafcan, Nabeiei, Shokrpour, & Moadab, 2015). Sokhanvar et al. (1997) even noted that only 23.90% applied nursing ethics, and only 63% observed standard professional ethics (Bazrafcan et al., 2015). However, nursing practice is intertwined with moral dilemmas and complexities (Hoskins, Grady, & Ulrich, 2018), and observing utmost ethical and moral standards may be difficult for a beginning nurse cognizant of different factors like practice setting, culture, societal norms, and expectations. On the other hand, research in nursing is one of the most challenging core competencies for a beginning nurse (Konwar & Kalita, 2018) because of several personal perceptions and infrastructure limitations in various settings.

Albeit the presented results, this study has certain limitations. First, the study only included 37 respondents from a single institution who graduated from a similar school of nursing. Hence, the generalizability of results may be limited. Second, the study utilized a self-report questionnaire thus, over- and underestimation of results is possible.

CONCLUSION

This study showed that the graduate nurses of the competency-based education BSN curriculum of the UPCN has high perceived relevance and effectiveness, high applicability, and moderate to high degree of confidence with the competencies taught in the curriculum. With the competency-based education, graduate nurses inculcated high levels of relevance and effectiveness, applicability, and confidence with the nursing process, clinical care, and professionalism. However, the graduate nurses had moderate perceived applicability and confidence in utilizing bioethical principles and initiating research activities. These results pave way for the improvement of the curriculum towards the CHED-recommended outcomes-based education.

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Perceptions of BS Nursing Students on Online Learning During the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic prompted a shift from face to face classes to online learning. Though numerous studies have been conducted to describe these experiences, there has been limited literature on perceptions of nursing students in online learning especially in low-middle income countries. This study aimed to examine the perceptions of BS Nursing students in an institution in the Philippines on online learning. Utilizing a cross-sectional design, 159 respondents were asked to describe their perceptions on online learning through a 46-item survey questionnaire. High levels of self-efficacy were observed, however, management, ignoring distractions, and accessing library resources were areas of perceived low capability. A significant difference was found between the perceived self-efficacy of first year and third year nursing students, and none between males and females. No significant difference was also found between the perceived effectiveness of online learning among different year levels. A relationship was found between perceived self-efficacy and perceived effectiveness of online learning. As self-efficacy increases, perceived effectiveness also increases. There are still improvements that can be made in terms of the delivery of e-learning to reduce perceived barriers and various methods may be explored for the students to better manage themselves when acclimating to this mode of learning and help improve their self-efficacy.

Keywords:

Nursing Education, Philippines, Online Learning

Introduction

The emergence of the corona virus disease 2019 (COVID-19) pandemic led to indefinite suspension of face-to-face classes for schools all over the world, which required shifting to remote learning as one of the measures to control the spread of the virus. As the surge of COVID-19 cases continued, the Philippine government directed local government units (LGUs) to implement enhanced community quarantine (ECQ), which is a set of protocols and measures that prohibits outside travel and limits economic activity. As a result of the ECQ implementation, the Commission on Higher Education (CHED) encouraged higher education institutions (HEIs) to transition to flexible remote learning to avoid disrupting education in the Philippines.

In low-middle income countries (LMICs) such as the Philippines, issues may arise in terms of the learning management systems (LMS) used to deliver online classes. Though online learning is by no means a new mode of delivering education, pressure has been put upon educational institutions and learners to adapt to the sudden change in the delivery of courses. Among these institutions, there are degree programs that heavily rely on face-to-face learning, such as nursing. Alsoufi et al. (2020) stated that instructors should consider that medical courses must be delivered safely while ensuring the integrity and continuity of the medical education process are not jeopardized. As a result, adjustments were made, such as utilizing simulations for medical case scenarios or demonstrating medical skills with the aim to reflect real-life scenarios.

Though numerous studies have been conducted to describe these experiences, there has been limited literature on perceptions of nursing students in online learning, especially in low-middle income countries. This study aims to determine the perceptions of BS Nursing students towards online learning delivered during the COVID-19 pandemic in terms of its barriers, benefits, effectiveness, and the students' self-efficacy.

Method

A cross-sectional study design was used to investigate the variables of interest. The sample size was computed using the G*Power with the following

Table 1. Profile of Respondents (n=159)

	n	%
Year level		
First year	60	37.73
Second year	61	38.36
Third year	38	23.89
Sex		
Male	46	28.93
Female	113	71.07
Resources Given		
Study Guides	159	100
Lecture videos	159	100
Reading Materials	150	94.33
Technological resources available		
Smartphone	145	91.9
Tablet	64	40.25
Computer	149	93.17
Mode of Online Learning		
Synchronous & Asynchronous	155	97.48
Asynchronous	4	2.52

parameters: the type of test was an independent t-test; with a margin of error of 5%, an effect size of 0.8, and power at 0.8; on the other hand, for the one-way ANOVA f-test, it had a margin of error of 5%, power at 0.8, with an effect size of 0.25, and three comparison groups, referring to the three different year levels among students. The power analysis method used was a priori wherein the sample size was calculated before conducting the study and the study design itself. An a priori analysis was used to provide a method for controlling type I and II errors in proving the hypothesis for the t-test. This was done through a distribution-based approach that allows researchers to select the statistical test to be used through a drop-down menu in G*Power that calculates the sample size N (Kang, 2021). Effect size indicates the substantive significance or magnitude of difference between two significantly different means. The effect sizes of 0.8 (for comparing means), indicating a large effect, and 0.25 (for One-way ANOVA), indicating a medium effect, shows a large substantial significance or that there is a difference between two significantly different means (Sullivan & Feinn, 2012). A total of 159 out of the 216 students were selected: 60 out of the 81 first-year students; 61 out of the 83 second-year students; and 38 out of the 52 third-year students. The study was reviewed and approved by the Research Ethics Board at the University of the Philippines Manila.

Quota sampling technique was used to obtain the study respondents. The researchers recruited respondents by putting up a one-time poster on social media platforms, specifically Facebook, and through the assistance of year-level representatives in disseminating the questionnaire to their respective batches. The survey form included items adapted from questionnaires validated and utilized in previous studies related to online learning to elicit the perceptions of the students. The perceptions of the students in terms of their benefits, barriers, self-efficacy, and effectiveness of online learning were measured. The data on their perceptions were used to find associations among the variables. Data analysis on these associations was performed using ANOVA and independent t-test. Shapiro-Wilk test and Levene's test were also used to check for normality of the distribution and homogeneity of variances respectively.

Measures

Perceived Barriers

The research instrument was based on the questionnaire by Gaur et al. (2020) which assessed the attitudes of undergraduate nursing students in India. The questionnaire, with a Cronbach's alpha of 0.89 was validated through reviews by experts;. It utilized a five-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree, and is composed of 14 items.

Perceived Benefits

The research instrument was based on a questionnaire by Khan et al. (2020), which was utilized in their study to assess the benefits of online classes as perceived by college undergraduate students with Cronbach's alpha of 0.922. This questionnaire is composed of 10 items and was responded to on a five-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, (5) strongly agree.

Perceived Effectiveness

The research instrument was based on the questionnaire of Olum et al. (2020) with a Cronbach's alpha of 0.73. It was used to assess the attitudes of undergraduate students towards the effectiveness of online classes. A five-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree was also utilized for this measure.

Table 2. Perceived Barriers Encountered During Online Classes (n=159)

Statements	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
There is a lack of motivation for online classes	0	8 (5.03)	18 (11.32)	76 (47.80)	57 (35.85)
There is a lack of proper student evaluation in online classes	2 (1.26)	18 (11.32)	33 (20.75)	61 (38.36)	45 (28.30)
Online classes create anxiety and stress due to less technical assistance	0	7 (4.40)	21 (13.21)	71 (44.65)	60 (37.74)
There is a lack of student-teacher interaction in online classes	1 (0.63)	15 (9.43)	25 (15.72)	70 (44.03)	48 (30.19)
There is less time to learn in online classes	2 (1.26)	16 (10.06)	30 (18.87)	53 (33.33)	58 (36.48)
Online classes are very costly in terms of internet charge	2 (1.26)	6 (3.77)	30 (18.87)	64 (40.25)	57 (35.85)
There is a lack of privacy when taking online classes at home	4 (2.52)	16 (10.06)	21 (13.21)	56 (35.22)	62 (38.99)
Advanced technical knowledge in the use of computers are required for online classes	6 (3.77)	32 (20.13)	36 (22.64)	62 (38.99)	23 (14.47)
Access to strong internet connection is required to take online classes	0	0	3 (1.89)	51 (32.08)	105 (66.04)
There is a lack of discussion among students during online classes	2 (1.26)	23 (14.47)	17 (10.69)	64 (40.25)	53 (33.33)
Online classes usually lead to more physical problems such as fatigue, eye pain, and headaches	0	1 (0.63)	9 (5.66)	52 (32.70)	97 (61.01)
There is a lack of control over groups when taking online classes	2 (1.26)	15 (9.43)	18 (11.32)	63 (39.62)	61 (38.36)
There is a need for complete set up such as computer or other gadgets and electricity for online classes	0	2 (1.26)	11 (6.92)	76 (47.80)	70 (44.03)
There are more interruptions when taking online classes	0	5 (3.14)	11 (6.92)	61 (38.36)	82 (51.57)

Perceived Self-Efficacy

The Online Learning Self-Efficacy Scale (OLSES) by Zimmerman & Kulikowich (2016) was used for self-efficacy among the students. It consists of a total of 22 items and 3 subscales which include time management, technology use, and learning in the online environment. These subscales were made to include the multifaceted aspect of online learning self-efficacy, which was discussed in the aforementioned literature above. The Chronbach's alpha of the three subscales ranged from 0.843 to 0.890, specifically 0.890 for the 10-item learning subscale, 0.855 for the 5-item time subscale, and 0.843 for the 7-item technology subscale.

Data Analysis

IBM SPSS (Statistical Package for the Social Sciences) Version 27 was used for all the statistical tests employed in the study. Data were summarized using descriptive analysis, and a comparison of groups was performed using ANOVA and independent t-test. The Shapiro-Wilk test was used to check for normality and Levene's test for equality of variance. Statistical significance was set at a P value less than 0.05.

Results

A total of 159 (n=159) responses were obtained. The 159 responses represented 73.60% out of the two hundred sixteen nursing students of the institution of the Academic Year 2020-2021: 38 are third year students, 61 second year students, and 60 are first year students. Among the responses gathered, 71.07% (n=113) out of the 159 respondents were female and the remaining 28.93% (n=46) were male. Ages of the respondents ranged from 18 to 24 years old, with a mean age of 20.42 (±1.06).

In terms of resources given, technological resources available, and the mode of learning experienced, results show that 159 (100%) were given both study guides and lecture videos, while 150 (94.33%) were provided with reading materials.

Table 3. Perceived Benefits of E-Learning(n=19)

Statements	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Online classes are flexible in time and space	6 (3.77)	21 (13.21)	30 (18.87)	81 (50.94)	21 (13.21)
There is an ease and quick share of educational material	2 (1.26)	12 (7.55)	33 (20.75)	71 (44.65)	41 (25.79)
There is an improved collaboration and interactivity among students	22 (13.84)	61 (38.36)	50 (31.45)	21 (13.21)	5 (3.14)
Online classes allow access to higher education for all applicants	33 (20.75)	51 (32.08)	43 (27.04)	27 (16.98)	5 (3.14)
There is a possibility of working (e.g. part-time job) with e-learning	14 (8.81)	26 (16.35)	49 (30.82)	59 (37.11)	11 (6.92)
Online learning accommodates different types of learning styles	25 (15.72)	54 (33.96)	34 (21.38)	39 (24.53)	7 (4.40)
There is a quick feedback system	46 (28.93)	67 (42.14)	29 (18.24)	15 (9.43)	2 (1.26)
Online classes allow for wide and diverse interactions	21 (13.21)	55 (34.59)	40 (25.16)	42 (26.42)	1 (0.63)
Online classes allow easier and more effective access to study resources	10 (6.29)	19 (11.95)	35 (22.01)	74 (46.54)	21 (13.21)
Online classes allow for the use of updated learning material	3 (1.89)	14 (8.81)	31 (19.50)	87 (54.72)	24 (15.09)

As for the most common technological resources available, 145 (91.19%) used smartphones, 64 (40.25%) had tablets, while 149 (93.71%) owned computers. This would make smartphones and computers the most common technological resources available for the majority of the nursing students. Furthermore, 155 (97.48%) answered that the main mode of learning they experienced during the academic year was a mix of synchronous and asynchronous, while only 4 (2.52%) stated that their main mode of learning was asynchronous .

Table 2 shows the perceived barriers encountered during online classes, which range from 1 (Strongly Disagree) to 5 (Strongly Agree). Among the 14 statements, 66.04% (n=105) strongly agree that online classes require strong internet connection; 61.01 % (n=97) strongly agree that online classes often cause physical problems including fatigue, eye pain, and headaches; and 47.80% (n=76) agree that complete set of computer or gadgets and electricity are necessary in online classes. There were 51.57% (n=82) who strongly agree that there are more interruptions when taking online classes, 47.80% (n=80) agree that there is a lack of motivation for online classes, 47.80 (n=76) agree that online classes create anxiety and stress due to less technical assistance, and 39.62% (n=63) agree that there is a lack of control over groups when taking online classes. When it comes to cost, 40.25% (n=64) agree that online classes are very costly in terms of internet charge, 44.03% (n=70) agree that there is a lack of student-teacher interaction in online classes and 38.99% strongly agree that there is a lack of privacy when taking online classes. 40.25% (n=64) strongly agree that there is a lack of discussion among students during online classes, 36.48% (n=58) strongly agree that there is less time to learn in online classes.

Table 3 shows the results for benefits of online learning, wherein the students' answers ranged from 1 (Strongly Disagree) to 5 (Strongly Agree) where 44.65% (n=71) agree that it is an easy and quick way to share educational material. Also, 54.72% (n=87) agree that online classes allow for the use of updated learning materials, and 50.94% (n=81) agree having flexibility in time and space. There were 46.54% (n=74) who agreed that online classes did allow easier and more effective access to study resources, while 37.11% (n=59) perceive the possibility of working a part-time job as a benefit during online learning.

Conversely, 42.14% (n=67) disagree that there is a quick feedback system and 32.08% (n=51) disagree that online classes allow access to higher education for all applicants , and 38.36% (n=61) disagree that there is an improved collaboration and interactivity among their classmates. Lastly, 33.96% (n=54) disagree that online learning is accommodating to different types of learning styles, while 34.59% (n=55) disagree that online classes allow for wide and diverse interactions among students and teachers.

The results for perceived effectiveness of online learning are presented in Table 4. The statements regarding schedule flexibility and ease of use both had mostly positive responses with 38.99% (n=62) agree. On the contrary, the remaining two statements regarding increase in quality of knowledge attained and efficiency of online learning as a teaching method had most responses

Table 4. Perceived Effectiveness of Online Classes (n=159)

Statements	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
E-learning ensures schedule flexibility	11 (6.92)	33 (20.75)	45 (28.30)	62 (38.99)	8 (5.03)
E-learning is easy to use	15 (9.43)	39 (24.53)	44 (27.7)	54 (33.96)	7 (4.40)
E-learning increases quality of knowledge attained	40 (25.16)	64 (40.25)	42 (26.42)	13 (8.18)	0 (0%)
E-learning is efficient as a teaching method	28 (17.61)	46 (28.93)	61 (38.36)	21 (13.21)	3 (1.89)

ranging from Strongly Disagree to Neutral. From this, 25.61% (n=40) respondents strongly disagreed and 40.25% (n=64) disagreed that online learning is not effective in enhancing the quality of knowledge being achieved by the students. Overall, the results indicated a mixed perception by the respondents on their attitude towards effectiveness of online classes.

Perceived self-efficacy is shown in Table 5. In terms of being able to navigate online course materials efficiently, 21.38% (n=34) strongly agreed and 40.25% (n=64) respondents agreed. 34.59% (n=55) strongly agreed that they find the course syllabus online, while 41.51% (n=66) agreed to this statement. Following this, 18.24% (n=29) strongly agreed and 36.48% (n=58) agreed that they are able to communicate effectively with their instructors via e-mail. Out of those who claimed that they can submit assignments to an online drop box, 40.88% (n=65) agreed and 39.82% (n=63) strongly agreed while the rest answered slightly disagree to disagree. 20.13% (n=32) agreed that they are able to overcome technical difficulties on their own while 37.74% (n=60) agreed. A greater percentage of the respondents with 34.59% (n=55) agree and 21.38% (n=34) strongly agree that they can navigate grade books. With regards to completing their assignments on time, 10.06% (n=16) strongly agreed and 25.79% (n=41) agreed that they could do this. 14.47% (n=23) strongly agree that they can learn to use a new type of technology efficiently, while 41.57% (n=66) agree that they could do so as well. 24.53% (n=39) agree that they are able to learn without being in the same room as the instructor. On the other hand, 11.32% (n=18) strongly agree and 23.27% (=37) agree that they are also able to learn without being in the same room as other students. Most of the respondents, 27.04% (n=43) strongly agree and 36.48% (n=58) agree that they search the internet to find the answer to a course-related question. This was followed by 27.04% (n=43) strongly agree and 33.96% (n=54) agree that they search course materials online. 25.16% (n=40) strongly agree and 37.11% (n=59) agree that they are able to communicate using asynchronous platforms (discussion board, email, etc.). 8.18% (n=13) strongly agree and 28.30% (n=45) agree that they are able to meet deadlines with minimal reminders. 23.27% (n=37) strongly agree and 36.48% (n=58) agree that they are able to complete group projects entirely online. About 27.67% (n=44) strongly agree and 37.11% (n=59) agree that they use synchronous platforms to communicate with others. 21.38% (n=34) strongly disagreed and 25.16% (n=40) disagreed that they are able to focus on schoolwork when faced with distractions. 6.92% (n=11) strongly agree and 23.90% (n=38) agree that they develop and follow a plan for completing requirements on time. Meanwhile, 15.72 % (n=25) strongly disagree and 21.38% (n=34) disagree that they are not able to use the library's online resources efficiently. Lastly, 9.43% (n=15) strongly agree and 33.96% (n=54) respondents agree that when a problem arises, they promptly ask questions in the appropriate forum (email, discussion board, etc.).

In terms of the significant difference in perceived self-efficacy in online learning among different year levels (Table 5), the mean scores obtained from the self-efficacy test was 4.02 for the 1st years, 4.23 for the 2nd years, and 4.48 for the 3rd years, showing generally high results. Using ANOVA testing, a p-value of 0.01 was obtained. As the p-value was less than 0.05, this implies that there is a significant difference between the perceived self-efficacy among the three year levels. This value suggests that the null hypothesis stating there is no significant difference in the perceived self-efficacy among the BS Nursing students of different year levels be rejected. The Shapiro-Wilk test was done to check the normalcy of the data distribution and it resulted in a p-value of 0.32 which indicates that the means were normally distributed. A Bonferroni post-hoc test was done to show the differences of the mean value between each group. The post-hoc test results showed that among the three groups tested, the most significant difference was observed between first and third years with a significant difference of 0.01; this is followed by the less significant difference between first and second years with a value of 0.28; and lastly, the least significant difference observed between the second and third years at a value of 0.42.

On the other hand, Table 6 shows the difference in perceived effectiveness among the three year levels, the ANOVA test was used to determine the differences among the group means of the 1st year, 2nd year, and 3rd year students' responses to their perceived effectiveness of online learning. A p-value of 0.07 was obtained, which indicates that there is no statistically significant difference among the means of the groups. Though the overall F-value of the ANOVA was greater than 1 at 2.26, this may only indicate that the variance between-groups is 2.26 times the size of the within-group variance. The results of the one-way ANOVA revealed that there was no statistically significant difference in the

Table 5. Online Learning Self-Efficacy Survey Scale Results (n=159)

Statements	Strongly Disagree n (%)	Disagree n (%)	Slightly Disagree n (%)	Slightly Agree n (%)	Agree n (%)	Strongly Agree n (%)
Navigate online course materials efficiently	3 (1.89)	3 (1.89)	11 (6.92)	44 (27.7)	64 (40.25)	34 (21.38)
Find the course syllabus online	1 (0.63)	3 (1.89)	5 (3.14)	29 (18.24)	66 (41.51)	55 (34.59)
Communicate effectively with my instructor via e-mail	4 (2.52)	9 (5.66)	15 (9.43)	44 (27.67)	58 (36.48)	29 (18.24)
Communicate effectively with technical support via email, telephone, or live online chat	7 (4.40)	13 (8.18)	22 (13.84)	48 (30.19)	47 (29.56)	22 (13.84)
Submit assignments to an online drop box	0	2 (1.26)	4 (2.52)	25 (15.72)	65 (40.88)	63 (39.62)
Overcome technical difficulties on my own	1 (0.63)	6 (3.77)	14 (8.81)	46 (28.93)	60 (37.74)	32 (20.13)
Navigate the online grade book	3 (1.89)	7 (4.40)	17 (10.69)	43 (27.04)	55 (34.59)	34 (21.38)
Complete all assignments on time	16 (10.06)	19 (11.95)	27 (16.98)	40 (25.16)	41 (25.79)	16 (10.06)
Learn to use a new type of technology efficiently	2 (1.26)	5 (3.14)	15 (9.43)	48 (30.19)	66 (41.51)	23 (14.47)
Manage time effectively	20 (12.58)	47 (29.56)	25 (15.72)	42 (26.42)	18 (11.32)	7 (4.40)
Learn without being in the same room as the instructor	8 (5.03)	25 (15.72)	23 (14.47)	48 (30.19)	39 (24.53)	16 (10.06)
Learn without being in the same room as other students	14 (8.81)	19 (11.95)	22 (13.84)	49 (30.82)	37 (23.27)	18 (11.32)
Search the Internet to find the answer to a course-related question	3 (1.89)	3 (1.89)	16 (10.06)	36 (22.64)	58 (36.48)	43 (27.04)
Search the online course materials	0	4 (2.52)	11 (6.92)	47 (29.56)	54 (33.96)	43 (27.04)
Communicate using asynchronous technologies (discussion board, email, etc.)	2 (1.26)	3 (1.89)	12 (7.55)	43 (27.04)	59 (37.11)	40 (25.16)
Meet deadlines with very few reminders	10 (6.29)	25 (15.72)	26 (16.35)	40 (25.16)	45 (28.30)	13 (8.18)
Complete group project entirely online	2 (1.26)	5 (3.14)	12 (7.55)	45 (28.30)	58 (36.48)	37 (23.27)
Use synchronous technology to communicate with others	2 (1.26)	2 (1.26)	15 (9.43)	37 (23.27)	59 (37.11)	44 (27.67)
Focus on schoolwork when faced with distractions	34 (21.38)	40 (25.16)	26 (16.35)	34 (21.38)	22 (13.84)	3 (1.89)
Develop and follow a plan for completing all required work on time	17 (10.69)	20 (12.58)	29 (18.24)	44 (27.67)	38 (23.90)	11 (6.92)
Use the library's online resources efficiently	25 (15.72)	34 (21.38)	26 (16.35)	46 (28.93)	20 (12.58)	8 (5.03)
When a problem arises, promptly ask questions in the appropriate forum (email, discussion board, etc.)	3 (1.89)	14 (8.81)	19 (11.95)	54 (33.96)	54 (33.96)	15 (9.43)

Table 6. Mean difference in the perceived self-efficacy in online learning between groups

Between Groups	n	M	SD
First Year	60	4.02	0.14
Second Year	61	4.23	0.16
Third Year	38	4.48	0.16

perceived effectiveness among the three year levels (p value= 0.108). A post-hoc multiple comparisons between groups was not needed as there was no statistical significance in the overall p-value.

For determining the difference in perceived self-efficacy between male and female BS Nursing students, based on the statistical analysis using Independent T-test, a p value of 0.54 was obtained. For Levene's test for equality of variances, an F value of 0.05 was obtained. As the p-value is more than 0.05, therefore, there is no significant difference between the self-efficacy in online learning among male and female BS Nursing students

Lastly, the relationship between perceived self-efficacy in online learning and perceived effectiveness of online learning was tested using Pearson correlation. Using 0.05 as the level of significance, the Pearson correlation coefficient (r) obtained was 0.44. Meanwhile, the p-value obtained was $p < 0.001$. There is a positive moderate relationship between self-efficacy in online learning and perceived effectiveness of online learning. As self-efficacy increases, perceived effectiveness also increases.

Discussion

Perceived barriers to online learning

A common barrier perceived by students was slow and unreliable internet speed and connection as shown in a study among medical students engaging in online education in the Philippines by Baticulon et al (2021). The present study also found similar findings in terms of students having the lack of motivation in taking online classes which may possibly be due to the effects of being at home and lacking social interactions during the pandemic (Rotas & Cahapay, 2020). Interruptions may be due to factors such as their environment and individual responsibilities at home (Nazir & Khan, 2021). Limitation in resources such as electricity also causes interruptions in the students' online learning experience since virtual learning setup heavily relies on this energy source to work, which supports the perceived barrier of the students that online learning requires a complete set up such as a computer or other gadgets and electricity (Tadesse & Muluye, 2020). However, contradictory results were reported in Baticulon et al (2021) where limited resources was considered to be a hindrance for e-learning; this was not perceived to be one of the significant barriers for medical students in the Philippines. With this in mind, it is important to consider the student's socioeconomic status and geographical location (i.e. living in a rural vs. urban area) and its influence on their access to online learning because it affects accessibility to technology and the internet.

The results also showed that online classes often cause physical health problems including fatigue, eye pain, and headaches which is congruent to the findings of another study where eye strain and headache from prolonged use of gadgets were some of the physical health concerns when discussing individual barriers to medical students' e-learning in the Philippines (Baticulon et al., 2021). Therefore, managing and preventing such problems because the resulting physical health problems that come with online learning may negatively impact the capacity of students to perform well in an online setting.

A significant number of students reported having a lack of motivation in online learning as a barrier. This may have stemmed from the difficulty of students in coping with the new mode of learning given the lack of social interaction as it was stated that poor peer communication among Filipino university students had influenced their motivation to study online (Rotas & Cahapay, 2020). Problems regarding stress, coping and motivation were also reported in a study by Lyons, Wilcox, & Leung (2020) as medical students in Australia experienced moderate psychological distress stemming from worries regarding their level of clinical skills and concerning COVID-19 as well, which had subsequently impacted both their personal lives and their current studies. This may further validate the lack of motivation reported among the respondents.

Multiple respondents agreed that there was less time to learn in online classes. Some students perceived insufficient class time as a common hindrance in the adoption of online classes, associating this with both the students and faculty members being more familiar and equipped for the schedule of traditional classes (Khyzer et al., 2019).

Advanced technical knowledge in the use of computers required for online classes was identified as the least perceived barrier to online learning based on the results of the study. This may be attributed to the fact that the students' generation is already equipped and well-versed with navigating the Internet and gadgets because they are born during the rapid development of technology and technological knowledge (Alenezi, 2018). Also, in the initial stages of the pandemic, students and teachers alike were struggling in the online learning setup but were able to adapt eventually

in the short span of time given (Nazir & Khan, 2021).

Perceived benefits to online learning

In terms of benefits, mostly agreed that online learning allowed for the easier sharing of updated educational materials as it was shown to facilitate a faster and more efficient means of sharing these (Khan et al,, 2020). Another relevant benefit that was seen in the results of the present study is that online classes are flexible in both time and space. The nature of online classes allow students to access the information needed wherever and whenever they are able to do so as long as they have the right technological resources. In addition, the results of this study showed that the mode of classes used is a blended form in which students have both synchronous and asynchronous classes, this could imply that students are able to have more time to balance in between synchronous sessions and during their asynchronous sessions, making their schedule more flexible. E-learning has a more flexible schedule that helps students have a better understanding of the lessons and breaks the monotony of the typical classroom teachings (Suryawanshi & Venugopal, 2020). Although the results show that online classes offer students flexibility in a way that they can access resources during a time and place convenient for them, students may still face difficulty in accomplishing their learning requirements due to the barriers aforementioned in this study such as interruptions, unstable internet connectivity, and limitations with regards to actual resources such as electricity.

On the other hand, most of the students disagree that online classes allow access to higher education for all applicants and that it accommodates different types of learning styles. These contradict other findings stating that e-learning greatly enables access to and provides more opportunities for students to enroll in higher education systems and that online assessments were effective in terms of testing the knowledge levels of respondents (Khan et al., 2020; Elzainy et al., 2020). This may indicate that other underlying factors are at work, which may have affected their perception towards the accessibility and accommodation of online learning.

Also, mostly disagreed on the modality providing a quick feedback system as well as the lack of feedback, this result is congruent with other studies where the students are limited in their ability to properly concentrate during classes as they are unable to have good communication with their professors which may be causing anxiety with their performance (Subedi et al., 2020)

Perceived effectiveness of online learning

Majority of the respondents agreed that e-learning ensures schedule flexibility. The flexible schedule implied that this allowed students to balance classes with other responsibilities. Though the statement regarding e-learning's ease of use was the second highest in positive responses, a greater majority of the respondents either disagreed or stayed neutral. Indicating that e-learning may not be an easy platform to use and navigate. Difficulty in the use of e-learning was also stated as a barrier in other previous studies (Baticulon et al, 2021). Baticulon surmised that the use of e-learning was relatively new for its current users in the current setting leading to such difficulties. Fleming & Mills (2017) cited that some visual and auditory learners may also have difficulty in terms of learning in this mode given that some classes may be asynchronous because as discussed in the former sections, asynchronous sessions were integrated into learning, with multiple students receiving handouts which may have led to further difficulty for students with different learning styles.

Perceived self-efficacy in online learning

Most students had a positive perception regarding their self-efficacy in online learning in most of the statements included. This is in line with the previous finding where students did not perceive the need for advanced technical knowledge and skills as a problem. These results are consistent with a previous study which indicated a significant positive relationship between academic self-efficacy and computer self-efficacy (Jan, 2015). Results implied that difficulties may be attributed to the platform and modality itself which is non-reliant on the respondent's capabilities. Common difficulties encountered often focused on technology as well technical and management support as opposed to learner characteristics (Diab and Elgash, 2020).

Three items regarding ability to focus on schoolwork despite distractions, efficient use of library's online resources, and effective time management had significant negative responses. Distractions may include interruptions stated in previously cited literature such as individual responsibilities at home and environmental distractions. A similar study showed that distractions in the students' immediate environment (e.g. background noise and household obligations) and in the technological environment (e.g. digital programs and internet application) could be factors that affect the focus of students in terms of their schoolwork (Bdair, 2021). Issues regarding Internet connectivity can affect access to library online resources caused by the shift of learning modalities to an online setting. In another study, a common complaint among students was difficulty of access to books and the Internet (Kalanlar, 2022). Such factors may be considered with regards to the capability of students in using online library resources.

A significant number of respondents had also disagreed that they could manage their time wisely. Another study found that many medical students in the Philippines admitted that they lacked their own discipline and drive to study (Baticulon et al., 2021), which agrees with the results here. This finding led to the development of self-learning strategies such as time management for certain students. An implication of the results may be that nursing students from the institution also struggle with efficient time management and may benefit from similar strategies. Honicke & Broadbent (2016) discussed how time management is essential in self-regulated learning for online higher education platforms. With this in mind, students may benefit from being empowered through the teaching of proper time management strategies.

Difference in the perceived self-efficacy in online learning among year levels

Results showed that there was a significant difference among the three-year levels of BS Nursing students in terms of their perceived self-efficacy. In the post-hoc analysis, it was shown that the most significant difference was observed to be between the perceived self-efficacy of the 1st year and 3rd year BS Nursing students. This result is reflected in the study concerning self-efficacy among nursing students during the pandemic using the Online Learning Self-Efficacy

Scale (OLSES). It was found that the majority of the students did not have any prior experience in online learning before the outbreak occurred. This yielded results showing only around a quarter of the students reported having good online learning self-efficacy which the study attributes to the need for most students to quickly adapt to the new mode of learning and having no prior training or experience (Tiwari & Srivastava, 2021). It was also noted that there is a strong correlation between the academic self-efficacy and prior online learning experiences of the respondents (Jan, 2015). In line with this, it was previously mentioned that the 3rd year BS Nursing students have had prior experience with the face-to-face conduct of nursing classes and the basic use of learning management systems as opposed to the 1st year students who had no prior experience with face-to-face nursing classes and were immediately subject to the conduct of the online classes. Thus, the gap in experience can be considered as the cause of the significant difference between the perceived self-efficacy between the 1st year and 3rd year students.

Difference in the perceived effectiveness in online learning among year levels

Results show that there is no difference in the perceived effectiveness of online learning among the 1st year, 2nd year, and 3rd year BS Nursing students. This may imply that the sample taken from the student population of the Academic Year 2020 - 2021 all similarly perceived that e-learning is easy to use and ensures schedule flexibility while disagreeing that e-learning increases quality of knowledge attained and it is an efficient teaching method. Similar findings were reported with nursing students in Nepal, whereas it was found that more than half of their respondents stated that e-learning helps save time while also stating that most of their respondents felt that e-learning does not help achieve better results in terms of their academic performance (Thapa et al., 2021). This signifies that the nursing students find online classes to be effective for its utility in schedule flexibility as it frees up more time, although they may not necessarily see it as an efficient teaching method for their course.

Difference in the perceived self-efficacy in online learning between male and female BS Nursing students

The results showed that there was no difference between the male and female BS Nursing students in terms of perceived self-efficacy. This implies that self-efficacy is generally at the same levels between the two sexes and would indicate that sex is not a factor affecting the perceived capability and motivation of the nursing students in online learning.

However, the results of the present study on sexes is not in agreement with the results of multiple previous studies, as they have shown that sex is factor in predicting self-efficacy, that females had shown higher academic self-efficacy (Shen et al.,2013; Volchok, 2018). Another study further provides evidence that there is higher academic self-efficacy among females than males (Jan, 2015). However, it is good to note that there are more female respondents than male in the present study; therefore this result may not accurately measure the difference between sexes.

Relationship between perceived self-efficacy in online learning and perceived effectiveness of online learning

Based on the results of the present study, there is a relationship between the perceived self-efficacy of students and their perceived effectiveness of online learning. The finding suggests that self-efficacy may affect online learning and vice versa. Various studies support these findings that the effectiveness of modules used in blended learning influences the student's self-efficacy such that improving the effectiveness of the modules increases the student's self-efficacy (Anduyan, 2021). Wang et al. (2020) had also found in their study that students who are able to effectively carry themselves and become familiar with the online learning modalities tend to adapt to a more favorable perception towards the effectiveness of said modality, further supporting the results. This may imply that courses and programs should further strengthen student's self-efficacy in online education and may be beneficial in increasing how they perceive it to be effective in the process of learning.

Recommendations

Strengthening practice strategies and techniques on self-directed learning among nursing students is recommended to enhance their self-efficacy in terms of online learning and effective time management. A strengthened collaboration and capacity building among teachers and administrators with the students is necessary in mitigating the various barriers in online learning, this may include supplemental programs (i.e. online library access orientation). For future studies, an in depth study of other possible factors affecting the student perceptions such as previous experiences with face-to-face classes, clinical rotations, and use of online learning modalities; personal learning styles; socioeconomic factors; geographical location; and other barriers that influence the effectiveness of online learning and the self-efficacy of the students.

Limitations

The study results may not be representative of the whole population of nursing students within the institution as quota sampling was not done with true randomization. As a questionnaire was used, self-reporting may have also affected responses. The study also focused on the student's perceptions on online education. It did not delve into their socioeconomic and geographical status, and individual expectations and motivations for the mode of learning which may have also influenced their perceptions and experience.

Conclusion

The findings of the current study revealed that the nursing students had several significant perceived barriers regarding their online learning experience, with some being possibly linked to other predetermining factors. There were no instances wherein strong disagreement towards a given item was shown. Results show that there are still improvements that can be made in terms of the delivery of e-learning to reduce perceived barriers and various methods may be explored for the students to better manage themselves when acclimating to this mode of learning and help improve their self-efficacy.

Revisions and improvements may still be requisite on leveling of expectations, supervision and feedback mechanisms for students to ensure the effectiveness of online learning modality that may lead to enhanced perceptions and self-efficacy of the nursing students.

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