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Nursing Excellence:
From Research to Practice

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About NEP Journal

SCOPE
The **Nurse Educators and Practitioners Journal (NEPJ)** is a triannual publication of the *Nurse Educators and Practitioners Guild, Inc.* (NEPraGuild, Inc.), based in Baguio City. It strives to bridge the gap between nursing education and practice by publishing relevant studies and evidence-based practices and procedures. The journal covers a broad scope of the nursing field that include program and course development, teaching and learning approaches, educational and training needs assessment, simulation education, student evaluation, evidence based management, quality improvement, patient safety, interprofessional collaboration, role transformation, nursing administration, policy formulation, technological innovation, quantitative and qualitative research implementation and control, dignity safeguarding research, legal practice boundaries, nursing accountability, transcultural nursing, and health equity.

MISSION
To advance nursing excellence by fostering knowledge sharing, innovation, and policy influence, ultimately improving the quality of nursing education and patient care.

TARGET AUDIENCE
The primary target audience for the NEPJ includes educators (academe or in the clinical setting), clinical nurse specialists, advanced practice nurses, nursing students, researchers, healthcare administrators, and policymakers.

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EDITORIAL

Nursing Excellence: *From Research to Practice*

Nursing continues to evolve into an increasingly complex and specialized profession. As nurses, we must remain dedicated to advancing clinical excellence—anchored in expertise, efficiency, and evidence-based practice (EBP). Our shared goal is not only to meet but to exceed personal, organizational, and national benchmarks in patient care.

This inaugural issue of the Nurse Educators and Practitioners Journal (NEPJ) highlights the theme "Nursing Excellence: From Research to Practice." This theme underscores the critical connection between scientific research and its real-world application. Nurses serve as the bridge between evidence and practice, transforming research findings into high-quality, patient-centered care that saves lives and improves outcomes.

Nursing research lays the foundation for excellence. It informs best practices, challenges existing norms, and drives innovation. Through research, new care protocols are developed, patient safety is strengthened, and healthcare delivery is transformed. Yet, research achieves its true value only when translated into practice—a responsibility nurses carry with both rigor and compassion.

Clinical excellence also demands lifelong professional growth. Nurses can advance their education, pursue specialty certifications, join professional organizations, and actively participate in seminars and training. Within the workplace, we can lead change by addressing system gaps, initiating mentorship programs, improving collegiality, and sharing EBP findings with peers. Staff development and education are not optional—they are vital to patient safety and organizational success.

Equally important is the responsibility we hold to support our colleagues. When a knowledge deficit emerges, it should be addressed privately, respectfully, and constructively. Professional excellence grows in environments that nurture learning, collaboration, and mutual respect. By modeling a positive attitude and fostering lifelong learning, we inspire others to follow the same path.

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Nurturing the next generation of nurses is another cornerstone of excellence. Student nurses rely on our guidance to gain both technical skills and professional confidence. By investing time to explain clinical routines, rationales, and evidence-based interventions, we empower students to achieve their first professional milestones. Today's student may well become tomorrow's colleague, shaping the future of our profession alongside us.

Bridging research and practice is not always straightforward. It requires the concerted effort of researchers, clinicians, policymakers, and organizations working together. Nurses, as the frontline caregivers, are uniquely positioned to lead this integration—ensuring that research translates into compassionate, patient-centered care.

Healthcare organizations, too, strive for excellence, often measured by achieving national benchmarks or Magnet® recognition. Nurses can actively contribute by participating in committees, implementing quality improvement initiatives, and mentoring colleagues. Through leadership and collaboration, we strengthen both individual practice and organizational performance.

At its heart, nursing excellence is about more than knowledge or technical skill. It is about applying evidence with empathy, respecting the dignity of every patient, and adapting to the ever-changing needs of those we serve. Excellence requires continuous refinement, ongoing education, and a steadfast commitment to lifelong learning.

As we look to the future, one truth remains clear: nurses will continue to shape healthcare. By bringing research to the bedside, we transform knowledge into healing, innovation into safety, and compassion into measurable outcomes. This is the essence of nursing excellence.

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RESEARCH ARTICLE

Prevalence of Bullying and Workplace Violence Against Nurses in Adult Health Units: Its Impact on the Mental Health and Job Productivity of Nurses

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ABSTRACT

Introduction: This study seeks to investigate incidence rates of bullying as well as violence within designated adult health units while investigating correlated changes in mental health sequelae alongside productivity parameters.

Methods: This study employed a descriptive-correlational approach among 121 nurses practicing in adult health units located in Cabuyao, Laguna, Philippines. Respondents were recruited through a convenience sampling method. Data collection was conducted utilizing three validated instruments: a 6-item adapted WHO/ILO/ICN/PSI questionnaire on workplace aggression, a 7-item adapted DASS-21 for mental health evaluation, and the NWFQ regarding productivity at work. The analysis involved computation of descriptive data, Chi-square tests, Spearman Rho correlation, and regression analysis on Jamovi Software for multivariable assessments between examined factors. Data collection was carried out over a six-week period from March to April 2025.

Results: Despite a "Very Low" reported prevalence of workplace aggression (overall mean occurrence = 1.46, severity = 1.42), it had a statistically significant negative impact ($p = 0.017$) on nurses' mental health (depression, anxiety, and stress). Patients were the primary source of aggression (mean occurrence = 1.99), highlighting a critical issue. While overall mental distress is "Normal," a "Low" score for "thinking about quitting because of stress/bullying" suggests underlying dissatisfaction. Crucially, workplace bullying and violence had a statistically significant negative effect on nurses' job productivity ($\beta = -0.279$, $p = 0.032$), and specifically, stress is significantly associated with lower job productivity ($p = 0.009$).

Conclusion: Nurses reported "Very Low" levels of workplace aggression, particularly verbal abuse with patients as the primary perpetrators; even this minimal exposure significantly impacted their mental health (depression, anxiety, stress). Despite generally "Normal" mental distress, nurses frequently considered quitting due to workplace issues. Critically, overall "High" job productivity was negatively affected by workplace bullying and violence, with stress specifically linked to reduced productivity, suggesting an immediate detrimental influence on performance

Keywords: *Adult Health Units, Bullying, Workplace Violence, Nurses, Mental Health, Job Productivity*

INTRODUCTION

Bullying and violence in the workplace have become critical issues of public health, especially in the context of nursing. The rate of bullying in the workplace among healthcare professionals is particularly distinct. In fact, studies have found that between 26.3% and 66.9% of nurses report having been bullied during their professional lives (Goh et al., 2022). This phenomenon not only impacts the work culture but also has deep-seated consequences on the psychological wellbeing and productivity of nurses (Chen et al., 2024). For practicing nurses who are primarily involved in long-

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term care for sensitive populations, the potential impact of negative conditions may have a significant negative psychological, emotional, and possibly even physical consequences resulting from the challenging aspects of their work.

In understanding workplace bullying, it is crucial to define it as a form of intrapersonal aggression characterized by persistent and malicious behaviors that attack dignity and mental health (Galanis et al., 2024) of others. Bullying may take diverse forms such as verbal assault, social withdrawal, and public shaming. Workplace violence includes more overt physical aggression such as explicit threats or acts of violence from patients or other staff members (Xu et al., 2017). Both phenomena are essential contributors to an unhealthy organizational climate which hampers nurses' mental well-being and fosters chronic stress coupled with anxiety or depression (Hsieh et al., 2019).

A review of literature shows that bullying in the workplace deeply impacts satisfaction and productivity levels among nurses. Bullying reinforces disengagement, contributes to higher absentee rates, and fuels increased turnover intentions further illustrating its negative impact on retention (Lolai et al., 2023; Peng et al., 2021). Moreover, previous research suggests that organizational culture acts as an important mediator in these relationships; positive support may help mitigate the psychological impact of bullying in the workplace (Yun & Kang, 2018). Nevertheless, studying the interplay between these variables within adult health units in the Philippines remains limited, which may be attributed to broader cultural contexts and the peculiarities of the Philippine healthcare system.

This study is anchored on the Job Demand-Resources (JD-R) Model, which posits that job demands (e.g., bullying and violence) can lead to strain (e.g., stress and mental health issues), while job resources (e.g., support, effective policies) may buffer these effects and promote engagement and productivity. Applying this model helps explain how workplace conditions influence nurses' psychological well-being and job performance.

This study holds promise for guiding policy aimed at mitigating violence and bullying targeted at nurses. With targeted healthcare management approaches to address this issue, an improvement in mental health alongside job performance will be attained, leading to better patient care. The first objective was to describe how often and what types of workplace bullying and violence are experienced by nurses in adult health units. The second objective was to examine how these experiences affect nurses' mental health, focusing on depression, anxiety, and stress, as well as their job productivity.

METHODS

Research Design

This study employed a descriptive-correlational approach based on the two primary objectives outlined. The description provided essential information about the frequency of bullying, violence, as well as who was involved. The correlational component studied the significant relationships between workplace violence with other variables such as mental health and job performance. This study used a non-experimental design, meaning no variables were manipulated; instead, it involved observing existing situations or arrangements to identify systemic patterns (Aggarwal & Ranganathan, 2019).

Population and Sampling

This study focused on a specific population consisting of nurses employed in adult health units within hospitals in Cabuyao, Laguna, Philippines. There were 121 nurse respondents that took part in the study. Respondents were selected using convenience sampling. This approach enabled the researcher to choose respondents who were accessible and willing within the bounds of the practical limitations of the study. The required sample size was determined using the Raosoft Sample Size Calculator with a 95% confidence level, 5% margin of error, and an assumed response distribution of 50%. Based on the estimated population of nurses in the selected hospitals, the recommended sample size was 121 respondents, which was achieved in this study.

Questionnaire

Data were collected using three validated instruments designed to measure bullying, violence, mental health, and productivity among nurses.

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Workplace bullying and violence were captured using a 6-item adaptation of the Workplace Violence in the Health Sector Questionnaire (WHO, ILO, ICN, PSI), which measured the frequency and severity of verbal abuse, physical violence, and psychological harassment through two 5-point Likert scales. Mean scores were categorized as Very Low to Very High with corresponding numeric ranges capturing exposure (1.00–5.00) and impact (5.00) (International Labour Office et al., 2003)

The second is the mental health status of the nurses, which served as a mediating variable and was assessed using an adapted version of DASS-21 tailored to seven items, which measured symptoms of sadness and emotional exhaustion on a five-point scale, where 1 equated to "never" and 5 to "always". Scores were summarized using univariate methods across labeled tiers for each subscale, including depression (Normal: 0–4, Extremely Severe: 14–21) (Lovibond et al., 1995; Dhindayal & Letsoalo, 2022).

The third is the dependent variable, job productivity, which was evaluated through the NWFQ, containing newly developed items focused on nurses' work performance, alongside seven structured, curriculum-based questions centered on 'work functioning'. These scales measured nurses' capacity to perform her/his duties despite difficulties rated on a five-point range from "Strongly disagree to Agree". Productivity rankings placed nurses into 3 strata above or below average based upon mean scores ranging below the low threshold of 1.00–2.49, or moderate cut-offs at 2.50–3.49, achieving high if reaching pairwise flagged thresholds of minimum marked response averages above 3.50, as adapted from the Nurses Work Functioning Questionnaire (Gärtner et al., 2011).

To establish the validity of the research instruments, the questionnaires were subjected to expert review by three qualified professionals: the company physician, a former professor who is a licensed psychologist, and a university researcher with extensive experience in nursing and behavioral sciences. All three experts independently and unanimously confirmed that the items were clear, relevant, and aligned with the study's objectives, thereby supporting the content validity of the tools. For reliability testing, a pilot study was conducted involving 20 nurses who were not part of the actual study sample. The pilot results demonstrated strong internal consistency, with Cronbach's alpha values of 0.83 for the adapted job productivity tool, 0.81 for the adapted bullying and workplace violence questionnaire, and 0.84 for the adapted DASS-21 subscale measuring mental health. These results confirm that the instruments were both valid and reliable for use in the main data collection phase.

Data Collection Procedure

Data collection commenced after obtaining ethics approval from the St. Paul University Manila Institutional Review Board (IRB No. 2025-126-IMA-CNAHS) and the administrative permissions of participating hospitals. After permissions were secured, the researcher coordinated with the nursing service office to distribute printed questionnaires during shift breaks. A cover letter explained the purpose, assured confidentiality, and provided a separate informed consent form.

To uphold ethical standards during data gathering, participation was entirely voluntary, and respondents were informed of their right to withdraw at any time, without penalty. Anonymity was strictly maintained, and no identifying information was collected. To accommodate varying schedules and provide convenience, an online version of the questionnaire was also created using Google Forms. The online form contained the same instructions and consent process as the printed version. Respondents completed the surveys anonymously, either by submitting sealed printed questionnaires in designated drop boxes or by using a secured Google Forms link. Data collection was carried out over a six-week period from March to April 2025.

Data Analysis Process

The information gathered was analyzed through both descriptive and inferential statistical methods. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated for the respondents' profiles as well as the preva-

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lence and characteristics of workplace bullying and violence. Mental distress and productivity measures were also described using relevant metrics. Inferential statistics were used to analyze relationships among some variables. The Chi-square test was applied to assess significant relationships among demographic/professional attributes with the prevalence of workplace bullying and violence, as well as between workplace bullying/violence with mental health (depression, anxiety, stress). To evaluate the association between nurses' mental health and productivity, Spearman Rho correlation was calculated. Lastly, regression analysis with bootstrap was performed to assess whether workplace bullying and violence had a statistically significant effect on nurses' job productivity. All statistical analyses were conducted with JASP Software (Version 0.18.3).

RESULTS

Table 1 reveals that the majority of respondents were aged 25-34 years old (46.3%), followed by the 35-44 years old group (26.4%), indicating a relatively young and experienced workforce. The sample was predominantly female (84.3%), which is consistent with the gender trends in the nursing profession. In terms of experience, most nurses had 1-5 years of experience (43.0%), with a significant portion also having 6-10 years (25.6%), suggesting a mix of early to mid-career professionals. The Medical-Surgical Ward (41.3%) and Critical Care Unit (24.8%) were the most represented departments, reflecting the primary areas where adult health nurses are deployed. These demographic insights provide a context for understanding the prevalence and impact of workplace violence and bullying on this specific nursing population.

Table 1. *Demographic Profile of the Respondents (n=121)*

Characteristic	Frequency (N)	Percentage (%)
Age		
18-24 years old	18	14.9
25-34 years old	56	46.3
35-44 years old	32	26.4
45-54 years old	10	8.3
55-64 years old	5	4.1
Sex		
Male	19	15.7
Female	102	84.3
Years of experience as a nurse		
Less than 1 year	10	8.3
1-5 years	52	43
6-10 years	31	25.6
11-20 years	22	18.2
21-30 or more years	6	5
Department		
Medical-Surgical Ward	50	41.3
Critical Care Unit (ICU, CCU)	30	24.8
Emergency Department	20	16.5
Hemo-dialysis Unit	10	8.3
Industrial	5	4.1
Operating Room	4	3.3
Outpatient Clinic	2	1.7

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Table 2 presents the prevalence and severity of workplace aggression among nurses by both type and source. Overall, workplace aggression was rated as "Very Low" in terms of both frequency (mean occurrence = 1.46) and severity (mean severity = 1.42). Among the types, verbal abuse was the most frequently experienced (Mean = 1.70) and had the highest emotional impact (Mean Severity = 1.62). In terms of sources, patients were identified as the most common source of aggression, with a higher mean occurrence (1.99) and severity (1.88), compared to colleagues and supervisors, both of whom were rated "Very Low" in both categories. These findings highlight that even though workplace aggression is generally minimal, verbal abuse from patients remains a key concern.

Table 2. *Prevalence and Severity of Workplace Aggression by Type and Source*

Category	Subcategory	Mean Occurrence	Interpretation (Frequency)	Mean Severity	Interpretation (Severity)
Type of Aggression	Verbal Abuse	1.70	Very Low	1.62	Very Low
	Psychological Harassment	1.58	Very Low	1.56	Very Low
	Physical Violence	1.10	Very Low	1.09	Very Low
	Total (by type)	1.46	Very Low	1.42	Very Low
Source of Aggression	Patients	1.99	Low	1.88	Low
	Colleagues	1.61	Very Low	1.50	Very Low
	Supervisors	1.49	Very Low	1.47	Very Low
	Total (by source)	**1.70**	**Very Low**	**1.62**	**Very Low**

Table 3. *Mental Health Distress Among Nurses in Relation to Workplace Bullying and Violence*

Subscale	Mean	SD	Level
Depression			
Feeling sad, down, or hopeless	1.76	0.8	Very Low
Thinking about quitting because of stress/bullying	1.8	0.8	Low
Total Depression Score	*1.78*		*Normal*
Anxiety			
Feeling anxious or worried about going to work	1.84	0.71	Low
Having trouble sleeping because of work stress	1.85	0.78	Low
Total Anxiety Score	*1.85*		*Normal*
Stress			
Feeling stressed and overwhelmed at work	2.14	0.7	Low
Finding it hard to focus at work due to stress	1.96	0.69	Low
Feeling emotionally drained after a shift	2.12	0.85	Low
Total Stress Score	*2.07*		*Normal*
Overall Mental Distress	**1.93**	**0.81**	**Low**

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Table 3 presents the levels of mental health distress among nurses in relation to workplace bullying and violence. Nurses generally reported "Normal" levels of depression (Overall Mean = 1.78), anxiety (Overall Mean = 1.85), and stress (Overall Mean = 2.07), with overall mental distress being "Low" (Overall Mean = 1.93). However, "thinking about quitting because of stress/bullying" received a "Low" score (Mean = 1.80), indicating that workplace issues can still lead to thoughts of resignation despite overall low distress.

There is a statistically significant relationship (p = 0.017) between the overall prevalence of workplace bullying and violence (Overall Prevalence = 1.46, "Very Low") and the levels of depression, anxiety, and stress among nurses. This indicates that even at a "Very Low" prevalence, these incidents are significantly associated with adverse mental health outcomes (Table 4).

Overall job productivity was "High" (Overall Mean = 3.88), with most nurses completing tasks well (Mean = 4.50), staying focused (Mean = 4.26), and feeling motivated (Mean = 4.55). However, some nurses reported that workplace stress or bullying "Very Low" affected their ability to finish tasks (Mean = 1.76) (Table 5).

Table 4. *Relationship between the overall prevalence of workplace bullying and violence*

Mental Distress Level	Overall Prevalence of Workplace Bullying and Violence	Chi-square Value	P-value	Significance	Decision
Depression	1.46 (Very Low)	397	0.017	Significant	Reject Ho
Anxiety	1.46 (Very Low)	397	0.017	Significant	Reject Ho
Stress	1.46 (Very Low)	397	0.017	Significant	Reject Ho

Table 5. *Impact of Workplace Bullying and Support on Job Productivity*

Indicator	Mean	SD	Level
Completing tasks well despite workplace challenges	4.5	0.77	Very High
Staying focused on work without being distracted by stress or bullying	4.26	0.85	Very High
Feeling motivated to care for patients	4.55	0.68	Very High
Working well with the team despite conflicts	4.54	0.58	Very High
Feeling supported at work to do your job well	4.17	0.74	High
Workplace stress or bullying affecting your ability to finish tasks	1.76	0.97	Very Low
Feeling that hospital policies are effective in stopping workplace violence and bullying	3.4	0.99	Moderately High
Overall Job Productivity	**3.88**	**0.47**	**High**

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Regression analysis (β = -0.279, p = 0.032) revealed that workplace bullying and violence had a statistically significant negative effect on nurses' job productivity, meaning that as exposure to these issues increases, productivity tends to decrease (Table 6).

Only stress (Spearman's Rho = -0.237, p = 0.009) showed a statistically significant negative relationship with job productivity, indicating that higher stress levels are significantly associated with lower job productivity. Depression (p = 0.058) and anxiety (p = 0.505) did not show a statistically significant relationship with job productivity in this study

Table 6. *Relationship of Workplace Bullying and Violence on Nurses' Job Productivity*

Variable	Beta	Std Error	t-value	P-value	Significance	Decision
Constant	4.285	0.19	22.56	< .001	Significant	Reject Ho
Workplace Bullying and Violence	-0.279	0.128	-2.18	0.032	Significant	Reject Ho

Table 7. *Relationship between Nurses' Levels of Mental Status (Depression, Anxiety, and Stress) and their Job Productivity Levels*

Mental Status Subscale	Spearman's Rho	P-value	Significance	Decision
Depression	-0.176	0.058	Not Significant	Failed to reject Ho
Anxiety	-0.063	0.505	Not Significant	Failed to reject Ho
Stress	-0.237	0.009	Significant	Reject Ho

DISCUSSION

In this study, respondents reported that verbal abuse was the most common type of workplace bullying and violence, as reflected in the quantitative data, and this was associated with notable emotional distress. This aligns with existing literature. Previous studies have reported higher prevalence rates of bullying among nurses, such as Demir and Rodwell (2012), who found that between 17.6% and 34.3% of nurses reported being bullied. Similarly, Vincent-Höper et al. (2020) noted the serious impact of bullying and violence on nurses' mental health, including burnout. The differences in these findings may reflect variations in institutional reporting, enforcement of zero-tolerance policies, or cultural perceptions of bullying and violence.

Bullying and violence from patients were the most frequently reported by respondents, with a mean occurrence of 1.99, reinforcing earlier findings that workplace violence is not limited to psychiatric units but is widespread in medical and surgical wards (Lepiešová et al., 2015). This aligns with Table 2, where patients were also shown to be the highest source of aggression in both frequency and severity. Patients and their relatives were frequently identified as primary aggressors, as also noted by Weldehawaryat et al. (2020). This widespread issue highlights the urgent need for institutional interventions. In contrast, bullying and violence from colleagues and supervisors were reported less frequently by respondents. This differs from findings in other settings where horizontal bullying among peers was a significant issue (Cheung & Yip, 2017). Such differences may be due to cultural or organizational reporting practices. Therefore, training should focus not only on de-escalation techniques for patient aggression but also on addressing internal team dynamics and stress management.

The data on mental health distress (Table 3) indicate that respondents generally reported low levels of depression (Mean = 1.78), anxiety (Mean = 1.85), and stress (Mean = 2.07), highlighting a general trend of normal mental well-being among the sample. However, the response item "thinking about quitting because of stress/bullying" showed a con-

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cerning average, suggesting hidden emotional strain. This is consistent with Al-Fayyadh et al. (2022), who emphasized the role of job satisfaction in buffering distress. Likewise, Chien and Yick (2016) noted that excessive workloads can diminish satisfaction and increase stress.

This study confirmed, through quantitative analysis, the association between workplace bullying and violence and respondents' mental health. These results support findings by Nielsen et al. (2013), who classified bullying as a long-term stressor linked to mental health disorders. While the overall prevalence in this study was low, the statistically significant relationships highlight that even limited exposure can have negative psychological outcomes. Although job productivity scores were generally high, specific indicators particularly regarding focus and task completion, were negatively affected by bullying, violence, and stress. This paradox has been discussed in similar contexts by Ribeiro and Sani (2024) and Teo et al. (2021), who linked bullying to reduced satisfaction and performance.

Regression analysis in this study showed a significant negative effect of bullying and violence on job productivity. These findings are in line with previous reports that link workplace bullying with emotional exhaustion, lower morale, and diminished performance (Asif & Malik, 2014; Goh et al., 2022). The study's findings also reaffirm the link between stress and job productivity. Among the three mental health variables examined, only stress showed a significant inverse correlation with productivity. This supports research by Sajedian et al. (2023), Theorell et al. (2015), and Ngoc et al. (2020), who emphasized the direct impact of stress on professional performance. The lack of significance for depression and anxiety may be due to contextual or occupational variables, as suggested by Pouradeli et al. (2016).

The findings strengthen the case for institutional policies that address workplace bullying, violence, and occupational stress. Programs must be proactive, targeting both external bullying and internal organizational stressors to support nurse well-being and ensure quality patient care.

Study Implications

This study examines the important connections between the nursing work environment, mental health, and job performance. While reporting low levels of bullying and verbal non-physical distress, the results still show that some form of verbal abuse is present and has emotional impact. Even subtle bullying worsens stress, which signals the need for stronger workplace safeguards. A key finding is that relatives of patients are also frequent sources of aggression. This is a common issue across wards and calls for focused strategies to reduce this type of violence. Although overall productivity remains high among nurses, many still struggle to stay focused and complete tasks due to bullying and stress. The data reflects that while nurses strive to perform well, negative work conditions may be limiting their performance ceiling. The analysis showed that stress is strongly linked to reduced productivity. In contrast, depression and anxiety had less impact on work output. This suggests that immediate stressors may play a bigger role than other mental health symptoms in affecting job performance. These findings support the need for strong mental health policies. Institutions must provide timely support to nurses exposed to workplace aggression. Hospitals should implement anti-bullying protocols, accessible counseling, and training on stress and aggression management. In the Philippine setting, special attention is needed to address cultural barriers to reporting, such as respect for authority or fear of conflict. Hospitals should create a safe space where nurses feel empowered to speak up without fear. Immediate changes are necessary to protect nurses through clear anti-bullying systems. These systems should be grounded in policies that prioritize nurse safety, support mental well-being, and improve patient care outcomes.

Strengths of the Study

This study has several key strengths. The topic of bullying and mental health is both timely and relevant, as the healthcare sector has experienced increased stress following the pandemic. The research also provides a valuable local focus, offering real data on nurses in the Philippines, which is not widely available. Furthermore, the study goes beyond just emotional well-being by examining both mental health and job performance, showing how bullying impacts nurses' work. Ultimately, its findings are highly practical and can be used to guide hospital policies, giving leaders useful suggestions to better protect and support their nursing staff.

Study limitations

This study is impacted by a number of limitations. The study used convenience sampling for the 121 nurse respondents from Cabuyao, Laguna, which may lead to selection bias resulting in skewed representativeness of the nursing population as a whole.

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In addition, self-reported data on all work-related bullying and violence, mental health aspects, and productivity introduces inaccuracies due to social desirability bias where respondents tend to underreport negatives. Using descriptive correlational design allows identification of relationships among variables albeit without establishing causality. The cross-sectional nature snapshot data collection at one point in time further limits understanding the impact or change over time, restricting the perception of workplaces dynamics developing with time beyond shifts.

CONSLUSION

The study shows that even low levels of workplace bullying and violence can adversely affect nurses' mental well-being and job performance. Stress appears to be the most immediate and impactful consequence of workplace bullying and violence. These results underscore the importance of promoting a healthy work environment where nurses feel safe, supported, and valued. Practical implications include the urgent need for healthcare institutions to implement clear anti-bullying policies, provide stress management resources, and foster a workplace culture that prioritizes psychological safety. Addressing these issues can enhance nurse productivity, retention, and the overall quality of patient care.

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CONFLICT OF INTEREST

The author declares no conflict of interest related to the conduct and publication of this research.

DECLARATION OF DEGENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors utilized Gemini (Google) for grammar checking and minor linguistic adjustments to improve the flow and clarity of the manuscript. Other generative AI, AI-assisted technologies, or any form of technology were not employed in the writing, figure production, content generation, or in any form of analysis. The author is fully responsible for the content of this publication.

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"I believe that everything affecting our society affects nurses and that eventually will hemorrhage over to the nursing profession."

—Denetra Hampton, RN, documentary filmmaker of Racism: The African American Nursing Experience Short Film

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RESEARCH ARTICLE

Structured Exercise among Pregnant Women during the Third Trimester

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ABSTRACT

Introduction: Maternal mortality remains a significant concern in the Philippines, with a high maternal mortality ratio, emphasizing the need for effective interventions. This study investigated the level of awareness and extent of practice of structured exercises among pregnant women in Baguio City, Philippines.

Methods: A descriptive correlational design was employed to investigate the level of awareness and extent of practice of structured exercises among 105 pregnant women in Baguio City. A convenience sampling was utilized to identify factors influencing exercise adoption and inform the development of culturally appropriate interventions aimed at improving maternal health outcomes. A validated questionnaire was used through "yes/no" responses and categorical scale with three response options, in determining the awareness and practice of various exercises. Data was analyzed using descriptive statistics, and simple linear correlation.

Results: Findings revealed an overall moderate level of awareness (Mean Percentage Score = 49.31%) and practice (Mean Percentage Score = 1.99%) of structured exercise. Significant positive correlations were found between awareness and practice for several exercises, particularly those involving ankle and toe exercises, reflecting a direct translation of awareness into action. Educational attainment and the history of previous pregnancies positively influenced both awareness and practice, suggesting that prior experience and higher educational levels are associated with greater understanding of exercise benefits and increased self-efficacy. Conversely, engagement in exercises, such as abdominal and pelvic exercises, remained low, indicating an important area for intervention. This discrepancy accentuates the potential influence of perceived barriers, such as fear of complications and lack of access to resources, which outweigh perceived benefits.

Conclusion: Further research is needed to assess the applicability of these findings across various populations and settings, as well as to evaluate the effectiveness of culturally tailored interventions aimed at overcoming the identified barriers. Ultimately, this research aims to contribute to broader strategies for reducing maternal mortality in the Philippines by promoting safe and effective exercise during pregnancy.

Keywords: *Awareness, Practice, Pregnancy, Structured Exercise, Third Trimester*

INTRODUCTION

In the Philippines, limited healthcare access contributes to significant maternal and child health challenges. The high maternal mortality ratio, 84 per 100,000 in 2023, improving from 129 per 100,000 in the year 2000 (Philippines | World Bank Gender Data Portal), highlights the urgent need for innovative, cost-effective interventions. Promoting structured exercise during pregnancy, defined as planned activity with specific goals, intensity, duration, and frequency (Physical Activity and Exercise During Pregnancy and the Postpartum Period, 2020), offers a promising approach to improve maternal health and contribute to the Sustainable Development Goal of reducing the global maternal mortality rate to less than 70/100,000 live births by 2030 (SDG Target 3.1 Maternal Mortality, n.d.)

Numerous studies demonstrated the maternal benefits from exercise during pregnancy, which includes lower risk of pregnancy-related complications, improved quality of life, and reduced risk of delivering

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a large-for-gestational-age infant (Ribeiro et al., 2021; Hu et al., 2024; Marfu'ah & Wijayanti, 2023). These benefits stem from understanding and accommodating the physiologic adjustments of pregnancy, which impact various body systems (Filipec & Matijevic, 2022). The American College of Obstetricians and Gynecologists (ACOG) recommends at least 150 minutes of moderate-intensity aerobic exercise weekly, including activities like walking, swimming, and yoga (Physical Activity and Exercise During Pregnancy and the Postpartum Period, 2020).

Despite these documented benefits, misconceptions, such as fears of miscarriage and the belief that daily activities suffice, and practical barriers, like time constraints, perceived difficulty, concerns about fetal well-being, hinder participation (Ahmad et al., 2019; Skjold et al., 2022; Ekelin et al., 2018; Laure & Facina, 2022). This study addresses a significant gap in understanding the awareness and practice of structured exercise among Filipino women in their third trimester. Improving exercise participation among pregnant women has the potential to significantly impact maternal health outcomes in the Philippines. Even a modest 5% reduction in the current maternal mortality rate would translate to approximately 420 fewer maternal deaths annually. By investigating these factors, the research directly addresses the high maternal mortality rate in the Philippines. Specifically, this research investigates 1) the sociodemographic profile of pregnant women in Baguio City; 2) their level of awareness regarding structured exercise; 3) their extent of exercise practice; 4) the relationship between awareness and sociodemographic profile; 5) the relationship between exercise practice and sociodemographic profile; 6) the relationship between awareness and practice; and 7) the development of culturally appropriate exercise program based on the findings.

The Health Belief Model (HBM) will provide a framework for understanding the influence of perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy on exercise behavior. The researcher hypothesized that: 1) awareness of structured exercise will not be significantly associated with sociodemographic profile; 2) the extent of practice will not be significantly associated with sociodemographic profile; and 3) the awareness and practice of structured exercise will not be significantly correlated. The aim is to establish a baseline understanding of these factors that will be invaluable in developing effective interventions to promote exercise during pregnancy, improve maternal outcomes, and contribute to reducing maternal mortality rates in the country.

METHODS

Research Design

This quantitative study employed descriptive correlational research design. Data collection utilized an adapted questionnaire, based on a tool by Jahan and Anaiba, (2023), with permission.

Participants/ Sampling

The population for this study consisted of pregnant women in their third trimester who were not experiencing any complications and were receiving checkups in the areas of district health centers (DHU), including Lucban Health Center (19 respondents), Quezon Hill Health Center (18 respondents), Asin Health Center (5 respondents), and Aurora Hill District Health Unit (12 respondents), and those having antenatal check-ups in private clinics (51 respondents) in Baguio City, Philippines. The four DHUs were selected based on the number of barangays each health district covers, combined with the convenience of accessibility for the researcher. The respondents were randomly chosen while queuing during their checkup between the months of February and March 2025. The number of respondents was 105 in total. Sample size was determined by using G*Power V3.1.9.7, targeting 89% power (alpha = 0.05) to detect a medium effect size (correlation coefficient = 0.3) using a two-tailed t-test for bivariate normal data. This ensured sufficient sensitivity to detect a relationship between variables.

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Data Collection Procedure

The study used a three-part questionnaire adapted from Jahan and Anaiba 2023, gathering socio-demographic data, level of awareness through "yes" and "no" responses, and the extent of practice was measured using categorical scale with three response options for each exercise: "Always" (more than 3 times per week), "Sometimes" (less than 3 times per week), and "No exercise at all". The questionnaire was validated by experts and demonstrated high reliability (Cronbach's alpha = .89; pilot test alpha = .85), as interpreted by Konting et al., 2009.

The following norms for interpretation were used to determine the level of awareness and extent of practice of structured exercise of the respondents:

Level of Awareness

Percentage	Descriptive Rating	Item Description
80.01-100.00	Very High (VH)	Very high awareness (80.01-100.00%)
60.01-80.00	High (H)	High awareness (60.01-80.00%)
40.01-60.00	Moderate (M)	Moderate awareness (40.01-60.00%)
20.01-40.00	Low (L)	Low awareness (20.01-40.00%)
00.00-20.00	Very Low (VL)	Very low awareness (00.00-20.00%)

Extent of Practice

Mean Percentage	Descriptive Rating	Item Description
2.33-3.00	Always (A)	Highly practice (2.33-3.00)
1.67-2.32	Sometimes (S)	Moderately practice (1.67-2.32)
1.00-1.66	No exercise at all (NE)	Low practice (1.00-1.66)

Following UNP ERC approval (A-2025-074), data were collected from pregnant women at four district health centers and two private clinics in Baguio City. The researcher, and nurses at the healthcare facilities, administered the questionnaires. The collected data were checked for completeness, coded, and analyzed using Microsoft Excel.

Ethical Considerations

This study adhered to ethical guidelines, ensuring informed consent from all participants (aged 18+), maintaining confidentiality through anonymized data and coded identifiers, and minimizing risk by using clear questionnaires and allowing withdrawal at any time. No conflict of interest was declared, and no compensation was offered.

Data Analysis

The data analysis involved several steps. First, frequencies and percentages were calculated to describe the distribution of respondents across various socio-demographic categories. Next, mean percentage scores (MPS) were computed to quantify the overall level of awareness and extent of practice for each type of structured exercise. These MPS were then categorized using pre-defined descriptive ratings (DR) to facilitate interpretation. Finally, simple linear correlational analysis was used to examine the relationships between socio-demographic factors and both awareness and practice of structured exercise, as well as the relationship between awareness and practice themselves.

RESULTS

Socio-demographic Profile of the Respondents

The majority of the 105 respondents were aged 20-29 years, with a smaller proportion aged 30 or older and few under 19. Most respondents (n = 59) were

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married, while the remainder were single. The majority (n = 57) had completed college, with the rest having completed high school. Most respondents earned less than 15,000 per month, with only a few earning 25,000 or more. Regarding pregnancy, 54 respondents were in their ninth month, while significant numbers were in their eight (n = 25) and seventh (n =26) months. Finally, most respondents had 0-1 previous pregnancies, with smaller proportion reporting 2-3 previous pregnancies.

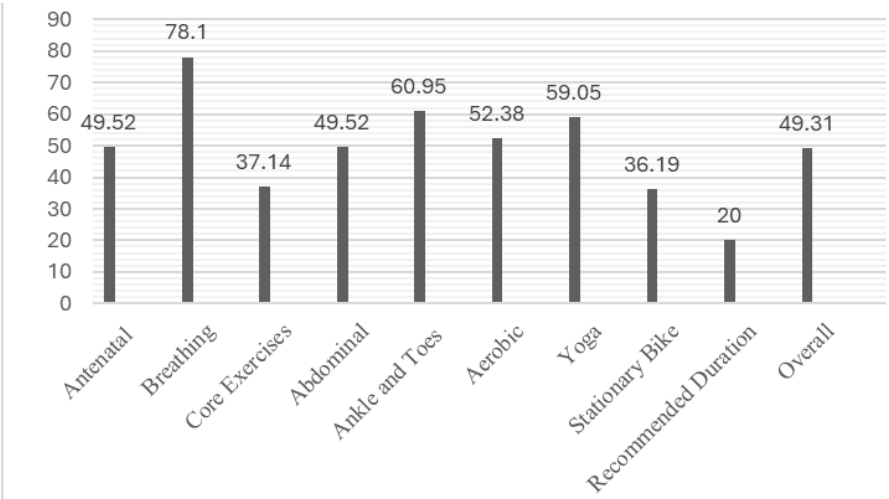
Figure 1 presents the mean percentage scores (MPS), which indicate the level of awareness of pregnant women with regard to various structured exercises during the third trimester of pregnancy when participants have their antenatal checkups. Descriptive ratings are based on the percentage ratings on the level of awareness.

Overall awareness of structured exercise was moderate (49.31%). Awareness was high for breathing (78.10%) and ankle and toe exercises (60.95%), but very low for recommended duration (20.00%). Awareness varied across different exercise types.

Figure 2 presents the mean ratings for each type of exercise to determine the extent of practice of structured exercise during the third trimester. Descriptive ratings are based on the percentage ratings on the extent of practice

The study revealed an overall mean percentage score of 1.99, resulting in a moderate extent of practice on different types of exercises. Walking exercise received the highest mean percentage score (2.70) with a descriptive rating of "High" (H). Abdominal (MPS = 1.52) and pelvic exercises (MPS = 1.56) were found to have low descriptive rating.

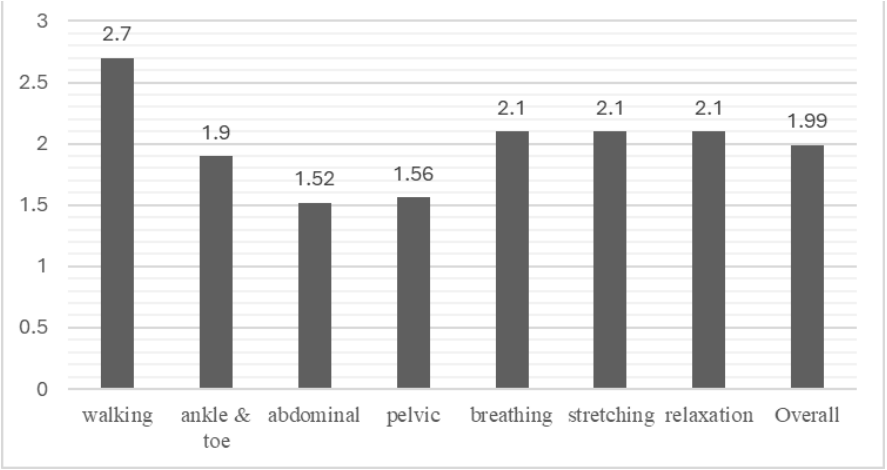
Figure 1. *Mean Percentage Score of Level of Awareness*



Legend:

Percentage Score	Item/Overall Descriptive Rating
80.01 –100.00	Very High (VH) level of awareness
60.01-80.00	High (H) level of awareness
40.01-60.00	Moderate (M) level of awareness
20.01-40.00	Low (L) level of awareness
00.00-20.00	Very Low (VL) level of awareness

Figure 2. Mean Percentage Score of Extent of Practice



Legend:

Mean Percentage Score	Item Descriptive Rating	Overall Descriptive Rating
2.33-3.00	Always (A)	High (H)
1.6-2.32	Sometime (S)	Moderate (M)
1.00-1.66	No Exercise at All (NE)	Low (L)

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Table 1. *Correlation Coefficients between Level of Awareness and the Socio-Demographic Profile*

Profile	Type of Exercise: Antenatal	Breathing	Core Exercise	Abdominal	Ankle & Toe	Aerobic	Yoga	Stationary Bike	Recommended Duration	Overall
Age	-0.062	-0.039	0.033	0.077	-0.037	0.135	0.029	0.157	-0.052	0.053
Marital Status	-0.085	0.136	0.083	0.107	-0.077	0.119	0.162	0.186	-0.134	0.103
Educational Attainment	-0.123	.300*	0.191	0.106	0.010	.312*	.363*	.293*	-0.019	.286*
Family Monthly Income	0.009	0.065	-0.007	0.009	-0.157	0.180	0.082	0.070	0.014	0.052
Month of Current Pregnancy	-0.020	0.031	-0.057	-0.134	0.092	-.222*	-.269*	-.218*	0.155	-0.140
Number of Pregnancies	-0.049	0.086	0.103	.246*	.255*	-0.026	-0.017	0.001	.233*	0.160

Legend: *with * is significant*

Table 2. *Socio-Demographic Profile and Extent of Practice on Specific Exercises*

Socio-Demographic Profile	Extent of Practice on: Walking	Ankle, Toe	Abdominal	Pelvic	Breathing	Stretching	Relaxation
Age	-0.154	-0.108	-0.063	-0.095	-.252*	-0.158	-0.111
Marital Status	-0.100	-0.140	0.070	-0.004	-0.186	-0.127	-0.102
Educational Attainment	-.199*	-0.041	-0.096	-0.028	0.026	-0.094	0.016
Family Monthly Income	-0.083	-0.144	-0.065	-0.145	-.211*	-0.030	-0.113
Month of Current Pregnancy	-0.086	0.119	-0.033	.200*	0.047	0.137	0.089
Number of Pregnancies	0.009	.240*	0.176	0.036	0.042	-0.009	0.024

Legend: *with * is significant*

Table 1 shows the correlation coefficients between the level of awareness and the sociodemographic profile. Significant correlations existed between educational attainment and awareness of breathing, aerobic exercises, and yoga. A positive correlation was also observed between the number of pregnancies and awareness of abdominal and ankle and toe exercises. Conversely, the current month of pregnancy showed negative correlations with awareness of aerobic exercises, yoga, and stationary biking. Monthly family income showed no significant relationship with awareness levels.

Table 2 shows the correlations between socio-demographic and the extent of structured exercise practices. A significant positive correlations was observed between the number of previous pregnancies and ankle and toe exercises, and the month of the current pregnancy and pelvic floor exercises. Significant negative correlations were found between educational attainment and walking practice, and between monthly family income and breathing exercises. Other correlations were not statistically significant.

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Table 3. *Level of Awareness and Extent of Practice*

Profile	Type of Exercise									
	Antenatal	Breathing	Core Exercise	Abdominal	Ankle & Toe	Aerobic	Yoga	Stationary Bike	Recommended Duration	Overall
Walking	0.052	0.010	-0.099	0.014	0.114	-0.106	-0.066	-0.071	0.058	-0.022
Ankle, Toe	0.050	.275*	.206*	0.076	.612*	0.110	-0.003	0.178	.355*	.360*
Abdominal	.192*	0.123	.262*	.359*	0.187	0.040	-0.016	0.073	0.167	.277*
Pelvic	0.184	.260*	.423*	0.184	.362*	0.084	0.087	0.159	.346*	.409*
Breathing	.219*	.416*	.263*	.348*	.429*	0.083	0.170	0.081	.250*	.444*
Stretching	.193*	.304*	.262*	.193*	.417*	0.158	0.114	0.125	.341*	.412*
Relaxation	0.169	.310*	.210*	.196*	.369*	.217*	.258*	0.069	.279*	.409*

Legend: *with * is significant*

Table 3 explores the relationship between the level of awareness and the extent of practice regarding various types of exercise for pregnant women. A strong positive correlation ($r = .612$, $p < .05$) was found between awareness and practice of ankle and toe exercises. Significant positive correlations ($p < .05$) were also observed for abdominal, pelvic, breathing, stretching, and relaxation exercises. In contrast, walking exercise showed a weak overall correlation.

Table 4 presents a six-week structured exercise program developed based on the findings. The program is intended for healthy pregnant women in their third trimester and aims to increase awareness, address misconceptions, and improve safe exercise participation.

DISCUSSION

This study revealed a moderate overall level of awareness regarding structured exercise among the participants. While awareness of certain types of exercises like breathing and ankle and toe exercises were high, awareness of the recommended 150 minutes per week of moderate intensity aerobic activity (per ACOG guidelines) was low. This shows the lack of understanding of the importance of consistent exercise throughout pregnancy, suggesting a gap in perceived susceptibility and severity (HBM) concerning insufficient exercise. This insufficient awareness regarding recommended duration and specific types aligns with Daglas et al.'s (2024) findings on the adequate promotion of exercise by healthcare professionals. Given the healthcare provider's role as reliable sources of health information (Office of Disease Prevention and Health Promotion, 2021), actively promoting exercise throughout gestation is important to enhance perceived benefits and self-efficacy (HBM).

Importantly, the study revealed significant correlations between awareness and practice, particularly for exercises like ankle and toe exercises (reflecting a direct translation of awareness into action) and a positive correlation between educational attainment and exercise practice, which suggests that higher

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Table 4. *Structured Exercise during the Third Trimester*

Formulated Structured Exercise Program for Pregnant Women

Program	Type of Exercise	Starting Position	Technique	Duration or Number of Repetitions
Week 1-2: Introductory program	Pelvic Floor Exercises (Kegel's) *Purpose: strengthen pelvic floor muscles*	Sitting or standing	Squeeze and release, hold for few seconds (like picking something with pelvic floor)	10 repetitions
	Ankle and Toes Exercises *Purpose: Improve circulation, reduce swelling, and increase flexibility*	Sitting	Simple stretches like ankle rotations, toe curls, and pointing toes.	5 minutes
	Gentle Walking *Purpose: Improve cardiovascular function and increase stamina*	Standing	Start slow with comfort and posture focus; build habit then progress.	5-10 minutes
	Deep breathing *Purpose: reduce anxiety and stress, improve oxygen intake, and prepare for labor*	Sitting or standing	Inhale deeply, exhale slowly with purse-lip	5 minutes
Week 3-4: Gradual Progression	Pelvic Floor Exercises (Kegel's)	Sitting or standing	Squeeze and release, hold for few seconds (like picking something with pelvic floor)	10 repetitions
	Ankle and Toes Exercises	Sitting/ Standing	Simple stretches like ankle rotations, toe curls, and pointing toes; add variations such as alphabet tracing with toes	7-10 minutes
	Gentle Walking	Standing	Start slow with comfort and posture focus; build habit then progress.	10-15 minutes
	Deep breathing	Sitting or standing	Inhale deeply, exhale slowly with purse-lip	5 minutes
	Chair Yoga: (optional) *Purpose: Improve flexibility, reduce back pain, and promote relaxation*	Sitting	Simple seated stretches and poses	5 minutes
Week 5-6: Maintaining Momentum	Continue same exercises *Purpose: Maintain physical activity levels and improve overall well-being.*		Adjust as needed; Add short bursts of light exercises such as standing and stretching every 30 mins.	20-25 minutes per day

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educational levels are associated with greater understanding of benefits and increased self-efficacy. However, engagement in other important exercises like abdominal and pelvic floor exercises remained low, emphasizing areas in need for intervention. The discrepancy between awareness and practice suggests that perceived barriers (HBM) outweigh perceived benefits for these exercises. Future research should investigate these barriers, including fear of complications and limited access to resources (Gonçalves et al., 2024; Kianfard et al., 2020), within the specific socio-cultural context of the Philippines.

The negative correlation between the month of pregnancy and the practice of certain exercises (Wojtyla et al., 2019) suggests that perceived barriers related to fetal well-being and physical discomfort increase as pregnancy progresses. This emphasizes the need for interventions that adapt recommendations to the changing physical demands of pregnancy. The lack of correlation between monthly family income and exercises adoption suggests that financial resources are not primary barriers. Other factors, such as access to information and perceived barriers, are more influential. The positive correlation between prior pregnancies and exercise practice suggests that experience and peer support play a significant role (Dudonienė and Kuisma, 2023; Vatansever et al., 2024).

These findings strongly suggest that effective interventions must address several areas. First, targeted health educational campaigns should emphasize the importance of consistent exercise throughout pregnancy, with emphasis on the recommended duration and types of activities, and tailoring the information to different literacy levels, recognizing the health literacy disparities in the Philippines. Second, interventions should directly address the perceived barriers to exercise participation, such as fear of complications and lack of access to resources by providing clear information about exercise safety, creating accessible and culturally appropriate programs, and offering support groups. While walking emerged as the most prevalent activity in the study, it alone does not provide comprehensive benefits of well-rounded exercise program. Third, leveraging the positive correlation between prior pregnancies and exercise adoption, peer support programs could be highly effective. Finally, interventions should adapt exercise recommendations to the changing physical demands of pregnancy, providing modifications for different stages of gestation.

The findings, while specific to Baguio City, offer valuable insights applicable to other factors. The significant correlations between awareness, practice, and sociodemographic factors suggest similar patterns might be observed elsewhere. The identified barriers to exercise participation are likely relevant to pregnant women in diverse settings, although the specific nature of these barriers may vary among different cultures and healthcare system. The proposed structured exercise program on table 4, emphasizing simple, accessible exercises could be adapted for other populations by modifying specific exercises and incorporating culturally appropriate details. The program's core components, i.e., pelvic floor exercises, ankle and toe exercises, and breathing techniques, are generally applicable, but aerobic exercises and yoga might need adjustment based on local preferences and available resources. Integrating exercise education into antenatal care, providing healthcare provider training, and establishing support groups are broadly applicable recommendations. Healthcare providers, including doctors and staff, should actively promote exercise during antenatal visits, tailoring programs to individual needs and addressing specific concerns. The Department of Health could provide crucial education and training for healthcare providers on updated exercise guidelines during pregnancy. Furthermore, establishing support groups for pregnant women, perhaps facilitated by the Baguio Health Services Office, could leverage the positive influence of peer support. Doctors may consider referring pregnant women to physiotherapist for personalized exercise plans. Future research could assess the feasibility and effectiveness of this approach. Finally, further research may evaluate the effectiveness of various programs and exercise interventions. This research

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may explore the generalizability of these findings by replicating the study in diverse populations and settings, while also investigating the specific cultural factors that influence exercise behavior during pregnancy. The study's framework, utilizing the Health Belief Model, provides a useful structure for such future research. The findings should inform broader strategies to reduce maternal mortality in the Philippines, aligning with national health priorities and policies such as the Philippine Development Plan 2023-2028 (Philippine Development Plan 2023-2028 - Philippine Development Plan, 2023).

Limitation of the Study

The study's limitations include having a sample size of 105 third-trimester pregnant women from Baguio City, limiting generalizability to other populations and gestational stages. Qualitative data were absent, hindering exploration of the reasons behind observed correlations. Focusing on Baguio City may limit the applicability of findings to areas with different cultural environment and healthcare access.

CONCLUSION

This study provides major insights into awareness and practice of structured exercise among third-trimester pregnant women in Baguio City, revealing moderate levels of both but emphasizing significant gaps in understanding recommended exercise duration and engagement in exercises like abdominal and pelvic floor exercises. The strong correlation between educational attainment and exercise participation accentuates the need for culturally sensitive health education campaigns tailored to diverse literacy levels. Furthermore, the findings suggest that interventions should leverage the positive influence of previous pregnancy experience and the observed correlations between awareness and practice, while directly addressing perceived barriers related to exercise safety and physical discomfort. By identifying these key factors influencing exercise behavior during pregnancy in Baguio City, this research provides a foundation for developing targeted interventions to improve maternal health outcomes and contribute to the reduction of maternal mortality rates in the Philippines, aligning with national health priorities. Future research should focus on evaluating the effectiveness of these interventions and exploring the underlying reasons for low engagement in specific types of exercise through qualitative methods.

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RESEARCH ARTICLE

Resiliency of Community Health Nurses in Zamboanga City: Basis For Enhancement Program

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ABSTRACT

Introduction: Community Health Nurses (CHNs) are crucial to primary healthcare but face resource shortages, heavy workloads, and health risks that may lead to burnout and attrition. Limited research explores factors affecting their resilience, particularly during health crises in Zamboanga City.
Aim: This study aimed to explore the lived experiences of resilience among CHNs working in Zamboanga City.
Methods: This qualitative study used a phenomenological approach to explore the lived experiences of resilience among ten CHNs in Zamboanga City, this approach provides an in-depth description on the challenges and resiliency of CHNs. Respondents were purposively selected from three health centers with at least one year of experience. Data were gathered via semi-structured interviews and analyzed using thematic analysis, guided by Van Breda's Resiliency Model and Callista Roy's Adaptation Model.
Results: The study revealed that CHNs face multiple challenges—ranging from non-compliant patients and cultural barriers to resource shortages and emotional strain—especially during emergencies. In coping, they employed strategies aligned with Roy's four adaptive modes, reflecting their capacity for self-care, professionalism, problem-solving, and reliance on social support.
Conclusion: CHNs in Zamboanga city are resilient, effectively using coping strategies despite numerous workplace challenges. To enhance their resilience and to strengthen the healthcare programs, administrations, policies and healthcare services, adequate resources, continuing training, and institutional support must be provided among CHNs.

Keywords: *Challenges, Community Health Nurses, Phenomenology, Resiliency, Thematic Analysis*

INTRODUCTION

In the field of healthcare, community health nursing serves as the cornerstone of primary care delivery, bridging the gap between healthcare facilities and the communities they serve. It is a specialized field that combines public health, general nursing, and social support. Its purpose is to function as part of a larger public health initiative, working to improve health, enhance social and physical surroundings, and help people recover from illness and disability (WHO, 2017).

Community health nurses (CHNs) promote and maintain the health of individuals and communities, but they face significant challenges like limited resources, high patient volumes, and health risks, including those posed by the COVID-19 pandemic. These challenges can lead to emotional exhaustion and psychological stress (Ooijen et al., 2023; Terry et al., 2019), contributing to nurses leaving the profession.

CHNs' resilience is vital to their well-being and their ability to deliver quality care. While some research suggests demographic factors like marital status, having children, or higher education might be linked to higher resilience (Umaki et al., 2012), the evidence is not conclusive.

However, work experience appears to play a more significant role; newer nurses often show lower resilience due to adaptation stress, lack of confidence, and limited coping strategies (McGarry &

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Grabowski, 2021). More experienced nurses, on the other hand, tend to have a better understanding of their communities, stronger relationships, and more developed coping mechanisms, all of which contribute to greater resilience.

Resilience itself is an individual's ability to adapt and recover from adverse environments while maintaining physical and mental health during stressful events (Lin et al., 2019; Patel et al., 2017). It is influenced by individual traits, organizational culture such as the workplace (Afshari et al., 2021; Esterwood & Saeed, 2020; Huey & Palaganas, 2020), community dynamics and sociopolitical contexts (Poudel-Tandukar et al., 2019). Community Health Nurses (CHNs) in the Philippines demonstrate exceptional resilience, defined as their capacity to adapt, persevere, and maintain the delivery of essential health services despite systemic challenges and crisis situations. This resilience is deeply rooted in a strong sense of personal commitment and professional responsibility to protect and promote public health, especially in resource-constrained and high-risk environments.

Despite the critical role of CHNs and the documented challenges they face, there is a significant lack of studies specifically examining resilience among them during stressful events, particularly within the context of Zamboanga City. Therefore, to ensure the continued effectiveness of community health nursing services, it is crucial to explore the resilience of CHNs in Zamboanga City. The findings will provide valuable insights into the factors that foster resilience among CHNs and offer practical recommendations to strengthen resilience for them and other healthcare professionals facing similar demanding work conditions. Ultimately, the findings will have direct implications for improving CHN practice in Zamboanga City and informing healthcare policies that support the well-being and retention of these essential healthcare providers.

METHODS

Design

The study utilized a qualitative research design through a phenomenological method that emphasizes the CHNs' lived experiences. This approach provides detailed description of resilience, lived experiences and feelings of community health nurses.

Participants

The sample size was determined based on the principle of data saturation; The study included 10 participants from three health centers in Zamboanga city. Maximum variation was ensured by selecting participants who had at least one year of experience and represented diverse backgrounds in terms of religion, civil status, specialties, job positions, and education levels to capture broad range of perspective. Both female and male CHNs were interviewed (Table 1).

Setting of the study

The research was conducted in selected community health centers in Zamboanga City, a location noted for experiencing natural disasters and accidents. This setting was chosen because it provided a valuable context with CHNs who had direct experience with professional challenges and documented instances of resilience during difficult times.

Data Collection

The researcher interviewed the participants utilizing a validated interview guide consisting of two parts. Part I consists of the demographic data and Part 2 consists of the questions pertaining to challenges and coping strategies. The interview was carried out in October 14 and 15, 2024. Three experts in the field of research and community health nursing were consulted for the validation of the instrument. Their suggestions were incorporated in the questionnaire to ensure that the tool indeed facilitated to gather the data to answer the statement of the problem.

Table 1. *Profile of the Participants*

Profile		f
Age	31-40 years old	5
	41-50 years old	3
	51-60 years old	2
	Total	**10**
Civil Status	Single	2
	Married	8
	Total	**10**
Religion	Roman Catholic	6
	Islam	3
	Protestant	1
	Total	**10**
Educational Attainment	With Master's degree	1
	With MA units	1
	College Graduate	8
	Total	**10**
Employment Status	Permanent	3
	Contractual	4
	Others	3
	Total	**10**
Work Experience	1-5 years	3
	6-10 years	3
	11-15 years	1
	16 years or more	3
	Total	**10**

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Ethical Consideration

Ethical clearance was secured from the Research Ethics Oversight Committee at Western Mindanao State University in Zamboanga City (Code No. 2024 -GS-0645). Participants signed a written informed consent, which thoroughly explained the study's purpose, voluntary nature of participation, agreement to record interviews, freedom to disclose or withhold information, right to withdraw at any time, right to be informed of results, potential benefits, and confidentiality/anonymity.

Data Analysis

Data from the open-ended interviews were analyzed using Braun and Clarke's (2006) deductive thematic analysis framework, guided by van Breda's Model and Roy's four adaptive modes. The process involved six key steps:

1) Familiarization With the Data. The researcher read and re-read the transcripts to get initial ideas about the potential patterns related to the research problem.
2) Generating Initial Codes. The data was coded by the researcher according to the predetermined framework of van Breda's Model and Roy's four adaptive modes.
3) Searching for Themes. The coded data were reviewed by the researcher for consistency and overlaps. Similar codes were grouped together into the pre-identified themes.
4) Reviewing Themes. The identified themes were further examined by the researcher for coherence, consistency, and meaningful connections. Redundant themes were merged to enhance thematic clarity and coherence.
5) Defining and Naming Themes. Each theme was defined by the researcher, specifying its scope and relevance to the research question. Sub-themes were also identified to capture more detailed aspects of the main theme.
6) Synthesizing findings for the report. The researcher incorporated the participants' narratives to support each theme to enhance clarity, coherence, and depth, ensuring that the themes accurately reflect the experiences and perspectives of the participants.

Following Braun and Clarke's (2006) framework, the researcher first immersed themselves in the collected data, reading and rereading the transcripts to gain a thorough understanding and noting initial ideas. Next, the researcher systematically generated initial codes across the entire dataset, labeling meaningful segments that captured their essence. Then, the researcher began the process of searching for potential themes by examining the codes, grouping related ones, and identifying broader patterns of meaning. These initial themes were then rigorously reviewed against the coded data and the complete dataset to ensure they were well-supported and coherent, leading to some being refined or discarded. Subsequently, the researcher clearly defined and named each viable theme, articulating its core essence and significance. Finally, the researcher selected compelling excerpts from the data to illustrate each theme and constructed a detailed narrative of the analysis, connecting the identified patterns to the research questions and existing literature. This iterative process allowed for a rich and insightful understanding of the key themes within the participants' experiences.

Moreover, Callista Roy's Adaptation Model (RAM) provides a valuable framework for understanding the resilience of CHNs, as it emphasizes the dynamic process of adaptation to internal and external stimuli in their workplace (Fig. 2).

- Resilience, within this context, can be analyzed through the model's four adaptive modes: physiologic-physical, self-concept-group identity, role function, and interdependence (Roy, 2009).

- Physiologic-Physical Mode. This mode addresses the body's basic needs and functions, such as energy, hydration, and rest, as well as responses to stressors. For nurses, resilience in this domain includes maintaining physical health amidst demanding work environments.

- Self-Concept-Group Identity Mode. This mode refers to nurses' perception of themselves within a group, encompassing their beliefs, feelings, and sense of belonging within that group, essentially how they see themselves as part of a larger social identity. A nurse's self-concept is crucial in navigating challenging situations and maintaining a sense of purpose and confidence.

- Role Function Mode. This mode pertains to the roles nurses assume within their professional and personal lives, balancing responsibilities and expectations. Resilience in this mode involves fulfilling professional duties

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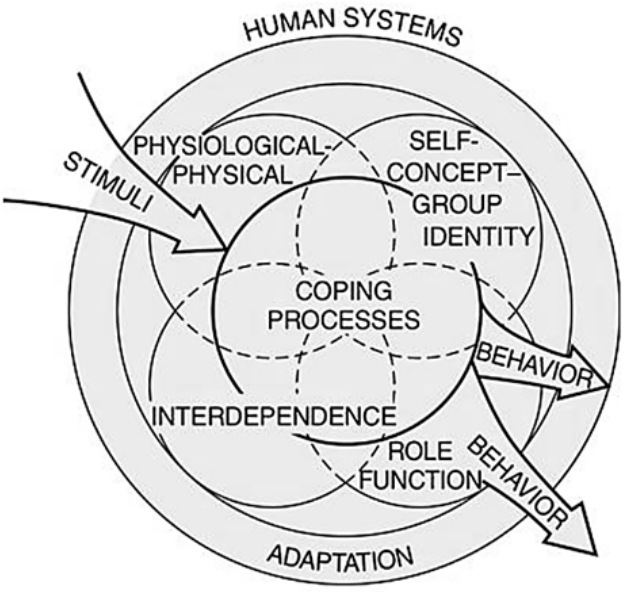
despite challenges while maintaining boundaries to prevent burnout.

- Interdependence Mode. This mode emphasizes relationships and social support systems. Resilient nurses engage in healthy interdependence, forming supportive professional and personal networks.

According to RAM (2009), resilience is a manifestation of effective adaptation. Nurses constantly encounter focal, contextual, and residual stimuli, such as patient emergencies, organizational policies, or prior experiences. Their ability to process these stimuli and respond constructively reflects their resilience.

By integrating the RAM in Van Beda's Model, the study can offer valuable insights into how CHNs maintain their well-being and adapt to the challenges of their work. This knowledge can inform strategies to support their resilience and ultimately, improve the quality of care they provide to the community.

Figure 2. *Roy's Adaptation Model*



Note. From Roy, C., & Andrews, H. (1999). The Roy adaptation model (2nd ed.). Upper Saddle River, NJ: Pearson.

RESULTS & DISCUSSIONS

Community Health Nurses (CHNs) face a complex array of challenges in their profession, ranging from difficult patient interactions to resource limitations and interpersonal conflicts. Despite these hurdles, CHNs demonstrate remarkable resilience through various coping strategies, often aligning with adaptive modes that prioritize their physical, emotional, and social well-being. In the Philippines, CHNs face a range of systemic and operational challenges that significantly impact their effectiveness and overall well-being in the workplace.

Guided by the conceptual framework, the results are presented based on the order of the research questions in the statement of the problem, with corresponding excerpts from the interviews of community health nurses (CHNs).

For this study, the resilience model of Van Breda integrating Roy's four adaptive modes as coping strategies, were adapted. (Figure 3)

To understand the resilience of Community Health Nurses (CHNs) in Zamboanga City, this study acknowledges that they navigate various adversities within their personal and professional lives, defined as stressful, traumatic, or difficult situations encountered during their community duty. The identified challenges – difficult patients, communication barriers, resource limitations, vaccine hesitancy, interpersonal conflicts, equipment issues, and workload – represent significant risk factors, as described by van Breda's theory, potentially hindering their well-being and service delivery.

Moreover, the diagram highlights that CHNs employ diverse coping strategies, acting as protective factors, which align with Roy's Adaptation Model's four adaptive modes. Their Physiologic-Physical coping involves self-care and boundary setting; Self -Concept-Group Identity focuses on positive self-perception; Role Function emphasizes problem-solving and professional conduct; and Interdependence leverages support systems and professional growth. Through these adaptive strategies, CHNs

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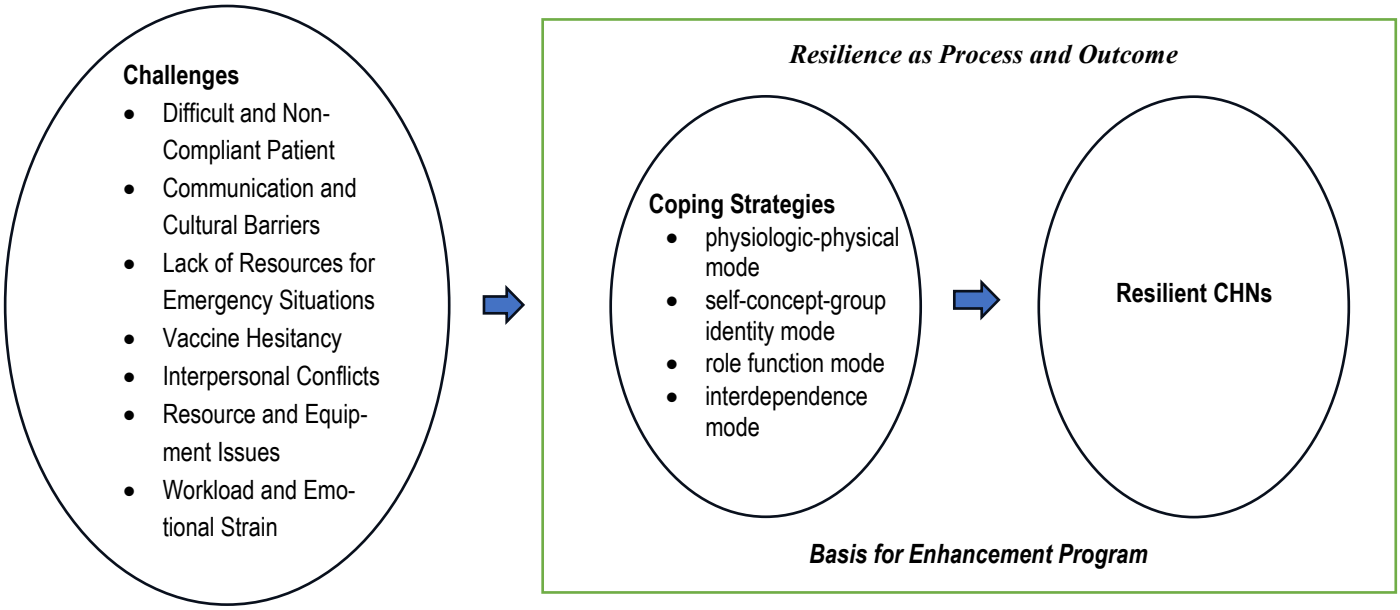

demonstrate resilience as a dynamic process—navigating and overcoming adversity, surpassing expectations, and emerging stronger from their experiences.

CHNs frequently encounter significant stressors in their day-to-day work, impacting their professional and personal lives.

Below are the themes culled out from the responses of the participants to the first research question:

Challenges Encountered by Community Health Nurses

- Difficult and Non-Compliant Patients
- Communication and Cultural Barriers
- Lack of Resources for Emergency Situations
- Vaccine Hesitancy
- Interpersonal Conflicts
- Resource and Equipment Issues
- Workload and Emotional Strain

Difficult and Non-Compliant Patients

A major source of stress for CHNs is dealing with uncooperative, non-compliant, or strongly opinionated patients. This includes patients who resist understanding their health situations due to firmly held beliefs or fail to follow prescribed treatment plans, as mentioned in these transcripts:

> *"Some stressful events in my workplace is when dealing with patients that don't want to understand the situation and insisted what they believe in" (Respondent 1)*

> *"When patients don't follow through with the treatment plan. This can be frustrating and stressful" (Respondent 2)*

This non-adherence can stem from various factors such as patients' beliefs, understanding levels, and psychological stressors, leading to increased frustration and stress for the nurses. Several studies confirm the high emotional toll this takes on healthcare providers, highlighting how patient resistance and non-compliance exacerbates the caregiving role and creates a challenging environment for effective treatment (Gong et al., 2020; Umaki et al., 2012; Tarrier & Bobes, 2000).

Communication and Cultural Barriers

This theme pertains to the CHNs experiences when serving diverse populations which present challenges in communication and cultural understanding:

> *"...serving diverse populations, the staff may face language or cultural barriers that can complicate communication" (Respondent 3)*

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Language barriers significantly hinder effective communication, especially in diverse regions. Organi et al. (2024) report that healthcare staff struggle with patients lacking proficiency in the dominant language, affecting diagnosis and treatment. Morgan (2019) found that confusion over cultural norms leads to care gaps. Cultural competency training was identified as a key solution, promoting respectful, effective communication and improving healthcare delivery for diverse populations.

Lack of Resources for Emergency Situations

This theme highlights the stress experienced by the CHNs during emergency situations with limited resources:

> *"Some stressful events in the health center include patients on emergency situations… The reason it gives me stress is the lack of equipment to aid those patients…" (Respondent 4)*

Numerous studies have highlighted the intense stress placed on healthcare workers during emergency situations due to inadequate resources. The lack of equipment and support during critical moments not only affects the quality of care but also significantly contributes to the occupational stress experienced by healthcare professionals (Basu, 2017; Rondeau & Francescutti, 2005).

Vaccine Hesitancy

This theme pertained to the experiences of CHNs during the COVID-19 pandemic, highlighting vaccine hesitancy as a significant challenge:

> *"During Covid vaccination, most people did not want to get vaccinated. As health care workers, it was hard for us to explain and convince patients to have it" (Respondent 5)*

> *"The Covid-19 pandemic has unprecedented challenges, including the need for widespread vaccination… a significant population remains hesitant to receive them" (Respondent 6)*

As highlighted by Lu (2022), global studies revealed that vaccine hesitancy was a major challenge during the COVID-19 pandemic, driven by cultural, psychological, and informational factors. This resistance placed added stress on nurses, who faced increased workloads and emotional strain while promoting vaccination.

Interpersonal Conflicts

This theme shows that disagreements and misunderstandings with colleagues serve as a significant source of stress for CHNs, as illustrated in these statements:

> *"Disagreement with workmates in some events like plannings..." (Respondent 7)*

> *"Conflict or misunderstanding between workmates" (Respondent 8)*

> *"Co-worker conflict" (Respondent 9)*

According to Naeem et al. (2023), disagreements among coworkers are common and can adversely affect team dynamics and individual stress levels. For instance, interpersonal conflicts within the workplace create a highly-stressed environment, negatively impacting job performance and overall employee well-being. Increased workplace stress correlates with high competition and pressures, often leading to misunderstandings among colleagues (Castellini et al., 2022).

Resource and Equipment Issues

This theme shows that the outdated equipment and technological issues contributed to the increased workload and stress experienced by CHNs:

> *"Materials or equipment not updated, also technology or computer problems" (Respondent 9)*

Shortages and outdated equipment intensified the pressure on healthcare professionals during the pan-

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demic (Libretti, 2022), leaving many nurses feeling unprepared to meet the demands of their roles. This lack of resources heightened their anxiety and contributed to a decline in the quality of patient care. As Silva and Moura (2014) emphasize, these challenges highlight the critical need for healthcare systems to invest in modern equipment to reduce stress and support nurses in delivering safe, effective care.

Workload and Emotional Strain

This theme highlights how extended working hours contribute to emotional strain among CHNs:

> *"Responding to emergencies like disease outbreaks or natural disasters leading to long hours and emotional strain" (Respondent 10)*

Nurses often experience extreme workloads during public health emergencies resulting in prolonged hours of work and heightened emotional strain (He et al., 2024). This indicates that healthcare workers must not only manage the demands of their roles but also the psychological pressures that arise from high-stress environments.

Guided by Roy's four adaptive modes, the themes identified for coping strategies are as follows:

Physiologic-Physical Mode of Coping

Under this mode of coping are actions that maintain the physical and physiological integrity of the CHNs:

Relaxation Techniques:

> *"I always practice mindfulness to reduce stress with deep breathing exercise..." and "By taking breaks and tour to recharge my energy and refresh my mind so as to relax my body" (Respondent 1)*

> *"Do deep breathing for a few moments" (Respondent 4)*

Literature emphasizes the effectiveness of relaxation methods for reducing anxiety and burnout in nurses, including progressive muscle relaxation and guided imagery (Pamungkas, et al., 2023; Gangadharan & Madani, 2018). Relaxation not only calms the mind but also decreases physiological stress responses, enabling nurses to sustain their care quality. Training in such techniques has shown measurable improvements in psychophysiological health of nurses.

ROY'S FOUR ADAPTIVE MODES

Coping Strategies Employed by Community Health Nurses	*Physiologic-Physical Mode of Coping*	Relaxation Techniques: Set work-home boundaries: Task Delegation and Collaboration: Knowledge Seeking and Empowerment: Protective Practices: Prioritization of Self: Nutrition:
	Self-Concept-Group Identity Mode of Coping	Coping with Emotional and Psychological Challenges: Recognizing and celebrating achievements: Maintaining a Positive Self-Image: Handling Criticism and Negative Feedback:
	Role Function Mode of Coping	Strategies in Managing Stress to Prevent Burnout: Professional Learning and Growth Strategies: Family Support in Managing Work-Related Stress:
	Interdependence Mode of Coping	Peer Understanding and Cooperation at Work:

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Set work-home boundaries:

"I won't bring work to home" (Respondent 5)

"Establish clear boundaries between work and home" (Respondent 10)

CHNs can prioritize mental and physical health by establishing clear boundaries between work and personal life (PMC, 2023) to safeguard their mental health. Such practices could include limiting work-related thoughts at home and investing time in activities that contribute to personal well-being, further reinforcing the notion that a balanced life enhances professional resilience.

Task Delegation and Collaboration:

"*Delegate tasks to other team members" and "Collaborate with colleagues for shared responsibilities and emotional support" (Respondent 4)*

Studies shows that appropriate task delegation among nursing teams can reduce job-related stress and protect physical health (Edwards, 2018; Barrow & Sharma, 2020). Moreover, collaboration within nursing leadership improves teamwork, nurse satisfaction, and efficiency, indirectly mitigating burnout.

Knowledge Seeking and Empowerment:

"Read more articles about health issues" (Respondent 6)

"Educating patients using their own language" (Respondent 7)

Empowerment through acquiring health knowledge enables nurses to better care for themselves and their patients (Singh & Chatterjee, 2017). Nursing education that fosters empowerment and leadership skills improves confidence and professionalism, which are linked to reduced stress and enhanced job satisfaction.

Protective Practices:

"Wear appropriate gear to protect against waterborne diseases" (Respondent 4)

Studies by Amer, Eltahery, & Bakr (2024) validate the importance of personal protective equipment (PPE) and strict hygiene measures among nurses, particularly in community settings, to safeguard physical health.

Prioritization of Self:

"Don't be afraid to decline additional task." and "Make time for activities that promote well-being" (Respondent 10)

The prioritization of self-care activities, including scheduling rest and declining additional responsibilities, is critical in preventing burnout. Research advocates embedding self-care into nursing culture to foster professional longevity (Gantt, & Haberstroh, 2023).

Nutrition:

"Eat regular and balanced meals…" (Respondent 2)

"Take supplements like vitamins and proper hydration…" (Respondent 3)

"Reduce caffeine intake…Take time to eat nutritious food/snacks without distraction to enhance digestion" (Respondent 4)

"Frequent, small meals help maintain stable blood sugar levels and sustained energy throughout the day" (Respondent 7)

"Don't forget to eat even just snack and hydrate yourself" (Respondent 9)

"Eat balanced diet…" (Respondent 10)

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Proper nutrition supports both cognitive function and physical stamina, critical for nurses managing demanding healthcare roles (Reed, 2014). Reducing caffeine intake and limiting screen time is well-supported by studies demonstrating caffeine's disruption of sleep quality and the detrimental effects of excessive screen exposure on circadian rhythms and mental restfulness.

Self-Concept-Group Identity Mode of Coping

Under this mode of coping are strategies that the CHNs used to maintain their sense of self-worth and identity:

Coping with Emotional and Psychological Challenges:

"Practice self-care through adequate rest and sleep, healthy lifestyle" (Respondent 1)

"Practicing mindfulness to calm mind and deep breathing" (Respondent 2)

"Be with my family and friends" (Respondent 3)

"Talk to colleagues and friends" (Respondent 4)

"Connecting with friends" (Respondent 5)

"Stay focused. Do things one at a time. Take rest if needed" (Respondent 6)

"Engaging in my personal activities at home" (Respondent 7)

"Letting my emotions out by talking to someone I can trust" (Respondent 8)

"Run to my family for their support" (Respondent 9)

"Establish clear boundaries between work and personal life" and "Deep breathing or calming music" (Respondent 10)

Respondents largely emphasize self-care and relational support as primary coping methods. Practices such as mindfulness, deep breathing exercises, connecting with family and friends, and sharing experiences with colleagues support emotional regulation and stress reduction. These findings align with literature from Malek and Maakip (2020) promoting social support, mindfulness-based stress reduction, and boundary setting as effective coping strategies in nursing.

Recognizing and celebrating achievements:

"I usually give myself credits and rewards when I feel I give what is due to my constituents because helping them is also my achievement" (Respondent 1)

"By rewarding myself. Caring for yourself allows you to recognize that your well-being is also a priority, reinforcing the importance of balance in such a service-oriented role" (Respondent 2)

"Treat myself like giving rewards by buying something which I like most" (Respondent 3)
"Celebrate with the team through outing or picnic" (Respondent 4)

"Usually, I treat myself to some good food or gifting myself by buying something in my wants list'" (Respondent 8)

"Ask colleagues, supervisors or patients for feedback on your work. Positive feedback can boost your confidence and reinforce your sense of accomplishment; set realistic goals for yourself and track your progress towards achieving them. Celebrate your achievements, both big and small" (Respondent 10)

Acknowledgement of professional achievements primarily involves self-reward and social sharing. Respondents employ rewarding themselves with treats or gifts, celebrating with colleagues through outings or shared experiences, and reflecting on the

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positive impact of their work. Sharing success fosters a positive work environment and mutual reinforcement of accomplishments. These practices nurture professional dignity and psychological well-being, reinforcing motivation and job satisfaction (Baxter et al., 2024).

Maintaining a Positive Self-Image:

"Always feeling and thinking positively" (Respondent 1)

"Practicing self-compassion, focusing on growth" (Respondent 2)

"Understand it's okay to make mistakes" (Respondent 4)

"Remind myself why I became a nurse" (Respondent 7)

"Do my work with my best" (Respondent 9)

Respondents maintain positive self-image by cultivating optimistic attitudes, practicing self-compassion, and focusing on growth and personal values. Acceptance of human fallibility is also vital and professionalism despite external influences indicates resilience. This reflects psychological theories asserting that self-compassion, positive cognition, and purposeful engagement strongly buffer against occupational stress and sustain nurses' self-image (Hagerman, 2020).

Handling Criticism and Negative Feedback:

"Think of it as a constructive criticism, where you can learn from it" (Respondent 3)

"Remind myself that everyone makes mistake and that criticism is a part of the learning process" (Respondent 4)

"I stay open-minded, and I make sure to listen to their concerns without immediately reacting to fully understand their perspectives" (Respondent 7)

"I just listen to what some people say, talk about it to someone then ignore those people" (Respondent 8)

"Pay attention to the feedback and try to understand the perspective of the person giving it …Use the feedback as an opportunity to identify areas where you can improve" (Respondent 10)

A key mode of coping with criticism involves reframing it as constructive and an opportunity for growth. The collective approach underscores emotional regulation and reflection as essential to effectively handle workplace feedback (Yumiya et al., 2019).

Role Function Mode of Coping

Under this mode of coping are ways on how CHNs fulfill their roles effectively, whether professional or social, to meet social integrity:

Strategies in Managing Stress to Prevent Burnout:

"Take regular break at work and spend time with loved ones and make it a memorable one" (Respondent 1)

"Have time to relax away from work and spend time with family" (Respondent 3)

"Taking short breaks during workdays for rest and recharge" (Respondent 4)

"Going out and spending time with my family, friends, and loved ones" (Respondent 5)

"Prioritize self-care, hydrate, set boundaries, learn to say no, communicate with supervisor, prioritize sleep, eat balanced diet, practice ergonomics, take vacations, take breaks between task" (Respondent 10)

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According to Yalim et al., (2024), regular breaks and social support are foundational stress management tactics for healthcare professionals, mitigating fatigue and emotional exhaustion that contribute to burnout. Relaxation practices have also been linked to reductions in anxiety and burnout symptoms (Shoji, 2024). Collectively, these approaches align with established stress coping mechanisms such as problem-focused coping, active coping, and social support that have demonstrated efficacy in healthcare settings

Professional Learning and Growth Strategies:

"Set clear goals in career and life" (Respondent 1)

"Continual practice and learning from seminars or workshops" (Respondent 3)

"Seek opportunities" (Respondent 5)

"Attend conferences, seminars, and district meetings to update knowledge and exchange ideas" (Respondent 7)

"Learn from working with different health workers and patients; ask questions if unsure" (Respondent 9)

The above learning strategies correspond closely with scholarly views of Shinners & Graebe (2020) that healthcare professionals engage in lifelong learning through both formal avenues—such as continuing education and professional development programs—and informal routes like experiential learning and peer collaboration. Continuing professional development (CPD) is crucial for maintaining competency given rapid advancements in healthcare and technology, supporting the need for ongoing skill acquisition and reflective practice. Studies by Kläser (2018) emphasize the role of self-assessment and goal-driven learning in fostering reflective practitioners capable of adapting to evolving clinical contexts. In addition, despite limited access to formal professional development, many CHNs take initiative in informal learning and community-based training to enhance their competencies in leadership, disaster preparedness, and preventive care.
The integration of seminars, workshops, and conferences provides structured forums for updating knowledge and networking, contributing to overall professional growth.

Interdependence Mode of Coping

This mode of coping focuses on the CHNs' social support systems and meaningful relationships that foster adaptation.

Family Support in Managing Work-Related Stress:

"Having a strong support system, especially from my family will really deduce my stress from work" (Respondent 1)

"Family is important above all. Mingle with people that gives you positive vibes" (Respondent 6)

"Having people who truly understand the unique pressures...my family is my diary, especially my daughter" (Respondent 7)

These views align closely with the study of Amalia, Fithri, & Bachtiar (2020) in Bangladesh showing that social support from family significantly buffers the effects of work-related stress. For instance, railroad workers with low support were far more likely to experience stress, while farmers, despite demanding work, coped better with strong family ties. Frontline working mothers and married veterinarians also relied on emotional and instrumental family support, highlighting its vital role in managing stress and promoting well-being across diverse and high-pressure professions.

Peer Understanding and Cooperation at Work:

"It is important that you and your workmate or duty-mate understand each other in order to finish your work earlier and less stress" (Respondent 9)

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The importance of mutual understanding between workmates to reduce stress and improve work efficiency is supported by studies indicating that peer support and positive work relationships are associated with lower stress levels. For example, research among academic staff in Ireland reveals that peer support is linked to reduced work-related stress risk, with social dynamics among coworkers alleviating stress (Foy, 2015). Another study highlights how fostering cooperative environments and supportive cultures within organizations can significantly reduce work-related stress (McClure & Moore, 2020). Supportive networks play a critical role in reinforcing this resilience. Collaboration with barangay health workers (BHWs), midwives, local leaders, and community organizations fosters shared accountability, peer encouragement, and emotional support, all of which help mitigate stress and prevent burnout.

The resilience of Filipino CHNs is further shaped by deeply embedded cultural values and societal strengths. The concepts of *bayanihan* (communal unity) and *malasakit* (compassionate concern for others) serve as moral anchors, motivating nurses to serve with empathy and dedication—even in the absence of adequate compensation or recognition (Castro-Palaganas et al., 2017).

This resilience also reflects broader Filipino cultural characteristics. Filipinos are known for their strong social support systems, drawing emotional and practical strength from family, friends, and their communities (Dela Cruz et al., 2014). Many CHNs come from the very communities they serve, creating a strong sense of mutual connection and shared purpose. Furthermore, faith and spirituality are central to Filipino life, often providing both comfort and strength during difficult times. Nurses may draw upon their faith to offer both emotional and spiritual support to their patients (Dela Cruz et al., 2014).

Ultimately, it is the combination of social solidarity, cultural values, spiritual strength, and professional dedication that underpins the remarkable resilience of public health nurses in the Philippines. These nurses routinely go beyond their job descriptions—often addressing broader community needs—demonstrating a level of commitment that is both inspiring and essential to the health of the nation (Fajardo & Maglaya, 2013).

CONCLUSION

The findings of this study highlight the resilience of CHNs in Zamboanga City as they navigate various workplace challenges. Despite facing difficulties such as patient non-compliance, cultural and communication barriers, resource limitations, vaccine hesitancy, interpersonal conflicts, and emotional strain, the CHNs employ a range of coping strategies to maintain their well-being and professional effectiveness. Their resilience is evident in their ability to integrate self-care, professionalism, problem-solving, and strong support systems into their daily practice.

For nursing management, understanding how these challenges act as stimuli impacting CHNs' adaptive modes is crucial for developing an enhancement program for resiliency of CHNs. Furthermore, for administrators within the City Health Office, recognizing this relationship underscores the need for interventions that bolster protective factors and mitigate risk factors, such as providing adequate resources, fostering supportive work environments, and facilitating skills development, ultimately sustaining effective healthcare services in the face of recurring challenges.

In light of the findings, it is recommended that nursing administrators develop and implement a structured Resiliency Enhancement Program to support the Community Health Nurses (CHNs). This program should be multidimensional, focusing on the psychological well-being, preventive mental health strategies, and administrative support systems necessary for sustaining effective healthcare delivery in the community. Key components of the program should include:

1) Psychological Support and Preventive Care. Regular mental health check-ins, stress management workshops, mindfulness training, and access to counseling services to help

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CHNs manage emotional strain and prevent burnout.

2) Skills Development and Professional Updates. Continuous capacity-building activities such as seminars on culturally sensitive communication, conflict resolution, and updates on health trends, including vaccine education and emergency preparedness.

3) Administrative and Structural Support. Establish clear administrative protocols that address workload management, provision of adequate resources, and fair delegation of tasks. Integration of feedback mechanisms where CHNs can voice concerns and suggest improvements.

4) Sustainability and Evaluation. Equip CHNs with competencies not only in clinical care but also in self-regulation, teamwork, and leadership. Periodic evaluations should be conducted to assess the effectiveness of the program and adapt it based on evolving challenges.

This initiative will not only strengthen the resilience and well-being of CHNs, but also serve as a foundation for sustainable community healthcare, ensuring that nurses remain empowered, supported, and capable of delivering high-quality care amidst adversity.

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CONFLICT OF INTERESTS

There were no identified conflict of interest influencing the outcome of the study.

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Resilience in nursing is best described as "not the absence of adversity, but the adaptive capacity to transform challenges into strength". It thrives when "nurses set boundaries, seek support, and care for themselves"—adaptive actions that preserve both their health and their professional integrity.

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RESEARCH ARTICLE

Factors Associated with Infection Prevention And Control (IPC) Practices among Primary Healthcare Nurses in Saudi Arabia

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ABSTRACT

Introduction: Adequate training in infection prevention has been associated with improved knowledge and better practice adherence among nurses. This study aims to assess the factors associated with infection prevention and control (IPC) practices among primary healthcare nurses, providing a much-needed focus on this critical group within the healthcare system.
Methods: This cross-sectional study assessed IPC practices among primary healthcare nurses in Aljouf City, Saudi Arabia, from March-April 2023, using a WHO-adapted questionnaire. Data were analyzed via descriptive statistics and multiple regression. This study was conducted with the approval of the University of Hail Institutional Review Board (H-2022-032).
Results: Primary healthcare nurses demonstrated an "Advanced" overall level of IP practices (283/335), but the "Infection Control Programme" was at an "Intermediate" level (29.99).Tests of differences revealed no significant variations in IPC scores by age, gender, or nationality. However, significant differences were found by educational attainment (master's vs. baccalaureate, p=0.020), years of service (5-10 years vs. others, p=0.034), and IPC training (trained vs. untrained, p=0.028), with higher scores observed in nurses with master's degrees, 5-10 years of service, and IPC training. Multiple regression analysis confirmed these findings, indicating that educational attainment, years of service, and IPC training were significant predictors of IPC practice scores.
Conclusion: This study highlights that primary healthcare nurses demonstrate advanced IPC practices, but the "Infection Control Programme" lags behind. Education, years of service, and training are key predictors of IPC proficiency, suggesting that interventions aimed at enhancing these areas will effectively improve IPC outcomes. These findings emphasize the need for continuous professional development and strategic program enhancements to ensure optimal infection prevention and control.

Keywords: *Infection Prevention and Control (IPC), Primary Healthcare, Nurses, Healthcare Workers*

INTRODUCTION

Infection prevention and control (IPC) methods are essential in service delivery, including within primary care where nurses function as the first line of defense in the delivery of health services. Similarly, the World Health Organization (WHO) saw strong IPC practices as one of the strategies to mitigate healthcare-associated infections (HAIs) and healthcare quality in general (Sahiledengle et al., 2021). As primary health care providers, nurses have several IPC practices to follow, inclusive of handwashing, wearing personal protective equipment (PPE), and all other forms of disinfection (Desta et al., 2018). As much as these have been adopted, other issues like resource constraints, absence of teaching platforms, and poor compliance among professionals continue to exist (Jemal et al., 2020; Bekele et al., 2020).

It has been documented those attitudes, perceptions, and even interpersonal relations of nurses working in primary healthcare facilities are used as significant predictors of compliance with IPC protocols (Mustafa & Lahu, 2019). For example, adequate training in infection prevention has been linked with increased knowledge and consequently improved practices among nurses (Sarani et al., 2015). Lack of adequate institutional support, such as the nonexistence of IPC committees and poor funding, undermine spending on IPC practices (Ogoina et al., 2015; Keleb et al., 2023). Notwithstanding, many

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healthcare professionals report being constrained by excessive workload, time pressure and lack of infection prevention resources that obstruct full compliance with established standards (Ogoina et al, 2015; Tafere et al, 2024). There is not enough literature that analyzes what primary health care nurses face as barriers and facilitators in the IPC implementation processes within the Saudi Arabian health system. Existing literature focuses on the hospital setting or offers a general description of health personnel without differentiating them by staff, especially nursing, (Tafere et al, 2024). Moreover, little attention is given to how individual factors such as a nurse's attitude towards risk and previous infection history affect compliance with IPC procedures in primary care nursing (Deryabina et al., 2021). This is gap clearly shows that there is a need for specific research to assess the socio-cultural and occupational factors that affect adherence to IPC practices among primary health care nurses.

Filling this gap has real features in promoting patient safety and improving health outcomes. A better understanding of the causes of nurses' IPC practices may foster the design of more focused training programs and better resource allocation within the healthcare facilities (Sahiledengle et al., 2018). Protecting the health of patients and health workers requires nursing workforce familiarization with operative IPC practices on the interdisciplinary level (Jemal et al., 2020; Cioffi & Cioffi, 2019). Hence, this research seeks to determine the correlates of IPC practices among nurses in primary healthcare, bringing attention to an important segment of the health workforce.

METHODS

Research Design

This was a descriptive cross-sectional study which emphasizes the assessment of a given population's status at a particular point in time to observe, recognize, and examine the relationship between a set of variables without attempting to ascertain causation. With this design, the researchers were able to capture the status of infection prevention and control (IPC) practices among primary healthcare nurses by measuring them at a single point in time.

Population/Sampling

The study included 189 staff nurses (94.5%) from primary healthcare centers in Aljouf City, Kingdom of Saudi Arabia, who had direct patient contact. This sample size met the Raosoft calculator's (http://www.raosoft.com/samplesize.html) requirement of 189 participants, based on a 95% confidence level and 5% margin of error. Although 200 nurses were invited to account for attrition, 189 ultimately participated via convenience sampling. Participation criteria required nurses to be employed at the centers for at least six months, be willing to participate, and be English literate, as the survey was in English.

Setting

The study was conducted at primary healthcare centers in Aljouf City, Saudi Arabia. These centers are essential institutions within the healthcare system that work towards attaining health goals and strategies that strengthen the idea that primary healthcare is central to service delivery. Among the focus of these centers is the provision of holistic patient-centered care, which include preventive and rehabilitative measures and the continuity of care to patients in and out of the geographic area.

Data Collection

When collecting data, the researchers held preliminary discussions with the health authorities supervising the primary healthcare centers to notify them about the research objective. Preliminary sessions were conducted
to explain the aims and importance of the study to potential participants and guarantee that they were aware of their entitlements, including the ability to withdraw from the study at any stage. Although there was no formal written consent granted, completing the questionnaire was considered consenting to participate in the study. The participants were informed that the results may be published in scientific journals or presented at research conferences.

The participants were asked to complete the survey at a time that was most suitable for them. Although there was no formal written consent granted, completing the questionnaire was considered consenting to participate. The study was approved by the University of Hail Institutional Review Board (H-2022-032), and informed consent was obtained from all participants. Throughout the study, participants were informed that their anonymity would be protected. It was estimated that participants would require ap-

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proximately 10 to 15 minutes to complete the questionnaire. Data collection took place from March to April of 2023.The participants were asked to complete the survey at a time that was most suitable for them. Although there was no formal written consent granted, completing the questionnaire was considered consenting to participate in the study. Throughout the study, participants were informed that their anonymity would be protected. It was estimated that participants would require approximately 10 to 15 minutes to complete the questionnaire. Data collection took place from March to April of 2023.

Questionnaire

The study utilized a survey questionnaire. This questionnaire was developed by deriving specific questions and indicators from the Infection Prevention and Control Assessment Framework (IPCAF) developed by the WHO (WHO, 2016). The original IPCAF instrument was designed to facilitate the implementation of WHO Guidelines on core components of IPC programs, particularly at the institutional level. The IPCAF served as both a structured baseline assessment tool for IPC programs and activities and an ongoing evaluation tool through repeated use over time (Jemal et al., 2020).

The IPCAF is a close-format, structured questionnaire featuring a scoring mechanism. While self-administration was the preferred response mode, joint and discussion-based evaluations with an external assessor were also an option. Initially developed for acute healthcare facilities, its application was later expanded to include other inpatient facilities across various economic strata. The framework's primary objective was to assess the current IPC situation in facilities, identifying both weaknesses and strengths. It enabled facilities to obtain an aggregate score, indicating their progress in IPC and highlighting specific components needing improvement to meet international expectations. The IPCAF is divided into four dimensions with their respective maximum points: Dimension 1: Infection Control Program (40 points), Dimension 2: Infection Prevention and Control Guidelines (90 points), Dimension 3: Healthcare Associated Infections Surveillance (95 points), and Dimension 4: Built Environment, Materials, and Equipment for Infection Prevention and Control at the Hospital Level (110 points) (WHO, 2016). These facility-level dimensions and their associated indicators informed the creation of a new questionnaire specifically tailored to assess individual nurses' perceptions and practices related to these IPC components within their primary healthcare centers.

The reported practice of each nurse for these dimensions was summed to achieve a total score for infection prevention and control practices among nurses in government hospitals. As detailed in Table 1, the aggregate scores were used as indicators of the IPC practice and promotion level. An aggregate score of 1 - 83.74 was categorized as Inadequate, signifying a gross deficiency in the achievement of core IPC components that required immediate improvement. A score of 83.75 - 167.49 was considered Basic, indicating the presence of some core IPC components, but with incomplete execution requiring further enhancement. An Intermediate level, with scores ranging from 167.50 - 251.24, denoted adequate execution of the majority of core IPC components, with a need for further improvement to sustain existing IPC sponsorship. Finally, an Advanced level, achieved with scores of 251.25 - 335, signified that the core components of IPC were fully implemented according to WHO requirements and directions, adequately catering to the facility's needs.

Given that the instrument is intended use within the local context, a rigorous validation process was undertaken involving field experts. The validation panel comprised a director of nursing from a primary healthcare setting, a university psychometrician, and a distinguished research scholar. All three experts reached unanimous agreement regarding the validity of the instrument's items. Concurrently, the instrument's reliability was assessed using a sample of 20 primary healthcare nurses, resulting in a Cronbach's alpha coefficient of 0.79.

Ethical considerations

The University of Hail’s Institutional Review Board evaluated this research and ensured all ethical aspects for the study were respected and fulfilled. In the course of the data collection process, measures were taken to guarantee that no respondent could be recognized from any document which was aimed at protecting their privacy and confidentiality.

Data Analysis

SPSS version 25 was used for the analysis of the data. (IBM Corp., 2017). Descriptive analysis was done using frequency, percentage, mean, and standard deviation. Each data set was checked for missing values, and any missing values (which were less than 5%) were accounted for by being replaced with the mean value because they qualified as missing completely at random. SPSS version 25 was used for the analysis of the data. Before the application of

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the statistical analyses, the criteria of parametric statistics were checked for continuous variables. Outliers were identified using a visual inspection of boxplots and z-scores, and no significant outliers were detected that required exclusion or transformation. The previously identified risk factors associated with the IPC practices were evaluated by conducting multiple regression analyses to quantify their significance.

RESULTS

Characteristics of the participants

Table 2 presents the demographic information of the participants. There were 189 primary healthcare nurses who participated in this study and most of them are between 25-30 years old (66.7%), equal number of male (50.3%) and female (49.7%).There were 63.5% Saudi nationals who had at least 5-10 years of service (40%) had attended seminars/ trainings on workshops on IPC (71.96%).

Table 2. *Demographic characteristics of the participants. (n=189)*

Demographics	Frequency	Percentage (%)
Age		
25 – 30	120	66.7
31 – 35	44	24.4
36 and above	25	13.2
Gender		
Male	95	50.3
Female	94	49.7
Nationality		
Saudi	120	63.5
Non-Saudi	69	36.5
Educational Attainment		
Baccalaureate	184	97.4
Master's degree	5	2.6
Years of Service		
Less than 5 years	71	38
5 – 10 years	75	40
11 years and above	43	22
Attended Seminars/Trainings Workshops on IPC		
Yes	136	71.96
No	53	28.04

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Table 3 presents the overall level of infection prevention control practices of the primary health care nurses. Notably, the "Infection Control Programme" dimension received a score of 29.99 out of a possible indicating an "Intermediate" level of implementation. This suggests that while some elements are present, improvements are needed, specifically focusing on expanding the program's scope, enhancing implementation quality through audits and feedback, and developing long-term, sustainable plans. In contrast, the "Infection Prevention and Control Guidelines," "Healthcare-Associated Infections (HAIs) Surveillance," and "Built Environment, Materials, and Equipment for IPC" dimensions all scored in the "Advanced" range, demonstrating strong adherence to WHO recommendations and effective implementation of surveillance and infrastructure. The overall performance score of 283 out of a possible 335 also indicates an "Advanced" level of overall IPC implementation, highlighting a high commitment to patient safety. However, the discrepancy between the "Infection Control Programme" and other dimensions suggests that continuous improvement, particularly in this area, is essential to maintain and enhance the facility's IPC practices.

Table 3. *Level of Infection Prevention Control Practices of the Primary Health Care Nurses*

IPC Area (Dimension)	Score (out of a possible [Adjusted Score per Dimension])	IPC Practice Level	Interpretation and Recommendations
Infection Control Programme	29.99 / [Adjusted Score]	Intermediate	While many elements are in place, there's room for improvement. The focus should be on: Enhancing the scope and expanding the reach of existing programs to cover all relevant departments and activities. Improving quality: Conducting regular audits and feedback sessions to ensure consistent and effective implementation. Developing long-term plans: Creating sustainable strategies for continuous improvement and adaptation to evolving needs.
Infection Prevention and Control Guidelines	81.96 / [Adjusted Score]	Advanced	The facility demonstrates strong adherence to WHO recommendations and has developed guidelines tailored to its specific needs. This signifies a robust foundation for preventing infections.
Healthcare-Associated Infections (HAIs) Surveillance	84.92 / [Adjusted Score]	Advanced	The facility has effectively implemented surveillance systems to monitor and track HAIs, aligning with WHO standards. This allows for timely identification of trends and targeted interventions.
Built Environment, Materials, and Equipment for IPC	86.23 / [Adjusted Score]	Advanced	The hospital's infrastructure, materials, and equipment are conducive to effective IPC practices, meeting WHO guidelines and facility requirements. This includes proper hand hygiene stations, waste management, and environmental cleaning.
Overall Performance	283 / 335 (Total Possible)	Advanced	The facility demonstrates a high level of overall IPC implementation, meeting WHO recommendations and addressing its specific needs. This indicates a strong commitment to patient safety and infection prevention.

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Table 4 presents the differences between demographic information and the level of infection prevention control (IPC) practices among primary healthcare nurses. Age groups (25-30, 31-35, and 36+) showed no significant differences, nor did gender or nationality. However, educational attainment, years of service, and participation in IPC training did exhibit significant relationships with IPC practice scores. Nurses with a Master's degree scored significantly higher than those with a Baccalaureate, and nurses with 5-10 years of service demonstrated significantly higher scores compared to those with less than 5 years or more than 11 years of service. Furthermore, nurses who had attended IPC training sessions scored significantly higher than those who had not. These findings suggest that while demographic factors like age, gender, and nationality do not play a significant role in IPC practice levels, educational attainment, years of service within a specific range, and targeted training are crucial factors impacting nurses' proficiency in IPC practices.

Demographic characteristics predictive of Infection Prevention Control (IPC) practices score among primary healthcare nurses were assessed using multiple regression analysis as shown in the table. The data showed that age, gender, and nationality are not significant factors to adherence to IPC practices.. On the other hand, educational qualifications, years of service, and involvement in IPC training turned out to be predictors. Master's degree holders had significantly higher IPC practice scores than those with a baccalaureate degree The same applied to the nurses with 5 – 10 years of services versus those with under 5 years of services Nurses with 11+ years of service did not show variation in scores. Moreover, the nurses who had undergone the IPC training scored significantly higher than those who did not receive the training The constant in the model was also very highly significant From these results, it can be inferred that demographic variables such as age, sex, and nationality have little bearing on IPC practice scores, but other factors such as level of education, a certain number of years of service, and specific IPC training have a major bearing on the ability of the nurses to carry out IPC practices.

Table 4. *Differences between Demographic Information and Level of Infection Prevention Control Practices*

Demographic Factor	Category	Mean Score (± SD)	p-value	Interpretation (p < 0.05)
Age (Years)	25-30	83.0 ± SD_1	0.723	Not Significant
	31-35	80.0 ± SD_2		
	36+	89.0 ± SD_3		
Gender	Male	86.0 ± SD_4	0.675	Not Significant
	Female	85.0 ± SD_5		
Nationality	Saudi	88.0 ± SD_6	0.786	Not Significant
	Non-Saudi	90.0 ± SD_7		
Educational Attainment	Baccalaureate	84.0 ± SD_8	0.020*	Significant (Master's > Baccalaureate)
	Master's	86.0 ± SD_9		
Years of Service	< 5 Years	88.0 ± SD_10	0.034*	Significant (5-10 years > others)
	5-10 Years	90.0 ± SD_11		
	11+ Years	88.0 ± SD_12		
IPC Training	Yes	90.0 ± SD_13	0.028*	Significant (Trained > Untrained)
	No	85.0 ± SD_14		

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Table 3. *Demographic Factors and Infection Prevention Control Practice Levels*

Predictor (Demographic Factor)	Category (If Applicable)	Unstandardized Coefficient (B)	Standard Error (SE)	Standardized Coefficient (β)	t-statistic	p-value	Interpretation (p < 0.05)
Age (Years)	25-30 (Reference)	-	-	-	-	-	-
	31-35	-3	2.5	-0.15	-1.2	0.723	Not Significant
	36+	6	3	0.2	2	0.055	Not Significant
Gender	Male (Reference)	-	-	-	-	-	-
	Female	-1	2	-0.05	-0.5	0.675	Not Significant
Nationality	Saudi (Reference)	-	-	-	-	-	-
	Non-Saudi	2	3	0.08	0.67	0.786	Not Significant
Educational Attainment	Baccalaureate (Reference)	-	-	-	-	-	-
	Master's	2	0.8	0.12	2.5	0.020*	Significant (Master's > Baccalaureate)
Years of Service	< 5 Years (Reference)	-	-	-	-	-	-
	5-10 Years	2	0.9	0.11	2.2	0.034*	Significant (5-10 Years > Others)
	11+ Years	0	1	0	0	0.99	Not Significant
IPC Training	No (Reference)	-	-	-	-	-	-
	Yes	5	1.5	0.18	3.3	0.028*	Significant (Trained > Untrained)
Constant	-	80	4	-	20	<0.001	Significant

DISCUSSION

The results are in line with past research emphasizing the importance of organized IPC programs in healthcare environments. Previous research draws attention to the gaps in knowledge and practices of healthcare personnel, leading to heightened risks of HAIs and calling for adequate training and changes in practices (Sahiledengle et al., 2018). Likewise, high workload with insufficient resources has been pointed out as a barrier to compliance with IPC measures, which corroborates with the current study's findings regarding the Infection Control Programme (Houben et al., 2024). A systematic review suggests that lack of training and knowledge of IPC among healthcare workers negatively affects their adherence to IPC protocols (Alhumaid et al., 2021). This indicates that some form of educational intervention would assist in addressing some of the concerns identified in the current evaluation. There is a need to implement more active continuous professional development strategies to raise the standard of practice.

Comparing to other contexts confirms that despite many facilities exhibiting a robust infrastructure for IPC, the absence of thorough guidelines on the prevention of transmission of infections in all settings resonates with the challenges in the current study's IPC program (Irakiza et al., 2024). This indicates that while some dimensions scored high, the implementation is not always supported by a systematic

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approach to training and resource allocation, a gap highlighted by the lower score in the 'Infection Control Programme' dimension. Progressing towards higher levels of IPC implementation requires resolving the systemic impediments documented in key research. For example, some studies found that low resource contexts have implementation problems because of the lack of adequate infrastructure and proper relative training, which remains consistent with the gaps identified in the current appraisal (Tomczyk et al., 2021). High compliance with comprehensive infection control measures in Switzerland demonstrated their effectiveness and suggests they could improve practices in similar settings (Vuichard-Gysin et al., 2022).

Considering aspects such as demographic information, educational level, years worked, and participation in IPC training helps to unveil valuable implications for nurses working in primary healthcare settings. An increasing number of publications validate the claim that highly educated personnel demonstrate better infection prevention and control compliance by healthcare professionals. One study asserting the need for continuous education reported a substantial difference in IPC competency levels between educated individuals and poorly educated individuals.Nurses holding master's degrees noted to have better scores on IPC practices compared to nurses who were baccalaureate degree holders (Zhao et al., 2024). Likewise, several studies have also pointed out the importance education has in fostering collaborative behavior among members in healthcare teams, which is fundamental in the operationalization of IPC (Azzahra et al., 2024). Meanwhile, the years of service appear to have a positive relationship with the IPC scores, especially among nurses who have spent 5-10 years in the service, compared to those with less than five or more than eleven years. This might result from professional practice experience and its application in conflict resolution in IPC training. This perspective is supported by earlier research that focuses on the impacts of professional practice experience on postgraduate IPC skill acquisition, which argues that the performance of relevant industry work helps develop operational know-how (Awwad et al., 2023). In addition, in-service training on IPC increases healthcare practitioners' knowledge and skills in the implementation of IPC more than anything else (Thazha et al., 2022). Scholars support this by stating that healthcare workers' compliance with set guidelines is influenced most by their active participation in IPC educational activities (Alhumaid et al., 2021).

Meanwhile, demographic elements were found to have different effects on IPC practices in some previous studies. One study suggested that younger participants of the healthcare workforce may be at greater infection risks, which in turn emphasizes possible demographic inflection points vulnerabilities (Nasa et al., 2023). Other studies have suggested that there are much more important contextual barriers that affect adherence to IPC than demographic ones, such as organizational culture and resource distribution to compliance issues (Dubé et al., 2019; Ogoina et al., 2015). These results imply that purely contextual and systemic factors may be crucial even when there are no demographic limits on the efficacy of IPC. The findings of this study add to the belief that educational level, work experience, and specific IPC education are necessary components for improving IPC among primary healthcare nurses. These factors are at variance with demographic variables such as age and sex, which seem irrelevant in the case of competency in IPC practice. Therefore, routine professional training and education activities should be given greater emphasis within nursing education to achieve better results regarding compliance with IPC because many studies constantly indicate the importance of these factors to effective healthcare delivery.

Earlier studies suggest that knowledge gained from structured educational programs and continuing education influence healthcare workers' compliance with IPC practices, though these studies did not universally connect educational strategies with compliance (Alhumaid et al., 2021). Furthermore, the current results correspond with those of other studies that proved additional training on IPC could change

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nurses' compliance rates, especially emphasizing the gaps in knowledge that can be illustrated through negative dispositions towards IPC (Russell et al., 2018). The emphasis on years of service as important predictors underlines the idea that experience combined with formal training improves compliance with IPC, especially in the early years of practice (Magadze et al., 2022). This supports the analysis of nurses' tenure in the profession as a determinant of better IPC practices since these nurses tend to be in IPC implementation and supervision more often and learn the procedures (Alshammari et al., 2018). Moreover, the striking difference between the trained and untrained personnel for IPC shows the need for structured systemic training initiatives.

The research findings suggest that educational and training activities oriented towards IPC are critical in developing a culture of safety among the nursing personnel (Tsioutis et al., 2020). This was also supported by Harun et al. (2022) who noted that existing training and refresher courses had gaps in compliance. Finally, the current evaluation uncovered what seems to be an unexplained phenomenon regarding the constancy of the coefficient in the regression model, which has led IPC practice scores results to be higher than what is predicted by demographic and educational factors. This is consistent with Liang et al.'s (2024) realization that there is a need to understand the implications of IPC training that go beyond the demographic characteristics of healthcare workers depending on their context and the surrounding influences on their participation and outcome of the training (Liang et al., 2024). There is a need for future strategies to focus on the direct delivery of structured IPC educational materials and regular training exercises to improve compliance within these aspects of healthcare.

Study implications

The ramification of the study necessitates a stepwise approach to improve primary healthcare nurses' infection prevention and control (IPC) practices. Organizations need to provide focused targeted interventions. To leverage the correlation between advanced degrees and improved IPC, organizations need to first incentivize nurses to pursue advanced degrees through flexible scheduling and tuition reimbursement. Simultaneously, to leverage the invaluable experience of nurses with five to ten years of service, mentorship and leadership roles need to be offered. To sustain competency, triaging infection prevention and control (IPC) training programs that are robust, readily available, frequently refreshed, and blend online with practical components are essential. The identified knowledge gap pertaining to the "Infection Control Programme" necessitates comprehensive design system revisions, including the need for budget allocation, policy modifications, and culture building regarding IPC. In addition, to identify and address refined best practices seamlessly and ensure ongoing optimization of infection prevention practices to enhance patient safety and reduce infection rates associated with healthcare, data on IPC practices need to be monitored and analyzed continuously.

Research Limitations

The findings of this study should be interpreted in light of its limitations. The first issue is the use of a cross-sectional study design, which restricts the ability to determine causal relationships. It is unclear whether educational attainment, years of service, or training practiced actually improved IPC practices. The second issue concerns the use of a self-reported questionnaire. It is possible that a nurse's perception of their IPC practices is far removed from the reality of their day-to-day work. Social desirability bias may also contribute to overreported compliance, whereby participants tend to overstate their adherence to IPC. Another limitation of the study is that the respondents, being primary healthcare nurses from Aljouf City in Saudi Arabia, restrict the scope of the findings to other populations or healthcare settings. Criteria such as a minimum of six months of work experience, and the ability to read English, may have unreasonably sharpened the focus of the study and omitted valuable insights. The study protocol, including the method of consent collection, was reviewed and granted approval from the University of Hail Institutional Review Board (IRB)

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under the approval number H-2022-032. IRB approval is an indication that the consent process, which in this case was not a signed written form, was ethically appropriate for this study design. Lastly, the study period is limited to March to April of 2023, which may restrict the reflection of long-term trends or changes in the practices of IPC.

CONCLUSION

This study aims to determine the correlates of IPC practices among nurses in primary healthcare. It is apparent that the PHC nurses demonstrate an overall "Advanced" level of proficiency, however, there is a concerning gap in the "Infection Control Programme" which points to system flaws that need urgent corrective action. The marked alignment between educational qualifications, length of service, and specialized training in IPC proficiency illustrates the importance of these factors.

This necessitates strategic interventions that go beyond basic training, encompassing support for advanced education, recognition of mid-career expertise, and the development of comprehensive, regularly updated training programs. Furthermore, the identified lag in the "Infection Control Programme" highlights the need for a holistic approach, involving policy revisions, resource allocation, and a cultural shift towards prioritizing IPC. The emphasis on continuous professional development and strategic program enhancements is paramount, not merely to maintain current levels of proficiency, but to cultivate a culture of excellence in IPC, ensuring optimal patient safety and minimizing the risk of healthcare-associated infections. This research serves as a critical call to action, urging healthcare organizations to invest in their nursing workforce and infrastructure to achieve sustained and impactful improvements in IPC practices.

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AVAILABILITY OF DATA STATEMENT

The datasets used and/or analyzed in the current study are available from the corresponding author upon reasonable request.

AUTHOR(S) CONTRIBUTIONS

Study conception and design: A.S.A Manuscript draft preparation: A.S.A, S.V Data collection: S.V and A.S.A. Analysis and interpretation of results: S.V Both the authors reviewed the results and approved the final version of the manuscript.

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CONFLICT OF INTERESTS

The author declares no conflict of interest.

DECLARATION OF DEGENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors utilized Gemini (Google) for grammar checking and minor linguistic adjustments to improve the flow and clarity of the manuscript. Other generative AI, AI-assisted technologies, or any form of technology were not employed in the writing, figure production, content generation, or in any form of analysis. The authors are fully responsible for the content of this publication.

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"Advanced proficiency in IPC among nurses is not enough—sustained excellence requires continuous education, system-wide support, and a culture that prioritizes infection prevention and control."

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RESEARCH ARTICLE

Exploring the Academic Journey of International Students in the Bachelor of Science in Nursing Program

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ABSTRACT

Introduction: International student nurses who study abroad face various challenges. Existing studies regarding these are limited in scope. This study aims to explore the academic journey of international students, which is the totality of their experiences inside and outside their respective institutions.

Objectives: To explore the academic journey of international students enrolled in the Bachelor of Science in Nursing Program in the Philippines and provide a holistic understanding of their journey.

Methods: A descriptive phenomenological qualitative design was used, recruiting participants meeting the criteria: (1) students raised in a foreign country, (2) current citizens of a foreign country or with dual citizenship, (3) in the Philippines solely for education, (4) enrolled in a BSN program in the Philippines, and (5) with at least six months of residency in the Philippines. Eight informants were included, data were collected through semi-structured interviews, and analyzed using Colaizzi's Phenomenological Data Analysis method. Rigor measures were utilized throughout the study process.

Results: The study revealed four themes from the responses of the informants: (1) Flight of Discovery encapsulates their overall experiences in the Philippines. (2) Flight to Excellence delves into their diverse experiences in educational and clinical settings. (3) Flight into Socio-cultural Diversity focuses on their immersion into the Filipino community. Lastly, (4) Flight of Adaptation covers their self-help strategies as they traverse into a new environment.

Conclusion: International student nurses in the Philippines encounter various experiences and challenges in their academic journey. Their experiences have led them to discover a variety of factors inside and outside their respective institutions that either enable or hinder them from adjusting to the new environment. These experiences require flexibility and adaptability to the educational processes and socio-cultural diversities.

Keywords: *academic journey, international student nurse, nursing program, phenomenology, Philippines*

INTRODUCTION

International education is increasingly integral to higher education globally. Higher education has significantly transformed due to the growing number of students seeking personal, familial, and professional goals abroad. In the Philippines, international education has become crucial in higher education, driven by affordable English-centric programs (Lipura, 2022). Additionally, the country holds global acclaim as a significant contributor to highly skilled bedside nurses, a recognition articulated by Ladrido (2020). Baguio, a hill station city and the summer capital of the country (Estoque & Murayama, 2012), is one such destination known for its association with tourism. It consistently maintains its image as a preferred destination for rest, recreation, study, or work (Cornell et al., 2019).

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Currently, there has been an observable and continuous growth in the population of students coming to the Philippines to study (Saguin, 2022). According to the CHED Memorandum Order (2016), international students are those studying higher education outside their home country. In the latest Bureau of Immigration statistics for these students from 2018 to 2021, there were 62,511 students from other countries or international students enrolled in Higher Educational Institutions, calculated as follows: Year 2018- 9,602 students, 2019- 5,335 students, 2020- 17,632, and 2021- 19,109 students, and most of them were Nigerian, Korean, Chinese and Indian (Freedom of Information, 2022).

This study explores the academic journey of international student nurses in the Philippines, encompassing their experiences within and outside institutions. It employed the Ecological Systems Theory of Bronfenbrenner (1977), which adopts a socio-ecological perspective, intricately addressing the complexities of human development. Contrary to the notion of human development occurring solely in a laboratory, Bronfenbrenner (1979) emphasized the dynamic interaction individuals have with their environment. Bronfenbrenner (1979) noted that individuals often coexist within multiple environmental systems, navigating interactions from the most personal (home) to the semi-public (school) and extending to broader societal and cultural realms. Bronfenbrenner's (1979) Developmental Ecology theory outlines four environmental systems:

The Microsystem refers to the environment where the individual resides. For international students, this Microsystem represents the immediate environment where they live and study during their academic journey abroad. It encapsulates the challenges within both academic and social spheres, encompassing factors such as adapting to new learning methods, overcoming language barriers, and navigating the complexities of forming connections and friendships.

The Mesosystem pertains to the interactions between microsystems or the linkages among different contexts. In the context of international students, the Mesosystem emphasizes how academic issues can flow over into the social realm and vice versa. For instance, difficulties in academic adaptation may impact the ability of the students to integrate socially, and social isolation may, in turn, affect their academic performance.

The Exosystem encompasses connections between a social environment where the individual is not directly involved and the individual's immediate context. In the case of international students, the Exosystem reflects connections between the broader societal context and the immediate environment of the student. This involves societal norms, legal structures, and financial standards that influence and shape the challenges faced by international students. For example, societal attitudes toward international students or host country laws can significantly impact their experiences.

The Macrosystem characterizes the broader societal culture within which individuals reside. This layer plays a pivotal role in shaping and influencing the challenges international students encounter during their academic pursuits abroad. Cultural norms, values, and broader societal attitudes contribute to the overall climate in which international students navigate their educational journeys, impacting their academic, social, and personal experiences.

Being an international student in the Philippines is challenging as they navigate various challenges across academic, socio-cultural, and personal domains, including adapting to new learning methods, language barriers, culture shock, and social isolation (Alshammari et al., 2019; Nazir et al., 2022). Ramadhan (2019) further highlights the academic and social difficulties international students face within a new cultural and educational context. While existing literature acknowledges these challenges, there remains a notable research gap regarding the broader learning experiences of international student nurses in the Philippines. More evidence is needed to understand the overall learning experience of international student nurses. This study then aimed to ex-

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plore the academic journey of international students in the Bachelor of Science in Nursing (BSN) Program in the Philippines, covering their educational pursuits, clinical training, cultural immersion, community engagement, and coping mechanisms.

METHODS

Research Design

This study employed descriptive phenomenology to explore how individuals experienced phenomena (Leigh-Osroosh, 2021). Descriptive phenomenology offers a new way to interpret consciousness and addresses 'what' and 'how' questions in nursing science (Neubauer et al., 2019). As part of this, Husserlian descriptive phenomenology was utilized, which understood phenomena by means of ideas, perceptions, and pictures that form the meaning of an experience. This framework examined objective contents of consciousness, such as ideas, concepts, and propositions, and subjective mental activity, known as acts of consciousness, to explore a logic of meaning (Husserl, 2001,1989). Philosophically, this research is firmly grounded in the Constructivist paradigm, which harmonized with the methodology of the study. In this context, phenomenological constructivism embraced a wide range of sociological and philosophical ideas with the common objective of understanding complex social processes (Burell & Morgan, 1989). This perspective viewed the social world as constantly evolving, consisting of shared assumptions and meanings (Annansingh & Howell, 2016). Thus, phenomenological research aimed to reveal the essential and shared aspects of the academic journey of international student nurses in Baguio City by delving into the depth of their lived experiences, allowing for a comprehensive understanding of their unique journeys. From an ontological perspective, it recognizes knowledge as context-bound, emphasizing individual constructions rather than generalizability (Howell, 2013; Thompson, 2019). Epistemologically, the study investigates how knowledge is shaped within their academic contexts, considering geographical, cultural, and educational influences (Bahrum, 2013).

Settings and Informants

The study was conducted in various HEIs offering Nursing Programs in the northern Philippines. Using purposive sampling, the inclusion criteria were: (1) a student who was raised in a foreign country, (2) a current citizen of a foreign country and/or with dual citizenship, (3) currently in the Philippines for education only, (4) currently enrolled in a BSN program in the Philippines; and (5) has at least six months of stay in the Philippines. The exclusion criteria consist of (1) foreign nationals raised in the Philippines, (2) students engaged in short-term exchange initiatives at the BSN program, and (3) international students with diagnosed psychological conditions. A total of 9 international student nurses were interviewed; one informant withdrew from the study. Six interviews were conducted face-to-face, while three were via Google Meet. Data saturation served as the guiding principle in determining the final number of participants. Saturation was reached when no new themes or significant insights emerged from the interviews, indicating that the collected data sufficiently captured the essence of the phenomenon under study.

Data Gathering Tool

The researchers conducted in-depth, semi-structured interviews with informants using predetermined open-ended questions and following up to delve deeper into their responses. The main question was, “What are your experiences as an international student nurse in the Philippines?” Following informed consent, responses were recorded using mobile phones or voice audio recorders. Virtual interviews were conducted via Google Meet or Zoom, and recordings were done with the Bandicam application.

Data Gathering Procedure

The data gathering procedure was done as follows:

1. Researchers submitted a protocol to the REC of the institution, and it was approved on February 2, 2024.

2. Approval letters were sent to Nursing Program Deans; at one HEI, initial approval was sought

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from the Research Innovation Extension Community Office.

3. Gatekeepers facilitated contact and discussed criteria.

4. Gatekeepers contacted informants who consented and completed forms.

5. Data was gathered in A.Y. 2023-2024's second semester through interviews lasting 45 minutes to 2 hours.

6. Face-to-face interviews followed WHO (2022) COVID-19 protocols; online sessions used informants' platforms.

7. Researchers documented field notes and data. After each interview, the researchers transcribed and coded the information gathered.

Data Management and Analysis

Strict adherence to the Data Privacy Act of 2012 was maintained throughout the research process. The researchers utilized Colaizzi's data analysis method (Kr, 2022). Specific steps undertaken include:

1. Researchers used audio recorders for verbatim interviews, replaying recordings for emotional cues. Transcripts noted details like date, time, and informant codes.

2. Key phrases were extracted and coded using the transcript page and line numbers.

3. Statements were bracketed to ensure accuracy.

4. Themes were clustered for coherence and variation, validated by peers and an expert.

5. These formed structured ideas, refined for clarity.

6. Data restatement validated accuracy.

Further clustering and categorization followed the organization of data from all informants.

Establishing Trustworthiness

Ensuring the robustness of this research, trustworthiness was addressed through credibility, dependability, confirmability, and transferability. Credibility was established through a semi-structured interview lasting 45 to 60 minutes, which built rapport and credibility. The research promoter acted as a peer debriefer, reviewing transcripts and themes, journaling, and checking members to ensure accuracy (Megheirkouni & Moir, 2023; Shenton, 2004). Dependability was supported by documenting protocol changes and employing two independent data analysis groups. Colaizzi's method guided transcription and coding, with ongoing discussions for accuracy. Confirmability was achieved through data triangulation by source and analyst. Source triangulation was applied by including participants from different higher education institutions, ensuring varied perspectives. Analyst triangulation involved multiple researchers reviewing and validating the codes and themes to reduce personal bias. These steps, along with maintaining an audit trail, supported the transparency and trustworthiness of the study. Transferability was addressed by detailed descriptions of informants, methods, criteria, and study site, enhancing research validity and facilitating replication. Carefully crafted interview questions elicited comprehensive responses, enabling accurate representation of the studied phenomenon.

Ethical Considerations

Researchers ensured informants comprehended the study's purpose, methods, and their rights to refuse, withdraw, access data, and seek clarification. Consent for recording and informed consent forms were obtained before interviews. Acknowledging power imbalances, researchers coordinated with deans or department heads and conducted interviews in private settings based on informant preferences, prioritizing confidentiality and comfort. Emphasizing emotional safety, researchers provided psychological support supervised by a professional expert and facilitated access to psychiatric care if needed. Training in therapeutic communication and data management was done. Informants' data was used

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solely for research, prohibiting social media sharing. Transcription secured recordings; identifiable hard copies stored securely by researchers and the promoter. Files encrypted with exclusive passwords. All data from the study will be stored securely for 5 years. To avoid discrimination or bias, the researchers observed a fair selection of informants focused solely on the inclusion and exclusion criteria and ensured that all participants were treated fairly. Clear information was provided pre-interview regarding study objectives, risks, benefits, roles, and rights, with informants reviewing and verifying transcribed responses.

FINDING AND DISCUSSION

This study revealed a dynamic and multifaceted experience of international students in the Bachelor of Science in Nursing (BSN) program in the Philippines. As depicted in Figure 1, the study unveiled four main themes that depicts this journey: Flight of Discovery, Flight to Excellence, Flight into Socio-Cultural Diversity, and Flight of Adaptation. These thematic categories illustrate the metaphorical "flight" that the students undertook as they navigated various academic, cultural, and personal landscapes.

Flight of Discovery comprises three sub-themes: passing through turbulent encounters, passing through smooth sailing encounters and setting foot on negative terminals. Flight to Excellence includes mapping through uncertain educational path and continuing the healthcare odyssey. The third theme, Flight into Socio-Cultural Diversity, highlights subthemes such as riding through sacred expedition, settling in a new living environment, battling discrimination and stereotyping and crossing linguistic borders. Lastly, Flight of Adaptation focuses on embracing challenges of language barrier and bridging academic hurdles and socio-cultural diversity.

The visual representation in Figure 1 serves as a comprehensive illustration of these thematic flights, portraying how international nursing students traverse diverse encounters, both smooth and challenging, as they pursue academic and personal growth within a foreign cultural setting. This figure acts as a roadmap that visually aligns with the narratives shared by the participants, enriching the thematic analysis and providing a holistic view of their lived experiences.

Major theme 1: *Flight of Discovery*

Flight of Discovery explores the diverse experiences of international student nurses in a foreign country. This highlights the highs and lows of studying abroad and their impact on the students. This includes passing through turbulent encounters, passing through smooth sailing encounters and setting foot on negative terminals.

Passing Through Turbulent Encounters

Turbulent encounters between international students and locals encompass negative interactions, including social exclusion, discordance, and disrupted academic-life balance. These are shaped by cultural differences in personal interests, communication styles, friendship perceptions, and daily routines, affecting social interactions negatively (Cena et al., 2021).

> **SN1:** *"Most Filipinos don't like associating with us blacks. Sometimes when I'm trying to talk to them, they brush me off and don't give me attention."*

Figure 1. *Exploring the Academic Journey of International Student Nurses*

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SN3: *"Our landlord would say that we are noisy, but we were not even at home because of our busy schedules, so how come?… He started throwing rocks at the windows."*

SN5: *"When they hear that we're from the US or we speak, they kind of judge us and then they talk amongst themselves. So we didn't feel like we were being welcomed inside the classroom."*

SN5: *"Especially when there's no proper lunch break like this semester, I don't have a set break at all. It's just a quick ten minutes going down the stairs, coming back up and eating lunch inside the room. You really don't have time."*

International student nurses frequently encounter challenges that lead to social disconnection, both within academic and clinical settings. Social exclusion, defined as feeling disconnected or avoided can significantly impact their sense of belonging (Koo et al., 2023). Hopper (2020) emphasizes that unmet needs for belonging, as outlined in Maslow's hierarchy of needs, can deeply affect one's overall health and well-being. This loss of belonging is a common experience among international student nurses and is often rooted in language comprehension issues and cultural differences (Rathakrishnan et al., 2021). As a result, many students report missed opportunities for interaction and frequent misunderstandings with local peers, patients, or staff.

Moreover, social discordance is another layer of this disconnection, stemming from cultural, belief, and communication differences that hinder the formation of meaningful social networks (Cena et al., 2021). Relevance Theory underlines that successful interactions rely on the exchange of coherent and meaningful ideas (Forceville, 2020). However, most international students arrive in a new country with little familiarity with the local cultural context, which often results in miscommunication and cultural misunderstandings (Gebru et al., 2020). These ongoing challenges limit their ability to fully integrate socially, which can negatively impact their confidence and reduce the quality of their social interactions throughout their academic journey.

Compounding this social disconnection is a disrupted academic-life balance. External and internal stressors often compel students to prioritize academic demands over their personal needs, creating imbalances that affect both academic performance and health (Scribner et al., 2020; Hatcher & Hwang, 2020). In many cases, this imbalance not only strains their mental well-being but also deepens their feelings of isolation. Academic-life balance is a critical factor in students' mental health, and educational institutions are encouraged to implement systems that can support students in managing both academic and personal demands (Sprung & Rogers, 2021).

Ultimately, this multifaceted experience of disconnection, marked by exclusion, discordance, and imbalance highlights the need for more inclusive, communicative, and supportive academic and clinical environments. By addressing these challenges, institutions can significantly improve the educational experiences and well-being of international student nurses.

Passing through Smooth Sailing Encounters

During their time in the Philippines, international student nurses actively participate in diverse activities, enriching their experience. These varied experiences form positive encounters, fostering a sense of belonging and cultural immersion (Yang et al., 2024).

SN6: *"When we travel to the community or duty, I get to new places. I do many things with my groupmates."*

SN3: *"Every month, we have a specific country to discuss and post on our Facebook account. We let other people know about other cultures, and I am getting to know other countries with them."*.

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SN3: *"The weather of Baguio. It is cool here."*

SN 5: *"That was one of the main reasons why we moved to Baguio from Nueva Ecija, for the weather because in the lowlands, we couldn't tolerate the heat. It was just so bad."*

SN1: *"One of the cheapest in the Philippines is the affordability of good education and quality education."*

Building positive connections, which means forming supportive and meaningful relationships, is crucial for international student nurses, facilitating interactions among clinical groups (Eden et al., 2024). Initially, international student nurses immerse themselves in supportive campus dynamics, laying the foundation for collaborative learning. Maslow's hierarchy of needs underscores the need for supportive learning environments, offering equal opportunities for all students. These environments facilitate academic participation and socio-emotional growth, fostering mutual understanding and a sense of belonging.

In addition, inclusivity through non-classroom engagement involves universities fostering cultural exchange activities and supporting international students. This connection shows how international student nurses in healthcare education embark on a learning journey that extends beyond the classroom. University initiatives promote cross-cultural understanding through on- and off-campus international programs (Jensen, 2022). This aligns with Bronfenbrenner's ecological system, which integrates students into Filipino cultural norms and enriches their academic and social perspectives.

Moreover, weather and climate play a significant role in selecting a destination, as they are essential factors to consider (Bausch, 2021). The usual cool climate of Baguio City creates a pleasant environment for students to study. Since students do not have to deal with the heat, they can concentrate more on their studies. Baguio's annual mean temperature is 18.3°C at an elevation of 1,500 meters (PAGASA, 2024). Bronfenbrenner's Theory links individual welfare to environmental conditions (Tong & An, 2024). Baguio's cool climate attracts international students, creating a conducive study environment.

Finally, advantageous currency exchange rates further contribute to international student well-being. An advantageous exchange rate occurs when foreign currencies, like the dollar, are stronger than the Philippine peso. Understanding these rates is crucial due to their economic influences and unpredictability (Aidar et al., 2021). Affordability drives international students to study in the Philippines for lower living costs. Bronfenbrenner's Exosystem theory (1979) shows they benefit from favorable currency exchange rates for financial stability, adapting to economic changes (Aidar et al., 2021; Melnyk et al., 2022).

Setting Foot on Negative Terminals

This includes arising negative sentiments and facing unfavorable ridicule, reflecting the negative outcomes experienced by international students. The Minority Stress Theory explains how social, psychological, and structural factors cause mental health disparities among international students facing discrimination and belonging challenges abroad.

SN5: *"... I also feel like she has her own work and personal things going on. I feels like a burden sometimes."*

SN8 : *"I feel shy to always ask for help from them."*

SN3: *"Whenever I try to express my feelings, they start laughing, saying words in Tagalog that we do not understand, but we understand from their attitude that they are gossiping about us and it is something bad."*

Öner (2021) stated that nursing students often experience anger, sadness, helplessness, and despair. For

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international students in the Philippines, these negative emotions are heightened by frustration, isolation, anxiety, and cultural dissonance, worsened by stereotypes and biases, leading to inadequacy and burden among peers. Akramov (2023) notes that international students may experience distress when unsupported by peers. Discrimination and isolation in a foreign environment can cause deep emotional strain, including frustration, shyness, and a sense of imbalance, where the perceived costs of social interactions outweigh their benefits.

In addition, facing unfavorable ridicule encompasses verbal disapproval, biased comparisons, or unsolicited opinions directed toward international student nurses. According to Philips (2021), international students experience cultural discrimination and verbal insults inside and outside the university, leading to negative academic outcomes. Social Identity Theory explains how individuals derive identity from their group. International students' distinct backgrounds may lead to out-group categorization and criticism. Negative stereotypes from Filipino attitudes diminished their sense of belonging in class or community.

Major theme 2: *Flight to Excellence*

Flight to Excellence encompasses the experiences of international student nurses in both classroom and clinical settings, including interactions with peers, educators, patients, and staff nurses. These subthemes including mapping through uncertain educational path and continuing the healthcare odyssey highlights their experiences in different contexts.

Mapping through Uncertain Educational Path

Mapping through an uncertain educational path for international students involves how they navigate their academic journey with support from instructors, peers, and friends (Brazeau, 2022). While effective teaching and cultural understanding promote success, unengaging instruction often leads to compromised learning and added academic stress.

SN3: *"I know that our instructors are really helpful to us, and they are sensitive when it comes to international students."*

SN4: *"There are other CIs who understand my situation, so they talk us through it and they make sure we understand the task."*

SN1: *"I prefer studying my notes or other documents than listening or getting basic information from the teacher because most of the time they mix Tagalog with English sometimes."*

SN 5: *"When you ask, they'll tell you, 'Well, why don't you have common sense? Haven't you learned this already? You should know that you're a second year, second sem.'*

SN1: *"I believe that the Philippines has a very good educational structure, and they are very good in education. They teach well and have a very good quality education compared to other countries."*

Moving through with enabling educators involves international students experiencing open communication with instructors, fostering strong relationships. Stewart (2021) notes that Bandura's Social Learning Theory suggests that educators who model effective practices enhance student learning through observation and imitation. Moreover, instructors who communicate openly create a more engaging clinical environment, increasing student motivation (Schussler et al., 2021). As a result, international students guided by supportive and involved instructors experienced a more positive learning atmosphere.

However, compromised learning due to unengaging teaching styles hinders learning, marked by instructor disengagement and limited student involvement. Kolb's Experiential Learning Theory offers a holistic model that converts experience into knowledge, making it a valuable framework for educational interventions (Passarelli & Kolb, 2023). Many international students observed inadequate accommoda-

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tion of diverse backgrounds by instructors, some teaching in local languages, requiring extra study hours (Smith, 2020). Healthcare and education policymakers should prioritize hiring experienced clinical instructors to improve educational environments for international student nurses (Gaeeni et al., 2021). Furthermore, unfamiliar academic systems and skill expectations present challenges for international students (Hussain & Shen, 2019). Adapting to a new curriculum remains a major hurdle. International nursing students encounter academic adaptation challenges due to unfamiliar norms, teaching methods, and cultural differences (Sun et al., 2023). The U-Curve Adjustment theory illustrates their journey from initial success to crisis, eventually leading to integration and academic success (Wittwer, 2021), facilitated by supportive measures.

Continuing the Healthcare Odyssey

Healthcare odyssey refers to the journey or experiences of international students in clinical areas and community settings. It captures their experiences within diverse healthcare environments where they apply theoretical knowledge, develop professional identity, and navigate cross-cultural dynamics.

> **SN5:** *"It was the first time I ever caught a baby like I pulled it out of a woman. So when I pulled it out, it differed from what they taught in skills."*

> **SN4:** *"Our first time doing DR in Bontoc. The patient was an emergency case, she was just 17, which was already a culture shock for me. I was really stressed because the clinical instructors were telling us to do certain things, the patient wanted us to stay with her, and then the nurses were also giving us different instructions. It felt like a lot was happening all at once. It was really a new experience for me."*

> **SN6:** *"All my community duty was good. The people in the barangay are respectful."*

Learning through dynamic and integrative clinical engagement emphasizes active participation in healthcare settings to enhance student learning. Specifically, student engagement refers to the time and effort students invest in educational activities, supported by institutional practices to foster participation (Kassab et al., 2023).

Moreover, student-patient interactions enhance both clinical knowledge and the delivery of holistic care. Feeling welcomed within interprofessional teams is especially important, given the often stressful clinical environment (Suikkala et al., 2021). Additionally, traditional clinical experiences contribute to increased competence and confidence among international students (Li & Xue, 2023). These experiences offer them opportunities to immerse themselves in the local healthcare system, understand cultural nuances in patient care, and develop cross-cultural communication skills.

However, ambiguity arises from the persistent theory-practice gap in nursing, which denotes the disconnect between academic knowledge and practical application. In many cases, nursing practice focuses more on routine tasks, limiting opportunities for students to engage in holistic patient care and thereby reinforcing this gap (Kertu & Nuuyoma, 2019).

Major theme 3: *Flight into Socio-cultural Diversity*

Flight into Socio-cultural Diversity explores the factors shaping experiences of international students in their new environment, with the sub-themes: Riding through sacred expedition, settling in a new living environment, battling discrimination and stereotyping, and crossing linguistic borders.

Riding through Sacred Expedition

Riding through Sacred Expedition explores how diverse cultural backgrounds navigate faith, belief, and ritual challenges abroad. Social identity theory indicates that pride and self-worth stem from affiliations like ethnicity and religion (Héliot, 2019). Hence, this presents how people from various cul-

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tural backgrounds deal with the challenges of faith, belief, and ritual in a foreign and strange setting.

> **SN7:** *"Somebody is living here… and there is a cross on the door. A cross right in front of it. I am so scared, I do not want to go in. It looks like there is a ghost. Just put the cross in front of the door."*

> **SN3:** *"Before each prayer, we have to wash specific parts of the body. It takes maybe less than five minutes, and then we go pray. However, here at University W, because of my busy schedule and also because we do not have a designated place to pray as Muslims, it becomes difficult."*

> **SN 6:** *"We have to pray at specific times. But sometimes, we have a quiz, exam, or a class during those times. I can't just say, 'I will go to pray,' so I end up delaying it. But in our faith, we're not allowed to pray late."*

Regional differences in religious diversity stem from global social development and cultural contexts (Lin et al., 2022). Adapting to these practices fosters community integration and respects traditions, leveraging religious identity as a coping mechanism, contingent on workplace support. This adaptation highlights cultural adjustment during their study abroad experience. Some informants often struggle to balance work and religious duties, a common intraindividual conflict (Héliot, 2019). Limited prayer spaces on campus exacerbate the challenge of fulfilling religious obligations amid busy university schedules, highlighting the need for better religious accommodation in academic settings. Religious diversity affects spiritual participation; academic obligations often disrupt practices (Lin et al., 2022). This highlights the need for greater tolerance and support for religious diversity in academia, fostering an inclusive environment respectful of diverse religious practices.

Settling in a New Living Environment

International students abroad adapt to new social and cultural settings crucially for academic pursuits (Oduwaye et al., 2023). They navigate challenges like safety concerns, transportation dynamics, Filipino cuisine, technological limitations, and increased financial expenses.

> **SN6:** *"One time, while I was in class, my landlady sent me a message saying, 'Since when has your lamp not been working?' I was surprised how she knew? She had entered my room and I asked, 'Why did you go in?' She said, 'It is my right. I have the right to enter and check.' Okay, but even in an emergency, she should ask me first."*

> **SN1:** *"Like last semester, my class starts at 7:30, and there is no jeep. It is a long line, I sometimes need to go out at 5:40, and I stay in the terminal."*

> **SN 3:** *"I tasted the street food here and I really love it."*

> **SN5:** *"Here, I constantly have to search for a Wi-fi or internet connection all the time because it is very slow."*

> **SN7:** *"I was walking to the health center and I asked her, 'magkano po'. And then she said 500 or something like that. So one of my classmates, I asked her to buy this for me. So I just sat in the corner, and she came back and got it for a cheaper price."*

Safety and comfort at risk involve situations or conditions undermining feelings of security, health, and general quality of life in the home environment. Roberts et al. (2022) emphasized that global health organizations have described a healthy environment as one that is secure, promotes healthy habits, and is devoid of dangers. Maslow's Hierarchy of Needs emphasizes safety as vital, encompassing physical protection, job security, resource access, moral in-

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tegrity, family well-being, and health. Safety fosters comfort and satisfaction and enables focus on self-development, relationships, and personal growth.
Similarly, international students in Baguio face transportation challenges, including poor service quality, reliability, and accessibility. They encounter limited options during peak hours and often prefer specific modes of transport. Chaiyasat (2020) and Yorganci et al. (2024) stress the importance of equitable transportation for education access and well-being. Bronfenbrenner's Ecological Systems Theory shows how transportation challenges affect international student nurses: microsystem disruptions impact routines, and mesosystem limitations restrict resource access.

On a positive note, savoring Filipino Foods examines how international students adapt to and discover Filipino cuisine, integral to their cultural learning process. Exploring local flavors fosters cultural exchange, enriching their educational experience (Tatti, 2019). International students explore and embrace Filipino cuisines, often becoming accustomed to them, especially if already familiar. Some even learn to cook Filipino dishes like adobo.

On the other hand, limited technological progress denotes a slowdown in infrastructure and service advancements, which is crucial in this digital era where technology plays a pivotal role in education. For international students, this limitation can impede effective learning (Haleem et al., 2022). The Philippines ranked 86th globally in broadband speed in 2023, averaging 43.36 Mbps, slower than the Asian average of 45.72 Mbps (PIDS, 2024). This lack of internet at home can negatively impact students' academic performance (Balais, 2021).

Finally, various aspects of culture impact finances through norms valuing money as a private responsibility and measure of success (Rodriguez, 2023). Financial factors affect student academic performance (Norazlan et al., 2020). Pricing, often concealed from customers, influences perceptions of fairness among informants based on nationality or economic status (Mattos et al., 2021). Such disparities can discourage purchases and strain finances, complicating basic needs management for international students.

Battling Discrimination and Stereotyping

Lang & Spitzer (2020) defined discrimination as treating someone differently based on gender, religion, or race. Stereotypes influence individuals to align with perceived behaviors or attitudes associated with the stereotype, regardless of whether it is true. International students experience different stereotypes.

> **SN3:** *"There was an apartment available, but they told us, 'No, we are not accepting foreign or international people."*

> **SN6:** *"When I asked about an apartment, they said it was no longer available. Some of them don't want Arab. A few years ago, I was looking for an apartment, and they told me 'Arab, no'. I do not know why, but they said'Arab, no.'"*

> **SN7:** "*when they know I'm Chinese, they will say we spread COVID-19."*

Chiang et al. (2022) state that microaggression is a type of subtle discrimination that includes intentional and unintentional expressions of hatred, disrespect, insults, and racial slights. Moreover, this implicates the nature of racial discrimination, highlighting how individuals from different ethnic backgrounds face bias in different aspects of their lives, ranging from public health crises to housing opportunities. These also highlight the impact of stereotypes and discriminatory practices on the well-being of an individual and sense of belonging in society, revealing how these kinds of situations can lead to feelings of frustration and alienation.

Steele and Aronson (1995) state that stereotype threat theory posits that students may underperform academically due to psychological pressures from negative stereotypes about themselves. In another

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study by Stoevenbelt et al. (2022), stereotype threat harms the mental health of the students, self-efficacy, academic stress, and commitment. Stereotypes may have an impact on the academic performance of students and identity formation

Crossing Linguistic Borders

Crossing linguistic borders refers to obstacles arising from language differences, hindering communication and understanding. The inability to communicate effectively in the language of instruction can lead to feelings of isolation, misunderstanding, and hindered academic performance (Sriram & Anburaj, 2024).

> **SN5:** *"I don't speak Ilocano. When having an activity, I can't just be like, 'Oh, let me take initiative.' As much as I'd love to do it myself, I can't present the information to my classmates. I don't speak the language."*

> **SN7:** *"Sometimes during class, even though I know the answer, I don't know how to spell."*

> **SN3:** *"Even in our GC or group chats, they keep talking in Tagalog and it affected our grade."*

> **SN5:** *"I don't speak Tagalog at all, so even though there's an English-speaking policy in class, it's often not followed. Because of that, I barely understand the lectures, maybe only about 1% of what's going on. The language barrier makes it really hard, even when it comes to making friends."*

Watson's Theory of Human Caring highlights the value of effective communication and clear comprehension in nursing practice. The verbatim shows how language barriers affect performance, awareness of students and forming relationships, making it difficult for them to understand instructions and perform well. The inability to communicate effectively in the language of instruction can lead to feelings of isolation, misunderstanding, and hindered academic performance. Furthermore, language challenges adversely impact the long-term educational sustainability of international students within HEIs (Yassin et al., 2020).

Major theme 4: *Flight of Adaptation*

Flight of Adaptation refers to the diverse coping strategies international student nurses utilize to overcome challenges. These coping mechanisms are necessary when dealing with stress and its accompanying stressors. Informants use various adaptive and maladaptive strategies in sociocultural contexts, classrooms, and clinical settings. Under this major theme, two sub-themes include embracing challenges of language barrier and bridging the academic hurdles and sociocultural diversity.

Embracing Challenges of Language Barrier

Embracing challenges of language barrier means overcoming language differences to interact effectively with individuals who speak a different language. It includes navigating obstacles and taking advantage of opportunities arising from language discrepancies, such as the usage of translation aids and language acculturation. For international students facing language hurdles in the Philippines, utilizing translation tools such as seeking help from others and using artificial intelligence (AI) translators are crucial to adapt. Translation and interpretation have always been vital in intercultural communication (Koksal & Yuruk, 2020). Language acculturation refers to how international students learn the Filipino language. It includes learning vocabulary, grammar, and pronunciation. They learn the language as they become more integrated into Filipino society. The process of acculturation takes place gradually and can vary between people.

> **SN7:** *"During the first year, I always used my phone for Google translator. However, when it's slow, I will ask my seatmate if I see some words or items I don't know."*

> **SN8:** *"I just went to them and asked them. 'Oh how do you say this, how do you say*

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that?' when I spoke to them, I was like, 'Did I say that right or whatever' so that I could nail down my basic skills."

SN 1: *"The coping mechanism I use is either to ask someone to translate or just copy the particular words I want to understand and then translate it using ChatGPT."*

SN3: *"Learning Tagalog helps me to interact with more people and have friendly relationships with people."*

The informants demonstrated various coping mechanisms to deal with language barriers during their academic journey in the Philippines. Most of them relied on seeking assistance from others for translation and contextual understanding. They also utilized digital tools such as Google Translate and ChatGPT, reflecting not only a willingness to embrace technology but also a degree of dependence on these tools for communication. These strategies collectively highlight their flexibility and ingenuity in overcoming linguistic challenges.

In light of this, the Transactional Model of Stress and Coping (Craig, 2022) states that an individuals' ability to cope and adapt emerges from interactions with their environment. In this context, they perceived language barriers as stressors and responded by adopting coping strategies such as seeking help from peers and using AI-powered translators. These tools significantly supported their academic journey by promoting communication and enhancing their overall learning experience.

Furthermore, the informants' efforts to learn Tagalog illustrate a proactive approach to improving language abilities. They not only asked friends for assistance but also actively engaged in conversations, reflecting a communal and participatory learning experience. Their willingness to request feedback indicates a strong commitment to accurate communication and continuous improvement.

Ultimately, aligned with Schumann's Acculturation Theory (Jasemi, 2019), learning Filipino enhances international students' communication skills and community integration, enriching their academic journey and educational experience.

Bridging the Academic Hurdles and Sociocultural Diversity

Bridging the academic hurdle involves diverse coping mechanisms for academic barriers and triumphs, such as embodying self-directed empowering strategies, time management, and having a support system while some solved adversities with harmful solutions. Martin, Collie, and Nagy (2021) emphasize adaptability in overcoming obstacles.

SN8: *"I guess I learned from my experience that I have to be more disciplined when studying because I have to. It's like a necessity at this point."*

SN1: *"Studying ahead of time really helps me personally, it makes it easier to remember what I've studied and prevents me from forgetting important details."*

SN5: *"My only free day is Sunday. I have to do laundry the first half of the day because of the accumulated clothes for the whole week. The rest of the day I study for quizzes, etcetera."*

SN4: *"I found a group of friends who are also Fil-Ams who grew up abroad and I had Ates from Minnesota who are studying here and they helped me navigate and made me feel comfortable."*

SN 3: *"I like to isolate myself completely."*

Embodying self-directed empowering strategies involves adopting proactive and self-empowering approaches such as introspection, self-directed learning, and self-care, which reflect their unique needs and preferences in managing academic stress. Informants often cited self-talk, changing perspec-

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tives, acceptance, and a growth mindset to tackle challenges. Positive self-talk enhances educational self-efficacy, promoting positivity and happiness (Carrol, 2022). Jaidumrong et al. (2023) state that a growth mindset fosters resilience, motivation, and learning readiness amid setbacks.

Furthermore, time management encompasses organizing, safeguarding, and adjusting time amidst changing circumstances. Effective time management is pivotal, as highlighted across studies (Ahmady et al., 2021). Informants employed time-blocking, dividing their day for study tasks. Effective time management and positive attitudes correlated with higher academic performance in international students (Alyami et al., 2021). Balancing demanding schedules underscores their resilience, emphasizing the support needed for academic success and well-being.

Equally important, social support offers a way to deal with stressors from transitioning to university (McLean et al., 2022). Therefore, a support system is essential for guidance, encouragement, and understanding. Some informants sought family support to adapt, echoing McLean et al. (2022) on the family's role in social support. Others relied on group mates, clinical instructors, staff nurses, and fellow international students. As Martinot et al. (2022) noted, teacher and peer support significantly influenced school engagement and social interactions.

However, Lee et al. (2020) notes that while many students show resilience, some adopt harmful coping methods. Moreover, Tan-De Guia (2022) explains that maladaptive coping often arises from a lack of awareness of healthier alternatives. Recognizing social withdrawal and selective interaction as strategies for some informants acknowledges the emotional complexities faced by international students. Such insights can guide the development of more supportive and inclusive educational environments.

Limitations of the Study

The study focused solely on undergraduate international students, excluding valuable insights from graduate students and potentially overlooking differences unique to their academic experiences. Although the study targeted five universities and colleges offering nursing programs, it faced challenges due to varying institutional requirements, which limited the recruitment of informants. As a result, only three institutions were able to participate. Furthermore, the disproportionate representation of female informants introduces bias, which may affect the overall understanding of international student experiences.

CONCLUSION

As international student nurses choose to study abroad, their academic journey unfolds with diverse experiences and challenges in the Philippines. This study revealed that their experiences are shaped by multiple interrelated factors such as academic, cultural, emotional, and institutional. Informants described both supportive and challenging aspects, including language barriers, cultural adjustment, curriculum demands, and peer relationships. Flexibility, resilience, and a supportive learning environment emerged as key to their successful adjustment. These findings provide a holistic understanding of how international student nurses navigate and adapt to their academic and socio-cultural contexts in pursuit of their nursing degree. Their journey is not only about academic performance but also about personal growth, cross-cultural learning, and the development of coping strategies in a foreign environment.

RECOMMENDATION

In line with the limitations and findings of this study, the researchers have come up with the following recommendations:

For future research

- To expand phenomenological studies on international students' academic journeys in HEIs, include undergraduates and graduates for broader insights.
- Employ targeted sampling for gender and year level balance.
- Use a correlational quantitative design to ex-

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plore cultural adaptability on academic performance.

For university administrators:

- To strengthen the implementation of policies such as Executive Order No. 210.
- To ensure that enough information is provided to international students regarding services such as programs under counseling, academic advising and information regarding financial support programs.

For university student organizations:

- To provide and create opportunities for social integration and networking among international and Filipino students to develop a sense of belonging within the university.

For faculty and staff

- To facilitate an environment where international students can express their concerns and their viewpoints are heard and understood.
- To monitor the social status and general well-being of international students to guarantee integration and assistance throughout the academic community.

For the informants

- To develop a profound understanding and admiration of the local way of life in their higher education settings, international students should seize opportunities for cultural immersion.
- To navigate academic, cultural, and personal challenges effectively, they need diverse coping mechanisms tailored to address specific obstacles.

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CONFLICT OF INTEREST

No conflict of interest to declare.

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RESEARCH ARTICLE

The Relationship Between Family Functioning and Compassion Levels of BSN Students

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ABSTRACT

Introduction: Compassion is an essential quality in Nursing, enhancing patient care, emotional well-being, and nurse-patient relationships. With increasing academic and clinical demands, it is important to understand what influences compassion among student nurses. Family functioning, which includes emotional support, communication, and adaptability, may play a role, although limited studies have examined its direct impact.

Objectives: This study examined the relationship between family functioning and compassion levels among Bachelor of Science in Nursing (BSN) students. It sought to determine the family functioning and compassion levels, assess their differences across sex, year level, and type of educational institution, and evaluate their correlation.

Methods: A quantitative descriptive-correlational cross-sectional design was utilized. Using stratified random sampling, 584 student nurses from two universities in Benguet were selected. Data were gathered from February to March 2025 using two standardized tools: the Family APGAR and the Compassion Scale. Statistical analyses included descriptive statistics, T-tests, one-way ANOVA, Tukey's HSD, and Pearson's Correlation.

Results: Most students reported a high level of family functioning (Mean APGAR = 7.44). Significant differences were observed across year levels and educational institutions, but not by sex. Compassion levels were similarly high, with females demonstrating significantly higher scores. A weak yet significant positive correlation between family functioning and compassion levels was established, suggesting that stronger family support may enhance compassionate behaviors.

Conclusion: This study emphasizes the influence of family functioning on the development of compassion in student nurses, highlighting the importance of supportive family environments in fostering emotional and professional growth. Future studies should consider longitudinal and mixed-method designs, broaden participant diversity, and examine additional factors such as mental health, socioeconomic status, caregiving experiences, and academic stress

Keywords: *Family functioning, Family APGAR, compassion, student nurses*

INTRODUCTION

The family is regarded as the most important and enduring institution in Philippine society, shaping individuals' emotional, psychological, and social development (Abalos, 2023; Moreno et al., 2024). Filipino families are typically characterized by strong interdependence, where caregiving and decision-making are shared responsibilities (Genilo, 2021). These familial dynamics significantly influence young adults, particularly student nurses, whose emotional and professional identities are still evolving. In Nursing, compassion is a core value essential to holistic, patient-centered care. It enhances patient outcomes, fosters meaningful relationships, and supports ethical practice (Malenfant et al., 2022; Özan & Polat, 2024; Peter et al., 2024). As a blend of emotional connection, empathy, and a desire to alleviate suffering, compassion is shaped by both internal traits and external influences, including the family.

Family functioning, measurable through the Family APGAR, plays a crucial role in modeling empathy, emotional regulation, and prosocial behavior (Hintsanen, 2019; Su et al., 2021). Supportive family environments have been linked to emotional intelligence, resilience, and effective stress management, which are factors that strengthen compassion in clinical settings (Szcześniak & Tułecka, 2020; Di Fabio & Saklofske, 2021; Jabbari et al., 2023). Conversely, dysfunctional family dynamics may hinder emotional growth or contribute to stress, though some individuals may develop high compassion as a com-

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pensatory response (Ulloque et al., 2023).

While Nursing education encourages compassion through leadership, reflection, and role modeling (Straughair, 2019; Younas & Maddigan, 2019), students face academic and clinical pressures that can weaken their compassion competency (Duthu, 2022). Studies have shown that mindfulness and common humanity enhance compassionate responses, while excessive self-judgment diminishes them (Alquwez et al., 2021). Yet, emotional development is often overshadowed by technical training, despite its importance to safe and empathetic care.

Compassion is also shaped by academic experiences. Clinical exposure across year levels allows students to cultivate compassion through direct patient care, but prolonged stress may lead to compassion fatigue (Yi et al., 2024). Findings suggest a nonlinear trend, with variations across academic years due to maturity, confidence, and curriculum structure (Sen et al., 2024; Bilgic, 2022). Additionally, family-related stress may impact compassion, particularly among second-year students who are transitioning into more intensive clinical roles (Luvira et al., 2023).

Demographic factors such as sex may also influence compassion. Research generally shows that females score higher on compassion and caregiving behaviors (Tendhar et al., 2024; Roman-Niaves et al., 2022), though differences are often influenced by social expectations rather than innate traits. Educational settings play a role as well. Government institutions expose students to diverse patient populations, fostering empathy, while private institutions emphasize structured training that also supports emotional development (Berduzco-Torres et al., 2021).

The Family APGAR tool conceptualizes the family as a psychosocial unit composed of individuals sharing mutual care and responsibility (Serrano, 2023; Wang, 2024). It assesses how well the family supports or hinders personal well-being (Elvira et al., 2023). This study addresses a gap in Nursing research by exploring the relationship between family functioning and compassion among student nurses. By understanding this connection, educators can design interventions that enhance emotional growth and improve patient care outcomes.

Theoretical Framework

This study is grounded in Murray Bowen's Family Systems Theory, which conceptualizes the family as an emotionally interconnected unit that significantly influences individual behavior, emotional development, and coping mechanisms (Čepukienė & Neophytou, 2024). Bowen's theory supports the idea that individuals cannot be fully understood in isolation from their family system, as each member's behavior affects and is affected by the others. In the context of Nursing students, this theory helps explain how family functioning shapes emotional maturity, interpersonal skills, and ultimately, the ability to demonstrate compassionate patient care.

Bowen identified several key concepts that relate directly to how Nursing students may develop and express compassion. First, the concept of Differentiation of Self (DoS), which refers to the ability to maintain one's emotional and intellectual autonomy while remaining emotionally connected to others, plays a central role. Nursing students from highly functional families tend to develop higher DoS, enabling them to regulate their emotions, empathize without becoming overwhelmed, and offer calm, supportive care even under stress (Calatrava et al., 2022). Compassionate caregiving requires this balance of emotional involvement and professional detachment, which Bowen considers a product of healthy family dynamics.

The nuclear family emotional process and the family projection process describe how unresolved emotional patterns, such as anxiety or conflict, are transmitted within families. For Nursing students, these patterns may influence how they manage stress, engage with patients, or respond empathetically. Students who grow up in environments marked by high emotional reactivity or unresolved tension may experience challenges in offering compassion. Alter-

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natively, they may become more compassionate as a compensatory response (Ulloque et al., 2023). Bowen's concepts explain these opposing possibilities by accounting for individual variability within shared systems.

Another relevant concept is triangulation, which occurs when two family members in conflict involve a third person to stabilize the relationship. In Nursing, triangulation may manifest when students transfer family-related stress into clinical interactions, either positively through increased empathy or negatively through emotional disengagement. Compassion may act as a stabilizing force that promotes healthier communication and mitigates stress, reflecting Bowen's assertion that emotional understanding and awareness contribute to system stability (Cohen, 2024).

The concept of multigenerational transmission, which refers to how emotional patterns and behaviors are passed down through generations, also supports the study's premise. Students raised in nurturing environments that value empathy and care are likely to internalize these traits and reflect them in patient interactions. Likewise, emotional cutoff, defined as the emotional distancing from family members to manage unresolved tensions, can diminish or complicate one's capacity for compassion. Students with high emotional cutoffs may struggle with interpersonal closeness, affecting patient engagement, although structured support in nursing education can help address these issues (Jakimowicz et al., 2021).
Furthermore, sibling position may subtly influence caregiving styles and expressions of compassion. Firstborns, often socialized into leadership and caregiving roles, may display more structured and outward compassion, while later-borns might exhibit flexibility and emotional attunement in different ways (Danas et al., 2024). These internalized roles, shaped by the family system, contribute to how student nurses approach care, communication, and emotional labor in clinical practice.

Lastly, Bowen's concept of the societal emotional process connects family functioning with broader external stressors such as academic demands, gender expectations, and institutional culture. Compassion, understood as both a personal trait and a learned behavior, enables students to navigate these pressures while maintaining emotional presence in patient care. Students from high-functioning families may develop greater emotional resilience and adaptability, while others may require more institutional support to foster these traits (Jakimowicz et al., 2021; Moreno et al., 2024).

Research Questions

This study aimed to examine the relationship between family functioning and compassion levels among student nurses from University A and University B across all four year levels. Specifically, the study sought to answer the following questions to achieve the outlined goal with supporting evidence:

1. What is the level of Family Functioning among student nurses in terms of: Adaptation, Partnership, Growth, Affection, and Resolve?

2. Is there a significant difference in the level of Family Functioning of student nurses when grouped according to:
   a. Sex
   b. Year Level
   c. Type of Educational Institution?

3. What is the level of Compassion of student nurses?

4. Is there a significant difference in the Compassion Levels of student nurses when grouped according to:
   a. Sex
   b. Year Level
   c. Type of Educational Institution

5. Is there a significant relationship between levels of Family Functioning and Compassion among student nurses?

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Significance of the Study

This study highlights the role of family relationships in shaping compassion among student nurses, an essential trait in patient-centered care. Recognizing how personal backgrounds influence caregiving can lead to more empathetic clinical approaches and holistic interventions.

Insights into the impact of family functioning on compassion can inform support systems and curriculum design. Schools can strengthen counseling services and integrate compassion training to enhance students' emotional well-being and caregiving skills (Malenfant et al., 2022).

The findings lay a foundation for further exploring how family dynamics influence the development of professional traits in healthcare students. This supports the creation of interventions that promote compassion and emphasizes family support's role in shaping caregiving behaviors. The study shows how emotional support, communication, and shared values within the family contribute to a student's compassionate development. Families are encouraged to reflect on their impact and actively support future healthcare professionals.

Moreover, student nurses may better understand how family dynamics influence their compassion, encouraging reflection that supports professional development and patient-centered care. Identifying compassion-related factors supports learning environments that foster empathy. As Babaei et al. (2022) noted, compassion is key to quality care. The findings stress the need for education that considers personal and emotional influences.

METHODS

Research Design

The researchers utilized a quantitative, descriptive, cross-sectional correlational design. This design was chosen to analyze associations and differences at a specific point in time without manipulating variables, while also exploring how these relationships vary across different year levels.

Locale and Population

The study involved BSN students from Year Levels 1-4 enrolled in the second semester of AY 2024 -2025 at a private (University A) and a government (University B) institution in Benguet. These students were ideal participants due to their exposure to compassionate care in clinical practice across all year levels. Students who shifted from non-Nursing programs were excluded.

Proportional stratified random sampling was used, with strata defined by year level and sex. Random samples were selected using StatTrek's online random number generator to avoid sampling bias. From a total population of 1,103 students at University A and 1,050 at University B, a sample of 584 was determined using Slovin's Formula. This included 293 students from University A (214 females, 79 males) and 291 from University B (241 females, 50 males). All 584 participants successfully completed the questionnaires with no attrition recorded during the data collection period.

Data Gathering Tools

The Family APGAR, developed by Smilkstein (1978), assesses family functioning across five areas: Adaptation (resource-sharing and satisfaction with care), Partnership (family communication and joint problem-solving), Growth (emotional development through role flexibility), Affection (individual's satisfaction with intimacy and family interactions), and Resolve (time-sharing and fulfillment of family commitments) , using a simple three-point Likert scale (Torres et al., 2021). Scores range from 0–10, classifying family function as severely dysfunctional to highly functional. It is open-source, reliable ($\alpha = 0.84$), and widely used in various settings.

The Compassion Scale by Pommier et al. (2019) measures compassion through 16 items across four subscales: Kindness, Common Humanity, Mindfulness, and Indifference (reverse-scored), rated on a five-point Likert scale. It has strong internal consistency ($\alpha = 0.865$) and captures both compassionate and uncompassionate tendencies.

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Data Gathering Procedure

The researchers secured permission from the Research Ethics Committees, university administrators, and deans of Nursing in both institutions. Upon receiving ethics approval, the researchers communicated the study objectives to the deans and department heads of each year level to obtain access to student participants. Enrollment lists of BSN students for the second semester of Academic Year 2024–2025 were requested from both universities through their respective dean and associate dean of Nursing in both universities. These lists served as the sampling frame for identifying potential participants across all four year levels based on the study's inclusion criteria.

Prior to data collection, coordination with university administrators ensured the process occurred during class hours or at agreed-upon times to minimize academic disruption.

During the scheduled data collection period from February to March 2025, the researchers distributed printed questionnaires in classrooms per year level. The gathering of data took place simultaneously by dividing the group into two subgroups, one was collecting at University A while the other group was gathering data at University B. A brief orientation explained the study's purpose, procedures, and written informed consent. Participation was voluntary, with assured confidentiality and the right to withdraw at any time. Anonymity was maintained, with the option to include names left to the participants' discretion. All completed questionnaires were gathered collectively to ensure that individual responses remain anonymous.

The researchers remained available outside classrooms to address questions and foster a supportive environment. Participants completed the questionnaires at their own pace with a reminder to finish within 10-15 minutes, and class representatives submitted the completed forms. All data were securely stored in adherence to ethical and confidentiality protocols.

Ethical Considerations

Nursing ethical principles were observed to uphold the study's integrity. Autonomy was respected by informing participants about the study's objectives, procedures, and their right to withdraw at any time without penalty. An informed consent form outlined the study promoter's name, study purpose, voluntary participation, and withdrawal rights, allowing for well-informed decisions.

Justice was ensured by treating all participants fairly and selecting a diverse sample. Beneficence was reflected in the study's intent to improve patient care, family relationships, and nursing education, contributing to broader healthcare knowledge. Non-maleficence was upheld by identifying and minimizing risks, particularly psychological distress from discussing family issues, through strict confidentiality and the availability of support measures. No participants reported or exhibited distress during data collection. Anonymity was ensured by excluding names and other identifiers, which were deleted when no longer needed. Data was stored in password-protected, encrypted files accessible only to authorized researchers. Confidentiality was maintained by securing personal information and ensuring it was not disclosed without consent. Following the principle of veracity, researchers committed to honest and complete disclosure of findings, positive or negative, while maintaining participant confidentiality.

Statistical Treatment

Various statistical tools were used to analyze the data and address the research questions. Descriptive statistics summarized the participants' demographic profile. Differences in family functioning and compassion levels were examined based on sex, year level, and type of institution. The Independent Samples T-test assessed differences between males and females, and between private and government school students.

To compare across year levels, One-Way ANOVA was used to determine significant differences. If sig-

nificant differences were found, Tukey's HSD post hoc test identified which year levels varied.

Due to the lack of standard cutoffs for the Compassion Scale, median splits (Pommier et al., 2019) categorized participants into "higher" and "lower" compassion groups for more comprehensive group comparisons.

To explore the relationship between family functioning and compassion level, Pearson's Correlation Coefficient was applied to measure the strength and direction of the association.

Family APGAR Interpretation (Smilkstein, 1978)

Score Range	Interpretation
7-10	Highly Functional Family
4-6	Moderately Dysfunctional Family
0-3	Severely Dysfunctional Family

Compassion Scale Interpretation

Score Range	Interpretation
Scores < 4.125	Lower Compassion Level
Scores ≥ 4.125	Higher Compassion Level

Median: 4.125

Table 1. *Level of Family Functioning among BSN Students*

Level of Family Functioning	Frequency	Percentage	Mean
Highly Functional (7-10)	408	69.86	8.67
Moderately Dysfunctional (4-6)	134	22.95	5.28
Severely Dysfunctional (0-3)	42	7.19	2.38
Total	584	100.00	Overall Mean: 7.44

Mean = 7.44 (Highly Functional Family)

Variable	Level	Counts	Proportion	p
Adaptation	0	17	0.029	< .001
	1	197	0.337	< .001
	2	370	0.634	< .001
Partnership	0	55	0.094	< .001
	1	234	0.401	< .001
	2	295	0.505	0.836
Growth	0	26	0.045	< .001
	1	220	0.377	< .001
	2	338	0.579	< .001
Affection	0	46	0.079	< .001
	1	235	0.402	< .001
	2	303	0.519	0.385
Resolve	0	46	0.079	< .001
	1	232	0.397	< .001
	2	305	0.522	0.301

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RESULTS AND DISCUSSIONS

Table 1 shows that most student nurses (69.86%) came from highly functional families, with an average Family APGAR score of 7.440. Meanwhile, 22.95% reported moderately dysfunctional families, and 7.19% were categorized under severely dysfunctional families. The overall mean score indicates that most perceive their family environments as supportive especially in the aspect of Adaptation showing a high proportion of 0.634. However, individuals from dysfunctional families may encounter challenges, notably in the area of Partnership with 0.94 in proportion, that adversely affect their emotional well-being and academic performance.

The findings align with previous literature emphasizing the role of family support in students' emotional development. Zhang et al. (2024) and Martin et al. (2021) emphasized the impact of family support and early emotional communication on adolescents' mental and physical development. Similarly, Juan (2023) noted that students from broken families often face financial, emotional, mental, social, and behavioral challenges that hinder academic performance.

Applying Bowen's Family Systems Theory further clarifies how family dynamics affect student development. Jakimowicz et al. (2021) used this theory in Critical Care Nursing, showing that awareness of family systems enhances care quality. Theoretically, students from highly functional families may exhibit stronger emotional support and self-differentiation, while those from dysfunctional families may face emotional challenges tied to systemic issues like emotional triangles or projection, which can negatively impact academic and clinical performance.

Table 2 showed that female student nurses reported slightly higher Family Functioning scores (mean = 7.468) compared to male students (mean = 7.341). However, the difference was not statistically significant ($p = 0.569$), suggesting that sex alone does not significantly influence perceptions of family functioning.

This result supports Bowen's Family Systems Theory, which emphasizes that emotional processes are more deeply influenced by family dynamics than by individual characteristics like biological sex. Salimah and Nuryanti (2021) and García-Mendoza et al. (2021) found no significant sex-based differences in family functioning or parental involvement, emphasizing the greater impact of familial interactions. Similarly, Ojewale (2021) linked poor family functioning and socioeconomic issues to student depression, regardless of sex. Conversely, studies by Hsieh et al. (2022) and Bilal et al. (2021) suggest that males may report poorer family functioning or exhibit less emotional expressiveness regarding family experiences compared to females.

Taken together, these findings reinforce Bowen's assertion that core elements of family functioning, such as multigenerational transmission, role patterns, and self-differentiation, are not inherently tied to sex. Instead, they are outcomes of the emotional systems embedded within family and professional environments.

Table 2. *Differences in Family Functioning According to Sex*

Sex	Frequency	Mean
Female	455	7.468
Male	129	7.341

$t = 0.7=571$, $p = 0.569$ (significant)

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Table 3. *Differences in Family Functioning According to Year Level*

Year Level	Frequency	Mean
1	139	7.194
2	157	7.975
3	180	7.300
4	108	7.213

F = 4.245; p = 0.006 (significant)

	Sum of Squares	df	Mean Square	F	p
Year	62.347	3	20.782	4.245	0.006
Residuals	2839.555	580	4.896		

Post Hoc Tests

		Mean Difference	SE	Df	t	pscheffe
0	1	-0.780	0.258	580	-3.028	0.028
	2	-0.106	0.250	580	-0.423	0.981
	3	-0.019	0.284	580	-0.066	1.000
1	2	0.675	0.242	580	2.792	0.052
	3	0.762	0.277	580	2.753	0.057
2	3	0.087	0.269	580	0.323	0.991

Significant difference lies between “0” and “1”, p = 0.028

Table 3 presents the differences in family functioning according to year level. The analysis revealed a significant difference in Family Functioning scores across year levels, with second-year students reporting the highest mean score of 7.975. Post hoc analysis showed a significant difference between first- and second-year students (p = 0.028), while other comparisons were not significant. This suggests that perceived family support may vary as students’ progress through their academic journey.

The higher scores among second-year students may reflect increased family support during the early stages of clinical exposure, an adjustment period that often elicits increased familial involvement. As academic and clinical pressures intensify in later years, perceived support may decline due to reduced interaction time and expectations of independence (Liu et al., 2023).

These results align with Ulloque et al. (2023) and Nguyen et al. (2022), who highlighted the role of strong family functioning in supporting students' psychological well-being and academic adjustment. While these studies underscore the importance of family functioning for mental health, its influence on compassion remains underexplored in Nursing education (Miller et al., 2024).

Using Bowen’s Family Systems Theory, this fluctuation may reflect how students at different stages shift roles within the family system. Second-year students may benefit from stable, supportive structures, while higher-year students may be undergoing role shifts that reduce perceived family cohesion, reflecting transitions in the family functioning levels.

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Table 4. *Differences in Family Functioning According to Type of Educational Institution*

School	Frequency	Mean
University A	293	7.157
University B	291	7.725

t = 3.099, p = 0.002 (Significant)

Table 5. *Level of Compassion among BSN Students*

Level of Compassion	Median	Frequency	Percentage
Higher Compassion	> 4.125	331	56.68
Lower Compassion	< 4.125	253	43.32
University B		584	100.00

Table 4 reveals a statistically significant difference in family functioning scores between student nurses from both institutions (p = 0.002), with University A students reporting lower mean scores (7.157) than those from University B (7.725). This suggests that institutional context influences student nurses' perceptions of family support.

University B may offer an environment that enables students to maintain family connections despite academic pressures. This aligns with Ulloque et al. (2023), who linked strong family functioning with effective stress management and well-being, and Moreno et al. (2024), who emphasized the role of emotional resilience shaped by family dynamics. Szcześniak and Tułecka (2020) similarly noted that family interactions affect emotional regulation and life satisfaction under academic stress. These studies highlight how institutional environments can shape not only academic success but also influence students' emotional and familial experiences.

From Bowen's perspective, such differences may reflect how students regulate emotional processes within family systems in relation to broader societal pressures. Students from University B may demonstrate stronger DoS and fewer emotional cutoffs, fostering healthier family ties. In contrast, students from University A may face unresolved familial tensions, possibly intensified by financial strain, resulting in lower family functioning scores.

Table 5 reveals that 331 out of 584 participants recorded a median compassion score of 4.125 or higher, indicating generally high levels of compassion among student nurses. This clustering at the upper end of the scale suggests that compassion is a well-developed trait among most participants.

Those scoring below 4.125 may reflect individual differences in emotional or interpersonal capacities affecting their capacity for compassionate care.

These findings support Duthu (2022) and Bilgic (2022), who highlighted that compassion is central to nursing, enabling student nurses to build meaningful patient relationships and manage care challenges effectively. Sadeghi et al. (2025) identified emotional intelligence and reduced fear of compassion as key predictors, while Alquwez et al. (2021) and Field-Richards et al. (2024) linked high compassion levels to improved caring behavior and the effectiveness of compassion training.

However, the presence of lower compassion scores among some students highlights variations in emotional development. Su et al. (2021) and Öztürk & Kaçan (2021) noted that compassion develops through experience and benefits from structured education and support. Thus, this highlights that while compassion is a prominent trait among most student nurses, there remains a need for continued support and education to nurture and sustain this essential quality.

Table 6. *Differences in Compassion According to Sex*

Sex	Frequency	Mean
Female	455	4.158
Male	129	4.021

t = 3.386, p = <.001 (significant)

According to Bowen's theory, the ability to show compassion may be linked to emotional differentiation within the family system. Students from highly functioning families may have learned healthy emotional regulation and empathy, whereas those from dysfunctional families may struggle with unresolved emotional cutoffs, affecting their capacity to consistently show compassion.

Table 6 shows that female student nurses (mean = 4.158) demonstrated significantly higher compassion levels than males (mean = 4.021), with a statistically significant difference (t = 3.386, p < .001). This suggests that sex influences compassion levels, aligning with research by Arkan et al. (2020) and Tendhar et al. (2024), who found female nurses exhibit greater compassion, often linked to maternal roles, collaborative communication styles, and emotionally attuned leadership. Deng et al. (2022) further noted that gender-based emotional socialization may foster stronger emotional responsiveness among females.

From Bowen's perspective, these differences may reflect multigenerational family patterns, females often raised to express emotions and nurture, while males may be socialized toward emotional restraint. These ingrained roles influence how compassion develops across genders. Such disparities have practical implications in clinical settings, where compassion and empathy are crucial for effective communication and patient-centered care

As seen on Table 7, there are no significant differences observed in compassion levels across year levels (p = 0.981), showing that scores remained relatively stable throughout the Nursing program. This suggests that compassion is likely developed early in the curriculum and continually reinforced, highlighting its role as a core value in Nursing education.

Bowen's theory supports this stability, proposing that traits like compassion are rooted in family emotional dynamics and emotional differentiation. If students enter Nursing with well-developed emotional maturity, their compassion is likely already stable, explaining the lack of significant differences across year levels. Supporting this, Duthu (2022) and Bilgic (2022) found that student nurses consistently demonstrate high compassion, regardless of year level, with Bilgic noting neutral moral sensitivity alongside strong compassion. Similarly, Samson-Akpan et al. (2022) reported stable compassion levels across Nursing years, suggesting that academic and clinical training effectively sustain this vital trait.

Table 7. *Differences in Compassion according to Year Level*

Year Level	Frequency	Mean
1	139	4.133
2	157	4.135
3	180	4.123
4	108	4.116

F = 0.060; p = 0.981 (Not Significant)

	Sum of Squares	df	Mean Square	F	p
Year	7.628	3	2.543	0.060	0.981
Residuals	24716.466	580	42.615		

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Table 8. *Differences in Compassion According to Type of Educational Institution*

School	Frequency	Mean
University A	293	4.149
University B	291	4.105

t = 1.303, p = 0.193 (not significant)

Table 9. *Relationship between Family Functioning and Compassion Level*

Variables	Pearson's r	p-value	Interpretation
Family Functioning - Compassion Level	0.117	0.004 (significant)	Weak Positive Correlation

As shown on Table 8, compassion scores between students from University A (mean = 4.149) and University B (mean = 4.105) showed only slight variation and were not statistically significant (p = 0.193). Both groups demonstrated consistently high compassion levels, indicating that institutional affiliation does not significantly influence compassion development among BSN students. Thus, the absence of a significant difference implies that compassion may not be primarily shaped by institutional factors but rather by individual and interpersonal variables.

These results support the idea that compassion is developed mostly through the interaction of social context and individual attitude, even when institutions provide a foundation. CHED Memorandum Order No. 15 (2017) and international frameworks like those from the National League for Nursing emphasize outcomes-based and competency-focused education. Berduzco-Torres et al. (2021) found personal and social environments more influential rather than institutional types in empathy development. Similarly, Alquwez et al. (2021) and Ma and Xiao (2024) emphasized the roles of self-compassion, social support, and resilience in shaping compassionate behavior while Karimi et al. (2023) also identified mindfulness and connectedness as key predictors of compassion.

From Bowen's perspective, students from high-functioning families likely enter with stable emotional processing, fostering consistent compassion regardless of school type. These findings highlight that compassion is a deeply personal trait, shaped more by background and interpersonal factors than by educational setting.

Table 9 shows a weak but statistically significant positive correlation between Family Functioning and Compassion Level (r = 0.117, p = 0.004), suggesting that students from more functional family environments report slightly higher levels of compassion. While the effect size is small, the results suggest that supportive family dynamics may foster emotional development and compassionate traits.

These findings align with Ulloque et al. (2023), who linked poor family functioning to reduced empathy, and Ardhana et al. (2023), who connected low self-compassion to emotional neglect. Moreno et al. (2024) emphasized that strong family ties foster psychological well-being and healthy social behavior. In the Filipino context, Genilo (2021) noted that close family bonds reinforce shared caregiving values, which may explain even small positive shifts in compassion as family functioning improves.

Jones and Taylor (2022) highlighted that a nurturing family environment contributes to emotional stability, resilience, and empathy, all essential for personal well-being and compassionate caregiving. From Bowen's theory perspective, students from emotionally healthy families likely achieve greater self-differentiation, enabling them to maintain compassionate behavior even under stress.

While the correlation is small, it underscores the foundational role of family in shaping caregiving attitudes. It also suggests compassion develops

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through a combination of factors, including personality, academics, peer influence, and clinical exposure.

Limitations of the Study

This study has several limitations. Its cross-sectional design limits causal interpretation, and self-reported measures may be biased. The lack of qualitative data restricted deeper insight into participants' experiences. The sample, drawn from only two institutions in Benguet, limits generalizability. Key factors like socioeconomic status, mental health, religion, and caregiving experience were not considered. The Family APGAR and Compassion Scale, while useful, lacked depth in assessing interpersonal dynamics and different compassion dimensions. Academic and clinical workloads, which may affect compassion, were also not examined.

CONCLUSION

This study explored the relationship between family functioning and the level of compassion among BSN students and found that most respondents came from highly functional families and exhibited high levels of compassion, with female students showing significantly higher scores. A weak but statistically significant positive correlation was identified between family functioning and compassion, suggesting that while family support plays a role, it is not the sole influencing factor. Differences in compassion levels were observed between private and government Nursing institutions, though these should not be viewed as direct comparisons or value judgments, as such variations may stem from differences in academic structures or clinical exposure. Grounded in Bowen's Family Systems Theory, the study affirms that family dynamics contribute to emotional development, yet the development of compassion in student nurses remains multifactorial, involving personal, academic, and experiential influences. Overall, this study emphasizes the importance of cultivating emotionally intelligent and compassionate nurses through holistic Nursing education. Strengthening both family and academic support systems is important in preparing students to deliver empathetic, patient-centered care, regardless of the institution they attend.

RECOMMENDATION

The following are recommended based on the study:

1. Use longitudinal designs to track changes in family functioning and compassion over time for deeper insights and causality.
2. Combine quantitative and qualitative methods (e.g., interviews, focus groups) to capture emotional depth and lived experiences.
3. Include more diverse samples across institutions, regions, and cultures to enhance generalizability and allow broader comparisons.
4. Explore additional variables like mental health, religion, socioeconomic status, and caregiving experience as potential influences.
5. Integrate theories such as Attachment Theory and Emotional Intelligence to deepen understanding of compassion development.
6. Use more detailed family assessment tools or look into each aspect of the Family APGAR to examine communication, role distribution, and conflict resolution.
7. Study different family structures within the Filipino cultural context for richer interpretation.
8. Assess the effects of academic and clinical workloads on compassion, considering stress and burnout as limiting factors and traits like emotional maturity and sensitivity that may affect empathetic and patient-centered care.

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RESEARCH ARTICLE

Adherence to Medication Regimen and Awareness of the Local Government Support Program Among Employees Diagnosed with Hypertension in a Selected Company

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ABSTRACT

Introduction: This study assessed the medication adherence and awareness of Local Government Unit (LGU) support programs among employees diagnosed with hypertension in a selected company. It examined the relationship between awareness and adherence and identified key factors influencing these behaviors to inform workplace and public health strategies.

Method: A descriptive-correlational design was used involving 103 purposively selected employees. Validated tools were utilized, including the Morisky Medication Adherence Scale (MMAS-5), a researcher-made LGU Awareness Scale, the Beliefs about Medicines Questionnaire (BMQ), and the Multidimensional Scale of Perceived Social Support (MSPSS). Data were gathered between April and May 2025 and analyzed using descriptive statistics, chi-square tests, Spearman's Rho, and multiple regression.

Results: The medication adherence was moderately high (M = 3.01), especially in following scheduled doses, but declined when symptoms improved or side effects occurred. Awareness of government health programs was also moderately high (M = 2.68), yet formal communication and actual usage were low. Behavioral factors ($\beta = 0.328$, $p = 0.002$), workplace conditions ($\beta = 0.305$, $p = 0.004$), and financial accessibility ($\beta = 0.320$, $p = 0.007$) significantly influenced adherence. Demographic factors such as age, sex, tenure, and education were not significantly associated. Awareness was moderately correlated with adherence ($\rho = 0.561$, $p < 0.001$), but behavioral factors and support systems did not significantly moderate this relationship.

Conclusions: While most employees with hypertension follow their medication regimen, barriers such as behavioral hesitations, workplace stress, and financial limitations reduce full adherence. This supports theoretical perspectives such as the Health Belief Model, emphasizing perceived barriers and cues to action. Findings underscore the importance of improving LGU program communication, strengthening workplace support, and addressing behavior-related barriers to enhance long-term hypertension management among working adults. From a policy perspective, workplace-based health promotion programs integrated with LGU services, such as orientation days and digital kiosks for medicine access, can support adherence.

Keywords: *Medication adherence, hypertension, Local Government Support Program, workplace health, support systems, public health programs*

INTRODUCTION

Medication adherence is a key pillar in managing chronic illnesses like hypertension, yet it remains a persistent global and national health challenge. In the Philippines, approximately 66% of patients adhere to their medication regimens, with blood pressure control rates as low as 20% (Effectiveness of a Pharmacist-led Expert System, 2023). Poor adherence contributes to uncontrolled hypertension, increased healthcare costs, and a higher risk of complications such as stroke or heart disease (Tomasino & Tomasino, 2025). In this context, Local Government Units (LGUs) offer programs aimed at reducing these barriers by providing free or low-cost medications,

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community health services, and patient education. However, underutilization remains widespread due to poor awareness and access (Carolino & Bernabe, 2023). Although these programs are designed to improve health equity, their success largely depends on how well individuals are informed about them and how accessible they are in real-world settings (Baylon, 2024).

Understanding medication adherence requires not only clinical insight but also behavioral and systemic awareness. Many patients stop taking medications when they feel better or encounter side effects, an issue tied to beliefs and knowledge rather than medical advice alone (Horne et al., 1999; Peña, 2020). In workplaces where employees face shift work, physical demands, and time constraints, these issues become more pronounced. Employees often skip doses or avoid consulting with health providers due to busy schedules, job pressure, or limited health resources (McCurley et al., 2021). Behavioral factors like forgetfulness, fear of side effects, and perceived lack of need contribute heavily to non-adherence (Boo et al., 2024). Social and workplace support systems, such as reminders from coworkers or access to clinic services, can help improve outcomes (Catindig et al., 2023; Jolly et al., 2020). Additionally, financial and logistical barriers such as transportation and medication costs reduce the likelihood that individuals will continue their treatment, even when programs are available (Hutchcroft & Gera, 2022).

This study aimed to explore how awareness of the Local Government Support Program influences medication adherence among employees diagnosed with hypertension. It also assessed how behavioral, social, and workplace conditions shape this relationship. By focusing on employees in a real-world industrial setting, this research adds practical value to Adult Health Nursing. It informs workplace policies, highlights the nurse's role in chronic disease management, and supports the integration of public health programs into occupational health practices. The ultimate goal is to ensure that awareness leads to action, access leads to adherence, and support

METHODS

Research Design

This study used a descriptive-correlational design to examine medication adherence and its relationship with awareness of the Local Government Support Program among employees with hypertension in a selected company. The descriptive part explored how well employees followed their medication regimen and how aware they were of government support programs. The correlational part assessed the relationships between awareness, adherence, and influencing factors such as behavior, workplace conditions, and support systems. No variables were manipulated; the study observed real-world behaviors and patterns to help inform workplace-based health interventions.

Population and Sampling

This study focused on a specific population consisting of employees diagnosed with hypertension at a selected beverage manufacturing company, Philippines. A total of 103 respondents participated in the study. Respondents were selected using purposive sampling. This method allowed the researcher to include only those employees who had a confirmed medical diagnosis of hypertension and were currently prescribed antihypertensive medication. The sampling approach ensured that the respondents met the specific inclusion criteria relevant to the objectives of the study.

Questionnaire

The study used a structured survey questionnaire composed of both adapted and researcher-made tools. It measured six main variables: medication adherence, awareness of the Local Government Support Program, behavioral factors, support systems, workplace conditions, and financial and accessibility factors. The medication adherence scale was adapted from the Morisky Medication Adherence Scale (MMAS-5), while behavioral and support factors were measured using modified versions of the Beliefs about Medicines Questionnaire (Horne et al.,

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1999) and the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), respectively. Researcher-made instruments included the LGU Support Program Awareness Scale, Workplace Health Support Scale, and Financial and Accessibility Factors Scale. The medication adherence items were rated on a 4-point frequency scale (1 = Never to 4 = Always), while the rest of the sections used a 5-point Likert-type scale (1 = Strongly Disagree to 5 = Strongly Agree) while the LGU Awareness Scale used a 5-point awareness scale (1 = Not Aware to 5 = Fully Aware). These tools were validated by health experts and pilot-tested to ensure clarity, reliability, and relevance to the target population.

Data Collection Procedure

Data collection was conducted after securing approval from the Institutional Review Board and the management of the selected company. Ethical clearance was granted by the Institutional Review Board of St. Paul University Manila (IRB No. 2025-130-IMA-CNAHS). Eligible employees diagnosed with hypertension were invited to participate voluntarily. Before participation, respondents were informed about the study's purpose, procedures, possible risks and benefits, and their right to withdraw at any point without penalty. Informed consent was obtained before distributing the questionnaires. Surveys were administered either in person during clinic visits or through online forms, depending on the respondents' availability and preference. The collection period lasted four weeks, allowing respondents enough time to complete the survey without disrupting their work schedule. Completed forms were collected, reviewed for completeness, and organized for data analysis. No personal identifiers were collected, and all responses were kept anonymous and stored in password-protected files that were accessible only to the researcher. Confidentiality and data privacy were strictly maintained throughout the process. Data were collected between April and May 2025.

Data Analysis Process

The data collected were analyzed using both descriptive and inferential statistical methods. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the demographic profiles of respondents, levels of medication adherence, and awareness of the Local Government Support Program. Inferential statistics were used to examine the relationships among key variables. The Chi-square test determined significant associations between demographic factors and awareness levels. Spearman's Rho correlation assessed the relationship between awareness and medication adherence, as well as the influence of behavioral, support, and workplace-related factors. Multiple regression was used to identify the strongest predictors of adherence. Lastly, moderated regression analysis tested whether behavioral factors and support systems affected the strength of the relationship between awareness and adherence. All analyses were conducted using Jamovi software, with a significance level set at $p < 0.05$.

RESULTS

Table 1 shows that the majority of participating employees were aged 35–44 years old (35.9%), followed by those aged 45–54 years old (31.1%), and 25–34 years old (20.4%), indicating a middle-aged workforce. Most respondents were male (68%), reflecting the male-dominated nature of physically demanding roles in manufacturing. Regarding tenure, most had worked in the company for 6–10 years (24.3%) and 16–20 years (18.4%), showing a stable employee base. Educational attainment was highest among high school graduates (56.3%), followed by vocational/trade school graduates (28.2%), which reflects the typical academic background of production staff in industrial settings. These demographics provide essential context for understanding medication adherence and awareness of public health programs within this workforce.

Table 1. *Demographic Profile of the Respondents (n=103)*

Demographic Profile	Frequency	Percentage
2.1 Age		
25–34 years old	21	20.4%
35–44 years old	37	35.9%
45–54 years old	32	31.1%
55–60 years old	13	12.6%
61 and above	0	0.00%
2.2 Sex		
Female	33	32%
Male	70	68%
2.3 Tenure		
6–10 years	25	24.3%
16-20 years	19	18.4%
21-25 years	13	12.6%
26–30 years	11	10.7%
30 years and above	2	1.9%
2.4 Educational Attainment		
High School Level	2	1.9%
High School Graduate	58	56.3%
College Level	10	9.7%
College Graduate	4	3.9%
Vocational/Trade School	29	28.2%

Table 2 presents the level of medication adherence among employees with hypertension. The results show that the overall adherence was moderately high (Mean = 3.01). Most respondents reported consistently taking their medicine at the same time each day (Mean = 3.52) and following prescriptions as directed (Mean = 3.40), both in the high to moderately high range. However, adherence dropped when respondents were busy (Mean = 2.99), when symptoms improved (Mean = 2.68), or when experiencing side effects (Mean = 2.45), with the latter falling into the moderately low category. These results suggest that while many employees adhere to their medication schedules, specific behavioral barriers still affect full compliance.

Table 3 shows the distribution of respondents across different levels of medication adherence. Nearly half of the respondents (48%) fell under the high adherence category, while 19% had moderately high adherence. However, a notable portion of respondents (33%) were classified as having low or moderately low adherence. This variation highlights that while many employees follow their medication regimens, a significant number still struggle with consistent adherence underscoring the need for targeted interventions in the workplace.

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Table 2. *Level of Adherence to Medication Regimens among Employees with hypertension in the Selected Company*

Statement	Level of Adherence
I take my medication as prescribed.	High
I remember to take my medicine even when I'm busy.	Moderately High
I continue taking my medicine even when I feel better.	Moderately High
I manage side effects while still taking my medicine.	Moderately Low
I take my medicine at the same time each day.	Moderately High
Overall Level of Adherence to Medication Regimens	**Moderately High**

Table 3. *Distribution of Respondents Across Levels of Medication Adherence*

Mean Score	Level	F	`%
1.00—1.74	Low	9	9%
1.75—2.49	Moderately Low	25	24%
2.50—3.24	Moderately High	20	19%
3.25—4.00	High	49	18%

Table 4 presents the key factors affecting medication adherence among employees with hypertension. Demographic variables such as age, sex, tenure, and educational attainment showed no significant effect on adherence. In contrast, behavioral factors ($\beta = 0.328$, $p = 0.002$), workplace conditions ($\beta = 0.305$, $p = 0.004$), and financial and accessibility factors ($\beta = 0.320$, $p = 0.007$) were found to have a statistically significant influence on adherence. These results suggest that practical challenges and health behaviors play a more important role than background traits in determining how consistently employees follow their medication regimen.

Table 5 displays the distribution of respondents across different levels of awareness regarding the Local Government Support Program. Most employees demonstrated very low (41%) or high (29%) awareness. Only a small portion had very high awareness (7%), and another 15% reported moderate awareness. These findings suggest a polarized trend where a group of employees is well-informed, a substantial portion remains uninformed or underinformed about government health services. This highlights the need for structured and consistent information campaigns within the workplace.

Table 6 shows the distribution of awareness levels regarding the Local Government Support Program among respondents. A significant number of employees demonstrated very low awareness (41%), followed by high awareness (29%). Only 15% had moderate awareness, and fewer had low (9%) or very high awareness (7%). This distribution highlights a clear gap: while a portion of the workforce is well-informed, many still lack knowledge of available LGU health services. These results suggest that communication and education efforts from both the workplace and local government must be improved to reach a broader segment of the employee population and ensure that all employees are equally informed and able to access available health support services.

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Table 4. *Factors on Medication Adherence among Employees with Hypertension*

Predictor	Estimate	SE	t	p	Significance	Decision	Discussion of Related Hypothesis
Demographic Factors							
Intercept	-0.760	0.4716	-1.611	0.111	NS	Failed to Reject H_0	No significant base-level effect of demographics on medication adherence.
Age (Reference: 25–34 years old)							
35–44 years old – 25–34 years old	-0.026	0.163	-0.160	0.874	NS	Failed to Reject H_0	Age did not significantly influence adherence; thus, H_{02} (no significant relationship between age and adherence) is retained.
45–54 years old – 25–34 years old	-0.168	0.203	-0.828	0.410	NS	Failed to Reject H_0	Adherence did not vary significantly among middle-aged employees.
55–60 years old – 25–34 years old	0.086	0.291	0.294	0.770	NS	Failed to Reject H_0	Older employees also showed no significant difference in adherence.
Sex	0.165	0.113	1.465	0.147	NS	Failed to Reject H_0	
Tenure (Reference: 11-15 years)							
1–5 years – 11-15 years	-0.296	0.275	-1.079	0.284	NS	Failed to Reject H_0	Shorter tenure did not significantly influence adherence. Findings support the null hypothesis H_{02} on demographics.
16-20 years – 11-15 years	0.311	0.161	1.934	0.056	NS	Failed to Reject H_0	Slight positive trend noted, but still not statistically significant. Longer tenure not a strong predictor of adherence.
6–10 years – 11-15 years	-0.074	0.153	-0.484	0.629	NS	Failed to Reject H_0	No meaningful difference between shorter and mid-level tenure groups.
21-25 years – 11-15 years	0.170	0.210	0.809	0.421	NS	Failed to Reject H_0	No significant change in adherence seen among long-tenured employees.
26-30 years – 11-15 years	0.051	0.261	0.195	0.846	NS	Failed to Reject H_0	Very minimal effect; tenure alone did not predict adherence.
30 years and above – 11-15 years	0.050	0.436	0.115	0.909	NS	Failed to Reject H_0	The longest-serving employees showed no significant advantage in adherence compared to mid-tenure peers.

Table 4. *Factors on Medication Adherence among Employees with Hypertension (continued)*

Predictor	Estimate	SE	t	p	Significance	Decision	Discussion of Related Hypothesis
Educational Attainment (Reference: College Graduate)							
College Level – College Graduate	-0.024	0.277	-0.088	0.930	NS	Failed to Reject H_0	College undergraduates showed no meaningful difference in adherence, supporting the null hypothesis H_{02}.
High School Graduate – College Graduate	0.083	0.261	0.316	0.752	NS	Failed to Reject H_0	High school graduates adhered at similar levels to college graduates, showing education was not a key factor in this setting.
High School Level – College Graduate	-0.307	0.437	-0.702	0.485	NS	Failed to Reject H_0	The small sample with lower education did not significantly differ in adherence behavior.
Vocational/ Trade School – College Graduate	-0.118	0.263	-0.449	0.655	NS	Failed to Reject H_0	Vocational training background had no significant effect on medication adherence in this group.
Other Factors							
Behavioral Factors	0.328	0.105	3.131	0.002	S	Reject H_0	Behavioral beliefs significantly influenced medication adherence. This supports the alternative hypothesis that behavior affects adherence.
Support Systems	0.063	0.091	0.690	0.492	NS	Failed to Reject H_0	Perceived social support did not significantly predict adherence, suggesting that external support alone may not drive medication-taking behavior.
Workplace Conditions	0.305	0.103	2.965	0.004	S	Reject H_0	Favorable workplace conditions significantly improved adherence, supporting the hypothesis that work-related factors impact health behaviors.
Financial and Accessibility Factors	0.320	0.116	2.759	0.007	S	Reject H_0	Access to affordable medication and financial ease significantly promoted adherence, aligning with the hypothesis that accessibility affects outcomes.

Note: Significant if $p<0.05$; Dependent Variable= Medication Adherence, NS=Not Significant, S=Significant

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Table 5. *Level of Awareness Regarding the Local Government Support Program among Employees with Hypertension in the Selected Company*

Statement	Mean	Std Dev	Awareness Level
I know that the government provides free or low-cost hypertension medication.	3.47	1.39	Moderately High
I understand the steps to apply for LGU support programs.	2.73	1.61	Moderately High
I know where to access local government health services.	2.94	1.42	Moderately High
I have received official information about LGU healthcare support.	1.70	0.92	Low
I have personally used a government health service for my condition.	2.54	1.63	Low
Overall Level of Awareness of Local Government Support Program	2.68	1.19	Moderately High

Table 6. *Distribution of Respondents Across Levels of Awareness Regarding the Local Government Support Program (n = 103)*

Mean Score	Awareness Level	F	%
1.00 – 1.80	Very Low Awareness	42	41%
1.81 – 2.60	Low Awareness	9	9%
2.61 – 3.40	Moderate Awareness	15	15%
3.41 – 4.20	High Awareness	30	29%
4.21 – 5.00	Very High Awareness	7	7%

Table 7 summarizes the main variables of the study. Overall, employees showed moderately high medication adherence (Mean = 3.01) and moderately high awareness of the LGU support program (Mean = 2.68). Behavioral factors were rated as moderately positive (Mean = 2.92), suggesting that most employees had favorable beliefs and habits regarding their medication. Support systems (Mean = 2.87) and workplace conditions (Mean = 2.95) were perceived as providing moderate to fair support, while financial and accessibility factors were rated as having moderate barriers (Mean = 2.81). These findings indicate that although most employees are managing their condition reasonably well, improvements in support and access could further enhance health outcomes.

Table 8 presents the statistical analysis of factors associated with awareness of the Local Government Support Program. Demographic variables such as age, sex, job tenure, and job position showed no significant relationship with awareness levels, as indicated by Chi-square tests ($p > 0.05$). In contrast, workplace conditions, support systems, behavioral factors, and financial and accessibility aspects were all significantly correlated with awareness ($p < 0.001$), based on Spearman's Rho tests. These results suggest that awareness is influenced more by the environment, support, and access than by an employee's background or position.

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Table 7. *Summary of Main Study Variables*

Variable	Description	Results	Interpretation
Medication Adherence	Consistency in following prescribed medication regimen	M = 3.01, SD = 0.85	Moderately High adherence among employees
Awareness of LGU Programs	Knowledge and understanding of government support programs for hypertension	M = 2.68, SD = 1.19	Moderately High awareness, but with limited actual usage
Behavioral Factors	Beliefs, habits, and barriers affecting medication-taking behavior	p = 0.002	Significant predictor of adherence
Support Systems	Perceived help from family, peers, and workplace programs	p = 0.492	Not a significant predictor of adherence
Financial & Accessibility	Access to affordable medications and healthcare resources	p = 0.007	Significant predictor of adherence
Workplace Conditions	Supportive or stressful work environment affecting health adherence	p = 0.004	Significant predictor of adherence

Table 8. *Correlation of Demographic and Workplace Factors with Variations in Awareness of the Local Government Support Program among Employees with Hypertension*

Factor	Computed Value	p-value	Significance	Decision	Discussion of Related Hypothesis
Chi-square Test					
Age	57.100	0.362	Not significant	Failed to reject H_o	Age was not significantly associated with adherence, supporting the null hypothesis that demographic variables do not influence medication adherence.
Sex	19.400	0.370	Not significant	Failed to reject H_o	There was no significant difference in adherence based on sex, indicating that gender does not play a major role in adherence behaviors.
Job Tenure	120.00	0.200	Not significant	Failed to reject H_o	Length of service did not significantly affect adherence, aligning with earlier regression findings on demographic neutrality.
Job Position	72.500	0.462	Not significant	Failed to reject H_o	Rank or job level did not influence adherence, affirming that position in the company does not drive health behavior differences.

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Table 8. *Correlation of Demographic and Workplace Factors with Variations in Awareness of the Local Government Support Program among Employees with Hypertension (continued)*

Factor	Computed Value	p-value	Significance	Decision	Discussion of Related Hypothesis
Spearman's Rho					
Workplace Conditions	0.471	< .001	Significant	Reject H_o	A positive and significant correlation shows that better workplace conditions are linked with higher medication adherence among employees.
Support System	0.409	< .001	Significant	Reject H_o	Strong social support is positively correlated with adherence, confirming the hypothesis that support systems improve treatment consistency.
Behavioral Factors	0.46	< .001	Significant	Reject H_o	Positive health beliefs and attitudes are strongly correlated with higher adherence, supporting behavior-focused interventions.
Financial and Accessibility	0.567	< .001	Significant	Reject H_o	Financial access and ease in obtaining medication strongly correlate with better adherence, validating the role of affordability in health compliance.

Note: Significant if p<0.05, Outcome Variable=Awareness of the Local Government Support Program

Table 9 shows the result of the Spearman's Rho correlation between awareness of the Local Government Support Program and medication adherence. A moderate positive correlation was found ($\rho = 0.561$, $p < .001$), indicating a statistically significant relationship. This means that employees who were more aware of available LGU health programs were also more likely to follow their prescribed medication regimen. The result supports the importance of health education and awareness-building efforts in improving treatment compliance among working adults.

Table 10 presents the moderated regression analysis to determine whether behavioral factors and support systems influence the relationship between awareness and adherence. The direct effect of awareness on adherence was significant ($\beta = 0.208$, $p = 0.002$), as were the independent effects of behavioral factors ($\beta = 0.469$, $p < 0.001$) and support systems ($\beta = 0.309$, $p = 0.001$). However, neither interaction term—Behavioral Factor × Awareness ($p = 0.319$) nor Support Systems × Awareness ($p = 0.271$) was statistically significant. This indicates that although awareness, behavior, and support individually contribute to better adherence, they do not amplify or

Table 9. *Correlation between Awareness of the Local Government Support Program and Medication Adherence among Employees with Hypertension*

Bivariate	Rho value	p-value	Significance	Decision	Discussion of Related Hypothesis
Awareness of the Local Government Support Program and Medication Adherence	0.561	< .001	Significant	Reject H_o	There is a moderate, positive, and significant relationship between awareness and adherence. Increased awareness of LGU programs promotes better medication adherence, supporting the hypothesis that awareness influences health behavior.

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Table 10. *Moderating Effect of Behavioral Factors and Support Systems in the Relationship between Awareness of the Local Government Support Program and Medication Adherence among Employees with Hypertension at the Selected Company*

Predictor	Beta	SD	T-value	P-value	Significance
Awareness -> Adherence	0.208	0.067	3.13	0.002	Significant
Behavioral Factor -> Adherence	0.469	0.084	5.553	0.000	Significant
Behavioral Factor x Awareness -> Adherence	0.074	0.074	0.996	0.319	Not Significant
Support Systems -> Adherence	0.309	0.094	3.287	0.001	Significant
Support Systems x Awareness -> Adherence	-0.089	0.081	1.1	0.271	Not Significant

DISCUSSION

On Medication Adherence Patterns and Behavioral Barriers

This study found that nearly half of the respondents (48%) demonstrated a high level of medication adherence, while 19% had moderately high adherence. However, 33% reported moderately low to low adherence, reflecting that a significant portion of employees still experience difficulty in maintaining consistent medication use. The highest adherence scores were related to taking medications on time and following prescriptions, but adherence declined when respondents were busy, felt better, or experienced side effects. These findings are consistent with previous literature identifying behavioral challenges such as forgetfulness and perceived improvement as barriers to long-term adherence (Peña, 2020; Boo et al., 2024). This supports Tomasino and Tomasino's (2025) observation that adherence often breaks down when symptoms subside, leading to poor control of chronic conditions.

These findings also support theoretical perspectives such as the Health Belief Model (HBM), which emphasizes that individuals weigh perceived benefits against perceived barriers. In this case, some employees may have perceived less benefit in continuing medication when symptoms improved, while others may have lacked self-efficacy to manage side effects, influencing their adherence.

On Awareness and Access to LGU Programs

Awareness of the Local Government Support Program was moderately high overall (Mean = 2.68). Most employees were aware that the government offers free or subsidized medications, but many lacked formal communication and direct usage of such services. Notably, 41% of respondents reported very low awareness. This is consistent with the findings of Carolino and Bernabe (2023) and Baylon (2024), who emphasized that poor promotion and communication hinder awareness and access to LGU health services, even when they are available. Under the HBM, this may reflect a lack of cues to action, external prompts such as health talks or posters that could trigger engagement. Moreover, perceived susceptibility and perceived severity may be low in those who believe their condition is manageable without support, contributing to reduced motivation to explore LGU services.

On Independent Effects of Awareness, Behavior, and Support

Despite the moderate awareness scores, a significant positive correlation was found between awareness and adherence ($\rho = 0.561$, $p < .001$), suggesting that more informed employees were better able to comply with their treatment regimens. This supports the argument of Shreyer et al. (2022) that improving health program awareness is key to promoting healthy behavior. However, moderation analysis

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showed that behavioral factors and support systems, while significant predictors of adherence on their own, did not significantly alter the effect of awareness on adherence. This means each factor influences adherence independently, contrary to earlier assumptions that strong support or better behavior would amplify the role of awareness, as suggested in health behavior models.

The independence of these factors supports HBM's assertion that health actions are taken when individuals feel confident (self-efficacy), perceive the threat as serious (perceived severity), and have both internal motivation and external cues to act. In this case, even when behavioral or support factors were present, the absence of strong perceived susceptibility or cue-to-action from formal LGU channels may have limited their amplifying effects.

On Environmental and Financial Influences

Regression analysis revealed that demographic characteristics such as age, sex, tenure, and educational attainment did not significantly influence adherence. Instead, behavioral factors ($\beta = 0.328$), workplace conditions ($\beta = 0.305$), and financial and accessibility factors ($\beta = 0.320$) had significant effects. These findings confirm earlier studies by Hutchcroft and Gera (2022) and Catindig et al. (2023), which emphasized that external barriers and support systems play a more direct role in treatment adherence than demographic background.

Workplace conditions, including stress and workload, were found to moderately influence both awareness and adherence. Employees working under stressful environments or with irregular shifts may have limited opportunities to seek health services or keep up with their medication schedule. Financial barriers also played a role, with many respondents citing challenges in consistently accessing medications due to cost or location. These findings are aligned with Cruz and Salazar's (2021) work, which highlights that accessibility and affordability are key components of effective chronic disease management. These external factors align with the HBM's concept of perceived barriers. Even if an individual understands the importance of adherence, logistical barriers like medication cost or lack of time may reduce perceived ability to act. Addressing these barriers directly increases the likelihood of action, reinforcing HBM's emphasis on modifying the cost-benefit evaluation of health behaviors.

Interestingly, although many employees did not receive formal orientation about government programs, 29% still reported high awareness. This suggests that informal sources such as peer discussions or posters may be filling some of the communication gaps. This bimodal pattern, wherein a large group of employees reported very low awareness and another group reported high awareness, suggests inconsistent information delivery across the workplace. This highlights the need for structured and inclusive health communication strategies to ensure that all employees have equal access to LGU-related information and services. From an HBM lens, structured health communication provides the essential cue to action needed to trigger behavior change. Without formal orientation or official endorsement, employees may lack the necessary prompts to view participation in government programs as urgent or necessary.

Study Implications

This study highlights the importance of strengthening behavioral support, workplace health programs, and awareness of government services to improve medication adherence among employees with hypertension. Nurses play a key role not only in patient care but also in health education and system navigation. Occupational health teams can use these findings to design targeted strategies that address real-life barriers to adherence, such as forgetfulness, financial limitations, and poor communication. This study is useful for nurse educators, healthcare providers, and local government units in planning interventions that lead to full adherence to medication regimens and improved awareness of LGU programs. The results also suggest the need for stronger coordination between workplaces and local health units to improve the visibility and usage of available public health programs. Since behavioral factors,

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support systems, and workplace conditions, not just demographics, were significantly associated with adherence, designing programs and activities that target these aspects may further increase employee engagement and long-term compliance.

Study Limitations

The study was limited to employees from a single manufacturing company, which may affect generalizability to other industries or regions. Self-reported data may also be subject to recall bias or social desirability bias. In addition, the study did not include qualitative data that might have provided deeper insight into personal beliefs and barriers. The cross-sectional design captured behaviors at a single point in time and did not account for changes in adherence over time.

CONCLUSION

This study found that medication adherence among employees with hypertension was moderately high but still affected by behavioral, workplace, and financial factors. Awareness of government support programs was also moderately high, yet many employees lacked formal communication or direct access to these services. A significant relationship between awareness and adherence was confirmed, but behavioral and support factors did not moderate this link. The findings suggest that adherence is shaped more by practical conditions than by personal background. Addressing behavioral barriers, improving access to healthcare, and promoting LGU programs through clear and structured communication can help improve health outcomes in the workplace.

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"Medication adherence is strengthened not only by awareness but by removing behavioral barriers, ensuring access, and clearly communicating support programs in the workplace."

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RESEARCH ARTICLE

Research Competency of Professional Nurses

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ABSTRACT

Background: Nurses face increasing demands for high-quality care, driven by local and global health advancements. This necessitates research and the adoption of evidence-based practices to enhance both nursing care and the profession itself. The literature reports the lack of understanding and accessibility of research related to the research capability of nurses. Collaborative nursing research across academic and practice settings is imperative to generate knowledge to improve patient care; however, models of academic/practice partnerships for nursing research are lacking. *Aim:* This study determined the research competency of professional nurses to serve as a basis for the development of research-based activities. *Methods:* Utilizing a quantitative descriptive survey design, with the use of a questionnaire and structured small group interview (4 small groups with 3-4 members per small group), data were gathered from 81 nurses employed at hospital X, which is a 250–bed capacity tertiary hospital. The self-made structured questionnaire is valid with a CVI=0.956. Frequency, percentage, mean, and the Kruskal-Wallis test were used to treat the data statistically. *Findings:* Majority of the respondents belong to the younger population (87.66%) belonging to less than 2-5 years of service in the institution. Respondents are advanced nurse researchers (mean=1.95) and have been serving as respondents in research (50.00). The respondents had the highest mean =2.02 in problem identification and the lowest in research utilization with a mean=1.90. The research competency of nurses is significantly associated with educational attainment, with a p-value of 0.011. Position (p value=0.387), length of service (0.210), area of assignment (p value=0.449), and research involvement (p value=0.169) are not significantly associated with their research competency. *Conclusion:* Based on the findings of the study, the researchers conclude that nurses who are employed at Hospital X possess the knowledge; however, they lack the practical experience in research. The variable of educational attainment is an important factor in achieving research competency. There are personal, organizational, and professional facilitators and barriers to the research competency of the nurses. A research capability enhancement program for the nurses can be developed. The researchers recommend: enhancing the research competency of the nurses through a research capability-building program developed for them; strengthening the institutional support for ongoing research training, especially for the nurses who are pursuing their postgraduate education or continuing professional development in the research process; recognizing and rewarding research engagement and output among nursing staff to sustain high-level performance; the promotion of mentoring systems where expert and proficient nurses can guide those still developing their research competencies, and the conduct of future studies involving multiple institutions to broaden generalizability and include more inferential analysis.

Keywords: *Research competency level, professional nurses, research problem definition, research methods, and procedures, data analysis and interpretation, research dissemination, research utilization, Hospital X*

INTRODUCTION

Nurses face increasing demands for high-quality care, driven by local and global health advancements. This necessitates research and the adoption of evidence-based practices to enhance both nursing care and the profession itself. The National Nursing Core Competency Standards (NNCCS) 2012 emphasize that nursing graduates must be able to function as a beginning nurse researcher, a beginning nurse practitioner, and a beginning nurse leader-manager. The ASEAN integration 2015 framework also emphasizes research competency of nurses for improved professional caring to be at par with international nursing standards. The dynamic and uncertain nature of the

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health care environment requires nurses to become competent (Hagbahery et al.,2004); thus, research competency, which refers to the knowledge and skills required of nurses to be able to conduct research, is an intrinsic part and outcome in nursing education and practice (Keefe, 2002). Nurses must also possess research capability, implying a collaborative process that can be deployed and through which research competencies can be applied.

Previous studies conducted about the research capability of Nurses report a lack of understanding and accessibility of research (Purkis et al., 2008). McCance et al. (2008) reported their findings from a research capability study among nurses and midwives that highlighted developing research expertise that will enable the profession to deliver programs of research. As shared by colleagues in the clinical areas, there is a lack of opportunities for them to engage in research, nor are not interested in doing one. They lack the experience in the conduct of research because they are more focused on patient care. Similarly, some colleagues in the academe are quick to admit that they are not able to understand the process of research. Some also do not want to have a load in research, RLE, or lecture. Although a mentoring research program is available, the hesitancy to engage in research is still evident.

In a systematic review by Lode et al. (2015), findings reveal that the research capability of clinical nurses is lacking in knowledge about how to increase research utilization, the ability to identify clinical problems, changing nurses' attitudes to research and research supervision, and finally, funding as a success factor. Cooke, J. (2005) has also suggested that research capability building should develop skills and confidence, support linkages and partnerships, ensure the research is 'close to practice', develop appropriate dissemination, invest in infrastructure, and build elements of sustainability and continuity.

Jacobson et al. (2008) shared that the factors influencing nurses to participate in research include consideration of the characteristics of nurses and their work settings, and highlighted that clinical research is necessary for the development of nursing's body of knowledge and improving the quality of care. Moreover, factors such as individual capacity, belief, and attitudes, and organizational factors have been identified to influence the implementation of research activities among nurses (Squires et al., 2013). Rodgers (2002), Parahoo (2000), and Squires et al. (2007) found that the attitude of nurses toward research is unfavorable, research involvement is low, and the use of research in practice is slow and haphazard. Nurses comprise a large number in the hospital industry where research opportunities exist that nurses can be a principal investigator, research assistant, subject or participant, identifier of problems, user and evaluator of research-based data, and an advocate. Tubbs-Cooley et al. (2013) mention that collaborative nursing research across academic and practice settings is imperative to generate knowledge to improve patient care; however, models of academic/practice partnerships for nursing research are lacking.

This study utilizes the concepts of research, the proficiency levels of Patricia Benner, and Dreyfus' Skill Acquisition Model. As defined, research is the search for knowledge or any systematic investigation to establish novel facts, solve new or existing problems, prove new ideas, or develop new theories, usually using a scientific or systematic approach. Through research, evidence-based nursing practice is determined through which will guide one's practice. Therefore, continuous training and learning, effective coaching, and counseling will help nurses to master their research competency. Research competency in this study refers to the knowledge and practice of nurses regarding the research process and all its related activities. It will also highlight the capability of the nurse to engage in research.

This study then aims to determine the research competency of professional nurses, specifically in the areas of a) Research problem conceptualization, b) Research methods and procedures, c) Research Data Analysis and Interpretation, d) Research dissemination, e). Research utilization. The study also deter-

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mined the barriers and facilitators in the research competency of the professional nurses in terms of a) Personal b) Organizational and c) Professional, and the association of the profile variables with the research competency of the hospital nurses to serve as basis for the development of research-based activities with the hope that the research findings will serve as a driving force for nurses to employ measures to improve their nursing care through engaging in research activities to determine evidence-based nursing care, and they will be made aware of their proficiency levels in research and will take measures to improve, For nursing administration to use the findings as basis for the development of programs/ activities that will engage nurses to do research, and for Nursing Education, this study will serve as an eye opener to curriculum planners to integrate love for research among the students, so that they can still do research even when they are in their work areas, and for Nursing Research, this study will serve a related literature for future studies about research competency.

METHODS AND PROCEDURES

Research Design

The study employed a quantitative descriptive survey design to determine the research competency level of nurses employed at Hospital X, utilizing a method of triangulation, which involves the use of more than one method of data collection to study the research question, in order to improve the accuracy, credibility, and depth. A method of triangulation (utilizing a questionnaire and structured small group interview) was used in the study.

Locale and Population

Locale: The study was conducted at Hospital X, a tertiary-level healthcare facility located in the City of Baguio, Philippines. As a prominent institution in the region, Hospital X serves a diverse patient population and offers a wide range of medical services and specialties. The hospital is equipped with advanced medical technologies and staffed by a team of highly qualified healthcare professionals, providing an ideal setting for investigating research competency among professional nurses. The importance of this locale is underscored by its commitment to continuous professional development and high standards of patient care.

Population: The target population for this study consisted of 110 professional nurses employed at Hospital X. From this group, a sample of 81 professional nurses was selected randomly, which represents 73.6% of the total population. The sample size includes registered nurses who have been employed at the hospital for a minimum of six months to ensure they have sufficient experience in their roles. To further verify and enhance the reliability of the data, a subgroup of 15 respondents participated in structured group interviews. These participants belong to the 81 survey respondents based on their availability and willingness to provide further clarification on selected survey topics.

Data Gathering Tool

A self-made structured questionnaire and a structured interview were utilized in gathering data. The self-made questionnaire is based on the National Nursing Core Competency Standards 2012 and the key areas of responsibility of the nurse, focusing on research competency. Content validity and reliability were established; thus, the questionnaire was evaluated by three (3) research experts and a nurse practitioner. Content validity index is 0.956, which indicates a very valid and reliable (r=0.86) tool. The structured interview was done after analysis of the questionnaire to clarify the results. Results of the structured interview were used to enhance the interpretation of the data gathered. The structured interview questions were similar to those of the questionnaire. There were 4 small groups with 3-4 members each.

Data Gathering Procedure

Before the data collection, the SLU Ethics Committee approved on April 10, 2018, Approval number: SLU-REC 2017-072 for the study proposal. Data gathering was done according to the time and place

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as agreed upon by the participants and researchers. The researchers ensured that patient care was not disrupted, and protocols were strictly adhered to. Confidentiality, anonymity, and privacy of the respondents were warranted through number-coding.

Permission to gather data was granted through a formal letter addressed to the administration officers of Hospital X. Once permission was granted, the researchers engaged the services of a research assistant, whose instructions about the research were given, and to gather data from the employed nurses. Data gathering was scheduled accordingly so that there would be no work disruption, as there were limitations in gathering the respondents for the group interview. The respondents were able to choose a day for the group interview upon their availability. The research assistant was briefed about the ethical considerations, which include voluntary participation, commitment, sincerity, and honesty in completing the questionnaire. An informed consent form was signed by the respondents. A group of 15 nurses agreed to be a part of the small group interview.

Treatment of Data

To determine the research competency level of professional nurses, the mean was computed, such that: 1:00 – 1:74 Novice Researcher -the nurse has a basic understanding of research but no practical experience in conducting research 1:75 – 2:49 Advanced Beginner Researcher - the nurse has a basic understanding of research, but has limited practical experience in conducting research 2:50 – 3:24 Proficient Researcher-the nurse can research because he has a sound theoretical knowledge and sufficient research experience. 3:25 – 4:00 Expert Researcher -the nurse can do research consistently to a satisfactory standard, because he has a sound theoretical knowledge and understanding of the topic, together with sufficient research experience to be able to complete/carry out the task independently and without assistance.

To determine the barriers and facilitators in the research competency of the professional nurses, the frequency and percentage were used. To determine the association of the research competency level of nurses with the variables (position, length of service, area of assignment, educational attainment, and exposure to research), the Kruskal-Wallis test was computed, which is a non-parametric method for testing whether samples originate from the same distribution. It is used for comparing two or more independent samples of equal or different sample sizes. This test was computed to determine the association of the extent of research competencies (dependent variable) and the variables (position, length of service, area of assignment, educational attainment, and exposure to research), which yielded categorical data (www.statisticssolutions.com).

RESULTS AND DISCUSSION

Profile of Respondents

Out of the total 110 registered nurse employees in the hospital, 81 participated, with a response rate of 80.20%. Of the total eighty-one (81) participants, the majority are nurses occupying the staff nurse position (87.66%), BSN (69.16% degree holders, working in special areas (66.66%), and with research involvement (77.78%). As to the length of service, most of the respondents (70.37%) are below 5 years (35.80% are below 2 years, and 34.57% belong to the 2 years -5years length of service). The profile implies a young population of respondents. The profile shows that the hospital nurses are involved in research.

Table 1a reveals the research involvement activities of the respondents, where 50% of the nurses served as respondents in a study. It is also noted that 18.87% of the respondents had been involved as participants in a research seminar. Around 15% conducted their own research, but as revealed by FGD groups, most of their research was conducted as a requirement in their graduate school courses. Although the small group participants agree that research is important, nurse participation is lacking, and the nurses attribute their lack of participation to

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Table 1a. *Profile of Respondents according to Research Involvement (Multiple answers)*

Research Involvement (Multiple answer)	Frequency	Percentage
Conducted Own Research	16	15.09
As Respondent	53	50.00
As co-researcher	13	12.26
As adviser	0	0
As participant in research seminar	20	18.87
As panel to research presentation	1	0.94
Validated questionnaire	3	2.83

a lack of time. Nurses are aware that to continually improve nursing practice and the patient experience is to learn more about how, why, what, by whom, and when nursing interventions are best implemented. Research participation is, therefore, mandated to ensure nursing practice remains relevant to, supportive of, and actively protecting our patients. Table 1a data confirm that the research involvement of the hospital nurses is not 100% although it can be assumed that the respondents are interested in research and their participation can also be related to their research competency. The data imply that nurses must continuously involve themselves in research and, as much as possible, conduct their own research because it is through research that nurses are able to determine effective best practices and improve patient care (Northeastern State University, 2017)

Nurses have a professional responsibility to 'deliver care based on the best available evidence' (Nursing and Midwifery Council, 2008); however, this does not necessarily translate to clinical practice position descriptions or practice itself. Clinical nurses frequently lack the time, training, and support to engage in the research activities, which will, in turn, support evidence-based practice. It is safe to conclude that the majority of nurses based in the clinical arena remain ill-equipped to fulfill this responsibility. The combination of clinical practice and research seems ideal as a foundation for a supportive environment where nurses can build high-quality clinical research and incorporate findings into practice as evidence-based. The findings of the present study are similar to the findings of a study involving Finnish nurses, where Kuuppelomaki and Tuomi (2003) found that the majority of nurses had carried out research as part of their basic nursing education.

Research Competency of Nurses

Table 2 presents the research competency of the respondents. The respondents garnered an average of 1.95, interpreted as being an advanced researcher. It is also noted that all respondents are classified as advanced researchers in terms of research problem conceptualizations (2.02), research methods and procedures (1.93), data analysis and interpretation (1.96), research dissemination (1.96), and research utilization (1.90). Participants express their concerns regarding the challenges brought by some of the steps in the research process.

In the present study, research utilization ranks lowest in the perceived level of competency, which means that respondents are able to have a basic understanding of the importance of research utilization; however, they lack experience in doing it. The lowest mean in research utilization may be attributed to the fact that there are barriers in the implementation of research findings or evidence-based findings, which may include personal, logistical, and the

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Table 2. *Research Competency of Hospital Nurse*

RESEARCH COMPETENCY	COMPETENCY LEVEL (MEAN)	INTERPRETATION
Research Problem Definition	2.02	Advanced Beginner Researcher
Research Methods and Procedures	1.93	Advanced Beginner Researcher
Data Analysis and Interpretation	1.97	Advanced Beginner Researcher
Research Dissemination	1.96	Advanced Beginner Researcher
Research Utilization	1.90	Advanced Beginner Researcher
AVERAGE MEAN	**1.95**	**Advanced Beginner Researcher**

support of the organization. Each of these three major barriers consists of a number of factors that require acknowledgement by the nurse researcher. Potential barriers that impede or discourage clinical nursing research must be overcome to facilitate nursing research in the practice setting. As described by scholars, research utilization is an application process of research findings and research methods during daily problem solving (C. B. Stetler, 1985; C. A. Estabrooks, 1999).

It is to be noted that the respondents are advanced beginner researchers in research methods and procedures, garnering a mean of 1.93. Nurses in the group interview shared that they want to utilize qualitative methods or quantitative methods, but when asked why the method is the most appropriate yet they cannot give the correct reason. They shared that they cannot find a tool, so they would rather use an interview method to gather data. Some also shared that they do not know what statistics are all about, which is why they are going to use a qualitative approach. The use of an appropriate method must be considered in the research conducted. It is good to use the most appropriate method so as to gather the correct data/information to answer the research question.

It is further noted that the respondents are advanced beginner researchers in data analysis (1.97) and research dissemination (1.96). They are again aware of these research competencies; however, they lack the experience of doing it. As they say, practice makes perfect. Nurses in the small groups mentioned that they are only able to analyze data in the area of their practice related to the increase in infections of admitted patients or data of discharges. They are able to present these data to their supervisors and physicians; however, such practices are only done once they are called upon during meetings.

Regarding the methods and procedures, the small groups are quick to say that data gathering is the most difficult. Recalling their experiences, they said that nurses are too busy to answer questionnaires, and they can see how devastating it for now if nurses do not participate in research. They now realize the importance of providing the truest data, so they suggest an online form of data gathering so that they can always attend to it at home or even during break times, rather than having the physical forms of the data gathering tool and losing or misplacing them.

The findings affirm the study of Sande (2017), which revealed that in the self-rating of nurses, research received a very satisfactory rating, only as one of the competencies in nursing. Moreover, nursing research is valued by nurses at every level and in every job. When it comes down to it, though, very few people actually participate. Nurses understand that the only way to improve nursing practice and the patient experience is to learn more about how, why, what, by whom, and when nursing interventions are most effective. As a result, research participation is required to guarantee that nursing practice remains relevant, supportive, and actively protects our patients (Franks & Meeks, 2020).

The overall research competency (1.95) reveals that nurses are advanced beginner researchers, and the lowest mean in research utilization is consistent with

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Table 3. *Research Competency Level and Hospital Nurses-Related Factors*

	Research Competency Level								
	RPD	RMP	DAI	RD	RU	Mean	Int	P-value	
Position									
Staff Nurse	1.39	1.74	1.70	1.71	1.87	1.784	ABR	0.387	*NS*
Head Nurse/Charge Nurse	2.00	2.00	2.00	2.00	4.00	2.400	ABR		
Nurse Supervisor	2.83	3.00	2.83	2.00	2.00	2.532	PR		
Asst. Chief Nurse	2.00	1.50	2.50	2.00	2.00	2.000	ABR		
Chief Nurse	4.00	4.00	4.00	4.00	4.00	4.000	ER		
Length of Service in the Institution									
Below 2 years	2.00	2.03	1.86	1.78	2.00	1.970	ABR	0.210	*NS*
2 to <5 years	1.89	1.75	1.82	1.89	2.00	1.870	ABR		
5 years & above	1.75	1.79	1.79	1.79	1.66	1.756	ABR		
Area of Assignment									
General Wards	1.96	2.02	2.03	2.07	2.00	2.026	ABR	0.449	*NS*
Special Wards	1.85	1.85	1.70	1.72	1.81	1.786	ABR		
Highest Educational Attainment									
BSN	1.64	1.71	1.55	1.78	1.91	1.718	ABR	0.011	*S*
With MA Units	2.30	2.05	2.20	1.85	1.30	1.940	ABR		
MSN/MN/MAN	3.00	3.00	2.25	2.25	3.00	2.800	PR		
With PhD Units	4.00	4.00	4.00	4.00	4.00	4.000	ER		
Involvement in Research									
With Involvement	2.01	2.00	1.98	1.82	1.74	1.906	ABR	0.169	*NS*
Without Involvement	1.83	1.55	1.44	1.77	2.33	1.784	ABR		

Legend: *PRC-Research Problem Definition*
RMP-Research Methods and Procedures
DAI- Data Analysis and Interpretation
RD-Research Dissemination
RU- Research Utilization
ABR- Advanced Beginner Researcher
PR- Proficient Researcher
ER- Expert Researcher

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the findings of the need to enhance the evidence-based practice (EBP) of nurses (Melnyk, Ford & Zellefrow, 2017). Research utilization is a part of EBP and is essential to deliver high-quality nursing practice. Many nurses need training to find and read research results to improve the quality of Nursing service (Moe & Enmarker, 2020). Research problem definition is the initial step of the research process wherein the nurse must be able to see the gaps between the ideal and reality. The result related to problem definition competency implies that the respondents are able to determine the gaps between wellness and illness states through their clinical observations in their practice, such as those concerning a patient and family crisis. The results further imply an enhancement of this competency, as (Shuttleworth, 2008) puts it, a clearly defined research problem is the fuel that drives the scientific process, and is the foundation of any research method and experimental design, from true experiment to case study (Khodabux, 2015). As often heard from nurses, there are a lot of problems in practice, but they are not sure if these identified problems are researchable. From the group interviews, one nurse verbalized that based on her experience, she has difficulty identifying which problems need to be further researched.

This study's findings reveal that the 81 professional nurses are advanced beginners in their research competency level. According to Benner's Novice to Expert model (1984), which is grounded in the Dreyfus Model of Skill Acquisition (Dreyfus & Dreyfus, 1980), advanced beginners demonstrate some experience and start to recognize patterns, but still rely on guidelines and rules. The advanced beginner stage is characterized by a growing ability to recognize aspects of situations, but a limited ability to prioritize and manage complex situations (Benner, 1984). In the context of research competency, this suggests that these nurses have some foundational knowledge of research principles and methods, but may struggle to apply this knowledge in practice or to critically evaluate research findings. The implications of these findings are significant for nursing education and practice. To support the development of research competency among professional nurses, targeted education and training programs are needed. These programs should focus on building skills in critical appraisal, evidence-based practice, and research application. Furthermore, mentorship and collaboration with experienced researchers can provide valuable opportunities for professional growth and development. By understanding the research competency level of professional nurses through Benner's framework, we can tailor support and education to meet their needs and facilitate their progression towards expertise.

Variables related to the research competency of the Nurses

Position

As seen in Table 3, the chief nurse has the highest mean (4.00) in all the aspects of the research process and the lowest mean (1.784) accorded to the staff nurses. It is gleaned from the table that the staff nurses garnered the lowest means in all steps of the research process, and the succeeding managerial positions garnered higher means, as compared to the staff nurses.

As to position, the chief nurse is considered to be at the executive level and manages the nursing workforce. The chief nurse leads the team, and he/she must be competent. Nurse supervisors who are members of the small groups verbalized that they have to show to their subordinates that indeed research conduct is important especially so that they have scheduled case presentations, and they are ashamed if they cannot contribute to the research endeavors of their subordinates/team which is also the same sharing that the head nurses/charge nurses had in the small groups. According to them, as nurse managers at their level, they have to help their subordinates and contribute to the case presentations. They are aware that their mentoring offered nurses the opportunity to be hands-on with the research process and at the same time fosters collaboration and socialization among research administrators, research nurses, and clinical nursing staff, and they recommended continuing to build research compe-

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tence among clinical nurses and developing the first generation of nurse scientists. Mentoring a less-experienced researcher is a professional responsibility of nurse supervisors, and mentoring responsibilities include sharing knowledge and skills, overseeing the trainee's work, helping the trainee to make contact with other researchers, and assisting with career counseling.

The staff nurses garnered the overall lowest mean (1.784). Being advanced researchers, they have a basic understanding of research, but they do not have practical experience in conducting research. This was confirmed by the staff nurses who are members of the small groups, who verbalized that it is their first time to join case presentations in the professional world, which is a follow-up of their nursing academe research studies.

Statistically, the p-value of 0.387 is higher than the 0.05 level of significance, so there is no significant difference in the research competency level of the nurses considering their position. It is only the chief nurse who got the highest mean, but all the other positions got low means interpreted as having the competency level of being advanced researchers. As the small group participants verbalized, the interest in research is utmost, because even if you are in a supervisory position, if you do not have an interest in research, then you cannot make others do research. This signifies the essence of motivation and professional competence in enhancing one's ability as a nurse researcher.

Length of Service in the Institution

As to length of service in the institution, the nurses are at the competency level of advanced researchers. The highest mean of 1.970 is accorded to those staff nurses who belong to the below 2 years category. There is a decreasing mean value as the years of service in the institution increase. The members of the small groups belonging to the more than 5-year category have admitted that as they age, they have diminishing energy to do research. They admitted to giving encouraging words to their teammates so that the research projects would continue. Statistical computations reveal that the p-value of 0.210 is higher than the significance level of 0.05; thus, there is no significant difference in the research competency level of nurses and their length of service in the institution. Applying the theory of Dreyfus on skill acquisition, the finding implies that the mastery of a skill requires practice and not merely how long a person has been employed. It strengthens the idea that competence can be achieved by passing through stages until mastery can be achieved.

Area of Assignment

Results show that regardless of the area of assignment of the nurses, they garnered 2.026 (general wards) and 1.786 (special areas), which is interpreted as the nurses having the competency level of advanced researchers, although it is noted that those in the general wards have higher means than those assigned in the special areas. Statistically, there is no significant difference in the research competency level of nurses and their area of assignment, which contradicts the results of the study of Lotereña et al. (2018) where it was concluded that generally, a large majority of nurses perceived a high level of competence in the hospital.

Regardless of the area of assignment of the nurses in the study, the respondents possess advanced research skills, as they verbalized in the small group interviews, they give more focus to their patients and are more attentive to their patient care, whether they are assigned to any area of assignment.
They have to perform their tasks and responsibilities towards their patients, which is their priority. Although they admit that research activities must be done, whether you are assigned to special or general wards.

Highest Educational Attainment

Table 3 also shows the research competency level of nurses according to educational attainment. The nurses with BSN and with MA units are having the competency level of advanced researchers, while

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those having a master's degree (2.800) and with PhD units (4.000) have a higher research competency level. Having a higher educational attainment level implies that research competency to the highest level is being attained because most of the courses are research-based/evidence-based.

The findings imply that critical thinking is a significant predictor for research use, and perception of competence is important information for nursing education as well as for nursing practice. Nurse leaders in clinical practice and in nursing education play an important role in nurturing student nurses and newly graduated nurses with respect to critical thinking. There is a need to assess whether teaching strategies meet the requirements of critical thinking and EBP in nursing education. As Patricia Benner puts it, proficiency level is developed as one goes up the education ladder, where knowledge acquisition is increased and skill is also mastered, thus the research competency is improved with a higher level and value for education.

There is a significant difference or association between the research competency level of the respondents and their educational attainment. Individual, organizational, and environmental factors play a significant role in developing and promoting research competency among nurses. According to Chien (2020), an educational degree was found as an influencing factor of nursing research competence of clinical nurses. Nurses with a passion for nursing research should pay attention to improving their critical thinking dispositions. Nurse educators and managers should provide better learning, working, and research environments and more support to cultivate a critical thinking disposition and improve nursing research competence in nursing research education and practice. Results show that there is a significant relationship (p-value = 0.011) between the respondents' highest educational attainment and their research competency level. The respondents who have higher educational attainments have higher levels of research competency.

The association of education and research competence has been documented in both earlier and more recent literature. Educational degree was found as an influencing factor of nursing research competence of clinical nurses (Chen, Liu, Zhou, & Tang, 2020). Davies et al. (2002) suggest that degree-level education predicted research experience as well as research interest. The practice nurses educated to graduate level, and those working in practices with nursing training or participation in external research, were most likely to want to undertake research. A positive research attitude is a result of an advanced educational background or research experience (Zhang, Yan, and Yue, 2020).

Involvement In Research

Nurses with and without involvement in research possess the competency level of advanced researchers, having a basic understanding of research, but have limited practical experience in conducting research.

The research involvement of these nurses is mostly being respondents in research studies, where they admitted that they just completed questionnaires given to them because they were always followed up by the student researchers, and they do not have an interest in conducting one. They realized now that they really have to conduct research as professional nurses to render evidence-based care services. Statistically, there is no significant difference in the research competency level of the nurses according to their involvement in research. Experiences from a research course in basic methodology show that programs designed for clinical nurses may facilitate and support their own research efforts as well as enhance their commitment to research in general (Adamsen, Larsen, Bjerregaard, & Madsen, 2003). There is no significant difference or association between the research competency level of the respondents and their positions, length of service in their institutions, and area of assignment, respectively. These findings confirm that nurses have historically struggled to comprehend the significance of nursing research in their clinical practice, necessitating more

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imaginative and interactive ways (experiential learning) to make research relevant to clinical practice (Aloweni et al., 2017). This signifies that motivational factors are crucial in promoting and sustaining self-regulated learning to gain research competence. Generally, the findings of the present study imply that a positive correlation to general critical thinking exists but an overall low level of nursing research competence (Chein, 2020). Furthermore, Chein found out that there is a moderate degree of positive correlation between critical thinking disposition and research competence among clinical nurses.

Of the five (5) variables, only the highest educational attainment yielded a p-value of 0.011, which is less than 0.05, that there is a significant association of the highest educational attainment with the research competency level. Indeed, education lays the foundation for research skills. The development of research skills in the nursing academe influences clinical practice interest in doing research.

According to the study of Pettersson & Jensen (2012), strong leadership, an organizational and supportive infrastructure, and a supportive infrastructure underlie research competence growth in nurses are all needed to help early career researchers. Research strategies, programs, and collaboration between academic and clinical leaders appear to be essential.

As noted, there is no significant relationship between the respondents' research competency level and their positions, lengths of service in the institution, and areas of assignment. These results are inconsistent with the study of Zhang, Yan, & Yue (2020), in which nurses who had been working longer in the field and/or those with higher positions tend to be more research-competent and have higher critical thinking abilities compared with new graduates.

In this study, nurse managers admit that research is important for their position as leaders and clinicians. Staff nurses, on the other hand, believe that being research competent is important in their clinical practice.

This study investigated the research competency levels of professional nurses, considering variables such as position, length of service, ward types, and research involvement. The findings reveal that, overall, professional nurses are advanced beginner researchers in their research competency. According to Benner's Novice to Expert model (1984), which is grounded in the Dreyfus Model of Skill Acquisition (Dreyfus & Dreyfus, 1980), advanced beginners demonstrate some experience and start to recognize patterns, but still rely on guidelines and rules. In the context of research competency, this suggests that professional nurses have some foundational knowledge of research principles and methods, but may struggle to apply this knowledge in practice or to critically evaluate research findings. The study found that the position of staff nurses, head nurses, and assistant chief nurses were generally at the advanced beginner level, while supervisors and chief nurses demonstrated higher levels of research competency. This suggests that leadership positions may provide opportunities for professional growth and development in research competency. The study also found that length of service was not a strong predictor of research competency level. This suggests that experience alone may not be sufficient to develop research competency, and that targeted education and training may be necessary to support professional development. The study found that nurses working in different ward types (e.g., general and special wards) had similar research competency levels. This suggests that research competency is not necessarily dependent on the specific clinical setting, but rather on individual factors such as education, training, and research involvement. The overall findings imply that research competency levels of professional nurses have implications for nursing education, practice, and research. To support the development of research competency among professional nurses, organizations should provide targeted education and training programs that focus on building skills in critical appraisal, evidence-based practice, and research application; encourage and support research involvement and participation among nurses; and develop leadership development programs that focus on research competency and evidence-based practice.

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The study's findings reveal a significant relationship between educational attainment and research competency level among professional nurses. Nurses with higher educational attainment, such as master's or doctoral degrees, demonstrated higher research competency levels, while those with lower educational attainment, such as bachelor's degrees, were generally at the advanced beginner level. According to Benner's Novice to Expert model (Benner, 1984), which is grounded in the Dreyfus Model of Skill Acquisition (Dreyfus & Dreyfus, 1980), educational attainment can play a crucial role in developing expertise. Nurses with higher educational attainment may have received more extensive training in research methods, critical thinking, and evidence-based practice, which can enhance their research competency. The Dreyfus Model suggests that expertise develops through a series of stages, from novice to expert, as individuals acquire more experience and knowledge. In the context of research competency, nurses with higher educational attainment may be more likely to progress through these stages, developing advanced skills in research design, data analysis, and interpretation. The findings of this study have implications for nursing education and research. To support the development of research competency among professional nurses, organizations should encourage and support nurses in pursuing higher education, such as master's or doctoral degrees, and provide opportunities for research training and mentorship; foster a culture of inquiry and evidence-based practice within the organization.

By understanding the relationship between educational attainment and research competency level, organizations can tailor support and education to meet the needs of their nurses and facilitate their progression towards expertise..

Barriers and Facilitators in the Research Competency of Professional Nurses

Table 4 presents the barriers and facilitators to the research competency of the respondents. Barriers are factors that hinder the attainment of the research competency of the nurses, while the facilitators are factors that make the processes of achieving research competency easier and faster. These barriers and facilitators are categorized into personal, organizational, and professional. Personal factors relate to the nurse as an individual. Organizational factors refer to operational attributes of the organization that hinder or facilitate the achievement of research competency of nurses. Professional factors refer to the available research resources in the working/ practice environment.

Personal Barriers and Facilitators

Among staff nurses, many personal factors could influence nurse research capacity, including job satisfaction, educational background, demographic and social factors, research experience, scientific research attitude, and working pressures (Zhang, Yan & Yue, 2020). Nurses' jobs often require that the entire time be spent on performing direct patient care, with limited or no paid time away from clinical responsibilities.

It is noted in Table 4 that the value of research for competent clinical practice (88.88%), followed by involvement in research projects/activities (79.01%, information seeking attitude (76.53% and computer literacy (75.30%) are prioritized facilitators to research competency. The small group participants confirmed that these factors are facilitators. They are happy to join research projects because they must render evidence-based care practices. Their research mind is activated if they are asked to join research projects. They also agree that finding out the reasons for a particular intervention activates their interest in research. Today, that technology is everywhere, and computer literacy is a facilitating factor. It makes searching for literature faster and easier, so they verbalized that nurses must also be computer literate for easier access to information that is needed for research projects. Nurses verbalized that nowadays, basic computer literacy is needed to carry out tasks commonly associated with research. These include the understanding and recognition of the differences between files and folders, accessing the internet, using databases and word processing packages, and using email software.

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Table 4. *Barriers and Facilitators to Research Competency*

Personal Barriers and Facilitators	F	B
1.Value of research for competent clinical practice	72(88.88%)	7(8.64%)
2.Adherence to ethical principles	57(70.37%)	21(25.92%)
3.Values	50(61.72%)	29(35.80%)
4.Beliefs	42(51.85%)	38(46.91%)
5.Involvement in research projects/activities	64(79.01%)	16(19.75%)
6.Information seeking attitude	62(76.53%)	17(20.98%)
7.Time for research activities	37(45.67%)	43(53.08%)
8.Organizational modeling	51(62.96%)	28(34.56%)
9.Lack of training	6 (7.40%)	74(91.35%)
10.Lack of financial resources	0 (0.00%)	79(97.53%)
11.Lack of motivation	1(1.23%)	79(97.53%)
12.Overworked	2(2.46%)	78(96.29%)
13.Computer literacy	61(75.30%)	19(23.45%)

Organizational Barriers and Facilitators	F	B
1.Funding applications to major funding bodies	41(50.61%)	36(44.44%)
2.Availability of research mentors to researchers	60(74.07%)	18(22.22%)
3.Supervision available	65(80.24%)	13(16.04%)
4.Additional information by supervisor re:topic	64(79.02%)	13(16.04%)
5.Guidance re: topic selection and refinement	66(81.48%)	10(12.34%)
6.Feedback on progress	66(81.48%)	11(13.58%)
7.Guidance in literature search	65(80.24%)	12(14.81%)
8.Opportunities for contact with other researchers	65(80.24%)	11(13.58%)
9.Opportunities to become involved in research	62(76.54%)	14(17.28%)
10.Seminar programs	67(82.71%)	10(12.34%)
11.Research ambiance	61(75.30%)	16(19.75%)
12.Access to technical support	57(70.37%)	20(24.69%)
13.Access to room	55(67.90%)	22(27.16%)
14.Access to equipment	56(69.13%)	21(25.92%)
15.Access to computing facilities	56(69.13%)	21(25.92%)
16.Appropraite financial support	51(69.26%)	26(32.09%)
17.Available mentorship program	56(69.13%)	20(24.69%)
18.Problems of feasibility of conducting research (doctors disallowing)	23(28.39%)	53(65.43%)
19.No structures for research activities/group/program	12(14.81%)	64(79.02%)
20.Lack of incentive	9(11.11%)	68(83.95%)
21.Provision of external support such as statisticians	28(34.56%)	48(59.25%)
22.Paid time for research	49(60.49%)	28(34.56%)

Professional Barriers and Facilitators	F	B
1.No forum to discuss research	13(16.04%)	63(77.77%)
2.Support from organization	59(72.83%)	18(22.22%)
3.Research agenda of organizations	53(65.43%)	23(28.39%)
4.Research training and workshops	55(67.90%)	21(25.92%)
5.Career pathing	57(70.37%)	20(24.69%)

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In the present study, among the personal barriers and facilitators, the value of research for competent clinical practice ranks the highest, which includes the interest in conducting research. The heavy clinical workload and barely having time to undertake searches of the research literature, as well as the lack of work time, often exacerbated by family commitments, was also frequently documented (Davies et al., 2002) as barriers. One staff nurse emphasizes the advantage of collaboration between nurse managers and staff nurses in the conduct of research. Nurse managers, on the other hand, emphasize the effect of work exhaustion, family commitments, and other factors on research engagement, including physical barriers.

These barriers to undertaking research may explain in part why a general belief in the value of practice nurse research did not necessarily translate into individual commitment (Davies et al., 2002). Also, clinical nurses emphasize that lack of designated time, interest, and knowledge constituted important research barriers as did lack of supervision and support (Akerjordet, Lode & Severenson, 2012a). Nurses working in clinical settings receive little research training. Research supervision is one of the most significant needs to enhance clinical nurses' research skills, management, and organization of research activities (Akerjordet, Lode, & Severenson, 2012a). Enhanced research supervision is central for improving registered nurses' research capacity (Akerjordet, Lode, & Severinsson, 2012).

Organizational Barriers and Facilitators

The top 5 prioritized organizational factors that serve as facilitators to research competency include: the feedback on progress (81.48%), guidance regarding selection of topic (81.48%), guidance in literature search (80.24%), opportunities for contact with other researchers (80.24%), and supervision available (80.24%). Data implies the presence of a research mentor in the organization, with the ultimate goal of the mentor being to establish the trainee as an independent researcher. Nurses in the small groups verbalized that a research committee was created in their organization and had been a great help to them; however, its operation was put on hold due to the pandemic. It was a great help to them then because they were able to get inputs for their case presentations from the team. They also verbalized that they are in need of a mentor who will also motivate them to do research and have verbalized that they need a mentor who will help improve the quality and integrity of scientific research.

The organizational barriers to research competency involves the two prioritized factors which are lack of incentive (83.95%) and no structures for research activities/group/program (79.02%). The barriers still point out to the presence of a research mentor as an important asset for research-related activities in an organization. The lack of incentive (83.95%) is prioritized. In an article written by Ulrich, .et al., (2004) emphasized that providing incentives in nursing research is not morally problematic. The financial incentive must be based on respect and it is recognized that participants must receive some compensation for their time and associated burden. Nurses verbalized that they do appreciate the value of research for evidence-based practice but they have to prioritize their patient care, however the in the article, it recognizes the associated effort and burden that results from research participation, thus the incentive given will result to higher rates of research participation among the nurses. No structures for research activities/group/program (79.02%) is the second prioritized organizational barrier to research competency. This factor clearly points to the presence of a research resource in the organization. The results of this study imply that the presence or availability of structures for research activities/group/program will make the conduct of research more easy and engaging. The research structures somehow increase the motivation to conduct research.

Professional Facilitators and Barriers to Research Competency

Among professional barriers and facilitators, support from the organization and career pathing rank the highest. The participants in this study express

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their concern regarding the inactivity of the research committee and the lack of research training in the institution. Repeatedly in the literature, time has been identified as a critical barrier and facilitator of research. Staff nurses, in this study, express the importance of time in the conduct of research activities. Staff nurses also expressed the importance of the application of studies done in the institution as a means to support the research initiatives of nurses.
Support from the organization (72.83%), career pathing (70.37%), research training and workshops (67.90%) are the professional facilitators for research competency, and the first barrier prioritized is no forum to discuss research (77.77%).

Results of the present study imply the clamor of the nurses for research-related activities or programs to further their competency in research. The nurse participants verbalized that they are happy nowadays that the case presentation per area of assignment activates their curiosity, and thus they conduct and participate in research; however, if these initiatives are not provided in the organization, then there would be no forum to discuss research, which becomes the number one barrier. They are thankful that with the presence of the case presentations, they can discuss research, and when the organizations permit them to enroll in the graduate school to further their studies, then research is discussed and appreciated, which to them is the support they get from the organization. Safdari et al. (2018) from the results of their study concluded that research activities are affected by numerous barriers; therefore, strategies, such as empowering researchers, employing new technologies in the creation of research teams, and benefiting from research experts in various stages of research, may have a positive effect on the removal of the barriers. Moreover, such results of the study attest to the study of Feliciano et. al (2020) that the Philippine professional core competencies' impact on nurses' key performance indicators for patient safety outcomes gives great emphasis on the vital importance of research in ensuring patient safety in hospitals. Thus, the results of this study, together with Sande (2017), highlight that a new generation of nurse researchers is needed to conduct research that informs evidence-based practices to improve patient care; thus, a program plan is developed from the results of the study. A research capability enhancement program is planned that involves a partnership and collaborative research program for the hospital nurses who clamor for more research activities so that they will become more confident in participating and conducting research. And since the nurse respondents are advanced researchers using Patricia Benner's Proficiency Levels, the nurse respondents need more practical experience in the conduct of research. O'Byrne & Smith (2010), in their narrative review of models to enhance research capacity and capability in clinical nurses, emphasized that to build research capability and capacity in clinical nurses, there is a need to evaluate models and determine the best approach that will provide clinical nurses with research opportunities. From the literature, they found that the model of evidence-based practice, facilitative and experiential learning models are dominant. These models integrate strong leadership and organizational needs and support management. The Nursing Research Immersion Program in Singapore General Hospital (Aloweni et al., 2017) is a relevant program that also strengthens the love for research. Capitalizing on the available research skills of the nurses can also lead to the accomplishment of a clinical research project with the support of the administration

Limit***ations of the Study.***

While this study provides valuable insights into the research competency levels of professional nurses, several limitations should be acknowledged: The study was conducted in a single healthcare institution, which may limit the generalizability of the findings to nurses in other hospitals or regions. Differences in institutional support, training programs, and workload may influence research competencies elsewhere. Another limitation is the sample size relative to the target population; although 81 out of 110 nurses participated, representing a substantial 73.6% response rate, the final sample size was slightly below the ideal sample size computed using Slovin's formula at a 5% margin of error. This may

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have a minor impact on the statistical confidence of the results. The self-reported responses with the use of a self-administered questionnaire may be subject to response bias, such as overestimation or underestimation of one's research knowledge and skills. Responses may also have been influenced by social desirability or misinterpretation of certain items. Although structured group discussions were used to clarify and validate responses, the presence of peers during discussions may have influenced how openly participants expressed their views. Some may have withheld certain opinions due to social pressure or perceived judgment.

RESULTS AND DISCUSSION

Conclusion:

Based on the findings of the study, the researchers conclude that nurses who are employed at Hospital X possess the knowledge; however, they lack the practical experience in research. The variable of educational attainment is an important factor in achieving research competency. There are personal, organizational, and professional facilitators and barriers to the research competency of the nurses. A research capability enhancement program for the nurses can be developed.

Recommendations:

The researchers recommend:

1. Enhancing the research competency of the nurses through a research capability-building program developed for them.

2. Strengthening the institutional support for ongoing research training, especially for the nurses who are pursuing their postgraduate education or continuing professional development in research methodology and statistics.

3. Recognizing and rewarding research engagement and output among nursing staff to sustain high-level performance.

4. The promotion of mentoring systems where expert and proficient nurses can guide those still developing their research competencies.

5. The conduct of future studies involving multiple institutions to broaden generalizability and include more inferential analysis.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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AUTHOR CONTRIBUTIONS

The principal author conceptualized the study. All authors contributed to data collection and analysis, writing, and reviewing the manuscript.

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ETHICS APPROVAL

This study was approved by the SLU Research Ethics Committee

DATA AVAILABILITY

Data is available upon request or accessible through nepjournal.org

PLAGIARISM STATEMENT

We confirm that this manuscript is original, and any borrowed content is properly cited.

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"Empowered nurses turn knowledge into impact when their research skills are strengthened through continuous education, institutional support, and dedicated mentorship. By investing in their growth, we cultivate not only competent practitioners but also innovators who advance nursing practice and patient care."

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RESEARCH ARTICLE

Values-Driven Adaptive Leadership among Millennial Filipino Nursing Deans: A Descriptive Phenomenological Study

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ABSTRACT

Introduction: Millennial deans (born 1981–1996) are increasingly visible in Philippine nursing education and are helping steer programs through accreditation, curriculum reforms, and workforce well-being concerns. Operating within culturally hierarchical institutions, these leaders describe anchoring decisions in values while adopting participatory and context-attuned approaches to change. Despite their growing presence, little is known about how these deans form and negotiate leadership identity as they assume the role, enact adaptive strategies in governance and day-to-day decision-making across diverse stakeholders, and cope with institutional and intergenerational pressures to sustain effective leadership.

Aim: This study aimed to describe the essence of the lived experience of Filipino millennial nursing deans, focusing on leadership identity formation, adaptive leadership strategies in governance and decision-making, and coping mechanisms for institutional and generational challenges.

Methods: Guided by Husserlian descriptive phenomenology, ten purposively selected millennial nursing deans from CHED-accredited Philippine institutions participated in in-depth semi-structured interviews. Data were analyzed using Colaizzi's method, ensuring credibility through member checking, peer debriefing, and strict adherence to ethical standards.

Results: Analysis revealed six major themes: (1) Thrust into Deanship Without Support, (2) Proving Legitimacy and Bridging Generational Differences, (3) Shared Governance, (4) Work-Life Balance, (5) Managing Vulnerabilities through Grit, and (6) Values-Driven and Adaptive Leadership. Intergenerational conflicts, emotional labor, sudden appointments, and a lack of mentorship were all mentioned by the participants. In spite of these obstacles, they showed tenacity and promoted inclusive, introspective, and wellness-focused leadership styles. These findings reveal that personal values and contextual adaptation are dynamically integrated into their leadership practices, reflecting key aspects of what can be called an adaptive-values approach.

Conclusion: Filipino millennial nursing deans navigate institutional and generational challenges by combining adaptive strategies firmly anchored in individual and group values, advancing culturally responsive academic governance practices. This study's insights offer crucial direction for creating leadership frameworks, mentorship programs, and organized succession planning that are suited to the particular generational and contextual requirements of nursing education.

Keywords: *Academic deans, adaptive leadership, generational leadership, millennial leaders, nursing education, phenomenology, values-based leadership*

INTRODUCTION

The leadership landscape in nursing education is undergoing a generational inflection point marked by the rise of millennial deans who bring distinctive values, expectations, and styles to academic administration. Defined here as those born between 1981 and 1996 (Easton et al., 2025), this cohort is characterized by digital fluency, collaborative and inclusive orientations, and a strong emphasis on work–life integration (Mellum, 2024; Cabalsa et al., 2023; Mandap, 2023; Gregorio-Sese, 2022). Recent concept analyses and horizon scans document the growing visibility of early-career leaders in nursing programs, propelled by succession pressures as Gen X and Boomer leaders retire (Greenway & Acai, 2024; Tussing et al., 2024; Al Hajri, 2024). Empirical reports, including those from the Philippines, show

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millennial administrators assuming critical roles and favoring participatory, transformational practices that cultivate psychological safety and innovation, alongside distinctive governance approaches and a discernible shift in decision-making styles (Archibald, 2025; Khajehmougahi & Zamanzadeh, 2023; Obmerga & de Guzman, 2022).

Against this backdrop, key issue clusters are especially important for understanding their leadership experiences. First, identity development among early-career academic leaders involves balancing age-based legitimacy, gender expectations, and concerns while integrating clinician–educator–administrator roles within historically hierarchical cultures (Greenway & Acai, 2024; Mandap, 2023; Hedley, 2021; Lamasan & Oducado, 2018). Second, leadership change work is intensified by outcomes-based and accreditation reforms, post-pandemic digital/hybrid delivery, research productivity targets, resource constraints, and multigenerational faculty dynamics that complicate shared governance and change adoption (Abou Hashish, 2025; Tussing et al., 2024; Molek et al., 2023). Third, coping with administrative challenges relies on mentoring and sponsorship, peer communities of practice, boundary management for work–life integration, reflective practice, and distributed leadership strategies reported to buffer role strain and sustain wellbeing (Archibald, 2025; Appiah, 2020; Obmerga & de Guzman, 2022; Khajehmougahi & Zamanzadeh, 2023). Yet much of the current literature generalizes generational attributes or remains anchored in traditional models, risking analytic blind spots regarding how these issues are lived by millennial nursing deans in context (Tussing et al., 2024; Molek et al., 2023; Hedley, 2021; Admane, 2018).

To address this gap, the study aimed to describe the essential features of millennial nursing deans' leadership as it is lived—how they build identity, lead change, and cope with administrative pressures within academic nursing settings. Ultimately, the study seeks to generate practice-relevant knowledge to guide mentoring and succession planning and to inform policies and institutional strategies, thereby advancing leadership development and policy reform that foster sustainability, inclusivity, and organizational resilience in nursing education.

METHODS

Design

This study used a qualitative, descriptive phenomenological design based on Husserlian principles to investigate and comprehend the distinct lived experiences, leadership difficulties, and career transitions of Filipino millennial nursing deans. Phenomenological research was specifically chosen based on its capacity to thoroughly explore the personal and professional realities of these nursing leaders, capturing their perspectives, interpretations, and the significance they attached to their experiences negotiating generational dynamics and institutional responsibilities in academic leadership. Consistent with the approach, the inquiry systematically bracketed researcher assumptions (epoché), performed phenomenological reduction to return to the phenomena as they are experienced, and used eidetic analysis based on Colaizzi's method to identify the core structures of meaning in participants' narratives.

Participants

Ten millennial nursing deans were purposively selected from higher education institutions across the Philippines. Inclusion criteria required participants to be: (a) born between 1981 and 1996, (b) currently serving as deans in CHED-accredited institutions, and (c) occupying the position for a minimum of one year to ensure substantial experiential insights. Exclusion criteria comprised acting or interim deans; leaders outside nursing education; deans under administrative/disciplinary review; individuals unable or unwilling to complete the interview and member-checking; and those for whom acute health or personal circumstances could render participation burdensome. The sample included six male and four female deans, with representation from public and private institutions, enhancing the diversity and transferability of findings across institutional types and demographic contexts.

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Setting of the Study

The study was conducted across various nursing education institutions in various regions of the country. This geographic breadth allowed the study to reflect Philippine nursing academia's sociocultural and institutional heterogeneity. Interviews were held in settings chosen by the participants, either in person or via secure online platforms, ensuring convenience and comfort during data elicitation.

Data Collection

Prospective deans were invited via email with a Participant Information Sheet and consent form. For remote interviews, participants e-signed the consent and sent it back via email beforehand; immediately before each interview, the researcher recorded a brief consent confirmation on the videoconferencing platform (voluntariness, right to withdraw, permission for audio recording, and use of de-identified quotations) and proceeded only after the participant's on-record affirmation. For two face-to-face interviews, written consent was obtained in person using the same script, with additional verbal consent recorded at the beginning of the audio recording.
In-depth, semi-structured interviews lasting approximately 60–90 minutes were scheduled at participants' convenience over a 16-week period. The interview guide centered on the key question, "Please describe (in as much detail as possible) your experience as dean in your nursing institution," with probes used to clarify, expand, and verify meanings. Interviews were audio-recorded and transcribed verbatim; reflexive field notes and an audit trail documented contextual details and emerging insights. Data saturation was reached by the eighth interview; however, to maximize variation and ensure representation across additional Philippine regions and institutional types, recruitment continued until ten participants were included. The final interviews confirmed saturation and supported the stability of themes during member checking.

Ethical Considerations

The study adhered strictly to the ethical conduct standards of academic research as approved by the university. Participants were provided detailed information about the study's purpose, procedures, confidentiality measures, and their right to withdraw without repercussions. Informed consent was obtained from all participants before data collection. All data were anonymized, with pseudonyms assigned to protect participants' identities and confidentiality. Interview transcripts and related documents were securely stored and accessible only to the research team. Participation involved minimal risk, mainly time commitment, emotional discomfort, and a low confidentiality risk. These were minimized through flexible scheduling, the option to pause, skip, or withdraw, debriefing or referrals as needed, and strict data Although no direct personal benefit was guaranteed, participants could gain reflective professional insight, and the study offers societal benefits by informing mentoring, succession planning, and inclusive leadership policies in nursing education.

Data Analysis

Data analysis was conducted using Colaizzi's phenomenological method, a systematic approach to uncovering the essence of lived experiences. Transcribed interviews underwent rigorous reading and re-reading to identify significant statements directly related to the phenomenon. These statements were extracted, coded, and organized into formulated meanings. Formulated meanings were then clustered into themes, allowing the emergence of core categories that accurately represented the participants' lived experiences.

Rigor and Trustworthiness

To improve the study's rigor and ensure a reliable description of participants' lived experiences, several interrelated strategies were employed. Credibility was supported through (a) peer debriefing with colleagues in qualitative research and dissertation adviser to critically examine emergent codes, meaning units, and thematic clusters; (b) bracketing and reflexive memoing before and during data collection and analysis to surface and set aside researchers'

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preconceptions; and (c) member checking, in which participants were asked to review a brief summary of preliminary themes and exemplar statements. Feedback from participants showed that the thematic synthesis connected with their experiences; theme labels and narrative explications were improved by incorporating clarifications like wording and emphasis.

Maintaining an audit trail that detailed the steps taken from data generation to theme consolidation helped to foster dependability. Reflexive documentation and maintaining an evidence chain that linked key statements to developed meanings and final themes improved confirmability and enabled external review of analytical choices. To address transferability, detailed descriptions of participants, organizational contexts, and illustrative quotes were included so that readers could assess their suitability for comparable contexts. These practices maintain the importance of participants' meaning structures while adhering to accepted standards for methodological rigor in descriptive phenomenology.

METHODS

An analysis of in-depth interviews with ten Filipino millennial nursing deans revealed six interconnected, overarching themes that collectively encapsulate the essence of their academic leadership experiences.

Table 1 presents the profile of the ten Filipino millennial nursing deans who participated in the study. The sample included six males and four females, aged between 34 and 41 years old. Their tenure as deans ranged from 1 to 6 years, with representation from both public and private higher education institutions across the Philippines. This diverse composition reflects a broad spectrum of experiences within the millennial cohort in nursing academic leadership.

Table 1. *Profile of Key Informants*

Dean	Sex	Age	Years as Dean	Institution Type
A	Male	33	2	Public
B	Female	36	5	Private
C	Male	36	4	Public
D	Female	35	4	Private
E	Male	38	1	Public
F	Female	34	3	Private
G	Male	36	5	Private
H	Female	41	6	Public
I	Male	38	4	Private
J	Female	34	2	Public

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Table 2. *Significant Statements and Formulated Meanings for Subthemes of Filipino Millennial Nursing Deans' Lived Experiences*

Overarching Theme	Subtheme	Representative Significant Statements	Formulated Meanings
1. Thrust into Deanship Without Support	Abrupt Appointment	"I was appointed because accreditation was coming. The previous dean retired, and the president said, 'You're next.' Just like that."	Sudden, unplanned leadership transition without prior consultation or readiness.
	Lack of Succession Planning	"There was no onboarding. None. The first year, I had to unlearn and relearn everything."	Absence of formal leadership pipeline or succession preparation.
	No Formal Mentoring	"When I officially became dean, I realized nothing had truly prepared me for the emotional and operational demands."	Lack of structured mentorship or guidance for new deans transitioning into the role.
2. Shared Governance	Consultative Leadership	"Leadership, especially at my age, is more about co-creating direction… I engage them through consultations and task force groups."	Emphasis on shared decision-making and participatory leadership.
	Inclusive Decision-Making	"We co-develop policies. Sometimes it is messy, but it is worth it…"	Prioritizing faculty inclusion in all stages of policy and curricular reforms.
	Empowering Faculty	"Instead of rolling out programs immediately, I now form task forces that include both young and seasoned faculty."	Delegating authority and encouraging faculty ownership of initiatives.
3. Work-Life Balance	Boundary-Setting	"I don't bring desk work home unless it's an emergency. That's a boundary I protect."	Setting clear limits between work and personal life to maintain well-being.
	Rest as Leadership Practice	"I block out weekends and use that time just to breathe."	Incorporating rest and recovery as essential leadership practices.
	Intentional Wellness Routines	"I schedule annual personal retreats."	Deliberate engagement in wellness and self-care activities to sustain leadership effectiveness.
4. Proving Legitimacy and Bridging Generational Differences	Perceived Youth and Inexperience	"I've been called 'anak' or 'bunso' in meetings… One faculty even said, 'Magpalaki ka muna ng anak bago ka magpayo.'"	Experiencing age-related skepticism and dismissal from senior colleagues.
	Proof through Performance	"When we passed Level III accreditation and the accreditors cited our reforms, it was the moment they saw me as a real leader."	Establishing leadership legitimacy through tangible achievements and results.
	Negotiating Authority	"Instead of enforcing policy changes top-down, I involved even the skeptics… served as pilot reviewers."	Using inclusive strategies to gain acceptance and authority.

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Table 2. *Significant Statements and Formulated Meanings for Subthemes of Filipino Millennial Nursing Deans' Lived Experiences (continue)*

Overarching Theme	Subtheme	Representative Significant Statements	Formulated Meanings
5. Managing Vulnerabilities through Grit	Emotional Labor	"Serving as dean has felt like stepping into an ever-expanding crucible that tests you emotionally… every single day."	Leadership entails hidden emotional burdens and constant interpersonal demands.
	Reflective Practice	"Every mistake became a leadership lesson."	Using self-reflection as a tool for growth and resilience.
	Adaptive Coping	"I journal. I block off weekends… empathy without boundaries can be damaging."	Developing personal strategies to manage stress and avoid burnout.
	Resilience and Self-Compassion	"Some days, survival is the goal—and that's valid."	Recognizing vulnerability and practicing self-compassion as part of enduring leadership.
6. Values-Driven and Adaptive Leadership	Caring Culture	"We built a culture of care, not just compliance."	Prioritizing empathy, dignity, and holistic support over rigid rule enforcement.
	Tradition-Innovation Synthesis	"I blend traditional values with modern tools."	Harmonizing respect for tradition with openness to new ideas and technologies.
	Values-Driven, Service-Oriented Leadership	"Leadership is service, not status."	Framing leadership as an opportunity to serve rather than wield power.
	Psychologically Safe, Inclusive Leadership	"My generation values mental health, so I modeled that."	Advocating for mental health support and psychological safety in academic environments.

Notes:

- The significant statements were extracted verbatim or paraphrased from participant narratives and illustrative excerpts to reflect everyday lived experiences.
- Formulated meanings represent the underlying essences distilled through phenomenological analysis, capturing the shared interpretations of these experiences.
- This thematic structure underscores millennial nursing deans' complex challenges and adaptive strategies navigating cultural, institutional, and generational dynamics in Philippine higher education.

Theme 1: Thrust into Deanship Without Support

This theme highlights the core issue of role shock, as millennial Filipino nursing deans are suddenly promoted to executive leadership positions often during urgent institutional needs, with minimal succession planning, onboarding, or mentorship. The experience is characterized by quickly taking on high-responsibility roles without adequate institutional support.

Within this theme, three interrelated subthemes emerged. ***Abrupt appointment*** was common; participants were tapped at short notice, often because accreditation or leadership turnover demanded an immediate replacement. "*I was appointed because accreditation was coming. The previous dean retired, and the president said, 'You are next.' Just like that.*" (Dean J). ***Lack of succession planning*** compounded the shock, with deans describing a transition devoid of structured handover or developmental scaffolding: "*There was no onboarding. None. The first year, I had to unlearn and relearn every-*

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thing." (Dean H). Even those with prior titles felt a stark mismatch between earlier responsibilities and the deanship's emotional, strategic, and operational scope: "*I was already handling leadership roles behind the scenes. However, when I officially became dean, I realized nothing had truly prepared me for the emotional and operational demands*." (Dean I). The consequences were affectively heavy feelings of inadequacy, anxiety, and isolation "*I felt unprepared… There was no manual—just high expectations."* (Dean E) and were intensified when life-stage transitions coincided with appointment: "*My appointment came while I was pregnant… I was still expected to run the college like I had been there all along."* (Dean D). Finally, ***no formal mentoring*** meant participants relied on personal values and meaning-making to cope in lieu of institutional support: "*Honestly, I never intended to be in the position… maybe this is God's will*." (Dean D); *"I was a program head for four years, but the transition to college dean? No coaching, no succession planning. Just expectations."* (Dean B). Narratives reflect an institutional culture where the assumption is that competence is transferable by default, without acknowledging higher executive leadership's distinct emotional, administrative, and strategic complexities.

Broader findings in academic leadership scholarship critique higher education institutions' reliance on ad hoc succession and insufficient onboarding for emerging leaders, particularly early-career appointees, are aligned with this. The reactive appointment practices observed in this study echo documented gaps in leadership pipeline development, where emergent leaders are thrust into positions without intentional preparation or support structures (Smith & Jones, 2021). In the Philippine higher education's specific sociocultural and organizational milieu, characterized by hierarchical norms, informal power networks, and relational decision-making, the consequences are magnified, placing millennial deans in situations where they must rapidly adapt while negotiating legitimacy, expectations, and their own evolving leadership identity.

The experiences under this theme reveal a pattern of sudden elevation into leadership coupled with limited institutional investment in developmental continuity. The deans' reliance on personal resilience, retrospective sense-making, and informal supports signals individual adaptation and systemic vulnerability. Addressing this requires a shift from episodic filling of vacancies toward deliberate succession planning, structured onboarding, and mentorship programs tailored to millennial academic leaders' generational and contextual layers. Institutions run the risk of sustaining cycles of leadership stress in the absence of such reforms, which would undermine deans' well-being and the strategic continuity of nursing education governance.

Theme 2: Shared Governance

The second theme denotes a deliberate move by millennial Filipino nursing deans from hierarchical command toward co-created leadership, anchored in consultation, inclusive decision-making, and faculty empowerment. Its central meaning is the redistribution of voice and authority so that policy and program change are built with, rather than for, stakeholders.

Consultative leadership as a subtheme was enacted as routine dialogue and joint sense-making. Deans described leadership as a collaborative craft "*Leadership, especially at my age, is more about co-creating direction… I engage them through consultations and task force groups"* (Dean F) and acknowledged the productive complexity of this stance: "*We co-develop policies. Sometimes it is messy, but it is worth it*" (Dean F). Consultation functioned not as courtesy but as the primary mechanism for shaping priorities and pacing change.

Next is ***inclusive decision-making*** was operationalized through structures that bridged generational and positional lines - task forces, intergenerational committees, and shared implementation teams to distribute ownership and reduce resistance. As one dean put it, "*Instead of rolling out programs immediately, I now form task forces that include both young and seasoned faculty"* (Dean G). Another highlighted how sharing technical leadership with senior faculty altered dynamics and buy-in: "*When we transitioned to a new grading system, I had a senior faculty co-lead the training. That changed everything they felt heard and involved*" (Dean E).

Third, ***empowering faculty*** rested on an ethical and relational foundation of respect, mutuality, and psychological safety, marking a shift from proving authority to cultivating voice. *"I used to think leadership meant proving I was right. Now I know it is about creating a room where everyone's voice matters"* (Dean F). This stance was expressed as principled practice: "*I treat everyone like equals. Even when we disagree, I never use coercion—just coaching… Respect, always"* (Dean A). Empowerment here was both a means to durable change and a moral commitment to fairness.

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The culture emerging from shared governance also facilitated collective accountability and diminished rigid silos that traditionally hindered cross-cutting collaboration. Engaging diverse faculty voices in policy, curriculum, and program innovation led deans to report deeper buy-in and more resilient implementation. The approach served dual purposes: managing resistance through participation and fostering an evolving institutional identity that valued authenticity and relational trust. *"Building trust through transparency and inclusion is more sustainable than exercising authority,"* one dean reflected, capturing this orientation's strategic and philosophical payoff. (Dean A).

Shared governance is consonant with relational leadership theories emphasizing the centrality of mutual influence, trust-building, and shared meaning-making in effective organizational change. It resonates with Filipino cultural values of communal decision-making and "pakikisama," or social harmony in collective action. In reimagining governance, millennial deans act as stewards who navigate entrenched hierarchical expectations while embedding inclusive practices that recalibrate institutional power dynamics. Their experiences suggest that fostering participatory leadership strengthens operational outcomes and shapes a more adaptive, humane, and contextually grounded academic leadership culture.

Theme 3: Work-Life Balance

A conscious shift in leadership identity has emerged, emphasizing work-life balance not merely as a private coping strategy but as a clear leadership priority and ethical principle. This theme signifies a deliberate redefinition of leadership identity in which millennial Filipino nursing deans view balance not just as personal coping, but as an ethical and strategic commitment to leadership. Its core message is the intentional safeguarding of personal and collective capacity through boundary-setting, the normalization of rest, and routine wellness practices that exemplify sustainable work.

Within this theme, three interlocking subthemes were evident. First, ***boundary setting*** was articulated as a value-laden decision that resists the academic norm of perpetual availability: *"I don't bring desk work home unless it's an emergency. That's a boundary I protect"* (Dean A); *"I limit communications past 7 PM"* (Dean J). Second, ***rest as a leadership practice*** recasts recovery as a visible, sanctioned element of stewardship rather than an indulgence: "*I block out weekends and use that time just to breathe"* (Dean B); "*Boundaries are a form of leadership too*" (Dean F). Third, ***intentional wellness routines*** embedded self- and team-care into daily rhythms and unit culture: "*I schedule annual personal retreats"* (Dean J); "*We stopped glorifying exhaustion. If a faculty member is overwhelmed, we talk. I ask them what they need, not just what they can deliver"* (Dean A). Leaders also described concrete rituals that reinforced role compartmentalization and presence, "*When I'm home, I'm home. We do device-free dinners, weekend walks, and family devotionals*" (Dean I) and disseminated these expectations to staff: "*I tell my faculty to take wellness pauses. And I mean i*t" (Dean G). Together, these practices reoriented communication norms, reduced cognitive load, and fostered shared accountability for well-being.

Within the Philippine context, where professional and personal spheres often blur under collectivist and relational pressures, these accounts represent a conscious reframing of what leadership endurance looks like. Millennial deans redefine care, productivity, and legitimacy norms by institutionalizing balance in order to navigate cultural expectations of availability. According to their stories, incorporating self-care into governance is necessary for sustainable academic leadership in modern nursing education, not as an afterthought, but as a moral and practical necessity.

Theme 4: Proving Legitimacy and Bridging Generational Differences

Another emerging theme is how millennial deans work continually and performatively to prove their legitimacy and bridge generational gaps in environments where authority has traditionally been linked to age, tenure, and seniority. This theme highlights how millennial deans' ongoing, relational efforts involve earning recognition in cultures where authority is historically connected to age, tenure, and seniority. Its core meaning focuses on legitimacy as a practice: credibility is not simply granted by appointment but is built over time through performance, inclusion, and negotiated authority across generational divides.

Three subthemes emerged, starting with ***perceived youth and inexperience***, which caused participants to face skepticism, subtle infantilization, and direct challenges to their credibility. "*I've been called 'anak' or 'bunso' in meetings… One faculty even said, 'Magpalaki ka muna ng anak bago ka magpayo sa faculty issues'*" (Dean J). The result

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was a persistent burden of legitimacy: "*You have to keep proving, again and again*" (Dean A). Next is ***proof through performance***, where deans used visible accomplishments and external validation to reshape internal perceptions. "*When we passed Level III accreditation and the accreditors cited our reforms, it was the moment they saw me as a real leader*" (Dean I). They also won over skeptics by giving them meaningful roles in change efforts: "*Instead of enforcing policy changes top-down, I involved even the skeptics… served as pilot reviewers"* (Dean J), a strategy that led to attitudinal shifts: "*The same senior who doubted me early on? He later defended one of my proposals"* (Dean F). Additionally, ***negotiating authority*** involved leaders blending humility with strong stewardship, recognizing institutional memory while fostering innovation. "*There was this unspoken, 'What can he teach us?' vibe. I listened and respected what they built*" (Dean I). As another noted, appointment didn't equal acceptance: "*Being appointed didn't mean being accepted. You have to prove that you belong in the role, every day*" (Dean F). These efforts reflect what intergenerational leadership research describes as the balancing act between honoring tradition and introducing change—negotiating continuity while gently recalibrating culture.

The theme aligns with scholarship on intergenerational tension and authority reconstruction in academic institutions, where younger leaders often must perform credibility through demonstrated competence, relational trust-building, and symbolic victories to overcome implicit biases about age and experience (Bongco & Ancho, 2023). Deans negotiated two imperatives: demonstrating respect for institutional heritage while claiming a credible, modern leadership identity. In the Filipino cultural context, the importance of "pakikiramay" (empathic connection) and deference to elders coexists with evolving expectations for participatory leadership. Their experience emphasizes how legitimacy is rarely static in these kinds of environments; rather, it is constantly negotiated through inclusive engagement, respectable relationship work, and evident success.

Collectively, the deans' narratives emphasize that bridging generational divides is not a one-time confrontation but a sustained process of mutual adaptation. Attempting to gain a place at the table through co-creation, empathy, and evidence rather than replacing seniority with power. They can turn early skepticism into cooperation through this layered, iterative, and relational legitimacy work, which sets the stage for long-term institutional coherence and innovation.

Theme 5: Managing Vulnerabilities through Grit

The fifth theme highlighted the often unseen emotional landscape that millennial deans navigate, where grit and vulnerability intertwine as key aspects of long-term leadership. Managing vulnerabilities through grit explains how millennial Filipino nursing deans maintain leadership amid ongoing strain by combining honest acknowledgment of fragility with disciplined perseverance. According to participants, the deanship was a place that challenged them intellectually, emotionally, spiritually, and personally, requiring constant self-recalibration of identity and capacity.

Emotional labor, one of the subthemes, depicts deanship as continual containment of others' distress alongside institutional pressures. As one dean recalled, "*Seventy-eight students were crying in my office because they couldn't graduate… I had to hold that space—with objectivity and empathy*" (Dean H). Daily tasks oscillated between bureaucratic urgency and interpersonal care: "*Some nights I'm drafting advisories at 2 a.m., and other days mediating between a parent and a faculty member*" (Dean I), underscoring leadership as relational work rather than detached decision-making. The second subtheme, ***reflective practice***, shows leaders using introspection and meaning-making to metabolize role demands: "*Serving as dean has felt like stepping into an ever-expanding crucible that tests you emotionally, intellectually, and even spiritually every single day*" (Dean J); "*I didn't feel ready… 'Will they respect me? Am I enough?' But I reminded myself, no one wakes up ready to be a dean. You grow into it*" (Dean I). The third subtheme, ***adaptive coping***, highlights boundary-anchored routines that safeguard judgment and compassion: "*I journal. I block off weekends… empathy without boundaries can be damaging"* (Dean J); "*It's a lonely job. You absorb so much from everyone but rarely have anyone to process it with*" (Dean F), indicating that time-bounded rest and solitude are protective disciplines rather than retreats. Finally, ***resilience and self-compassion*** emerged as a generative pairing: "*You lead not just with policy or plans but with your whole self. Some days you break down, but you still get up*" (Dean F), capturing persistence without self-erasure and signaling a humane standard for sustained leadership.

All things considered, the stories highlight a structural weakness: while millennial deans create their own coping strategies for dealing with vulnerability, there is little official support to maintain these ef-

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forts. Their grit manifested in continuous self-growth, boundary cultivation, and emotional regulation is compensatory in the absence of systemic wellness frameworks. These findings indicate that to move beyond individual resilience myths, institutions need to establish spaces for peer debriefing, leadership coaching, and mental health support that recognize the emotional complexity of academic stewardship. Doing so would affirm the lived experiences of deans and turn vulnerability from a hidden burden into a supported and integral part of sustainable leadership.

Theme 6: Values–Driven and Adaptive Leadership

This theme captures how millennial Filipino nursing deans root leadership in moral stewardship while adjusting responsively to context. Its central organizing meaning is leadership as relational, service-oriented co-production that cultivates care and psychological safety while bridging tradition and innovation.

Across accounts, deans described building a ***caring, psychologically safe culture*** in which trust and voice are protected: "*We built a culture of care, not just compliance*." (Dean A). This stance is inseparable from ***values-driven, service-oriented leadership***, a conscious rejection of prestige as the basis of authority: "*Leadership is service, not status*" (Dean F) and an identity performed through presence rather than position: "*I don't lead by title. I lead by presence. I serve. I listen. I grow with my team.*" (Dean F). Inclusive practice was operationalized in routine decision-making, signaling ***inclusive leadership*** that redistributes voice: "*It's never about being the smartest in the room. It's about building a room where every voice matters*." (Dean J). At the same time, leaders enacted a ***tradition–innovation synthesis***, honoring legacy while introducing change through co-ownership: "*I pilot new systems with senior faculty, let them review it, then co-present the results. That way, tradition and innovation go hand in hand*." (Dean J). Communicative agility reinforced this synthesis: "*I use the language of legacy with senior faculty and the language of design with the younger ones*" (Dean I), illustrating adaptive framing across generational audiences.

Anchored in the Filipino ethic of *pakikipagkapwatao*, leadership is enacted as morally intentional and intersubjective labor: values guide inclusion, trust is co-constructed through dialogue, and change proceeds via pilot-and-refine cycles. Within this stewardship frame, authority is reframed as the protection of voice and dignity while facilitating adaptive reform, such that caring operates as strategic infrastructure for collaboration, and innovation acquires legitimacy when tethered to culturally resonant practices and shared values.

The deans' narratives show how this cultural–ethical foundation translates into everyday governance: decision-making is seen as an act of collective care rather than domination, compassion is embedded in the system, and communities of practice uphold moral accountability and human dignity. Values are put into action through inclusive practices, culturally layered communication, and collaborative innovation—an emerging leadership style that is disciplined, empathetic, and responsive to the context rather than just rhetoric. In this view, lasting academic leadership gains its legitimacy from combining ethical intention, relational flexibility, and adaptive ability, allowing institutions to recalibrate from within.

Overall, the six themes provide a grounded portrait of Filipino millennial nursing deans navigating leadership amid institutional pressure, generational expectations, and cultural norms. Thrown into roles with minimal preparation, they developed practical, values-driven approaches that emphasize shared decision-making, caring for people's well-being, and earning legitimacy through relationships rather than authority. Emotional resilience and intentional self-care became essential strategies for survival and sustainability, while a strong ethical commitment motivated their efforts to make nursing education more humane and relevant. Their leadership is not a fixed blueprint but a lived, adaptable practice shaping change from within the system by blending responsiveness with purpose.

DISCUSSION

The lived experiences of Filipino millennial nursing deans reflect a leadership trajectory characterized by abrupt entry into executive roles, ongoing legitimacy work, a pivot toward shared governance, intentional well-being practices, resilience through reflective coping, and an ultimately values-driven, adaptive posture. These patterns appear to mirror challenges documented for novice academic leaders globally while being shaped by the collectivist and hierarchical contours of Philippine higher education (Obmerga & de Guzman, 2024; Archibald, 2025; Batang et al., 2025; Ballena, 2022). Taken together, the findings likely indicate that generational leader-

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ship preferences interact with institutional culture to shape how authority is constructed and how change is implemented in nursing education.

Millennial nursing deans in this study commonly entered the role abruptly and with little formal preparation, a sequence that generated role shock, early self-doubt, and rapid, on-the-job sense-making. This pattern is likely tied to accreditation-driven timelines and hierarchical, ad hoc succession practices that prioritize continuity of operations over leadership socialization (Al Hajiri, 2024; Hoque & Zheng, 2024; Dahlan et al., 2021; Wolverton & Gmelch, 2002). Limited exposure to administrative work prior to appointment may further attenuate identity consolidation, echoing concerns about the weak professionalization of academic leadership roles (Del Favero, 2006; Brindley et al., 2024). Theoretically, these data extend transition and identity-work perspectives by portraying the deanship as a liminal stage in which leaders renegotiate competence and legitimacy while learning the hidden curriculum of governance; the experience appears less like a separate promotion and more like a period of intensified socialization under time constraints. Framing abrupt appointment as a liminal passage helps explain why early misalignment between responsibilities and self-efficacy persists even among previously accomplished faculty; identity stabilization likely depends on timely access to communities of practice and clear role scripts. Further research should include comparative and longitudinal evaluations of onboarding and mentoring models to identify which combinations, such as pre-appointment shadowing combined with first-90-day coaching, most effectively enhance early decision quality, psychological safety, and retention (Del Favero, 2006; Brindley et al., 2024). Realist approaches could also help determine what works, for whom, and under which time constraints typical of accreditation cycles (Al Hajiri, 2024; Hoque & Zheng, 2024). Programs that sequence structured handovers, clear task and authority maps, observational shadowing, and early coach pairing are likely to reduce initial ambiguity and speed up situated learning; pairing leaders with mentors outside their immediate hierarchy can also buffer evaluative pressure while expanding conflict management and resource negotiation skills. Requiring written succession plans, protected acclimatization periods, and funded mentorships creates the conditions that daily practice alone cannot achieve (Hill-Berry & Burris-Merville, 2024; Price, 2022).

Nursing deans described a deliberate pivot to consultative, inclusive decision-making that redistributed voice and ownership. In a collectivist, seniority-oriented environment, this approach likely functions as an adaptive response to legitimacy pressures and aligns with transformational/servant tendencies common among millennial leaders (Gabriel et al., 2020; Archibald, 2025; Galdames & Guihen, 2020). Mechanistically, recurring consultation, co-design of policies, and shared implementation may cultivate psychological safety and collective efficacy conditions linked to innovation and accountable follow-through in nursing education (Khajehmougahi & Zamanzadeh, 2023; Price, 2022). The pattern reinforces relational/co-production views of leadership, suggesting that legitimacy is produced in interaction rather than granted by position. Concise implications include: integrating participation and transparency indicators into quality assurance and accreditation at the system level to align incentives and consolidate gains; institutionalizing participation through time-bounded feedback loops, standing cross-generational committees, and published decision rationales; and testing the values, psychological safety, innovation pathway using a combination of methods that pair climate metrics with implementation outcomes (Batang et al., 2025; Price, 2022).

Leaders normalized boundary-setting, rest, and wellness as leadership work, reframing self-care as a precondition for sound judgment and sustained care of others. This orientation likely reflects millennial commitments to holistic sustainability and may operate as a resource-conservation strategy that reduces role strain and decision fatigue, thereby buffering burnout and turnover already documented among academic leaders (Galdames & Guihen, 2020; Saylor et al., 2025; Hosseini et al., 2022; Potempa & Tilden, 2004). Establishing time-bound communication norms, predictable recovery cycles, and reflec-

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tive debriefs as organizational capabilities rather than personal preferences, these accounts conceptually expand on sustainable/embodied leadership. Empirically, realist or mixed-methods evaluations would usefully test whether specific boundary policies (e.g., evening email curfews, meeting-free blocks, structured "wellness pauses/breaks," peer-support debriefs) actually mediate reductions in burnout and improve retention. Operationally, codifying such routines along with explicit recognition of emotional labor and guaranteed recovery time could shift local incentive structures away from presenteeism toward sustainable performance and climate health (Strout et al., 2023). Modeling these practices, millennial deans signal new norms that plausibly enhance leader and faculty well-being while creating the conditions for consistent, high-quality educational leadership.

Authority in these settings was not bestowed but continuously accomplished: credibility had to be demonstrated through performance evidence and cultivated via inclusive engagement. This ongoing negotiation likely reflects age-linked seniority norms and the need to "lead up" to more tenured colleagues, dynamics possibly intensified when reform agendas unsettle legacy practices (Gabriel et al., 2020; Awashreh, 2025; Pekkola et al., 2022; Rudolph et al., 2018; Jing et al., 2025). From a conceptual standpoint, the pattern reinterprets legitimacy as an intersubjective process that entails continuous accomplishment as opposed to a fixed quality or trait. Empirically, it suggests researching authority negotiation and ageism while determining whether specific interventions, such as designating skeptics as co-leads on pilots and utilizing outside validations, successfully alter perceptions and boost adoption rates. Cross-generational mentorships, transparent evidence standards, and routine opportunities for dissent without penalty may reduce relational friction and quicken consensus formation; at the system level, anti-ageism guidance embedded in appointment and appraisal criteria could normalize these expectations. Taken together, these moves translate legitimacy from personal charisma to a reproducible set of relational and evidentiary practices suited to seniority-based academic cultures.

Deans in this study sustained leadership continuity by balancing substantial emotional labor with reflective practice and adaptive coping, indicating that the role's high relational demands and constrained resources likely require continuous affect regulation, sense-making, and boundary work. Reflective journaling, spiritual grounding, peer debriefs, and intentional recovery routines may convert strain into adaptive capacity by enhancing self-regulation, clarifying values, and protecting empathic bandwidth. This reframes academic leadership as an embodied, affect-laden practice in which vulnerability and grit operate together, extending authenticity and resilience accounts while situating judgment quality within leaders' emotional economies. Furthermore, the pattern suggests measuring emotional-labor load and testing whether structured reflection, coaching/supervision, and recovery cycles mediate outcomes such as burnout, retention, and decisional clarity. Codifying protected reflection time, scheduled supervision or peer-support debriefs, and clear crisis-triage protocols could normalize care for caregivers and reduce decision fatigue. Workload models that acknowledge emotional labor, provide access to private coaching and counseling, and use evaluation standards that prioritize climate stewardship in addition to technical performance are likely to improve leader well-being and stabilize governance capacity at the system level.

In this inquiry, leadership was enacted as service-oriented stewardship that integrated institutional tradition with innovation through psychologically safe, inclusive processes. This orientation likely draws on Filipino relational ethics (pakikipagkapwa-tao) and aligns with adaptive/servant leadership logics in which change is stabilized by low-risk pilots, co-presentation of results, and audience-specific framing that bridges generational perspectives (Heifetz & Linsky, 2009; Ballout, 2025; Archibald, 2025; Easton, 2025). Psychological safety may mediate the pathway from espoused values to innovation by lowering interpersonal risk, enabling dissent, and converting participation into shared ownership of reforms. The pattern integrates cultural relationality with adaptive leadership, suggesting a contextually

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grounded model in which authority is expressed as care, reciprocity, and co-production. Practically, institutions could plausibly consolidate these gains by codifying values, charters and safe-meeting norms, training leaders in code-switching across generations, and normalizing pilot-and-refine routines that invite senior and junior faculty as co-authors of change; selection and appraisal systems that weight relational competence, along with seed support for low-risk pilots, would likely further embed this values-driven, adaptive governance.

Across various themes, sudden changes and generational conflicts seem to drive a shift toward inclusive governance, wellness-focused habits, and reflective resilience, leading to a culturally rooted, values-based form of adaptive leadership. The collection of findings indicates a multi-tiered agenda: developing theory around legitimacy as practice and sustainable leadership; conducting evaluative research on onboarding, psychological safety, and wellness policies; creating practical toolkits for participatory governance and emotional labor support; and implementing policy strategies that embed succession planning, inclusion, and leader well-being into Philippine nursing education.

CONCLUSION

This phenomenological investigation illuminated the complex and culturally embedded lived experiences of Filipino millennial nursing deans, highlighting how institutional culture, generational identity, and core values collectively shape their leadership journeys. Millennial deans provide detailed, evocative accounts revealing the embodied challenges of abruptly assuming leadership roles, navigating intergenerational dynamics, and managing the emotional labor inherent in academic leadership. Despite these challenges, a clear pattern of values-driven adaptability and a collaborative leadership approach emerged, aligning with principles of transformative leadership and participatory governance. These findings underscore the critical role of situated agency, meaning-making, and reflexivity in shaping effective leadership within higher education, offering important insights for both leadership development and institutional policy.

This work emphasizes the experiential knowledge of a generational cohort that is frequently underrepresented in leadership literature, making a significant contribution to the ongoing conversation on academic leadership in nursing education. It advances our theoretical and practical understanding of how millennial leaders reinterpret the praxis and meaning of deanship in a hierarchically structured, culturally specific, and resource-constrained environment. Furthermore, this study underscores the need to reimagine leadership development through a generationally responsive and contextually relevant lens that values mentoring, wellness, and inclusive decision-making as cornerstones of sustainable leadership practice. These findings provide an empirically grounded foundation to inform the development of leadership preparation programs and institutional policies responsive to the evolving realities of academic environments. This study also emphasizes the necessity of rethinking leadership development from a contextually relevant and generationally responsive perspective, emphasizing inclusive decision-making, wellness, and mentoring as essential components of sustainable leadership practice. These results offer an empirically supported basis for guiding the creation of institutional policies and leadership development programs that adapt to the changing realities of academic settings.

Limitations

Although this qualitative study provides in-depth, contextually grounded insights into the actual experiences of Filipino millennial nursing deans, a number of limitations should be considered. The study's small sample size and purposive sampling limit the findings' generalizability beyond this specific cohort and context, as is typical in phenomenological research. Despite triangulation efforts, the use of self-reported interview data may also introduce social desirability effects or recall bias. The depth of interaction and rapport may have been impacted by the two different data collection methods (online and in-person), which could have had an impact on the richness of the narrative. Lastly, the results may not be as applicable in other disciplinary or national

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contexts due to the cultural and institutional peculiarities of nursing education in the Philippines. These limitations highlight opportunities for future research to expand and diversify the understanding of millennial leadership in nursing education.

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CONFLICT OF INTEREST

The author declares that there are no conflicts of interest related to this research. No financial, personal, or academic relationships exist that could have influenced the study's outcomes or interpretation.

DISCLOSURE OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES

The author utilized ChatGPT, an AI language model by OpenAI, and Grammarly software primarily for refining and editing the manuscript's language and clarity. Additionally, the author employed Perplexity AI as a tool to aid in efficient literature searching and gathering relevant references. Despite these technological supports, the author independently verified, revised, and ensured the accuracy and integrity of all content. Full responsibility for the originality and authenticity of this publication rests solely with the author.

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LITERATURE REVIEW

Healthcare Beyond Earth: A Literature Analysis on "Aerospace Nursing"

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ABSTRACT

"Aerospace Nursing" is an emerging interdisciplinary field focused on addressing healthcare challenges in air and space travel, extreme remote environments, and analog missions. This analysis of 45 studies from 1975 to 2024 covers four research objectives: (1) identifying clinical and operational challenges, (2) evaluating required skills and training, (3) assessing nurses' roles in crew well-being and safety, and (4) informing educational frameworks. A conceptual framework based on the nursing metaparadigm ("Person," "Environment," "Health," and "Nursing") with moderators ("Education," "Training," and "Research") guide the analysis. Findings demonstrate physiological, psychological, and ethical issues, establish the need for trauma care and telehealth competencies, and recognize nurses' critical contribution to mission safety. Gaps related to standardized curricula and the feasibility of adapting Earth-based nursing to space settings are identified. The analysis provides implications for practice, education, and policy, supporting the development of "Aerospace Nursing" programs.

Keywords: *aerospace nursing, flight nurse, aerovac nursing, literature analysis*

INTRODUCTION

"Aerospace Nursing" integrates healthcare, space science, and technology to meet the demands of air and space travel, extreme remote environments, and analog missions. As space exploration expands, nurses are pivotal in ensuring crew health and safety in environments characterized by microgravity, radiation, and isolation. Four research objectives emerged from the literature analyzed: (1) identifying challenges and complexities for nurses in the space industry, (2) exploring specialized skills, knowledge, and training requirements, (3) describing nurses' roles regarding crew well-being and safety, and (4) generating content for curricula, training programs, and the scope of "Aerospace Nursing". This paper maps 45 studies to accomplish these objectives, and to evaluate support and identify gaps. A refined conceptual framework clarifies relationships between variables, and new discussions assess the feasibility of transitioning from Earth-based nursing and summarize key findings with implications for practice, education, and policy. Table and figures support the analysis, and limitations and biases are evaluated to guide future research.

Conceptual Framework for "Aerospace Nursing"

The conceptual framework (Figure 1) is grounded in the nursing metaparadigm: "Person" (aerospace travelers, analog astronauts, and extreme environment dwellers), "Environment" (air, space, extreme remote environments, and analog/simulated contexts), "Health" (optimal well-being), and "Nursing" (specialized care for aerospace and analog missions, including in extreme remote environments). "Nursing" acts as an intervening variable mediating the effects of "Environment" on "Health," impacting the "Person". Moderators—"Education," "Training," and "Research"—optimize "Nursing" interventions. Figure 1 illustrates these relationships, showing "Environment" (X1) and "Health" (X2) as exposure variables affecting the "Person" (Y) through "Nursing" (M), moderated by "Education" (W1), "Training" (W2), and "Research" (W3). Supported by Rivera et al. (2024), this framework emphasizes the environmental challenges such as microgravity and health risks like muscle atrophy that nurses need to manage. It affirms the importance of "Education" and "Training" to effectively respond to these issues and provides a structured approach for analyzing such challenges.

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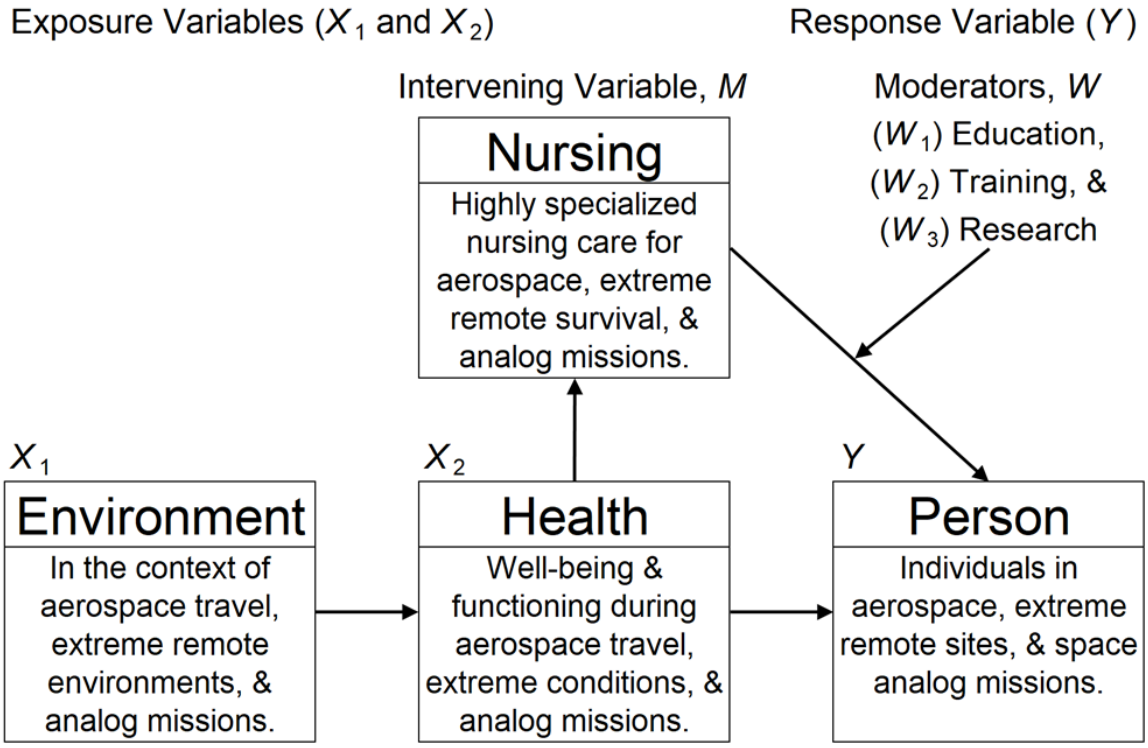

Fig. 1 *Conceptual framework for "Aerospace Nursing" practice. "Environment" (X1) and "Health" (X2) influence the "Person" (Y) through "Nursing" (M), moderated by "Education" (W1), "Training" (W2), and "Research" (W3)*

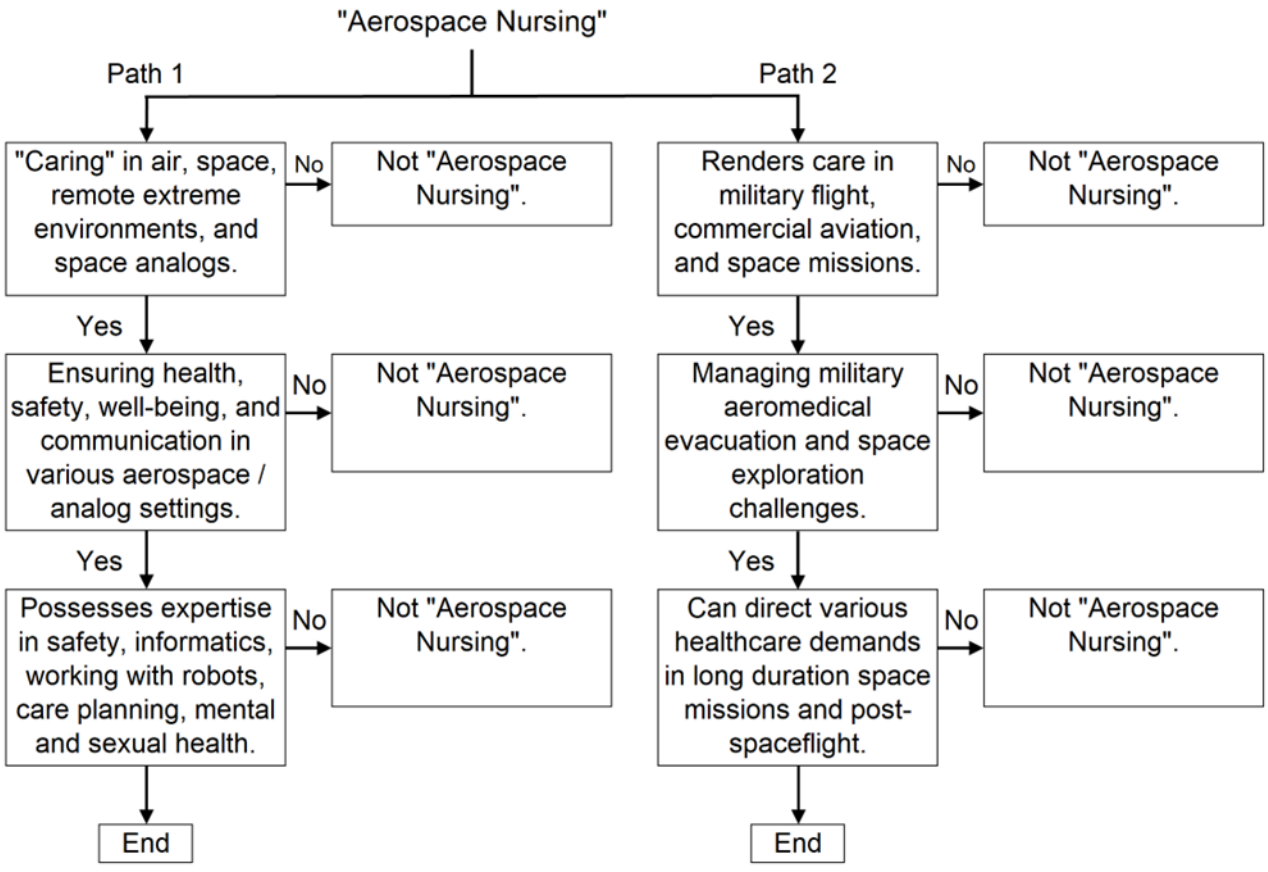

Fig. 2 *Decision tree for delineating the scope of "Aerospace Nursing"*

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Path 1 covers healthcare delivery for commercial or private air travel, paid space exploration, and analog habitats that simulate extraterrestrial conditions, either for tourism or agency-funded research. Nurses serve as either flight crew or ground crew. Rivera et al. (2024) describe the specialized role of "Nursing" in these settings. This ranged from promoting health (in high-risk jobs) and ensuring travelers' safety to maintaining flight communications. The scientific basis for this path is based on evidence regarding "Environment[al]" conditions, such as air quality, which can significantly impact occupant "Health" in confined spaces like aircraft or space habitats. For instance, poor air quality in space analogs has been linked to respiratory and cognitive impairments, so "Nursing," (Figure 1) acting as the agency intervening through "countermeasures," is needed to monitor and reduce these risks.

Moreover, the psychological effects of isolated and extreme "Environment[s]" to "Health" require "Nursing" (Figure 1) to possess skills in psychotherapies and knowledge in sleep medicine. Rivera et al. (2024) note the importance of psychological support, where "Environment[al]" stressors such as confinement and sensory deprivation can exacerbate psychological distresses in the "Person" (Figure 1), even in analog habitats.

The "aerospace nurse" must combine clinical proficiency with "technological competency" (Locsin, 2017), embodying "caring" in healthcare delivery by integrating real-time monitoring of health and medical alarms or alerts, interpreting vital signs alongside stress data analysis (Hernandez et al., 2025), and detecting misinformation and disinformation to fact-check and verify information when generating insights from online information networks (Hernandez, 2022). These processes can be further enhanced through data sonification (Hernandez, 2025).

"Nursing" must be versatile, agile, and vigilant in its knowledge process with technology for example, by collecting data via a nurse chatbot (Hernandez, 2019) or its humanoid robot avatar equivalent, along with biophysiological sensors (e.g., wearables for oxygen saturation, electrocardiogram [ECG], electroencephalogram [EEG], etc.) securely linked to onboard electronic health records (EHRs). This requires knowledge of cybersecurity protocols and best practices. These systems must remain interoperable—that is, information can be communicated, exchanged, and used seamlessly among different systems, devices, or agencies—with data transmitted to mission control and stored at ground-based data centers. Additionally, this opens opportunities for creating virtual replicas of the "Person" in spaceflight (whether nurses onboard, crew members, or space tourists) to: predict human cognitive performance against fatigue from hypobaric and hyperoxic flight conditions (Damato et al., 2022; Netzer et al., 2024); conduct scientific investigations based on novel findings in aviation studies (Damato et al., 2022; Netzer et al., 2024); run computer simulations and model validations; and optimize operations using "digital twin technology" (Gu et al., 2023; Vallée, 2023; Zhang et al., 2024; Carroll & Garcia-Dia, 2025; Kuruppu et al., 2025).

Proficiency in programming languages such as Python, Java, C#, JavaScript, and R (Luong, 2024) is fundamental to operating space informatics systems (Hernandez, 2025), which utilize machine learning, advanced computing, sensitive electronics, and robotic systems onboard the spacecraft. Care delivery in space eventually becomes a "transactive" collaboration with robots (Tanioka, 2017) but must be dynamically adjusted to achieve closed-loop synchronization among the patient, the robot, and the healthcare system (Hernandez, 2024).

The advanced skill set required for Path 1 also includes reviewing and updating safety protocols and interdisciplinary collaboration. In particular, nurses must be adept at managing emergencies in microgravity or high-altitude conditions, where traditional medical practices may be less effective. For example, administering cardiopulmonary resuscitation (CPR) in microgravity requires specialized techniques (Smowton et al., 2025), demanding training in unconventional medical procedures. The integra-

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tion of robotics, as noted by Rivera et al. (2024), further enhances the capacity of "Nursing" (Figure 1) to deliver precise and efficient care, such as through automated diagnostic tools or telemedicine platforms.

Path 2 relies on the historical and contemporary roles of nurses in military flight operations and non-commercial space missions. According to Rivera et al. (2024), nurses have long contributed to "aeromedical evacuation" and "aircraft crew support," roles that have evolved to meet the requirements of modern space exploration. This involves the "Health" component shown in Figure 1, covering up to the rehabilitation phase after the return to Earth. In both military and commercial aviation, "Nursing" plays a critical role in ensuring the safety of passengers and crew, often under high-stress conditions. During "aeromedical evacuations", for example, these nurses are responsible for stabilizing patients throughout transport, frequently facing challenges such as turbulence and high-altitude environments. The skills required for these tasks include rapid assessment, trauma care, and coordination with flight crews to maintain operational safety. Historical nursing roles demonstrate the established foundation of this specialty, which has evolved to incorporate advanced technologies and protocols over time.

Moreover, Path 2 is care-directed toward professional astronauts with formal duties (e.g., trained members of the astronaut corps) on issues such as prolonged radiation exposure, muscle atrophy, and cardiovascular deconditioning. Nurses play an active role as part of the crew, in mission planning, and in key operations. Rivera et al. (2024) did mention the need for specialized knowledge regarding alterations in physiology that can persist long after re-entry. For example, post-spaceflight orthostatic intolerance requires careful management to prevent complications and implementation of rehabilitation medicine. "Nursing," by its position in Figure 1 and its autonomy to provide independent care, should have the capacity to evaluate crew behavioral changes during crises (e.g., anxiety, depression, suicidal thoughts, acute psychotic symptoms) and to apply de-escalation techniques in situations involving heightened conflict or aggression progressing toward vio-

METHODS

This paper retrieved 45 studies from PubMed using the search terms "nursing" and "aerospace" from 1975 to 2024. Each study was evaluated for relevance based on thematic content and findings. The literature was organized into four sections: (1) challenges and complexities, (2) skills and training, (3) nurses' roles, and (4) curricula development. Supporting studies were summarized with author-year citations, and gaps were identified where literature was sparse. Qualitative synthesis grouped studies by objective, assessing collective insights. Table 1 summarizes key findings and gaps, while Figure 3 visualizes the distribution of studies. The feasibility and trajectory of "Aerospace Nursing" were assessed by integrating literature relevant to the objectives, focusing on applicability of Earth-based nursing. The summary of findings discusses implications for practice, education, and policy. Limitations and potential biases were evaluated by reviewing the original study's methodology and scope.

Literature Analysis

Challenges and Complexities in the Space Industry for Nurses

The literature identifies numerous complexities for aerospace nurses, aligning with the framework's "Environment" and "Health" concepts. Environmental stressors in air transport, such as altitude, noise, and turbulence, complicate patient care (Oxer, 1977). These factors are exacerbated in specialized contexts, including the transport of seriously ill patients where physiological and psychological stresses must be managed meticulously (Oxer, 1977). Nursing care in outer space involves unique physical and mental challenges (Perrin, 1985). For example, providing maternal care in microgravity (Tucker, 1990) is difficult because low-gravity environments make it hard to follow normal nursing procedures for childbirth. Extended space missions introduce complexities due to extreme conditions (Czerwinski

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& Booher, 1998), including the need to manage health requirements guided by General Systems Theory and National Aeronautics and Space Administration (NASA) standards for long-duration missions. Occupational stress and the lack of social support further compound these issues, showing negative correlations that highlight the need for resilient coping mechanisms in high-stress aerospace settings (Singh, 1990). Additionally, "occupational health nursing" in space presents obstacles, such as the impacts of microgravity, space limitations, and evolving roles in diagnosing space-specific injuries and illnesses (McGinnis, 1991). The phenomena of burnout and distress accompany the expanding roles in nursing, particularly in specialized fields like "Aerospace Nursing," necessitating strategies to mitigate these risks (Gaudinski, 1979). Musculoskeletal injuries among "aeromedical evacuation personnel" also represent a prevalent challenge, affecting mission success and requiring preventive measures (Fouts et al., 2015). Patient safety incidents and near misses during "en route care" add layers of complexity, influencing the overall safety landscape (McNeill et al., 2014). In aerospace environments, nurses face logistical and care demands across pre-flight, flight, and post-flight phases, including equipment organization and patient prioritization in demanding conditions (Raduenz et al., 2020). Conflict and emotion management, alongside bridging technical knowledge with clinical practice, are critical in "aeromedical care," especially during high-altitude interventions like managing gastric distention and ventilation (de Morais et al., 2021). Physiological alterations (e.g., muscle atrophy, radiation effects) and psychological stressors (e.g., isolation, asthenia) are well-documented (Kanas et al., 2001; Pandian et al., 2022; Rivera et al., 2024). Microbial risks, including increased pathogen virulence and antibiotic resistance, are significant (Pavletić et al., 2022; Simões & Antunes, 2021; Wazir et al., 2023). Immune monitoring faces challenges in sample storage and technology limitations (Crucian et al., 2021). Ethical dilemmas in "space tourism", such as the safety of "space hotels", further complicate practice (Marsh, 2006). Gaps arise in managing chronic conditions, long-term radiation effects on nurses who will be working in aerospace settings, and developing deep space emergency protocols.

Specialized Skills, Knowledge, and Training Requirements Essential for Aerospace Nurses

Aerospace nurses require specialized skills, aligned with the framework's "Nursing" concept and the "Training" moderator. Holistic care skills address physical, emotional, and psychological needs (Barron, 1975), providing the foundation for comprehensive patient care during aerospace missions. Technological competence and leadership are critical (Burke, 1979), especially amid the rapid advancements and "nursing explosion" that demand strong philosophical bases for navigating expanded roles. On the other hand, advanced trauma life support skills are needed in "aeromedical evacuation" (Thomas et al., 1985), including comparisons of procedures between nurses and physicians to expand nurse capabilities in trauma care. Educational strategies for physiological stresses and telehealth proficiency are emphasized (Chonin, 1998; Polk-Walker, 1989), with telehealth requiring reliable communication systems for space environments and considerations for legal implementation. Research skills support evidence-based practice (Erier et al., 2000), as surveys of "flight nurses" reveal how research informs policies and study design in the field. Space health integration into curricula is advocated (Pandian et al., 2022), alongside skills in informatics, robotics, and environmental monitoring (Rivera et al., 2024). Trauma assessment and conflict management are necessary (de Morais et al., 2021), incorporating the ABCDE system for systematic patient management in pre-hospital settings. The ABCDE system includes Airway (ensuring a clear airway), Breathing (assessing respiratory function), Circulation (evaluating cardiovascular stability), Disability (performing neurological assessment), and Exposure (assessing injuries while preventing hypothermia) (de Morais et al., 2021). Simulation-based training is effective (Borges et al., 2022; De Jong et al., 2017; Eaves & Flagg, 2001), with preferences for this learning style among flight nurse students as it enhances clinical outcomes. Skills in equipment management and patient prioritization

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are noted (Raduenz et al., 2020), reflecting the demographic of experienced nurses with intensive care and emergency training. The complexities of clinical practice in "flight nursing" demand ongoing training for competence (Eastes, 1989). Specialized training covers in-flight opportunities and challenges (Davis, 2012), while future directions prioritize research and innovation in "aeromedical evacuation" (Lee et al., 2012). The lack of standardized curricula and scalable certification programs for deep space missions indicates a need for further development.

Role of Aerospace Nurses in Ensuring the Well-being and Safety of Crew Members

Aerospace nurses are vital in ensuring crew well-being, aligning with the framework's "Nursing" and "Person" concepts. Historical contributions in patient care are documented (Barger, 1979, 1980, 1985), including pioneering efforts in the U.S. Army Air Forces and the formative years marked by Cold War that shaped modern protocols. Synergistic interactions enhance "aerovac nursing" (Burke, 1980), applying Martha E. Rogers' framework to theoretical and practical aspects of patient care in flight. Nurses contribute to international rescue missions (Hoolahan, 2004), providing critical in-flight care for safety and advantageous outcomes. They develop trauma care protocols through qualitative research for improved safety (Schweitzer et al., 2011), focusing on pre-aerospace removal of victims. Patient safety during "en route care" (McNeill et al., 2014) and ergonomic strategies to reduce injuries (Fouts et al., 2015) target musculoskeletal issues among personnel. Nurses manage patient care and infection control across flight phases (Raduenz et al., 2020), including medication administration, documentation, and aircraft maintenance. They provide preventive, diagnostic, and therapeutic care, including psychological support (Rivera et al., 2024). Nurses have made important contributions to checking health, using new technology, and performing "aeromedical evacuation" (Czerwinski et al., 2000; Davis, 2012; Harper, 2005; Lee et al., 2012). These efforts are shaped by past accounts of nurses in the U.S. space program and their personal experiences during tough missions. Specialized roles include managing psychiatric patient transport (Jones, 1980), implementing peer review for clinical standards (Cook, 1981), and delivering care in remote environments like Western Australia's Royal Flying Doctor Service (Pugh, 2000). Adaptation to wartime settings, such as Vietnam, showcases resilience and coping skills (Ravella, 1995). Fundamental values guide decision-making and job satisfaction (Hutchison et al., 2001). Research on roles in long-duration missions or extraterrestrial settlements is sparse, necessitating studies on crew cohesion and health management.

Development of Curricula, Training Programs, and the Scope of "Aerospace Nursing"

The literature supports curricula development, aligning with the framework's "Education" and "Research" moderators. Integration of space health concepts and nursing theories is advocated (Pandian et al., 2022; Rivera et al., 2024), building upon competencies in "aerovac nursing" (Barger, 1980; Burke, 1980). Educational strategies and international teamwork are both required (Polk-Walker, 1989; Rudge, 1995). Studies in "aerospace medicine" show the importance of academic preparation. Simulation-based training is supported (De Jong et al., 2017; Eaves & Flagg, 2001), using tools like the U.S. Air Force pilot simulated medical unit to build competencies. Gaps in "air patient transport education" are reported (Passos et al., 2011), calling for improved curricula to resolve scientific knowledge deficiencies. Telehealth training is crucial (Chonin, 1998), extending applications to space for effective healthcare delivery. A comprehensive curriculum covering foundational concepts, trauma care, and leadership is proposed, informed by historical bibliographies and evolutions of flight nursing (Barger, 1985; Shorb, 1985; Skinner, 1983), including updates on the flight nurse section's 21-year accomplishments. Historical contributions of nurses to the U.S. space program underscore the scope's expansion through technology adaptation (Czerwinski et al., 2000). Recognition of nurse leadership, in tandem with "aerospace medicine," encourages profes-

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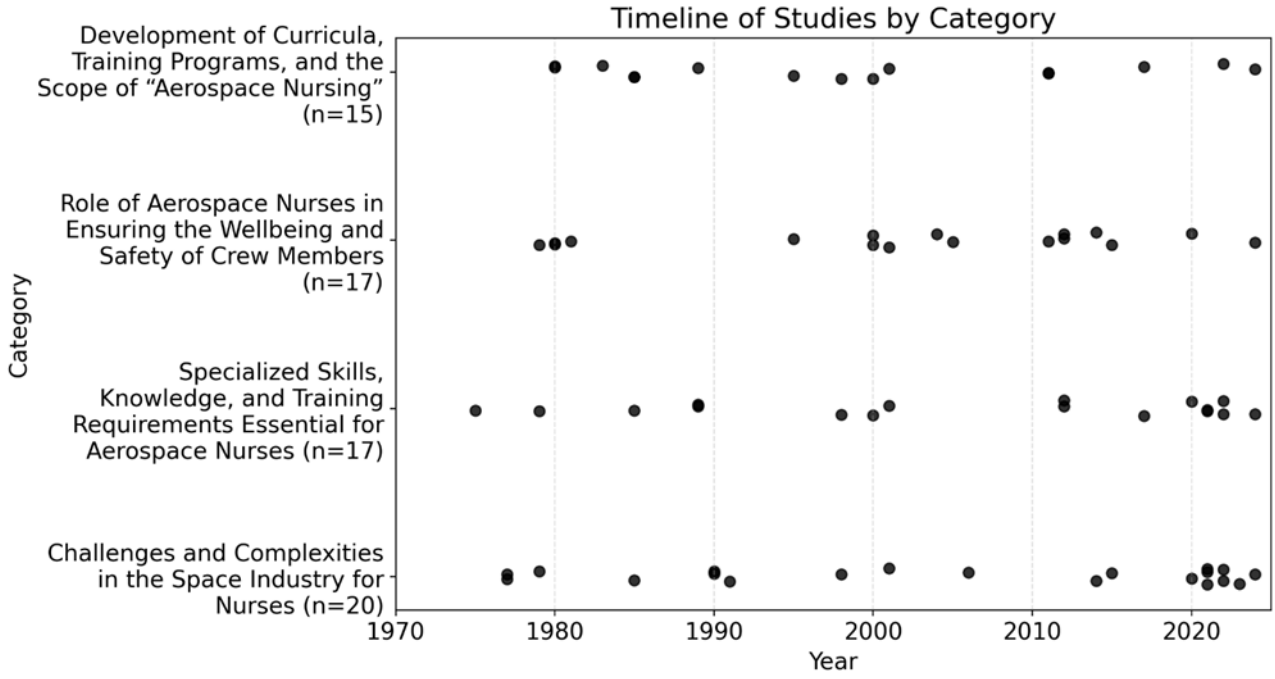

Fig. 3 *Distribution of Studies from 1975 to 2024. The chart shows the number of studies, with "**Challenges and Complexities**" having the highest distribution (20 studies) and "**Curricula**" the least (15 studies).*

sional development in the space industry (Space nursing - The final frontier, 2011). The absence of a standardized curriculum and limited research on emerging technologies, such as virtual reality (VR), extended reality (XR), and artificial intelligence (AI), indicate the need for evidence-based educational frameworks.

RESULTS

Table 1 summarizes key findings and gaps for each research objective, providing a concise overview of the literature's contributions and limitations. Figure 3 visualizes the distribution of the 45 studies across the objectives, showing research emphasis and gaps.

The category of Challenges and Complexities in the Space Industry for Nurses includes studies such as Oxer (1977), Tucker (1990), Singh (1990), de Morais et al. (2021), Simões and Antunes (2021), Crucian et al. (2021), Pandian et al. (2022), and Pavletić et al. (2022). It overlaps with the Specialized Skills, Knowledge, and Training Requirements Essential for Aerospace Nurses category, specifically through de Morais et al. (2021) and Pandian et al. (2022), which bridge discussions on environmental stressors, microbial risks, and the need for adapted training protocols in aerospace settings. (Total overlapping studies: 8)

The Development of Curricula, Training Programs, and the Scope of "Aerospace Nursing" category encompasses studies like Burke (1980), Barger (1980), Barger (1985), Shorb (1985), Passos et al. (2011), and Space Nursing - The Final Frontier (2011). It overlaps with the Role of Aerospace Nurses in Ensuring the Well-being and Safety of Crew Members category through Burke (1980), sharing emphases on historical frameworks and theoretical foundations that inform both educational development and practical roles in crew safety. (Total overlapping studies: 6)

The Role of Aerospace Nurses in Ensuring the Well-being and Safety of Crew Members features studies including Burke (1980), Jones (1980), Czerwinski et al. (2000), Pugh (2000), Lee et al. (2012), and Davis (2012). This category shows overlaps with Development of Curricula, Training Programs, and the Scope of "Aerospace Nursing" through Burke (1980), as well as with Specialized Skills, Knowledge, and Training Requirements Essential for Aerospace Nurses via Lee et al. (2012) and Da-

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vis (2012), connecting aspects of mission safety, psychological support, and the integration of specialized training for real-world aerospace applications. (Total overlapping studies: 6)

The Specialized Skills, Knowledge, and Training Requirements Essential for Aerospace Nurses category consists of Polk-Walker (1989), Eastes (1989), Davis (2012), Lee et al. (2012), de Morais et al. (2021), Pandian et al. (2022), and Borges et al. (2022). It demonstrates overlaps with Challenges and Complexities in the Space Industry for Nurses through de Morais et al. (2021) and Pandian et al. (2022), and with Role of Aerospace Nurses in Ensuring the Well-being and Safety of Crew Members through Davis (2012) and Lee et al. (2012), underscoring the interconnected needs for trauma care, simulation training, and physiological challenges in ensuring crew well-being. (Total overlapping studies: 7)

Table 1. *Summary of Key Findings and Gaps by Research Objective*

Objectives	Key Findings	Gaps
Challengesand Complexities	Physiological (e.g., muscle atrophy, radiation), psychological (e.g., isolation, asthenia), microbial, and ethical challenges identified (Oxer, 1977; Rivera et al., 2024; Kanas et al., 2001).	Chronic condition management, radiation effects on nurses, deep space emergency protocols.
Skills and Training	Skills in trauma care, telehealth, informatics, and leadership, as well as simulation-based training, are essential (Barron, 1975; De Jong et al., 2017).	Standardized curricula, scalable certification for deep space missions.
Nurses' Roles	Critical roles in patient care, safety, psychological support across military, civilian, space contexts (Barger, 1979; Rivera et al., 2024).	Roles in long-duration missions, extraterrestrial settlements.
Curricula Development	Space health integration, simulation, telehealth training proposed (Pandian et al., 2022).	Standardized curriculum, integration of VR/XR/AI.

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DISCUSSIONS

The literature confirms the four research objectives, as summarized in Table 1 and visualized in Figure 3, aligning with the conceptual framework (Figure 1) and scope (Figure 2). The framework's "Environment" and "Health" concepts drive challenges like microgravity and isolation, necessitating advanced "Nursing" skills in trauma care, telehealth, and leadership (Pandian et al., 2022; Rivera et al., 2024), moderated by "Education," "Training," and "Research". Nurses' contributions to the "Person" (crew well-being and safety) span mission planning, infection control, and psychological support. The distribution of studies (Figure 3) reveals that aerospace nurses' roles, skills, and training receive the most attention, while curriculum development is less explored, revealing an uneven research focus. It is also reasonable to think that gaining skills not only strengthens the important role nurses are expected to take on but may even define it. Gaps include chronic condition management, deep space emergency protocols, and nurses' roles in long-duration missions. The lack of standardized curricula and exploration of emerging technologies hinders scalability. These gaps prove the need for research to develop educational frameworks and the "next-practice" care protocols.

Figure 1 delineates a causal pathway wherein fixed "Environment[al]" (X1) stressors, experienced in aerospace or remote missions—specifically microgravity, radiation, isolation, and confined spatial conditions—adversely affect physiological and psychological functions and overall "Health" (X2) status in the "Person" (Y). Specialized "Nursing" (M) interventions, influenced by factors such as "Education," "Training," and "Research" (W), serve to counteract these impacts and support the "Health" (X2) of the "Person" (Y), thereby promoting "Health" (X2) maintenance despite the challenging "Environment[al]" (X1) conditions. This framework complements "aerospace medicine" plans (as an umbrella discipline for studying the domain of "Health" and conducting biomedical "Research" in outer space and analog settings), such as NASA's Bioastronautics Roadmap (Charles, 2005) and Human Research Program Plan (Milstead, 2025; Febus, n.d.), recognizing space hazards and advocating tailored conditioning, "Health" monitoring, and scientific investigations to understand adaptations of the "Person" in extraterrestrial (or extreme) "Environment[s]". Exposure to cosmic radiation and microgravity triggers cellular damage, including apoptosis and oxidative stress, increasing "Health" risks (Majima et al., 2009), and to date, this has called for evidence-based countermeasures. Interdisciplinary "Education" in the scope of "bioastronautics" provides a deeper understanding of "Environment[al]" impacts on human biology (Sklaveniti & Koulountzos, 2023), positioning "Nursing" to play a key role in protecting astronaut "Health" and resolving spaceflight challenges.

However, Figure 1 diverges significantly from Florence Nightingale's Environmental Theory (Gilbert, 2020; McEwan & Wills, 2021), which puts forth the "Environment" as a central, modifiable element that nurses proactively adjust, such as improving ventilation or cleanliness, to prevent illness or promote recovery. In contrast, the model treats X1 as an unchangeable condition, like microgravity or radiation in space, where "Nursing" responds reactively with adaptive care after exposure rather than transforming the "Environment" upfront. This shift is critical because Nightingale's approach is preventive and holistic, directly linking "Environment[al]" management to patient outcomes, whereas the model positions "Nursing" as a downstream mediator, addressing health challenges only after they arise from X1 and X2.

This reactive stance further distances the model from Nightingale's vision, as her theory focuses on controlling the "Environment" in settings like hospitals, where such adjustments are feasible.

While Figure 1 conveys adaptation to extreme contexts where "Environment[al]" modification is impractical, it instead prioritizes survival support for the "Person" through the purpose of (aerospace) "Nursing". This distinction sets the stage for its partial alignment across Grand Nursing Theories based on Human Needs (McEwan & Wills, 2021), includ-

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ing Nightingale's modifiable "Environment" concept, Virginia Henderson's 14 Fundamental Human Needs, Faye G. Abdellah's Problem-Solving Approach, Dorothy Orem's Self-care Deficit Model, Dorothy Johnson's Behavioral System Regulation Theory, and Betty Neuman's Stress Adaptation Theory. However, the model's static view of the "Environment" and reactive "Nursing" role contrast with these theories' focus on proactive need fulfillment and environmental manipulation through engineering in "bioastronautics" (e.g., providing life support systems air, water, nutrients, and temperature control that ensure the performance, protection, and well-being of astronauts while considering the influence of space on their biological functions) (Young, 2021 cited in Sklaveniti & Koulountzos, 2023).

The "Aerospace Nursing" framework finds stronger fit with Grand Nursing Theories based on Interactive Process (McEwan & Wills, 2021), such as Barbara M. Artinian's Intersystem Dynamics, Helen C. Erickson, Evelyn M. Tomlin, and Mary Anne P. Swain's Modeling and Role-modeling, Imogene M. King's Goal Attainment Theory through "nurse-patient interaction" (NPI), Sister Callista Roy's Adaptation to Environmental Stimuli, and Jean Watson's Caring Science. Here, the mediated relationship between "Environmental" stressors (X1), "Health" outcomes (X2), and the "Person" (Y)—facilitated by "Nursing" (M) and moderated by "Education" (W1), "Training" (W2), and "Research" (W3)—reflects the "interactive dynamics" described by certain nursing theories, though it lacks an elucidation of Jean Watson's humanistic caring relationships (i.e., it does not include the representational bidirectionality of the NPI in the illustration). Conversely, it struggles to align with Grand Theories based on Unitary Process (McEwan & Wills, 2021), including Martha E. Rogers' evolving concept of "unitary" human-environment-energy fields, Margaret A. Newman's Health as Expanding Consciousness, and Rosemarie R. Parse's Human Becoming Process, due to its linear, variable-based structure, which clashes with their holistic, non-causal perspectives.

Finally, with Middle Range Theories (McEwan & Wills, 2021), Figure 1 aligns also well with Patricia S. Benner's Skill Acquisition Stages—through "Education," "Training," and "Research"—which moderate successful "Nursing" for the "Person"; along with Madeleine Leininger's Cultural Care Theory, considering crew diversity in space missions, Nola J. Pender's Health Promotion Model, and Merle H. Mishel's Uncertainty in Illness Theory. The framework adapts "Nursing" to these unchangeable conditions, distinguishing it from Nightingale's controllable settings and aligning it with practical middle-range theories, which offer a testable framework based on interactive processes.

Summary of Key Findings and Implications for "Aerospace Nursing" Practice, Education, and Policy

Objective 1: "Challenges and Complexities". Key findings identify significant physiological (e.g., muscle atrophy, radiation exposure), psychological (e.g., isolation, asthenia), microbial, and ethical challenges in aerospace environments (Kanas et al., 2001; Oxer, 1977; Rivera et al., 2024). These align with the framework's "Environment" and "Health" concepts, emphasizing the need for specialized interventions to manage microgravity and confined settings. Gaps include limited research on chronic condition management, long-term radiation effects on nurses, and deep space emergency protocols. Implications for Practice: Nurses must adopt critical care protocols to manage space-specific physiological and psychological stressors, requiring advanced monitoring and infection control strategies. Implications for Education: Curricula should include modules on space physiology and psychology to prepare nurses for these challenges. Implications for Policy: Policies should mandate collaboration with space agencies to develop protocols for managing chronic conditions and radiation exposure, ensuring nurse safety and crew health.

Objective 2: "Specialized Skills and Training". Nurses require skills in trauma care, tele- health, informatics, and leadership, supported by simulation -based training (Barron, 1975; De Jong et al., 2017),

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aligning with the framework's "Nursing" and "Training" moderator. Space health integration into training is critical (Pandian et al., 2022). Gaps include the absence of standardized curricula and scalable certification programs. Implications for Practice: Nurses can use Earth-based skills in critical care and telehealth, adapting them for space through simulation training to ensure competence in extreme environments. Implications for Education: Nursing programs should integrate space-specific training, including simulation and informatics, to build competencies. Implications for Policy: Regulatory bodies should establish certification standards for "Aerospace Nursing" to ensure consistent skill development across institutions.

Objective 3: "Nurses' Roles in Crew Well-Being and Safety". Nurses play critical roles in patient care, safety protocols, and psychological support across military, civilian, and space contexts (Barger, 1979; Rivera et al., 2024), aligning with the framework's "Nursing" and "Person" concepts. Contributions to mission planning and infection control are vital. Gaps include limited research on roles in long-duration missions or extraterrestrial settlements. Implications for Practice: Nurses should expand roles to include space-specific tasks like psychological support and infection control, building on Earth-based expertise in high-acuity care. Implications for Education: Training should prioritize interdisciplinary roles, preparing nurses for mission-critical responsibilities in space. Implications for Policy: Space agencies should integrate nurses into mission planning and crew health management, recognizing their pivotal role in ensuring safety.

Objective 4: "Curricula Development and Scope". The literature supports integrating space health, simulation, telehealth training, and nurses' leadership (Pandian et al., 2022), which agrees with the framework's "Education," "Training," and "Research" moderators. Gaps include the lack of a standardized curriculum and limited exploration of VR/XR/AI. Implications for Practice: Nurses can apply curricula frameworks to deliver evidence-based care in space, leveraging simulation to bridge Earth-based and aerospace practice. Implications for Education: Academic institutions should develop standardized "Aerospace Nursing" curricula, incorporating emerging technologies to enhance training. Implications for Policy: Policymakers should fund educational initiatives and interdisciplinary collaborations to establish "Aerospace Nursing" as a recognized specialty.

According to Kim (2024), there are significant psychological risks associated with deep space missions, stemming from confinement in small spaces, extended mission durations (640–916 days), and hostile conditions such as radiation exposure and equipment failures. These "Environment[al]" stressors can lead to emotional challenges (e.g., irritability and anxiety), cognitive impairments, sleep disturbances, muscle atrophy, and neurophysiological changes in the "Person" (i.e., as illustrated in Figure 1). Astronauts frequently report feelings of longing for family, boredom, and irritability. Prolonged missions, compounded by communication delays of up to 20 minutes, heighten the need for autonomy and increase the risk of maladaptive behaviors, such as interpersonal conflicts or aggression. Analog studies reveal parallels with isolation-related issues, including fear, depression, and post-traumatic stress disorder (PTSD), with women and young, unmarried individuals being particularly vulnerable. These findings reveal the critical need for thorough psychological preparedness for Mars missions.

Adding the astronaut selection framework from Kim (2024) into a graduate program in "Aerospace Nursing" would prepare nurses to meet the qualifications for space flights, with astronaut training as rigorous as that required for NASA's Extravehicular Activity (EVA) and Human Surface Mobility Program (NASA, 2023) for the manned Artemis or Moon mission, including the more stringent qualifications and skills needed for deep space missions to Mars and beyond.

Graduate programs in "Aerospace Nursing" (e.g., Master of Science [M.S.], Doctor of Philosophy [Ph.D.]) are designed to progressively develop

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knowledge and skills, starting with foundational concepts, advancing through specialized training, and culminating in practical and leadership experiences. Kim (2024) explains that 'trauma-informed care' (acknowledging the impact of trauma while ensuring safety, trust, choice, and collaboration) and building resilience are key for selecting and training astronauts. The envisioned curriculum integrates the theoretical and practical components of these principles to effectively prepare nurses for commercial space travel and long-duration astronaut missions.

In Semesters 1 and 2, students are introduced to "Aerospace Nursing," exploring its historical evolution, ethical considerations, and principles of aeronautics and space travel. They study atmospheric conditions and microgravity's physiological effects on cardiovascular, respiratory, musculoskeletal, neurological, and psychosocial systems, contextualized by historical data, such as the NASA's Mercury to International Space Station (ISS) transitions and the Russian Space Agency's (Roscosmos) 422 cosmonauts. Drawing on Kim (2024), the coursework reviews countermeasures for psychological stressors such as isolation in confined spaces (25 cubic meters [m^3] during 640–916-day missions), family-related traumas (bereavement, divorce, abuse), and addictions (drugs, alcohol, smoking, gambling, sex), utilizing case studies from ISS journals and analog missions to methodically examine the effectiveness of coping strategies reported in the literature and to identify alternatives for enhancing human performance. Pre-flight assessments incorporate Kim's (2024) recommendations on psychiatric screenings for Post-Traumatic Stress Disorder (PTSD), anxiety, and addiction histories. Training in in-flight emergency care and telehealth focuses on real-time mental health monitoring, using medical equipment and communication systems designed for space flights.

In Semesters 3 and 4, the focus is on advanced skills in trauma and critical care, as well as rescue methods for space and aviation environments. This includes training for military flight nursing, air medical evacuations, and handling challenges related to combat, civilian flights, and "space tourism". Kim's (2024) resilience framework supports the development of care plans that promote mental health in high-stress situations. Assessment tools such as the NEO Personality Inventory (NEO-PI) and the Myers-Briggs Type Indicator (MBTI; dichotomies: Introversion-Extraversion [IE], Sensing-Intuition [SN], Thinking-Feeling [TF], Judging-Perceiving [JP]) are used to analyze personality traits (e.g., low neuroticism, high agreeableness) that may predict mission success. Leadership training incorporates conflict mitigation strategies from Kim (2024) to manage aggression and hostility in isolated or challenging environments. Fostering cultural awareness and competence is crucial for screening diverse astronaut candidates, including those in the European Space Agency's (ESA) parastronaut program, and for facilitating effective international collaboration.

The program culminates in Semesters 5 and 6 with a capstone project and clinical practicum. In Semester 5, students conduct an independent study (e.g., assessing trauma and addiction screening protocols in simulated Mars mission environments, as articulated by Kim, 2024) or propose countermeasures for maintaining crew well-being. Semester 6 includes practicums at settings such as NASA Johnson Space Center, ESA European Astronaut Centre, or Japan Aerospace Exploration Agency's (JAXA) Tsukuba Space Center, providing hands-on experience. Preceptorships focus on astronaut resilience training and mental health support. Mentorship sharpens skills and prepares students for leadership roles in "Aerospace Nursing".

Feasibility and Trajectory of "Aerospace Nursing" from Earth-Based Practice

The feasibility of "Aerospace Nursing" as a transition from Earth-based practice is achievable, supported by the literature aligned with the four objectives. For challenges and complexities (Objective 1), Earth-based nursing provides a foundation for managing physiological and psychological stressors, as seen in critical care (Oxer, 1977; Rivera et al., 2024). The transition requires adapting skills to space-specific challenges like microgravity, which is feasible given overlaps with high-acuity care

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(Perrin, 1985). Gaps in chronic condition management necessitate research to bridge practices (Crucian et al., 2021). For skills and training (Objective 2), Earth-based competencies in trauma care and tele-health are transferable, with simulation training already used in critical care (Barron, 1975; De Jong et al., 2017). The trajectory involves integrating space health into curricula, with existing infrastructure (Pandian et al., 2022), although standardization is needed. For nurses' roles (Objective 3), Earth-based expertise in patient care and safety is adaptable to space (Barger, 1979; Hoolahan, 2004), with expansion to space-specific tasks like infection control (Raduenz et al., 2020). Research on long-duration missions is needed. For curricula development (Objective 4), adapting Earth-based education through simulation and telehealth is achievable (Chonin, 1998; Eaves & Flagg, 2001), with certificate programs and VR/XR as next steps. The framework (Figure 1) shows "Nursing" mediating "Environment" and "Health" impacts, with "Education" and "Training" as key moderators, making the transition feasible. Strategic investment and interdisciplinary collaboration are needed to achieve this "next practice".

Limitations and Potential Biases

This paper has several limitations and potential biases. First, reliance on PubMed may have introduced selection bias, excluding studies in other databases (e.g., Scopus) or gray literature, limiting comprehensiveness. Second, the inclusion criteria (articles from 1975 to 2024 with accessible abstracts) may have excluded seminal works or preprints, skewing the scope. Third, the qualitative synthesis lacks quantitative metrics (e.g., effect sizes), potentially overemphasizing narrative findings. Fourth, focusing on English-language publications introduces a language bias, potentially overlooking research published in other languages. Fifth, the attention to the distribution of studies (Figure 3) on skills and training, followed by curricula development, reflects the author's priorities. These limitations reveal the need for broader search strategies and quantitative analyses.

Areas for Future Research

1. Chronic Condition Management: Limited research has been done on managing chronic illnesses (e.g., diabetes, hypertension) in microgravity that would require tailored interventions.

2. Long-Duration Mission Protocols: Protocols for lunar or Martian settlements are underdeveloped and need further study.

3. Standardized Training and Certification: Standardized training and certification programs are lacking.

4. Deep Space Medical Emergencies: Protocols for resource-constrained environments are underexplored.

5. Emerging Technologies: The effectiveness of VR, XR, and AI in spaceflight training requires further study.

6. Sexual and Reproductive Health: Comprehensive protocols for space sexology and childbirth are needed (Dubé et al., 2023).

7. Radiation Effects on Nurses: Long-term radiation exposure risks for nurses require occupational health studies.

8. Crew Cohesion: Nurses' roles in maintaining team dynamics during extended missions need exploration.

CONCLUSIONS

"Aerospace Nursing" is an emerging field for the healthcare needs in outer space, aviation, and extreme environments. Guided by the nursing metaparadigm ("Person," "Environment," "Health," and "Nursing") and moderated by "Education," "Training," and "Research," the analysis reveals intriguing relationships for further investigation and validation when empirical evidence becomes available. Physiological challenges like muscle atrophy

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and radiation, psychological issues such as isolation, and microbial risks demand specialized care, though gaps exist in chronic disease management and deep-space protocols. Nurses require skills in trauma, telehealth, informatics, and simulation-based training, but standardized curricula are lacking. Their roles are vital for crew safety, including preventive care and psychological support, yet underexplored in long missions. Educational frameworks should integrate space health and technologies like AI and VR. Overall, "Aerospace Nursing" extends Earth-based practice in an attainable manner, with "Nursing" mediating "Environment[al]" risks to "Health". Future research, collaboration, and investment are essential to standardize the field and support human space exploration.

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The author confirms this is an original work with no competing interests or financial disclosures.

ETHICS STATEMENT

This literature analysis, based on a qualitative synthesis of 45 PubMed studies from 1975 to 2024, involved no direct research on human or animal subjects and required no ethics approval. All referenced studies were assessed for ethical compliance as reported in their original publications, with no primary data collection conducted.

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Joannes Paulus Tolentino Hernandez, DComm, MAN, RN, CHSE, a Filipino-American nursing scholar, pioneers "Aerospace Nursing" by integrating nursing, communication, biology, and aerospace physiology. He is the first Filipino Associate Professor (teaching nursing theory, research, and statistics) and Associate Dean of Simulation at the Helene Fuld College of Nursing in New York City, USA, who also holds the Certified Healthcare Simulation Educator (CHSE) credential. His research explores Twitter infodemics during COVID-19, AI humanoid robots in healthcare, and stress patterns in nursing students during the pandemic, with publications in Biomimetics (2024) and The Journal of Medical Investigation (2025). Dr. Hernandez earned the Provost Faculty Leadership Award (2024) and the Vicente Teves Locsin, Jr. Research Award (2022). He presented his landmark data sonification of a large dataset describing pattern anomalies attributed to dark matter and dark photons at the inaugural CREDO Visegrad Workshop in 2024 at the Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences, Kraków, Poland, as well as on the global soundscape of well-being and care provided by nurses at the 2025 International Council of Nurses (ICN) Congress. He is one of the scientists working on a NASA-funded project to develop a mushroom-growing system for the International Space Station and potentially for the Artemis and Mars missions. He also serves as a nurse research fellow at the Advanced Space-Life Research Institute (ASRI), is Vice President of the Philippine Space Biosciences Society Inc., and leads an international CubeSat project studying moss resilience for protecting life in outer space.

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