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BNJ BELITUNG NURSING JOURNAL

EDITORIAL

ONE YEAR OF THE COVID-19 PANDEMIC: NURSING RESEARCH PRIORITIES FOR THE NEW NORMAL ERA

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KEYWORDS
COVID-19; pandemics; nursing theory; vaccine; palliative care; workload

We have been living in the COVID-19 pandemic since it was first detected in December, 2019 in Wuhan City, Hubei Province of China (World Health Organization, 2020). Every country has been trying to face the virus and its impacts on the community. At the beginning of the pandemic, policymakers and politicians were often accused of doing the wrong things as they balanced the dichotomies between to do lockdown or not; to close borders or not; and to protect life or economy. Did they actually make the wrong decisions based on what they didn't know or their political priorities? Basically, decisions could only be based on what seemed reasonable to do at a particular point in time because so little was known about this novel virus. In recent months of the pandemic, science is providing policy makers with updated data related to the virus' impact on its victims, transmission factors, and the effectiveness of mitigation strategies. However, it is a matter of choices and commitments of the policymakers and politicians to preserve lives today and what may happen next as well as the willingness of populations to comply with those policies.

Decisions varied greatly from one country to another. Clearly, different countries have come to different approaches and conclusions based on their particular situations, cultures, and most importantly, political realities. Each government needs to show consistency as a key to ethical decision-making. Inconsistency creates trust issues and a blame game among communities with differing outcomes related to the virus' impact. Examining the behaviors of more "successful" counties might provide the best clues to enhancing outcomes across the globe.

Today, thousands of research papers have been published to address all aspects of COVID-19. The scientific community has studied the origin, structures, and pathogenesis of the virus (Mishra & Tripathi, 2020). World Health Organization (WHO) has also updated the guidelines and protocols regularly, specifically to prevent the second wave although there are still many countries are fighting for longer for the first wave, such as Indonesia. However, although several potential vaccine candidates have been developed (Mishra & Tripathi, 2020), the trickiest time is still ahead, most critically when a safe and effective COVID-19 vaccine will be available and widely distributed.

As of December 8, 2020, there were 68,055,468 cases with 47,145,603 recovered, and 1,553,150 deaths worldwide (Worldometer, 2020). It is impossible to predict the ultimate COVID numbers. However, during the crisis, people are trying to adapt to the new normal while nurses and other healthcare workers are still struggling under the heavy load of the continuing pandemic. There is a lot of appreciation for the nurses, as they are referred to as heroes today. Their sacrifices have been huge, including many becoming sick themselves due to lack of protective equipment and continuous exposure to the virus over many hours of daily contact with the sick.

Despite the negative impacts of the COVID-19 pandemic, many people have seen the virus from the positive angles, such as the decreased pollution of reduced commuting to jobs, the application of hygiene-based preventive and action protocols in the institutions, paperless learning due to online courses, having more time with family due to working from home, and some examples of people and communities supporting one another (Acob, 2020; Gunawan, Aungsuroch, et al., 2020). This pandemic also teaches us deeply about our relationship to God, specifically in remembering about death that can happen at any

time (Acob, 2020). Life is a long marathon; slow it down, and enjoy every moment.

However, everyone has a role to play. As editors, we hope to play our part in curbing the virus and supporting the nurses in the new normal after the pandemic subsides. This editorial highlights ten nursing research priorities that may guide researchers to conduct future studies and advance collaboration. Setting research priorities is needed as research is vital to professional nursing practices that use evidence to provide optimal care (Lusmilasari et al., 2020). The ten research priorities are described:

First, during the COVID-19 pandemic, nursing care has been delivered both directly or virtually. The majority now use virtual nursing care in the community where possible (Gunawan, 2020). Therefore, the concept of virtual caring and nursing care model with less non-verbal communication should be further developed and examined. In addition, telenursing has become an essential component for nursing care delivery (Rakhmawati, 2020), whether we are ready or not for the new normal era. Nurse preparation and competence towards the use of telecommunication technology should be investigated. Also, the design of new tools for telenursing needs to be examined in terms of quality, ease, and effectiveness. Its impact on access and quality of care, especially for disadvantaged populations, will be vital. In addition, a protocol for telenursing evaluation and follow-up of patients should be developed. What health systems need to be altered to enhance these new practice realities? How does funding impact these? What is the time allotment impact of these new technologies? Are they more or less efficient?

Second, it is clear that, in the battle of COVID-19, people's behavior is one of the crucial components for fighting the novel coronavirus and its consequences while waiting for a COVID-19 vaccine. Preventive behaviors, such as keeping physical and social distancing, hand hygiene, and wearing a face mask, have been encouraged by the government and healthcare workers for everyone to follow. But some may subconsciously refuse to cooperate, and it may be related to many variables, such as knowledge, attitude, habits, culture, personality traits, and even conspiracy. Therefore, understanding people's complex behavior is another priority to explore, so we can act to mitigate its impacts. Studying the impact of culture on these behavioral variations will inform new approaches to improve compliance.

Third, stress, burnout, depression, stigma, and other mental health problems among nurses have become crucial issues today (Gunawan, Juthamanee, et al., 2020; Ketphan et al., 2020), and they should be prioritized now. Nurses are leaving the profession at alarming numbers due to these ongoing stresses. What supports work best to help nurses? How can they best be deployed? Psychological problems among all people during quarantine or lockdown, economic loss and the loss of beloved ones are also important topics (Gunawan, Juthamanee, et al., 2020; Ketphan et al., 2020). Designing, implementing and evaluating mental health science innovations and solutions are needed.

Fourth, research related to human resource management is essential. It is no doubt that we must start planning now for a future with enough nurses, and the entire nursing workforce should be better paid (Gunawan, 2020). Also, there is a generation gap for the replacement of retiring nurses. Designing staffing models and innovative human resource strategies for the new normal is necessary. Besides, organizational commitment among nurses needs further investigation due to high workload, low salaries, high ratios of patients/nurses, and other factors (Cabrera & Zabalegui, 2020).

Fifth, from the COVID-19 crisis, we realize that palliative care must be integrated with each level of nursing services, specifically to ensure that the frontline nurses have a degree of communicating emphatically and effectively and managing symptoms comfortably in a time of uncertainty and high stress. Palliative care models should be well developed, and palliative nurses' roles should be examined. The profound loss felt by families because their loved one died alone, without family ability to be there and comfort them can have lasting effects. How do nurses need to follow up with these grieving families??

Sixth, after one year of the pandemic, it is better to understand government responses and compare the politics of COVID-19 and how they impact nursing practice in both hospital and community settings. We should be able to review and judge whether the decisions that the policymakers made are acceptable. Variations in virus incidence and outcomes across settings provide data to compare effectiveness of policy on the populations.

Seventh, unfortunately, there is a gap in understanding how nursing theories are linked with nursing practice in the COVID-19 crisis. Perhaps, we may be able to develop nursing care models to create healing environments. The linkage of Florence Nightingale's theory, Jean Watson's caring, Betty Neuman's health system model, or other theories to nursing practice in the new normal era should be further analyzed.

Eighth, in the new normal era, e-learning in nursing education is mostly used, and it may impact the students' wellness and academic outcomes. Additionally, most of the students just sit down in front of their computers/laptops most of the days without real interactions. It may affect their mental health. Besides, nursing is still not attractive enough for a career choice for young generations, especially for men. It is the homework for nursing educators to provide the solutions.

Ninth, nurse competence is essential to improve COVID patient outcomes. From this pandemic, we learn that the hospitals lack trained nurses to provide full care for patients with COVID-19. Infection prevention and control should be the basic requirement and training for new nurses and the required curriculum for nursing students. The nurse competence should be regularly updated and examined to maintain the quality of care and patient safety. What have we learned about best nursing practices for these patients that enhance their outcomes and reduce complications? How can these be included in nurse competency updates?

Tenth, 2020 is considered the year of the nurse and midwife designated by WHO (Gunawan, 2020). Without a doubt, the image of nurses is increased during the pandemic in playing important roles to provide care and save lives (Gunawan, 2020). A high profile of nursing is in the spotlight right now. Evaluating and increasing the quality of the nursing image in the new normal are needed, as the image will influence the trust of the patients in nurses' abilities. Besides, some countries have poor professional consideration related to low autonomy and visibility (Cabrera & Zabalegui, 2020). Society should be aware of the full

potential of nurses and not have laws limiting that potential. How does nursing as a profession advocate for itself to eliminate these barriers to full practice?

Finally, these ten research priorities are expected to be the future nursing research direction in the new normal era. They should be viewed as a positive step for the nursing agenda in each country. It is clear that countries that invest more in their nursing workforce have a stronger healthcare system and make a more significant impact on health. We acknowledge the hard work of the nurses around the world in the battle of COVID-19. Their work should be truly valued, as cited in the anonymous quote, "save one life and you are a hero, save one hundred lives and you are a nurse."

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ORIGINAL RESEARCH

NURSES' PERSPECTIVES ON THE DEGREE OF MISSED NURSING CARE IN THE PUBLIC HOSPITALS IN HAIL CITY, KINGDOM OF SAUDI ARABIA

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Abstract

Background: Literature suggests that merely omitting nursing care can put patients in danger and that avoiding these omissions potentially prevents deaths in hospitals.

Objective: This study aimed to determine the perspective on the degree of missed nursing care among hospital nurses as it relates to their demographic profile.

Method: A quantitative comparative research design was employed in this study. The study was conducted in the public hospitals in Hail City, Kingdom of Saudi Arabia. The study participants were 317 staff nurses, chosen through a simple random sampling, from the public hospitals of Hail City. Data were collected through a self-administered questionnaire between February and June of 2019.

Results: The overall mean of the participants' reported scores was "never missed" at 4.62. Statistically significant results were found in terms of the number of children (0.001), years of experience (0.004), unit of assignment (0.001), and the level of satisfaction with the profession (0.001). All other variables such as gender, age, marital status, and shift were found insignificant, where all of the *p*-values were more than 0.05.

Conclusion: Nurses who had more children, a greater lack of experience, were assigned to a complex unit, and were less satisfied in the profession were more likely to miss nursing care. As such, these errors can compromise the outcomes of nursing care in hospitals.

KEYWORDS
nurses; nursing care; medical errors hospitals; attitude; health personnel

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BACKGROUND

Whether in part, entirely, or even just a delay, "missed nursing care" is essential care omitted by nurses (Lucero et al., 2010). More attention is needed to address this concern both globally and in the form of national policy development (Kalisch, 2016). Nurses need to be more fully aware that the quality of care they deliver is based on the standards established by the nursing profession. Therefore, refocusing and directing interventions on the factors that influence the improvement of the nursing practice is of paramount importance. According to Hessels et al. (2015), the degree of missed nursing care can be reduced significantly when the intervention of the elements affecting the environment of the nurses' workplace is targeted.

In 2001, the Institute of Medicine highlighted that errors are preventable, especially when organizations adapt to the cognitive strengths and weaknesses of their employees (Institute of Medicine (US) Committee on Quality of Health Care in America, 2001). Hospitals can be designed to ameliorate the effects of human error by correcting the practices of healthcare providers. One such example is the incorrect assumption of nurses in omitting the final check when counter-checking a previously identified cross-matching problem merely because they are working in a stressful condition (Allard et al., 2002). Another example is in the protocols that are not accessible at all times so that staff can refer to them when they are needed (Ibojie & Urbaniak, 2000). These practices threaten patient safety.

Literature has shown that being overwhelmed due to fatigue and "swamping" is one of the most likely and most common reasons for errors to occur (Roth, 2014). Indeed, research has revealed that nurses are likely to make errors in their work because of their working conditions (e.g., work shifts, uncertainties of their role, tiredness, and lack of occupational autonomy) (Demir-Zencirci, 2010; Fidanci et al., 2014; Yudiah et al., 2018). Such missed nursing care can affect patient outcomes significantly (Carthon et al., 2015).

Research suggests that merely omitting nursing care can put patients in danger and that avoiding this omission could potentially prevent deaths

in hospitals (Griffiths et al., 2018). For instance, reports have found that death can be prevented in hospitals when the nurses correctly measure and report the patients' vital signs, correctly assess the early signs of deteriorating patients, and provide timely reporting (Luettel et al., 2007). Researchers such as Hernández-Cruz et al. (2017) suggest that nurses' care may differ based on individual characteristics such as the level of education, work experience, and work shift. Because of the large quantity of and the range of different roles, nurses experience missed care more frequently than other healthcare groups. This includes their complex independent and dependent functions, more contact hours with their patients, and demanding work hours (Aydin et al., 2016; Smits et al., 2010). Studies demonstrate that undesired medical results can frequently be attributed to the provider of healthcare; consequently, the law acknowledges that using dynamic judgment in the clinical setting is required (Giordano, 2003). However, some researchers have argued that nurses need to recognize that errors suggest a prevailing problem in the safety context and not because they are doing a bad job (Al-Youssif et al., 2013). Innovations in research, life-saving devices, and even specialized nursing can assist nurses in facing complex physiological scenarios among their patients; nonetheless, medical errors in patient care continue to increase (Fidancı et al., 2014).

A study of Alahmadi (2010) in Saudi Arabia demonstrated that, along with an increase in media attention on improving the quality and safety of healthcare services, there is a rising concern for missed nursing care and malpractice. To the researchers' knowledge, there is limited research on this topic, specifically in the Hail Region, Saudi Arabia. This study uses data from a less studied region to provide educational institutions with an empirical baseline measurement for missed nursing care. It seeks to recognize the insights and characteristics of nurses that may have an impact on missed nursing care. This includes differences in the degree of missed care when staff nurses are grouped according to their demographics. In this study, it was predicted that no difference exists in the degree of missed care when staff nurses are grouped according to their demographic information.

METHODS

Design

The study used a quantitative comparative research design to determine the degree of missed nursing care that may fall below the nursing standards of practice in hospital-based delivery of care.

Sampling and Participants

The respondents of the study were staff nurses from the public hospitals in Hail, Kingdom of Saudi Arabia. These hospitals had the largest number of nurses in the region. A simple random sampling was employed in this investigation. The researchers' exclusion criteria eliminated both nurses who had no direct patient care and nurse interns. Nurses who were on leave during the study period were also excluded. The researchers assigned a unique number to each of the 2,171 nurses who exceeded the criteria. The researchers utilized the Lynch formula (Hulley et al., 2013) to identify the sample size, using a 95% confidence level and 5% confidence interval; this resulted in 327 nurses generated through random numbers, and 317 of them consented to participate. Upon approval from the authorities of the six participating hospitals, data were collected between February and June of 2019.

Instrument

The researchers adapted a survey with permission by Özata et al. (2013). It comprised two sections, which the first addressed the respondents' demographic information, and the second explored the responsibilities of staff nurses. It included five items on patient falls, eleven on drug application and transfusion, eleven on hospital infection, nine on patient monitoring and equipment safety, and five on doctor-nurse-patient communication.

The questionnaire was scored on a 5-point Likert Scale. The mean scores were interpreted as 5 (never missed), 4 (almost missed), 3 (occasionally/sometimes), 2 (almost every time missed), and 1 (frequently missed). The higher the mean, the lesser the chance of missed nursing care. Minor revisions such as adjustments to the number of items on the original questionnaire were made to suit the local context: Validity and reliability testing were conducted. The content validity was done by a panel of experts with master's and doctoral degrees in nursing. An overall content validity index of 0.88 for relevance and 0.89 for clarity was obtained, which indicates that the tool was highly valid. Pilot testing was conducted with 20 nurses to ascertain the reliability of the instrument. These nurses were not included in the actual data gathering. Cronbach's alpha was utilized: $\alpha = 0.70$, indicating that the instrument was reliable. The researchers followed the English version of the original developer of the tool. The translation was not needed since the participants could understand, write, and speak English.

Ethical Consideration

Ethical approval for this study was obtained from the Institutional Review Board of the University of Hail (H–2016–019). In compliance with research ethics protocol, the ethical principles of informed consent, beneficence, respect for anonymity, confidentiality, and respect for privacy were all applied in the study. The researchers scheduled an orientation for the possible participants to explain the research aims and the extent of their participation. The willing participants signed a written informed consent thereafter.

Data Analysis

The Statistical Package for Social Sciences Version 22 (SPSS 22) was used for analysis. Frequency count and percentage were used to determine the profiles of the respondents. A weighted mean was utilized to determine the degree of missed nursing care. The Kolmogorov-Smirnov test was conducted to check for the data distribution, with the hypothesis that the data were normally distributed. The result of the Kolmogorov-Smirnov test (0.93) was higher, with a p-value of 0.05, indicating normally distributed data. Therefore, an analysis of variance (F-test) was employed to determine differences in missed nursing care practices in terms of the participants' existing demographic information. The t-test was used to determine the differences in gender. All statistical analyses were performed at a 0.05 level of significance.

RESULTS

The majority of the participating nurses were females (97.5%), followed by males (2.5%). Most of the participants were single

(53.6%), while 45.7% were married. The age range varied among the study participants, with most of the staff in the 20–29 year age bracket (59.9%). Regarding the participants' number of children, a substantial proportion had no children (62.1%). In terms of the years of experience as a nurse, most had 5–9 years of experience (43.5%). As to the assignment unit, a greater part of the nurses were assigned to the intensive care unit (29.3%), 14.8% were assigned to the female medical ward, and 13.6% to the emergency room. The remainder of the participating nurses were dispersed across different units. Regarding the number of years working in the assigned unit, there was an almost equal distribution of less than 3 (46.7%) and 3–6 years (44.5%). Most of the participants were assigned to the morning shift (58.0%), while 22.7 and 19.3% were assigned to the afternoon and night shifts, respectively. A vast majority of the participants were highly satisfied with the nursing profession (79.2%); 11.4% expressed that they were moderately satisfied, and 9.5% were least satisfied (**Table 1**).

Table 1 Demographic Information of the Respondents

Profile		*f*	%
Gender	Male	309	97.5
	Female	8	2.5
Age	20–29	190	59.9
	30–39	108	34.1
	40–49	19	6.0
Marital Status	Single	145	45.7
	Married	170	53.6
	Widowed/Divorced/Separated	2	0.6
Number of Children	0	197	62.1
	1–2	56	17.7
	3–4	37	11.7
	5 and above	27	8.5
Years of Experience as a Nurse	Less than 5	132	41.6
	5–9	138	43.5
	10–14	25	7.9
	15 and above	22	6.94
Unit of Assignment	Emergency Room	43	13.6
	Outpatient Department	16	18.6
	Pediatric Ward	4	1.3
	Male Surgical Ward	36	11.4
	Neonatal Intensive Care Unit	42	13.2
	Intensive Care Unit	93	29.3
	Female Medical Ward	47	14.8
	Acute Care	18	5.7
	Pediatric Intensive Care Unit	4	1.3
	Gynecology	8	3
	Others (Burn, Ortho, etc.)	6	1.9
Shift	Morning	184	58.0
	Afternoon	72	22.7
	Night	61	19.3
Level of Satisfaction with the Profession	1. Least satisfied	30	9.5
	2. Moderately satisfied	36	11.4
	3. Highly satisfied	251	79.2

Overall, the degree of missed nursing care demonstrated that staff nurses have "never missed" (4.62± 0.22) nursing care. In particular, the lowest mean applies to the patient "falls" (4.16± 0.24), and the highest mean pertains to "drug applications and transfusion" (4.72± 0.07) (**Table 2**).

Table 2 The Areas of Concern that were Identified on the Degree of Missed Nursing Care by Staff Nurses in Terms of Falls, Drug Applications and Transfusion, Hospital Infections, Patient Monitoring/Equipment Safety, and Doctor-Nurse-Patient Communication

Area of Concern	Mean	Items that received the highest score from the subtitles	Mean	Items that received the lowest score from the subtitles	Mean
Falls	4.16 ± 0.24	5. I take necessary precautions in patient transfers.	4.50 ± 0.91	4. I encourage clients to use the grab bars mounted in the toilet and bathing areas and the railings along hospital corridors.	3.95 ± 1.23
Drug Applications and Transfusion	4.72 ± 0.07	4. I observe the 10Rs in giving medications.	4.77 ± 0.64	11. I know the indications, contraindications, side effects, adverse effects, and interactions associated with the medications. I question the order and discuss concerns with the ordering physician or my head nurse when I have doubts about the order.	4.56 ± 0.80
Hospital Infections	4.64 ± 0.04	10. I take care to maintain patient comfort by maintaining a sterile, closed urinary drainage system and ensuring no tension is on the catheter tubing.	4.68 ± 0.77	7. I check the patients' catheter every day	4.57 ± 0.86
Patient Monitoring/ Equipment Safety	4.61 ± 0.03	2. I convey essential patient care information during endorsements to ensure continuity of care. 4. I follow the doctor's orders in setting up to-follow IV fluids.	4.66 ± 0.71	1. When charting, I document nursing interventions by being specific, chronological, and recording exact times.	4.56 ± 0.76
Doctor-Nurse-Patient Communication	4.62 ± 0.05	4. When receiving a verbal telephone order, I document the order immediately on the chart, repeat the order back, and question the physician if there is any uncertainty regarding the order.	4.67 ± 0.73	1. I ensure that the patient is well educated on the procedures and medications before administration.	4.54 ± 0.76
Grand Mean	**4.62 ± 0.22**				

1.0–1.08 Frequently missed | 1.81–2.60 Almost every time missed | 2.61–3.40 Occasionally/sometimes | 3.41–4.20 Almost missed | 4.21–5.00 Never missed

The results indicate significant differences in the degree of missed nursing care in terms of demographic characteristics. The data yielded significant results in terms of the number of children ($p < 0.001$), years of experience as a nurse ($p < 0.004$), unit of assignment ($p < 0.001$), and the level of satisfaction with the profession ($p < 0.001$). All of the other variables, including such things as gender ($p > 0.093$), age ($p > 0.443$), marital status ($p > 0.808$), and shift ($p > 0.441$), were found insignificant to missed nursing care (**Table 3**).

Table 3 Differences in the Degree of Missed Nursing Care of the Staff Nurses in Terms of Their Profile

Demographic Profile		Mean Response	*t*-value	*p*-value
Gender	Male	4.63 ± 0.18	1.686	0.093
	Female	4.30 ± 0.55		
		Mean Response	***F*-value**	***p*-value**
Age	20–29	4.65 ± 0.20	0.817	0.443
	30–39	4.54 ± 0.14		
	40–49	4.68 ± 0.29		
Marital Status	Single	4.58 ± 0.15	0.324	0.808
	Married	4.65 ± 0.21		
	Widowed/Divorced/ Separated	4.85 ± 0.35		
Number of Children	0	4.63 ± 0.17	3.074	*0.001
	1–2	4.67 ± 0.18		
	3–4	4.26 ± 0.28		
	5 or more	4.96 ± 0.20		
Years of Experience as a Nurse	Less than 5	4.68 ± 0.19	3.521	*0.004
	5–9	4.49 ± 0.19		
	10–14	4.77 ± 0.16		
	15 and above	4.85 ± 0.20		
Unit of Assignment	Emergency Room	4.67 ± 0.21	2.323	*0.001
	Outpatient Department	4.83 ± 0.25		
	Pediatric Ward	4.79 ± 0.22		
	Male Surgical Ward	4.74 ± 0.19		
	Neonatal Intensive Care Unit	4.50 ± 0.33		
	Intensive Care Unit	4.77 ± 0.42		
	Female Medical Ward	4.32 ± 0.26		
	Acute Care	4.49 ± 0.31		
	Pediatric Intensive Care Unit	5.00 ± 0.00		
	Gynecology	4.72 ± 0.29		
	Others (Burn, Ortho, etc.)	3.57 ± 0.18		
Shift	Morning	4.58 ± 0.16	0.822	0.441
	Afternoon	4.68 ± 0.22		
	Night	4.65 ± 0.21		
Level of Satisfaction with Profession	Least satisfied	4.46 ± 0.17	5.192	*0.001
	Moderately satisfied	4.59 ± 0.16		
	Highly satisfied	4.41 ± 0.27		

*significant at 0.05 level

DISCUSSION

This study aimed to determine hospital nurses' perspectives on their degree of missed nursing care. In this study, staff nurses believed that, during the course of their duties, they would not commit an error in patient care, including in drug application and transfusion, hospital infections, patient monitoring/equipment safety, and doctor-nurse-patient communication. It was assumed that the nurses in this study prioritized patient care even though their roles and responsibilities were complex (Ozata et al., 2013). Griffiths et al. (2018) noted that the greatest area of missed dimensions of care was when assessing newly admitted patients together with the care plan set up, which entirely contradicts the findings of this present study. The participants conveyed communication, medications, and the handling of infections and related procedures as never missed care. This indicates that the staff nurses managed their priorities and operated within a well-organized work system, where interdisciplinary teamwork is frequently built-in. It is of note to this present study that nursing care on fall prevention was reported as "almost missed" by the participants. As corroborated in the study of Kalisch and Lee (2012), falls in the hospital continue to be a major and costly problem. This result is further validated by the previous study, which suggests that prescribed ambulation three times per day was the basic intervention that was missed the most (42.0%) (Moreno-Monsiváis et al., 2015).

In this study, the number of children of the nurses, the years of experience as a nurse, the unit of assignment, and the level of satisfaction with the profession were all-potentials for missed nursing care. The results could be attributed to the specific procedures and activities in the services studied. Nonetheless, the literature suggests that there is a relationship between nurses' family-related dimensions and the tendency to commit missed nursing care. The current results showed that the number of children was such a variable. This finding is in agreement with Yamaguchi et al. (2016). These authors found that distractions in work were significantly related to family needs and kinship responsibilities. Because of these reasons, nurses who are in clinical practice may feel difficulty creating a good working relationship with patients. Therefore, for the nurses to avoid missed

care, nurse managers should recognize this as a factor that leads to missed nursing care.

The current findings additionally indicate that the number of years of experience as a nurse can affect nursing care. A study by Björkstén et al. (2016) found that, in contrast to their more experienced colleagues, nurses might possibly commit an error, especially when they lack experience (e.g., wrong patient due to a "mix-up of patients" and the error "wrong route"). The inexperienced nurses were also more prone to "negligence, forgetfulness, or lack of attentiveness" (Björkstén et al., 2016, p. 8). Moreover, the results demonstrate that, when considering their unit of assignment, nurses showed significant differences in the degree of missed nursing care, which agrees with previous studies (Alshammari et al., 2019; Kalisch & Lee, 2012). This implies that the nurses in the busy units of hospitals tend to have more errors because of their more complex functions.

The level of satisfaction with their profession accounts for some instances of missed nursing care. Researchers such as Nyirenda and Mukwato (2016) validate this finding in affirming that job dissatisfaction among nurses generates negative attitudes, negligence, and malpractice. As a key person who plays a tremendous role in the delivery of excellent healthcare, nurses need to be supported by their managers in ensuring their job satisfaction. For instance, the nursing management needs to afford their nurses a healthier work scheduling (Yudiah et al., 2018) so that nurses can grow and freely exercise their autonomy. This promotes a healthy work environment where they further enhance proper attitudes toward fulfilling their responsibilities. To Hessels et al. (2015), it is of paramount importance for hospital administrators to create and employ well-organized but diverse resources to maintain the delivery of safe care that is error-free. The essential findings of this current study, such as the number of children, unit of assignment, and the level of satisfaction with the profession, have an impact on nursing practice. These findings could serve as valuable information for nurse managers on what and how to address the missed nursing care in their hospital. Addressing such missed nursing care that is omitted by the nurses can improve patient outcomes. Further, addressing missed nursing care with the findings of this study may prevent the likelihood of malpractice claims and litigation. Future research is recommended on expanding the variables that include nurses' experiences on missed nursing care and on how the nurse managers address them. This helps both the nurses and the managers to understand the deeper context of missed nursing with the actual experiences.

The researchers acknowledge some of the limitations of this study. For instance, the study was conducted in a small region of Saudi Arabia, where the results may not be applicable to other regions. This indicates that the need to conduct it in a wider context is recommended. Moreover, studies on perception are always prone to bias. Therefore, an interview could be conducted with the nurses to validate the results in the next study.

CONCLUSION

This study demonstrated that missed care is associated with several factors: The number of children of the nurses, the years of experience as a nurse, the unit of assignment, and the level of satisfaction with the profession. All of these characteristics are related directly to patient care. In this context, nursing administrators are required to manage staff and create a nursing workforce to address the demands of complex care. These changes could have an effect on an improvement in the work of the nurses, thus leading to improved patient outcomes.

Declaration of Conflicting Interests
There is no conflict of interest.

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Authors Contribution
MHA, HP, and EP were responsible for the study conception and design, while FA, AA, and EF were responsible for the acquisition of data. EF, RDD, and AA analyzed and interpreted the data. All of the authors drafted the manuscript and critically revised it. Further, all authors give final approval of the version submitted in this journal.

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Data Availability Statement
Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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ORIGINAL RESEARCH

KNOWLEDGE AND ATTITUDES TOWARD PEOPLE WITH DEMENTIA AMONG NURSING STUDENTS IN YOGYAKARTA, INDONESIA

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Abstract

Background: Nursing students are prepared to deliver care for vulnerable people, including people with dementia. Nursing students tend to have lower levels of knowledge and attitudes toward dementia compared to registered nurses. While there is less evidence that discussed this topic in the Indonesian nursing student's context, it will be necessary to identify an aspect related to knowledge and attitude among students to be considered for improvement in the future.

Objective: This study aimed to identify the knowledge and attitudes toward dementia among nursing students in Indonesia.

Method: This study was a quantitative study with a cross-sectional design. There were 334 nursing students recruited using a total sampling method at Universitas Gadjah Mada, Yogyakarta. Data were collected using the Dementia Knowledge Assessment Scale (DKAS) and Dementia Attitude Scale (DAS). Spearman Rank, Mann Whitney Unpaired, Kruskal-Wallis test, Pearson Correlation, Unpaired *t*-test, and Unpaired ANOVA were used for data analysis according to the type and the distribution of the data.

Results: The median of the DKAS was 24 (min - max = 7 - 40), and the mean of DAS was 99.60 (SD = 10.25). The variables that were statistically significant correlated to knowledge of dementia were age (r = .332, p < .001), class standing (H = 72.253, p < .001), and experience in taking care of people with dementia (U = 3314, p = .047). Meanwhile, only the age of the students was found to have a statistically significant correlation with attitudes toward dementia (r = 158, p = .004).

Conclusion: In general, among the nursing students, knowledge toward dementia was relatively low, while the attitudes toward dementia were relatively high compared to other research. Age, class standing, and experience in taking care of people with dementia had significant correlations to the knowledge score of the students. Lastly, age also had a significant correlation with the attitude score of the students.

KEYWORDS
attitudes; dementia; knowledge; nursing students

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BACKGROUND

The number of people with dementia (PWD) around the world has reached around 50 million people, with 4% of them resided in the Asia Pacific region and is likely to increase every year (Prince et al., 2015; World Health Organization, 2017). Furthermore, 1.2 million PWD is estimated to live in Indonesia (Republika Online, 2017). The increasing number of PWD tends to negatively impact the physical, emotional, social, and economic conditions of the caregivers (Mccurry et al., 2009; Prince et al., 2015; Shanahan et al., 2013). The negative impacts may be caused by the progressive decline in the cognitive function of the PWD, which will interfere with their daily activities (Tarawneh & Holtzman, 2012). The negative impacts also worsen because of the perceived information that the signs and symptoms of dementia are often considered to be common among elder people (Alzheimer Association, 2019; National Health Service, 2017). However, when the signs and symptoms worsened, and PWD becomes aggressive, PWD received rather negative attitudes from people around them (Dementia Australia, 2017; Nolan et al., 2006).

Those negative attitudes are also well known as stigma toward PWD. This stigma may change when people gain a better understanding of dementia. Then, it may change the perceived attitude toward PWD. Based on previous studies, knowledge, and attitudes of nurses toward PWD are higher than that of nursing students (Blaser & Berset, 2019; Scerri & Scerri, 2013; Smyth et al., 2013). Some identified factors that may affect the knowledge toward dementia were age, the professional status of the health workers, caring experience, professional, caring

experience, and dementia care training obtained (Blazer & Berset, 2019; Scerri & Scerri, 2013; Smyth et al., 2013). Meanwhile, some identified factors that may influence the level of attitude toward people with dementia were care setting, the experience of caregiving for people with dementia, clinical explanation of dementia, class standing, and age (Blazer & Berset, 2019; Scerri & Scerri, 2013; Smyth et al., 2013).

Compared to professional nurses, nursing students tend to have lower levels of knowledge about and attitudes toward people with dementia (Blazer & Berset, 2019). A high level of knowledge and attitudes have many benefits. There are many research on the knowledge and attitudes of nursing students toward PWD in many parts of the worlds such as in the United Kingdom (Scerri & Scerri, 2013), the United States (Kimzey et al., 2016), India (Poreddi et al., 2015), and even at Malaysia (Ahmad Basri et al., 2017). Nevertheless, based on the evidence discovered by the authors, there are only a few researches that mainly look at the knowledge and attitudes of the nursing students toward PWD in Indonesia. Providing stronger evidence on knowledge and attitudes of the nursing students toward PWD in Indonesia may bring more ideas in evaluating nursing education in Indonesia, especially in dementia care. Hence, this study is conducted to identify the knowledge and attitudes of nursing students toward PWD in Indonesia.

METHODS

Study Design

This study was a quantitative research with a cross-sectional design that aimed to identify the knowledge and attitudes of nursing students toward people with dementia and its related factors at Universitas Gadjah Mada, Yogyakarta, Indonesia.

Samples

The total sampling of 334 nursing students was applied in this study. The inclusion criteria of the sample were active students at Universitas Gadjah Mada, who was taking a bachelor's degree in nursing and were voluntarily willing to participate. Meanwhile, students who could not participate during the data collection period or were taking an academic leave were excluded.

Instruments

This research consisted of three instruments: demographic data questionnaire, Dementia Knowledge Assessment Scale (DKAS), and Dementia Attitudes Scale (DAS). The authors of both instruments supported the use of DKAS and DAS instruments.

The Indonesian version of the DKAS and the DAS was adapted using the Brislin model for instrument translation (Beaton et al., 2000). Both English versions of the instruments were translated into the Indonesian language by two sworn translators independently. Expert panel involving three experts with at least a Master's degree education background in elderly care were invited as the expert panel. This expert panel, resulting in the relevancy of the overall questionnaire (S-CVI) score for both questionnaires. The translation process was continued by the backward translation of both questionnaires to English. The previous expert panel was invited once again to conclude the Indonesian version of the questionnaires' wording. The field test and face validity test of the questionnaires were done before use in the actual study.

The DKAS was employed to measure student's knowledge about PWD. The DKAS was developed by Annear et al. (2015). The DKAS has 25 statement items with four domains: 1) causes and characteristics, 2) communication and behavior, 3) care considerations, and 4) risks and health promotion. DKAS scores range from 0 to 50. The questionnaire's translation resulted in a valid questionnaire with the S-CVI of the Indonesian version of DKAS of 1.00. The DKAS had acceptable reliability with Cronbach's alpha of .674 (Ursachi et al., 2015).

Meanwhile, the DAS was used to measure the attitudes of students toward people with dementia. The DAS was developed by O'connor and Mcfadden (2010). The DAS has 20 Likert-scale items that range from "strongly agree" to "strongly disagree" and has two factors labeled with "dementia knowledge" and "social comfort" (O'connor & Mcfadden, 2010). The questionnaire's translation resulted in a valid questionnaire with the S-CVI of the Indonesian version of DKAS of .99. The DAS had acceptable reliability with a Cronbach's alpha of .754.

Ethical Consideration

This study runs under a project that looks for knowledge and attitudes of the students toward a vulnerable population, in which people with dementia are part of that population. The cross-sectional approach for all the data collection was under one study protocol. This study protocol was reviewed and approved by the Ethics Committee of Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada on 24 May 2019 with the approval reference number KE/FK/0563/EC/2019. Participants were given participants' information and consent forms before the data collection. Following the ethic in research, participants were also allowed to withdraw from data collection without any force.

Data Collection

Data were collected after permission from the School of Nursing and ethical clearance were obtained. This research used primary data, and the data collection was around August 2019. The data collected were demographic data, DKAS, and DAS, as mentioned in the instruments section. Preparation of the data collection, including the questionnaire packages, briefing of the enumerators, and informing each class representative upon this data collection procedure. There were two enumerators on the data collection of this study. They were in their fourth year of bachelor's in nursing and a part of a bigger scheme of this research, as mentioned in the ethics document. Four class representatives were informed on the brief of the research and data collection procedures. Class representatives were informing the class about the data collection procedure, and along with the class, the date and time of data collection were made. On the date, the researchers and enumerators distributed the questionnaire packages to the participants, checked the completion of the questionnaire, and delivered research souvenirs as a token of appreciation.

Data Analysis

The data analysis was performed after inputting and checking the data distribution. After the distribution of the data was checked, it was found that the distribution of the DKAS score (knowledge of dementia)

was not normally distributed ($p < .050$), while the DAS score (attitudes toward dementia) was normally distributed ($p > .050$). Thus, different sets of central tendency data followed the data distribution of each score. The central tendency of the DKAS score was noted as median, minimum, and maximum score, while the DAS score was noted as the mean and standard deviation of the score. Thus, non-parametric bivariate tests, namely the Spearman's rank correlation coefficient, the Mann-Whitney test, and the Kruskal-Wallis test, were used. Meanwhile, the respondents' attitudes with socio-demographic data were tested by parametric statistical tests in the form of the Pearson correlation coefficient, *t*-test, and one-way ANOVA.

RESULTS

Characteristics of Respondents

Most of the respondents in this study were 19 and 20 years old (25.1 and 25.7%), and the majority of the respondents were females (98.2%). The percentage of each class standing did not differ significantly. Most respondents did not have any family history of dementia (86.2%), did not have any experience of caring for PWD (91.6%), had never interacted with people with dementia (65.6%). Furthermore, most respondents obtained information about dementia via the Internet (61.1%) (**Table 1**).

Table 1 Characteristics of Respondents ($N = 334$)

Characteristics	Frequency (*n*)	Percentage (%)
Age		
17	19	5.7
18	65	19.5
19	84	25.1
20	86	25.7
21	71	21.3
22	9	2.7
Sex		
Female	310	98.2
Male	24	7.2
Class standing		
First-year	100	29.9
Second-year	82	24.6
Third-year	68	20.4
Fourth-year	84	25.1
Family history of dementia		
Yes	46	13.8
No	288	86.2
Experience in caring for PWD		
Yes	28	8.4
No	306	91.6
Experience in interacting with PWD		
Yes	115	34.4
No	219	65.6
Sources of Information about dementia		
Printed media	14	4.2
The Internet	204	61.1
Family/Relative(s)	14	4.2
Friend(s)	1	3.9
Healthcare professional(s)	89	26.6

Knowledge About and Attitudes Toward Dementia

Due to the different distribution of DKAS and DAS scores, central tendency and statistical test results followed the data distribution of each instrument. The DKAS score in this study was not normally distributed, while the DAS score was normally distributed. From **Table 2**, it informs us that the central tendency of the knowledge was relatively in the middle while the DKAS score median was 24.00 (min-max = 7-40). Meanwhile, the attitude of the students toward PWD was relatively high, with the mean of the DAS was 99.60 ($SD \pm 10.25$) (see Table 2). The lowest score of the DKAS score was 76, and the highest score was 136.

Table 2 The Central Tendency of Knowledge and Attitude Variables ($N = 334$)

Variable(s)	*Mean*	*SD*	*Median*	*Min-max*
Overall score of DKAS	-	-	24.00	7 - 40
Causes and characteristics			5.00	0 - 13
Communication and behavior			5.00	0 - 10
Care considerations			7.00	1 - 12
Risk and health promotion			6.00	0 – 12
Overall score of DAS	99.60	10.25	-	-
Comfort	45.16	7.00		
Knowledge	54.55	5.19		

Looking at the DKAS items, especially in the cause and characteristic domain that consisted of items number 1, 2, 3, 4, 5, 6, and 7, item number 6 was the item with the lowest percentage of correct answers (**Table 3**). In the communication and behavior domain that consisted of items number 14, 15, 16, 17, 18, and 19, item number 15 and 16 were items with the lowest percentage of correct answers. All items in the care and considerations domain had a higher rate of correct answers than any other items in other domains (20, 21, 22, 23, 24, and 25). In the risk factor and health promotion domain that consisted of items number 8, 9, 10, 11, 12, and 13, item number 13 was the only item with the least correct answers in this domain (**Table 3**).

Table 3 Percentage of Correct Answers on DKAS ($N = 334$)

Item Number	Item	Percentage (%)
20	"People experiencing dementia do not generally have problems making decisions."	63.17%
11	"Exercise is generally beneficial for people experiencing dementia."	61.07%
5	"Planning for the end of life care is generally not necessary following a diagnosis of dementia."	60.17%
25	"Daily care for a person with advanced dementia is effective when it focuses on providing comfort."	60.17%
14	"It is impossible to communicate with a person who has advanced dementia."	55.08%
9	"Maintaining a healthy lifestyle does not reduce the risk of developing the most common forms of dementia."	52.39%
23	"People experiencing dementia often have difficulty learning new skills."	51.19%
12	"Having high blood pressure increases a person's risk of developing dementia."	49.40%
2	"Alzheimer's disease is the most common form of dementia."	48.80%
4	"Dementia does not result from physical changes in the brain."	36.22%

Table 3 (Cont.)

22	"People with advanced dementia may have difficulty speaking."	33.23%
18	"Uncharacteristic behaviors in a person experiencing dementia are generally a response to unmet needs."	31.43%
24	"Difficulty eating and drinking generally occurs in the later stages of dementia."	30.29%
21	"Movement is generally affected in the later stages of dementia."	25.44%
1	"Dementia is a normal part of the aging process."	25.14%
17	"People experiencing advanced dementia often communicate through body language."	19.46%
19	"Medications are the most effective way of treating behavioral symptoms of dementia."	17.66%
10	"Symptoms of depression can be mistaken for symptoms of dementia."	16.76%
3	"People can recover from the most common forms of dementia."	15.56%
8	"Early diagnosis of dementia does not generally improve quality of life for people experiencing the condition."	14.97%
7	"Most forms of dementia do not generally shorten a person's life."	5.68%
16	"It is important to correct a person with dementia when they are confused."	5.38%
6	"Blood vessel disease (vascular dementia) is the most common form of dementia."	3.89%
15	"A person experiencing advanced dementia will not generally respond to changes in their physical environment."	3.89%
13	"The sudden onset of cognitive problems is characteristic of common forms of dementia."	2.39%

Furthermore, the student's attitude toward dementia represented by the DAS score had a mean of 99.60, SD = 10.25. The lowest score was 76, and the highest score was 136 (**Table 2**). In the comfort factor, item number 8 was the item with the lowest mean. In the knowledge factor, item number 20 was the item with the lowest mean (**Table 4**).

Table 4 Mean of Answers on the DAS (N = 334)

Items	Mean (SD)
1. "It is rewarding to work with people who have ADRD."	3.72 (1.19)
2. "I am afraid of people with ADRD."	5.46 (1.20)
3. "People with ADRD can be creative."	4.87 (1.23)
4. "I feel confident around people with ADRD."	4.22 (1.23)
5. "I am comfortable touching people with ADRD."	4.86 (1.22)
6. "I feel uncomfortable being around people with ADRD."	5.17 (1.25)
7. "Every person with ADRD has different needs."	5.74 (0.97)
8. "I am not very familiar with ADRD."	3.49 (1.51)
9. "I would avoid an agitated person with ADRD."	5.08 (1.24)
10. "People with ADRD like having familiar things nearby."	5.41 (1.02)
11. "It is important to know the history of people with ADRD."	5.91 (0.96)
12. "It is possible to enjoy interacting with people with ADRD."	5.46 (1.03)
13. "I feel relaxed around people with ADRD."	4.82 (1.10)
14. "People with ADRD can enjoy life."	5.71 (1.05)
15. "People with ADRD can feel when others are kind to them."	5.93 (0.88)
16. "I feel frustrated because I do not know how to help people with ADRD."	4.04 (1.38)
17. "I cannot imagine taking care of someone with ADRD."	4.32 (1.35)
18. "I admire the coping skills of people with ADRD."	5.43 (1.22)
"We can do a lot now to improve the lives of people with ADRD."	5.52 (1.01)
19. "Difficult behaviors may be a form of communication for people with ADRD."	4.45 (1.28)

ADRD: Alzheimer's Disease and Related Disorder

Table 5 Relationship Between Knowledge About PWD and Respondent's Socio-Demographics Variables (N = 334)

Variable(s)	*Mean (SD)*	Score of Statistical Test	*df*	*p*-value
Age	19.40 (1.30)	.332	-	< .001*
Class standing		72.253	3	< .001*
First-year	98.97 (9.93)			
Second-year	98.46 (9.81)			
Third-year	100.13 (8.14)			
Fourth-year	101.04 (12.35)			
Family history of dementia		5665	-	.114
Yes	101.93 (11.67)			
No	99.23 (9.98)			
Experience in caring for PWD		3314	-	.047*
Yes	102.00 (11.29)			
No	99.38 (10.14)			
Experience in interacting with PWD		12587.5	-	.995
Yes	101.07 (10.81)			
No	98.83 (9.88)			

*significance at $p < .05$

Student's Knowledge and Attitudes Toward PWD and Their Relationship with Socio-demographic Variables

Table 5 shows that the age variable had a statistically significant relationship and showed a weak positive correlation ($r = .332, p < .001$). Class standing of the students and experience of caregiving for people with dementia had statistically significant differences in scores ($H = 72.253, p < .001$; $U = 3314, p = .047$). Family history of dementia did not have a statistically significant difference in scores ($U = 5665, p = .114$).

The statistical test analysis result of this study in **Table 6** shows that the knowledge about dementia measured by DKAS had a statistically significant relationship with the age variable ($r = .158, p = .004$). Class standing, family history of dementia, and experience of caregiving for PWD did not have statistically significant differences in scores ($F = 1.07, p =, 361$; $t = 1.66, p = .97$; $t = 1.29, p = .197$).

Relationship Between Student's Knowledge and Attitudes Toward PWD

Based on a statistical analysis using Spearman's rank correlation coefficient, there was a significant relationship between the score for knowledge about dementia and the score for attitude toward dementia ($p = .001$). The Spearman's rank correlation coefficient was .29, which indicated a relatively weak positive correlation.

Table 6 Relationship between Attitude toward People with Dementia and Respondents Socio-Demographics Variables ($N = 334$)

Variable(s)	*Mean (SD)*	Score of Statistical Test	*df*	*p-value*
Age	19.40 (1.30)	.158		.009*
Class standing		1.07	3	.361
First-year	98.97 (9.93)			
Second-year	98.46 (9.81)			
Third-year	100.13 (8.14)			
Fourth-year	101.04 (12.35)			
Family history of dementia		1.66	332	.97
Yes	101.93 (11.67)			
No	99.23 (9.98)			
Experience in caring for PWD		1.29	332	.197
Yes	102.00 (11.29)			
No	99.38 (10.14)			
Experience in interacting with PWD		1.90	332	.058
Yes	101.07 (10.81)			
No	98.83 (9.88)			

*significance at $p < .05$

DISCUSSION

Participant's Characteristic in Conjunction with the Overall Results

Participants in this study were relatively younger as they were in an undergraduate program in nursing. This research results were in line with the results of a previous study that most respondents were in the age range of 19 - 22 years (Anissa et al., 2018). Thus, this study's result might not only apply in a relatively young age population but also affect the overall results of the statistical test analysis of this study due to relatively homogeneous participants.

Moreover, most of the respondents had neither a family history of dementia (86.2%) or caregiving experience for people with dementia (91.6%), which might be implicitly attributed to their knowledge and attitude toward dementia. As mentioned by Scerri and Scerri (2013) and Shin et al. (2015), students had a somewhat lower score in knowledge and attitude toward dementia as most students might not have yet learned about the elderly, especially dementia, or interacting closely with them.

Most students obtained dementia-related material from the Internet (61.1%), which might differ from a previous study by Shin et al. (2015), which mentioned that most respondents obtained information about dementia from broadcasts and teaching staff. This might be due to differences in the number of respondents and research locations. Shin et al. (2015) conducted a study in Korea with 148 respondents, in which 42.6% of the respondents had received dementia-related learning, and 55.6% of the respondents had been exposed to dementia-related learning for two hours or more. Meanwhile, in our study, only fourth-year students had already obtained a course on dementia-related topics on the elderly in their third year.

Knowledge of the Nursing Students Toward Dementia

The median of scores for nursing students' knowledge was 24 (min-max = 7 - 40), which was relatively lower than the average. However, a similar result that was mentioned by Bentley et al. (2018) which used the 27-item DKAS, resulted in a maximum value of 54, and the median of scores for knowledge was 39 (min-max = 31-51). A relatively low score of knowledge might be due to the sample chosen in this research were nursing students. In contrast, the sample in the study conducted by Bentley et al. (2018) was doctors who had experience with dementia in a hospital. Also, most doctors have professionally provided dementia care for PWD.

Furthermore, among four domains, communication and behavior domains had the shortest score range and more false answers in two of six items. Similar results were also shown in a previous study that these domains had items with the lowest score of incorrect answers (Schelp et al., 2008). It indicated that most respondents had the assumption that people who have severe dementia would not respond to changes in their physical environment. The person with severe dementia still has awareness about themselves (Krishnamoorthy & Anderson, 2011). A person who has Alzheimer's cannot recognize a familiar person, place, or item, which can pose a difficult situation for caregivers (Alzheimer Association, 2015). Students also might not know what to do when

they meet PWD in a realistic care setting (Alzheimer Australia Vic, 2010). This result also implies that early exposure to PWD among nursing students may facilitate them to be more informed about PWD in general.

The Attitude of the Nursing Students Toward Dementia

In this study, the average score obtained was 99.60 (SD = 10.25). Based on the range of DAS scores (20 - 140), the average score of the DAS was relatively high. This result supports a previous study that also mentioned that nursing students had a rather high attitude toward people with dementia (Poreddi et al., 2015). As nursing students were the main subject of both researches, a different result might occur in different majors. The curriculum of nurse education might affect them to be more empathetic toward others. Notoatmodjo (2012) explained that attitude might be formed in multifactorial ways through personal experience, significant others, media, educational institution, and even religion. Rather similar result was also shown in Poreddi et al. (2015) ($Mean$ = 45.16, SD = 7.00; $Mean$ = 45.5, SD = 9.49). This result indicated that nursing students had a positive attitude toward dementia as they felt rather comfortable being around PWD (Poreddi et al., 2015).

Related Factors of Nursing Student's Knowledge and Attitude Toward Dementia

Knowledge toward dementia was statistically significant related to age (r = .332, p <.001), class standing (t = 7.04, p < .001), and experience in caring for PWD (t = 0.58, p = .56). This result strengthens the previous study from Scerri and Scerri (2013). However, Shin et al. (2015) mentioned no statistically significant difference in knowledge of the students who had a family history and those who did not have. This result might suggest further investigation upon correlation among academic year, and different majors of the students on knowledge toward dementia.

Meanwhile, the attitudes toward dementia among students were statistically related to the student's age only. This result was similar to the research conducted by Scerri and Scerri (2013) in which there was a significant relationship between age and attitude scores (p < .001). This was also consistent with the research of Mulyani et al. (2019) which found that age also had a significant relationship with attitude scores (r = .182, p = .010). The variable of class standing, family history of dementia, and experience of caring for PWD did not have significant differences in knowledge scores. Based on the experience of caring for PWD, there was no significant difference between the average attitude scores of respondents who had the experience in caring for PWD and those who did not have. This result was in accordance with the research of Kimzey et al. (2016), which discovered that there was no significant difference in attitude scores between students who had the experience of caring for PWD and those who did not have (p = .202).

Correlation between Knowledge and Attitude Toward Dementia Among Nursing Students

Among nursing students, knowledge and attitude toward dementia were statistically significantly related. Furthermore, Spearman's rank correlation coefficient was .29 with p = .001, which indicated a significant relationship between the scores for knowledge about dementia and the scores for attitude toward dementia. This result was in line with the research conducted by Scerri and Scerri (2013), which discovered a significant relationship between total scores of knowledge and attitude (r = .114, p = .018). However, the correlation coefficient score indicated a weak positive correlation. This result might suggest that to improve attitude, we might consider improving the knowledge, and vice versa (Dahlan, 2014; Uligraff, 2019).

Study Limitations and Recommendations

This study was conducted using the cross-sectional design on a rather specific subject; generalization to other populations might not be applied. Further investigations may include a broader range of communities such as age, major of the students, occupation, institution, or area. Educational institutions may add a dementia care course to their nursing education curriculum, including lectures or workshops with experts, people with dementia, and healthcare service providers or in the form of dementia care skills training. Future research may be expected to involve health workers, especially nurses, as respondents of the study. Future researchers may also use the Indonesian version of DKAS and DAS to maintain validity in measuring knowledge and attitudes toward dementia in general and is relatively reliable.

CONCLUSION

Nursing students' knowledge of dementia measured using DKAS had a median score of 24.00 (min-max = 7-40). In addition, the average total score for attitudes of nursing students was 99.60 (SD ± 10.25), which was relatively high. Based on the result of the statistical test, there was a significant relationship between age, class standing, and the experience of caring for PWD with student's knowledge of dementia. However, there was no significant difference between the student's knowledge scores based on a family history of dementia. There was a significant relationship between student's age and scores for attitude. However, there were no significant differences between the average scores of student's attitudes according to class standing, family history of dementia, and experience of caring for PWD. There was a significant relationship between scores of knowledge about dementia and scores of attitudes toward dementia.

Declaration of Conflicting Interest

There was no conflict of interest regarding the publication of this study.

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Author Contribution

SRAS was in charge of developing the research proposal, performing data collection, data management and analysis, and drafting the manuscript. ADS, Head of the research group, supervised the proposal development, ethical approval process, questionnaire validation process, data collection, data management and analysis, and completed the manuscript. SM supervised data analysis, the person in charge of the expert panel, and developed the manuscript.

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ORIGINAL RESEARCH

LIVED EXPERIENCES OF ELDERLY REMARRIED WIDOWS: ADJUSTMENT AND COPING TO NEW ROLES AS BI-PARENT

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Abstract

Background: At present, the existing studies which explore the factors influencing elderly widows to remarry and their achievement towards successful step-parenthood are limited. Remarriage and step-parenthood are integrated into the complexities of the social phenomena in human experiences, which entail coping and adjustments to life changes.

Objective: The study explored the lived experiences of elderly widows regarding coping and adjustments to remarriage and step-parenting as new roles.

Methods: The study made use of a phenomenological approach, particularly the transcendental approach, to have a better understanding of their lived-experience after remarriage. Self-made open-ended questions were raised in the series of interviews using interview guides. The study was conducted in Iligan City, Philippines, where all the six participants reside. Purposive sampling was used wherein participants are selected based on criteria necessary to answer the objectives of the study: (1) He/ she should be at least 60 years of age; (2) must be remarried after the death of the previous spouse; and, (3) must be a bi-parent. Thematic analysis was used for data analysis.

Result: Three themes emerged in all interviews: (1) adjusting to a new marital role, (2) sharing responsible parenthood, and (3) rewarding new parental role. Results highlighted bi-parenting among elderly widows as an aptly complex lived- experience as widows enter remarriage.

Conclusion: It is concluded that the remarried widows view life after remarriage with the new family and children as a positive experience despite the challenges. Remarriage and being with another family can improve the wellbeing of the elderly widows. Having children and a new partner around is an opportunity to bring back a complete family structure together. This research recommends further that the understanding of their experiences and phenomena should be the basis of identifying their status. Researchers and clinicians should provide essential information to elderly remarried widows about the healthy and proper coping and adjustment to this life-changing event.

KEYWORDS
bi-parenthood; coping; elderly; remarriage; widowhood

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BACKGROUND

Widowhood or the loss of the previous spouse encroaches many changes in family dynamics. This experience is a painful event in the life of anyone who just lost their partner on their behalf and as their co-parent. These issues are more significant among individuals owing particularly to cultural and social aspects. Women widows experience increased feelings of sorrow, aloofness, and guilt than men. The sociocultural context may also play a role in the tendency of women to reject depressive symptoms. The significant and profound distress can be indications of psychiatric problem usually needing serious attention (Perkins et al., 2016). Several literature reported that widows remarry to find alternatives to their loss (Connidis, 2010; Ewherido, 2015; Wu, Schimmele, & Ouellet, 2015).

Remarriage is accompanied by new roles and one of which is step-parenthood. The new spouse becomes stepparents of the previous spouse's children and vice versa. Stepparents in the blended family need to adjust and pay attention to establishing a good relationship with the children of the new partner. This can strengthen the likelihood of success by putting into consideration the needs of the kids. Personality, gender, and age are relevant, according to Kemp, Segal, and Robinson (2013), but the basic needs of the children should be met to achieve a good relationship. Each child is different and will display the stepparent how fast or slow to know them individually. Given enough time, patience, and interest, planning is necessary to sustain the relationship, and most children will eventually give stepparents a chance (Kemp et al., 2013). Many researchers are suggesting that stepparents who show their stepchildren appreciation, affection, and love, and no expression of hostility, and hatred, are competent in giving support and able to positively influence children's adjustment to a new family (Jensen, Lippold, Mills-Koonce, & Fosco, 2018). A good relationship between stepparent and stepchildren might also buffer stress linked with typical stepfamily difficulties (Jensen & Howard, 2015). The means of developing a positive relationship between the

stepparent and stepchildren takes time, even in the best of cases (Papernow, 2013). The development of a positive relationship might be particularly gradual when including stepchildren in early teens (Jensen & Howard, 2015). The presence of mature stepchildren when parents are already elderly may only be stressful when the quality of the relationship between the parents and the children are poor.

According to Psychology Today (n.d.), parenting is an ultimate long-lasting investment. One must be ready to decide to get involved in it. The joy of the couples lower the moment they become mother and father and may even get worse before the role gets bigger. But still, it can be the best rewarding work of a lifetime in the long run. It is essential for parents to give their children a good start, but it is also significant to recognize that children have their own set of temperaments. One of the parents' responsibilities is to prepare their children to become independent. Research shows that those left behind parents experienced higher levels of anxiety, loneliness, depression and had lower scores on psychological health than older parents with no migrant children (Sutinah, 2020; Thapa, Visentin, Kornhaber, & Cleary, 2018). A meta-analysis study also found that the empty-nest elderly's mental health is poor compared to non-empty nesters (Lv et al., 2013).

Having a close relationship between parent and child has a positive effect on parents' self-esteem (Keys, 2015). There are also experiences of parenthood that may potentially create parental strain and distress, such as parental bereavement, coresidence with adult children, and step-parenthood. Bi-parent was operationally coined by the investigator as a person who plays two roles, which is a parent to two sets of siblings after remarrying a spouse with children. What makes remarrying sets apart from the rest is that the couple has to make necessary adjustments in establishing rapport, gaining trust, and be loved by the children belonging to the previous spouse. To sustain the relationship, one has to be adaptive. Adjustments must be made not only with his or her new partner but also with the family dynamics along with the sets of children. The experience which they hold on as a bi-parent is what this section of this study also wanted to explore.

Based on the relevant literature, effective coping and favorable adjustments are critical ingredients to successful remarriage and step-parenthood. At present, the existing studies which explore the factors influencing elderly widows to remarry and the achievement towards successful step-parenthood among elderlies are limited. Remarriage and step-parenthood are integrated into the complexities of the social phenomena in human experiences, which need further exploration in which this study aims to achieve. The study explored the lived-experiences of widows regarding coping and adjustments in remarriage and parenting as new roles. By gaining a more in-depth understanding of how elderly widows live with coping and adjusting to remarriage and parenting as new roles, better insights will be elucidated about this group of people.

METHODS

Study Design

This study utilized phenomenology research design specifically, a transcendental phenomenological approach. A transcendental phenomenology focuses the study around rich, textural descriptions, structural descriptions, and the essence of the study (Creswell, 2013; Moustakas, 1994). Transcendental phenomenology is useful for describing the phenomenon using the participants' experiences, perceptions, and voices. During the series of interviews, the investigator not only observed what they said but also their gestures, tones, and other cues, which can help derive the meaning of what they experienced.

Participants

The study utilized purposive sampling wherein a total of six participants were selected based on the following inclusion criteria: 1) He/ she should be at least 60 years of age; (2) must be remarried after the death of the previous spouse; and, (3) must be a bi-parent.

Data Collection

Data collection was carried out for five months from January 2017 to May 2017 from the different Barangays of Iligan City, Philippines. The data were collected through in-depth interviews, which were audio-taped. The individual interviews were done using specific open-ended questions. Face-to-face interviews were done based on the convenience of the participants. Each interview runs for about 30-50 minutes. Some interview was conducted in the workplace, and some are at the home of participants. The interview was repeated three times just to get enough information from each participant. The data was saturated when no new information was added to what has been obtained from other participants.

Data Analysis

The data were coded by three coders and were analyzed using thematic analysis (Braun & Clarke, 2006), with the following steps: 1) Familiarizing yourself with your data, 2) Generating initial codes, 3) Searching for themes, 4) Reviewing themes, 5) Defining and naming themes, 6) Producing the report

Trustworthiness/Rigor

The four considerations for trustworthiness and rigor were utilized in this study: credibility, transferability, dependability, and confirmability. Triangulation was observed by asking the same research questions to all participants and obtained several methods to answer a similar inquiry. The credibility of the study was examined by asking the participants to review and check their responses that were transcribed to confirm if that is what they meant. The transferability of the study result can be assumed that similar answers would probably be provided. The whole research process was reviewed by the experienced research supervisors in the University as a dependability testing stage. The data categories were comprehensively defined and were harmonious in the findings; this can validate and justify the future replicability of this study.

Ethical Consideration

The investigator ensured the protection of the ethics rights of the study participants and that there were no ethical transgressions committed in the conduct of the study. Data gathering started after the approval of the College Research, Ethics, and Extension Committee (CREEC) of the Institute. All six study participants gave their approved consent to participate in the study and informed them that they could abstain from participating at any time and assured them of confidentiality and anonymity of their identity. Furthermore, the investigator asked the

participants whether they prefer to participate in the interview at home or their preferred place.

RESULTS

The final six participants were chosen, 50% were females, and 50% are males. The mean age of the participants was 62.67 years, and 7.83 was the average number of years since the participants' spouses passed away. All six participants had children, and 100% reported having children from both new and old spouse. The average years of being remarried among all the six participants are 10.5 years.

Table 1 Participants of the Study and their Demographic Profile

Participants' Code	Age	Gender	No. Children	No. Years Widowed	No. Years Remarried
P1	60	Female	4	11	17
P2	64	Male	3	2	4
P3	69	Female	6	19	4
P4	61	Male	3	3	9
P5	60	Female	5	4	19
P6	62	Male	4	8	10

Several themes emerged from the series of interviews that were conducted. The investigator was able to classify threads woven during the course of the interviews and the themes that overlapped with other themes. After long deliberation, three solid themes remained: (1) adjusting to a new marital role, (2) sharing responsible parenthood, (3) rewarding new parental role.

Theme 1: Adjusting to a New Marital Role

The first theme refers to participants' association with their new spouse, which is known as adjusting to a new marital role. The marriage quality is usually determined by concepts of happiness, satisfaction, adjustment, and evaluations of the couples (Kisşlak-Tutarel & Göztepe, 2012). The status of the participants of having a partner makes them feel better and happier. The new partner was perceived as a buddy whom they can share responsibilities with as parents to both of their children. Their daily living activities with a partner in parenthood seemed to be coming back like that with the previous first spouse. The participants expressed happiness over the attention they get from the partner:

> "They always fight with her previous partner; that is why we don't argue as much as possible. We just talk it over. I know how to approach him if we have problems and vice versa." **P1**

> "I only have a little adjustment when we got married because we all know what we wanted, and that is to be happy." **P5**

At the beginning of the partnership, one of the coping and adjustments made by the informant is by following what his new spouse wants. This strategy helps the informant to get to know more of themselves and their spouse. The participants explained that:

> "We never had a fight ever since we started living together because I just followed whatever he wants. We really do understand each other". **P3**

> "We talk as often as possible, and we understood each other's need; that is why we do give and take. We cheer for each other." **P6**

> "We used to fight regularly because I am a hard-headed person, but I realized later on that maybe I need to change and instead listen and follow my wife" **P2**

Theme 2: Sharing Responsible Parenthood

The participants have recommended that repartnering should be established before remarriage since this makes the adjustment easier. Repartnering prepares the participants to deal with the transitions of their journey like remarriage and bi-parenting. Agree with your new spouse on how you want to raise the children together, and make a plan necessary for coping and adjustments to parenting styles before remarriage (Segal & Robinson, 2019).

Participants explained that having new parents is not that easy for both the children and the new parent. It was found out in the study that the elderly new spouse seemed to initiate to reach out to the children. The children easily welcome the idea of their elderly parent getting a new spouse and them with a new elderly parent. The new spouse fulfills the role which their children's previous mothers and fathers did.

Others compare their new spouse as a more responsible parent than the previous spouse. The new spouse treats their own children and the children of the previous spouse suitably. They support children's physiological and psychosocial needs. Transcriptions of the individual interviews highlight these results, as shown below:

> "There is a big difference with my previous spouse, wherein I am now happy because my new spouse has no vices. My children are well taken care of by him, and he treats them like his own children" **P1**

> "He has friended all my children even before we got married and treated them like his own "**P5**

Sharing responsible parenthood with the new children seemed to be part of the instinct of the elderly who gets remarried. The experience seemed to be part of the entire process of remarriage. The participants claimed that their new spouse just instinctively knows to decide which is among the approaches is right in helping her children:

> "He does what is the best thing to do…he helps my children" **P3**

> "Whenever my children have problems, may it be emotional or monetary problems, she is always there to help." **P6**

Theme 3: Rewarding New Parental Role

Under any circumstances, parenting is a challenging responsibility. But it is more challenging to be a stepparent as you are moving into a family that is already complicated (Krasnopercova, 2019). In this study, all participants claimed that coping and adjustments are necessary when getting involved in this experience. In all transitions in life, effective coping and adjustments are needed and not only in remarriage among the elderly. The love and security which they lose before are now contented by the presence of their new spouse.

The rewarding experience is also motivated by the good treatment of the new spouse to their children. It makes the decision and experience even more rewarding than just getting remarried. The adjustment made by the new spouse to the children seemed not only to be accepted by the parent of the child but also with the children themselves as well.

"I am very happy to be with my new partner, and I love him dearly, he is really concern about me and the children" **P1**

"My children are happier now that they a new father who is always there to guide them. They sometimes argue about things, but at the end of the day, they are again ok with each other." **P5**

Remarriage becomes a reason for acting in a certain way that makes them more adjusted and has effectively coped from widowhood. The participants claimed that they were driven to change since they thought their problems were relieved with the presence of the new spouse. Having a partner makes them more motivated to decide and be effective in whatever decisions they take. The experience even made the entire family more united as it seemed like the family is complete again.

"My life changed because I have someone to help me with my problems, although I know how to manage my problems before; but it is different if you have someone to help you make a decision." **P2**

"You have someone to help you solve your problems. You have someone to help you decide on things which you have difficulty deciding before. My family is bigger now with no fights because we are united" **P6**

DISCUSSION

The first theme emphasizes the adjustment of the remarried widows to a new marital role. Marital adjustment is the satisfaction and happy couples have in their marriage (Yesiltepe, 2011). They become better and happier as they share responsibilities with their new spouse. The new couple spends activities together, which is seemingly even similar to their previous spouse. Throughout, the experience is viewed positively, which they missed during widowhood. According to the American Academy of Pediatrics (2017), most couples want their new marriages to work out well for everyone. Hopefully, they can achieve their hope, having learned from previous experiences. However, an adjustment has to be made by getting to know what the new spouse wants. This is one way of learning more about themselves and their spouse.

The second theme emphasizes the transition of sharing responsible parenthood. According to the American Psychological Association (2017), a marriage that brings with it children from a previous marriage presents many challenges, particularly in financial and living arrangements, issues with previous marriage, and changes in parenting. Repartnering during widowhood, are signs of highly adaptive responses, which prepares them to integrate the concept of remarriage and bi-parenting in their lives.

Having new parents is not that easy for both the children and the new parent. According to the American Academy of Pediatrics (2017), the biological family of the kids may be reminded of them. Sharing their parent with a new spouse and stepsiblings, they may manifest jealousy when the mother or father displays attention to them. Kids may feel more like a stranger than being a part of the blended family and feels awkward having to get used to two fathers or two mothers. However, this differs when the children of the remarried widows are mature enough, as in the case of elderly widows who got blended with another family because of remarriage.

Elderly new spouses seemed to initiate to reach out to the new set of children. Making contact with each other to begin working toward being more at ease with talking about the child makes the children more comfortable. The conveniences can be felt by both parties. The end goal is to reassure the children that they do not need to choose between developing a relationship with the stepparent and the love of the biological parent (American Academy of Pediatrics, 2017).

Children easily welcome the idea of their new elderly parent. The adjustment in remarriage is not only experienced by the couple. The children also need to adjust to their new blended family. The level of approval and acceptance grows as they get to know their stepsiblings and stepparent better. Life stages seemed to show different reactions. Good parental relationships develop quicker with younger children (American Academy of Pediatrics, 2017).

The new spouse fulfills the role of the children's previous parent. The interview even showed that a new spouse is more responsible. According to the American Academy of Pediatrics (2017), children will typically worry about their parent's remarriage. After remarriage, the couple expectedly will bring a new father or mother figure into their home. Children will feel like they lose the love and attention of their other father, and comparisons are just normal reactions by the children during this adjustment period. Eventually, the child becomes adaptable to the changes in family dynamics. It has been noted that in elderlies, the responsible sharing of parenthood is instinctive. Elderlies can decide which among the approaches is right in helping his spouses' children.

The last theme defines the new parenting role as fulfilling. Coping and adjustments are necessary when getting involved in this experience. The kids' transfer from a home with a solo parent to a new family that may now include stepparent and even stepsiblings. The family function, chores, and routines may also even change (American Academy of Pediatrics, 2017). It is surprising to note that love and security are well- provided by the new parent. Both the children and the new parent are motivated by the good treatment of each other. They make the decision and experience even more rewarding than just getting remarried with parenting.

Furthermore, the adjustment has to be made in a two-way process. The new parent and the children adjust to each other's convenience and principles. At first, it may be harder for children to find some space they can call their own. It is recommended that everyone needs to take part and adjust to the new system of the house since it takes time for a family member to adapt to the new set up (American Academy of Pediatrics, 2017).

The newly established relationship is nourished when sincerity and care are felt by the children from the new spouse. This concept of bi-parenting is an aptly complex experience that one has to explore and study. The need to satisfy the spouse is a positive sign of acceptance to the new role. Remarrying comes with different practices and may have many issues regarding the relationship of the children with their new parent and vice versa, and how the parent will divide tasks or responsibilities. The most formidable challenge in remarriage is making a structural plan to build and run a new family with everyone's favor to meet each other's own distinct necessities. That is why most

see this as a challenge and an opportunity to find happiness with their new partner at the same time.

Implications of the Study

The result of this study can help facilitate the acceptance of the process of remarriage and adaptation to changes in the lives of remarried elderly widows. Hence, the awareness and response gained out of the research findings will help promote fulfillment towards aging and reduction of the societal pressure to remarriage.

The result of this study may be used by the nurse clinicians, especially in their practice, by using validation, metaphors, and psychoeducation of the clients to help them learn how to handle widowhood and the coping needed for new responsibilities as a new spouse and bi-parent to a new set of children. More studies may also be conducted by the researchers to gain more understanding about the experiences of remarried widows. Other implications include the need for more accessible resources for bi-parents by the clinicians, such as family education, finances, and elderly care in communities.

Recommendations

This research recommends further that the understanding of their experiences and phenomena should be the basis of identifying their status. The coping of the person has been proven erratic in some ways due to traditions and norms defined by the society as generalized. The individual experiences seemed to matter most, as demonstrated in this research. The in-depth understanding of the benefits of remarrying and their fulfillment towards aging may be further explored using the results of this study as a basis.

Researchers and clinicians have an obligation to provide essential information to elderly remarried widows about the healthy and proper coping and adjustment to this life-changing event. More studies may also be conducted by the researchers to gain more understanding about the experiences of remarried widows. Other implications include the need for more accessible resources for bi-parents by the clinicians, such as family education, finances, and elderly care in communities.

CONCLUSION

Even though there were definite problems raised with every theme, there are issues that fit into these categories, displaying that these elderly face challenges that affect their everyday lives. The happiness, support for resources, and role transition among elderly widows may not be totally accounted for in researches due to its complexity.

However, when based on the findings of the study, it can be concluded that the remarried widows view life after remarriage with the new family and children as a positive experience despite the challenges. Remarriage and being with another family can improve the wellbeing of the elderly widows. It has been a common viewpoint among the elderly that a second relationship is better than the past. Overall, the participants viewed remarriage and bi-parenting as a fulfilling decision. Having children and a new partner around is an opportunity to bring back a complete family structure together.

The lived experiences are always involved with processes and phases which are constantly changing. For the widows, this stage in their lives has been perceived as unpleasant. The phases of remarrying and becoming part of the new family as a bi-parent are fulfilling. The support from the peers and members of the family for remarriage is highly recommended as these enhance adjustment and coping. Having a more extensive support network, and the presence of people around them makes them feel more secure and their needs fulfilled.

Declaration of conflict of interest

There is no conflict of interest to be declared.

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ORIGINAL RESEARCH

ASSESSING CARPAL TUNNEL SYNDROME AMONG ADMINISTRATIVE STAFF OF A HIGHER LEARNING INSTITUTION: A PRELIMINARY STUDY

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Abstract

Background: Repeated hand and wrist movements increase the risk of carpal tunnel syndrome (CTS). The administrative staff is one of the high-risk classes that repeatedly involve the execution of identical tasks.

Objective: This preliminary study was conducted to determine the prevalence of CTS among administrative staff and identify the socio-demographic and occupational risk factors for this syndrome.

Methods: Descriptive cross-sectional study design was conducted amongst administrative staff at one of the higher learning institutions in Pahang, Malaysia. A total of 61 respondents were conveniently sampled according to the inclusion criteria. Respondents were required to undergo three tests (Phallen's test, Thinel's test, Durkan's test) to identify probable CTS and answer questionnaires (socio-demographic background, occupational risk factors, and Boston Carpal Tunnel Syndrome Questionnaire). Data were analyzed using SPSS, and a Chi-square test was used to identify risk factors for CTS.

Results: The average age for respondents was 31.72 (±5.38). The majority of respondents were female (70.5%), with a bachelor's degree background and below (91.2%), and never used ergonomic tools (68.9%). The prevalence of probable CTS was 16.5% (n=10). There is no statistically significant finding between socio-demographic and occupational risk factors with probable CTS ($p > .05$).

Conclusion: The data from this preliminary study revealed no association between the use of computers at work and probable CTS in a higher learning institution. Although the findings are not significant, this study can be used as a baseline for a future longitudinal study for nurses and other healthcare professionals to encourage good occupational and environmental health.

KEYWORDS
preliminary data; carpal tunnel syndrome; median neuropathy; neuromuscular disease entrapment neuropathy; nursing

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BACKGROUND

Carpal tunnel syndrome (CTS) is a median nerve compression at the wrist joint level and the most common peripheral nerve entrapment syndrome. CTS is widely identified as the most costly upper extremity musculoskeletal condition among working-aged patients (Dale et al., 2013). The majority of CTS cases are chronic and idiopathic, with many risk factors reported (Wright & Atkinson, 2019). These involve the female gender (peak age 45 to 54 years), increasing age, obesity, thyroid disease, diabetes, pregnancy, renal failure, primary amyloidosis, and drug toxicity (Newington et al., 2015).

Computer use is associated with pain complaints, but it is still unclear if this association is causal. There is limited knowledge of particular conditions or diseases (Andersen et al., 2011). Evidence of increased hand activity and strength is linked to the increasing prevalence of carpal tunnel syndrome (Munolin et al., 2014). Administrative staff who have worked primarily in clerical, operational, and management offices, such as keeping records or accounts and performing other routine administrative tasks, may use a computer that requires repetitive movement to the wrist. This can trigger median nerve pressure when performing their duties at work. Typing induces changes in the median nerve that are affected by the ulnar deviation level. Poorer hand sensitivity and dexterity and excessive force exerted by digits and pen tips were reported in handwriting among CTS patients (Kuo et al., 2014). Although it is not clear if these changes contribute to long-term symptoms or nerve damage, their presence adds to the evidence of a potential connection between CTS and the

use of the keyboard (Toosi et al., 2015). There is no guideline for ergonomic devices in patients with CTS, but it remains based on personal preference (Schmid et al., 2015).

In Kuwait, approximately 18.7% of office staff reported having CTS (Raman et al., 2012). Currently, there is no clear prevalence reported for CTS among office workers in Malaysia. These data are essential for nurses and other healthcare professionals to encourage good occupational and environmental health and avoid further complications. Therefore, this study aimed to determine the prevalence of CTS among administrative staff and to identify the socio-demographic and occupational risk factors of this syndrome.

METHODS

Study Design and Participants

This is a cross-sectional quantitative descriptive study design. The participants were administrative staff engaged in clerical, operational, and office management at one of the higher learning institutions in Pahang, Malaysia. They were included based on the criteria of administrative staff who worked full-time, understand the English language, and willing to take part in the study. Respondents were excluded if they had an existing hand injury. The sample size was estimated based on the previous research, which recorded that the prevalence of workers having CTS below the age of 30 is 3% and above the age of 30 is 25% (Ithnin, 2012). By using the two proportion formulas and 95% confidence interval, the required sample was 76 (derived by Epi-Info software version 7).

Instruments

Respondents who had already confirmed diagnosed with Carpal Tunnel Syndrome were given the questionnaire directly, while respondents who did not confirm or did not know were tested with Phalen's test, Thinel's Test, and median nerve compression (Durkan test) test before giving the questionnaire. The test session lasted about 5 minutes, and the questionnaire lasted about 20-30 minutes. Upon completion, the respondents were asked to return the questionnaire, and the questionnaire was checked before leaving the session. Socio-demographic backgrounds and occupational risk factors such as years of work experience, computer use at the workplace, hours spent on the computer, ergonomic use of computer equipment were among the requirements measured among the respondents.

Data Collection

Data were collected from January to March 2015 from six faculties at one of the higher learning institutions in Pahang, Malaysia. Respondents were identified and approached based on the list name of the staff. The purpose of the research was briefly clarified, and some questions were asked to confirm whether he/she had been diagnosed with Carpal Tunnel Syndrome and had any wrist abnormality.

Data Analysis

Data were analyzed using descriptive and inferential analysis. A Chi-square test was used to determine the association between variables and probable for CTS. P-value <0.05 was considered to be statistically significant at a 95% confidence interval.

Ethical Consideration

Ethical approvals were obtained from the Kulliyyah (Faculty) of Nursing Postgraduate and Research Committee (KNPGRC) (IIUM/313/20/4/10) and IIUM Research Ethics Committee (IREC) (IIUM/305/14/11/2/IREC3). All respondents gave their written informed consent.

RESULTS

A total of 61 respondents participated in the study, and the socio-demographic characteristics are presented in Table 1. Respondents are between 22 and 45 years of age (mean= 31.72, SD= ±5.38). The majority (70.5%) of the respondents were female than the male respondents (n = 18). The BMI is 25.09 (SD= 3.60), while the level of education ranges from high school (32.8%), diploma (39.3%), bachelor (18.0%), and others (9.8%).

Table 1 The characteristics of the respondents (n=61)

Variable	n (%)
Age, years (mean±SD)	31.72±5.38
Gender	
Male	18 (29.5)
Female	43 (70.5)
BMI, kg/m^2 (mean±SD)	25.09±3.60
Kulliyyah (Faculty)	
Science	10 (16.4)
Allied Health	9 (14.8)
Pharmacy	9 (14.8)
Medicine	11 (18.0)
Dentistry	12 (19.7)
Nursing	10 (16.4)
Education	
High School	20 (32.8)
Diploma	24 (39.3)
Bachelor	11 (18.0)
Master/PhD	0 (0.0)
Others	6 (9.8)

Table 2 illustrates the prevalence of probable CTS and occupational risk factors among the respondents. The majority of probable CTS was 16.5% (n =10), and the working experience was between one year and 20 years (mean = 7.26, SD = 4.764). All respondents used a computer at their working place according to scheduled office time. Hours spent on the computer is ranging from three to eight hours (mean = 6.30; SD = 1.520). However, only 31.1% (n = 19) of respondents applied ergonomic tools when using a computer, while the remaining respondents, 68.9% (n = 42), did not use any ergonomic tool.

Table 2 The prevalence of probable CTS and occupational risk factors among the respondents

Variable	n (%)
Probable CTS	
Yes	10 (16.4)
No	51 (83.6)
Computer usage per day, hours (mean±SD)	6.30±1.52
Applied ergonomic tool	
Yes	19 (31.1)
No	42 (68.9)
Working experience, years (mean±SD)	7.26±4.76

Table 3 shows the associations between the prevalence of probable CTS and socio-demographic and occupational risk factors. The result showed that the probable CTS was not associated with any sociodemographic and occupational risk factors. However, the prevalence rate among respondents was higher in females (20.9%) than males (5.6%). The respondents with low BMI (24.04± 5.66) more likely to have probable CTS compared to those who have higher BMI (25.29±3.08). More respondents from Kulliyyah (Faculty) of Pharmacy and completed high school were reported having probable CTS compared to respondents from other faculties. Moreover, the respondents who have long working experience and computer use were reported to have more probable CTS. Interestingly, the respondents who reported applied ergonomic tools more likely to have probable CTS.

Table 3 The associations between prevalence of probable of CTS and socio-demographic and occupation risk factors

Variable	*n* (%)		P-value
	With Probable CTS	Without Probable CTS	
Total respondents, *n*= 61	10 (16.4%)	51 (83.6%)	
Age, years (mean±SD)	31.60±5.89	31.75±5.34	0.94
Gender			0.27
Male	1 (5.6)	17 (94.4)	
Female	9 (20.9)	34 (79.1)	
BMI kg/m^2 (mean±SD)	24.04±5.66	25.29±3.08	0.51
Kulliyah (Faculty)			0.24
Science	2 (20.0)	8 (80.0)	
Allied Health Sciences	2 (22.2)	7 (77.8)	
Pharmacy	3 (33.3)	6 (66.7)	
Medicine	1 (9.1)	10 (90.9)	
Dentistry	0 (0.0)	12 (100)	
Nursing	2 (20.0)	8 (80.0)	
Education			0.71
High School	4 (20.0)	16 (80.0)	
Diploma	4 (16.7)	20 (83.3)	
Bachelor	2 (18.2)	9 (81.8)	
Masters PhD	0 (0.0)	0 (0.0)	
Others	0 (0.0)	6 (100)	
Computer usage per day, hours (mean±SD)	6.80±1.48	6.20±1.52	0.25
Applied ergonomic tool			0.77
Yes	4 (21.1)	15 (78.9)	
No	6 (14.3)	36 (85.7)	
Working experience, years (mean±SD)	8.30±6.96	7.06±4.27	0.60

DISCUSSION

The finding showed no significant difference in the prevalence of acquiring CTS in terms of gender. This preliminary study indicates no difference between the prevalence of developing CTS in males and females. The insignificant result could be due to the unequal distribution of gender among administrative clerical staff with fewer respondents being male staff. However, gender has been shown to have a definite effect on nerve conduction study variables, and the effects have been reported as not similar in motor and sensory nerves (Jha, 2018). It has also been reported in a study in peninsular Arab (Raman et al., 2012). One possible reason could be the difference in workload at the workplace; male workers are more likely to engage in the physically required occupation.

The result showed no association between the prevalence of acquiring probable CTS with working experience among administrative office staff. Another study on the relationship between long exposure to the frequent high movement of the wrist and the hand, extreme wrist position, availability of protection, and hand-held vibrating tools have been identified as key factors of occupational risks (Cifidemir et al., 2013). However, only administrative staff were involved in this study, as the workplace task did not expose to the high risk of repetitive hand movement, vibrating tools, and extreme wrist position.

Computer use also shows no association with the prevalence of probable of CTS. There is no strong evidence in this study that shows the effect of long exposure to computer use that can develop CTS among respondents. This study is supported by the previous research that concludes no association between computer use and probable CTS (Mediouni et al., 2014).

Meanwhile, there is no association between the prevalence of acquiring CTS and ergonomic usage among office workers. However, another study demonstrates some personal and ergonomic factors associated with CTS among laboratory technicians (El-Helaly et al., 2017). It was recommended that proper work posture, including healthy working conditions, must be provided to make the work more comfortable and relaxed (Moom et al., 2015). Various ergonomic intervention programs may help reduce ergonomic risk factors among computer workers (Esmaeilzadeh et al., 2014; Lubkowska et al., 2016). Thus, it is crucial for nurses employed in occupational health or other healthcare professionals to develop, implement, and evaluate comprehensive occupational health and safety programs for administrative staff to prevent occupational injuries and illness.

The findings of this preliminary study were the outcome of a cross-sectional study that may not be generalized. A longitudinal study may be required to determine the causal relationship. The probable CTS in

this study sample was based on a self-reported questionnaire, which could lead to recall bias. The findings could lead to reporting bias as the administrative staff could do some other repetitive movement in daily activities such as mobile phone use. However, the authors assumed that other repetitive movements are not as thorough as their routine of work. Furthermore, clinical nerve conduction tests may be used in the future, although this approach is time-consuming and requires a great deal of cooperation from the respondents.

CONCLUSION

Data from this preliminary study showed no association between the use of computers at work and probable CTS in a higher learning institution. Although the findings are not significant, this study may be used as a baseline for future longitudinal studies. Potential large-scale research could be carried out to investigate the real prevalence of possible CTS among administrative staff in higher learning institutions.

Declaration of Conflicting Interest
The authors declare there is no conflict of interest.

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Authors Contribution

	MKCH	MSA	ZNBSA	FICJ	MKZHF
Concepts	√	√	√		
Design				√	√
Definition of intellectual content	√	√	√	√	√
Literature search	√	√	√		√
Data acquisition	√	√	√	√	√
Data analysis	√	√		√	
Statistical analysis			√	√	√
Manuscript preparation	√	√	√	√	√
Manuscript editing	√		√		√
Manuscript review		√		√	
Guarantor	√	√	√	√	√

Data Availability Statement
Research data is kept at the corresponding author's university and released upon request, if related.

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ORIGINAL RESEARCH

THE RELATIONSHIP BETWEEN THE COTININE LEVEL IN URINE AND VITAMIN D IN THE UNIVERSITY STUDENTS

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Abstract

Background: Vitamin D deficiency is today acknowledged as a pandemic. Vitamin D deficiency and insufficiency are associated with many chronic diseases, including common cancers, cardiovascular diseases, metabolic syndrome, and infectious and autoimmune diseases.

Objective: This study aims to investigate the relationship between the cotinine level in urine and Vitamin D.

Methods: This study employed a descriptive and relational screening design. It was conducted with 74 smoking university students between January 2019 and March 2020. Data were collected through socio-demographic form and Fagerstrom test for nicotine dependence. Besides, the participating students' blood and urine samples were taken in a suitable environment.

Results: The average age of the participating students was 21.50±2.09. Of all the students, 71.6% were males, 62.2% were exposed to the sun between 12 p.m. and 2 p.m., and the average number of cigarettes smoked daily was 13.52±8.22. The average Vitamin D level in blood was 32.4±15.3 (ng/mL), and the average cotinine level in urine was 1.60±.32 (ng/L). No statistically significant relationships were found between the Vitamin D level and the cotinine level (p<0.05).

Conclusion: Smoking causes diseases and death in many people, and it is a changeable risk factor. Nursing practices on the struggle against smoking are effective. No significant relationships were found between the Vitamin D level in blood and cotinine level in urine. Similar studies are recommended to be conducted with larger groups and participants from different age groups.

KEYWORDS
vitamin D; cotinine; smoking; risk factors; universities, tobacco

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BACKGROUND

Vitamin D is among the vitamins that dissolve in fat. Since in suitable biological environments, it can be synthesized endogenously, it is a sterol group with hormones and hormone precursors. Vitamin D has the most important effect on calcium, phosphor metabolism, and bone mineralization (Bringhurst et al., 2005; Champe et al., 2007). However, studies conducted recently have shown that Vitamin D deficiency and insufficiency could be related to several chronic diseases such as common cancers, metabolic syndrome, cardiovascular diseases, infectious diseases, and autoimmune diseases (Holick, 2007; Hyppönen et al., 2008).

More than 1 billion people worldwide have Vitamin D deficiency of insufficiency. Today, Vitamin D deficiency is acknowledged as a kind of pandemic (Manuvi et al., 2015; Wacker & Holick, 2013). A recent study conducted by Uçar et al. (2012) in Ankara, Turkey, reported a very high prevalence of Vitamin D deficiency (51.8%) and 20.7% Vitamin D insufficiency. Sufficient Vitamin D intake and maintenance of the optimum Vitamin D level in serum are highly important both for the bone, calcium, and phosphor mechanism and for general health and well-being. Vitamin D deficiency and insufficiency is a global health problem and could be a risk for wide-spectrum acute and chronic diseases (Pludowski et al., 2013).

The main source of Vitamin D is the formation of Vitamin D3 (cholecalciferol) in skin photochemically from 7-dehydrocholesterol by the type B ultraviolet (UVB) lights *endogenously*. Vitamin D3 is converted to its inactive products as a result of high exposure to sunlight. Vitamin D in the diet is available in the form of ergocalciferol (Vitamin D2) found in plants and cholecalciferol (Vitamin D3) in animal tissues. Vitamin D is mainly in the fish, egg yolks, and liver (Öngen et al., 2008; Uçar et al., 2012). Vitamin D 25(OH)D levels of below 20 ng/mL show Vitamin D deficiency, between 21 and 29 ng/mL show Vitamin D insufficiency, over 30 ng/mL show sufficient level of Vitamin D (ideal level is between 40 and 60), and over 150 ng/mL show vitamin D intoxication (Holick et al., 2011; Uçar et al., 2012).

The use of the sun as a source of Vitamin D is quite difficult due to factors such as cloudy weather affecting solar radiation, air pollution, ozone density, altitude, time of the day, season, differences in skin color, etc. (Tsiaras & Weinstock, 2010). One of the important causes of air pollution, which makes it challenging to use the sun as the source of Vitamin D, is tobacco use. Tobacco use is one of the biggest public health problems globally (Centers for Disease Control and Prevention, 2019; World Health Organization, 2020). The World Health Organization (2017) indicated the smoking prevalence among individuals aged 15 and over as 27.5%. Smoking is more common among university students than in general society (Hossain et al., 2017; Sezer et al., 2018; Tucktuck et al., 2018; Vatansev et al., 2019). Vatansev et al. (2019) reported the smoking rates as 11.6% among medical faculty students. According to a study, including nursing department students, 34.3% of the students smoked (Çifçi et al., 2018). Every year, more than 8 million people lose their life due to this reason. Of these deaths, approximately 1.2 million are caused by exposure to tobacco. Tobacco use is a significant risk factor for cardiovascular diseases, respiratory system diseases, and several cancer types (Centers for Disease Control and Prevention, 2019; World Health Organization, 2020). Continuing to smoke is assumed to be related to the rewarding effect of nicotine. Tobacco use disorder is a difficult disease to treat due to several biological, psychological, and sociological reasons.

The association of Vitamin D with neuropsychiatric diseases, which has recently been subject to much concern, has made the status of Vitamin D in tobacco addicts a topic of interest. Vitamin D is a steroid hormone whose effects mainly on the endocrine and skeleton system have been investigated in previous studies. Recent literature has shown that Vitamin D is related to several diseases ranging from neuropsychiatric to cancer diseases (Feldman et al., 2014; Spedding, 2014; Yüksel et al., 2014). However, the literature still includes little data on the relationship of tobacco consumption with low Vitamin D levels (Afzal et al., 2013; Shirkov et al., 2015).

The studies that investigated the association of tobacco use disorder with Vitamin D showed that 81.9% of tobacco users in the study conducted by Sengezer et al. (2016) had insufficient Vitamin D levels. Exposure to environmental tobacco smoke was reported to be associated with low Vitamin D levels in blood circulation and sinus tissues (Manavi et al., 2020). Besides, a 28-year cohort study conducted with the participation of 9791 individuals showed that 25(OH)D was not associated with other cancers but with high-risk of tobacco-related cancers, which indicated a different, potential relationship between Vitamin D and tobacco (Afzal et al., 2013).

Cotinine is the predominant metabolite of nicotine used as a biomarker for exposure to tobacco smoke. Cotinine concentrations can be detected in blood, urine, or saliva. The urine cotinine concentration levels are higher than those in blood or saliva. This makes urine a more sensitive matrix to detect low-concentration exposure (Avila-Tang et al., 2013). In light of this information, this study aimed to investigate the relationship between the cotinine level in urine and Vitamin D.

METHODS

Study Design

This study employed a descriptive and relational screening design. It was carried out in a university located in eastern Turkey between January 2019 and March 2020.

Sample

The target population was 109 students who were enrolled in the health-related departments of the university and who met the research criteria. The sample was 74 people calculated according to the "formula used in cases where the size of the universe is known" (Kilic, 2012; Naing et al., 2006). The study included students who attended the school between the dates mentioned above and volunteered to participate in the study to reach the sample size. The inclusion criteria of the study included individuals who smoked, those who did not use sun cream, exposed to sunlight in hands, face, and arms for at least three times a week and for 15 minutes, not obese or cachectic, not pregnant or breastfeeding, had no chronic diseases, did not use medicine regularly, and those who had no limits for consuming liver, eggs, and butter in their diet.

Measures

The data collection tools included the socio-demographic form and the Fagerstrom test for nicotine dependence. Blood and urine samples of the students who answered the questions in the data collection forms were taken on an empty stomach in the morning.

The socio-demographic form. This form has 12 questions that aim to collect data about tobacco use, exposure to sunlight, and dietary preferences.

The Fagerstrom Test for Nicotine Dependence (FTND). The test was developed by Fagerstrom and Schneider (1989) to identify the level of physical nicotine dependence. The reliability and validity of the test for our country were performed by Uysal et al. (2004); Cronbach's Alpha reliability coefficient was reported to be 0.56. Each item of the scale is scored as "0", "1", "2", and "3". The scores of the scale range between 0 and 10. The scores obtained from the scale increases as the nicotine dependence increases. The total scores obtained from the test indicate nicotine dependence in 5 groups in which 0-2 points indicate very low dependence, 3-4 points indicate low dependence, 5 points indicate medium dependence, 6-7 points indicate high dependence, and 8-10 points indicate very high dependence. The scale's Cronbach's alpha value was found 0.72 in the present study.

Data Collection

After the students were informed about the study through the informed consent form, written approval was obtained from those who volunteered to participate in the study. Blood and urine samples were taken in a suitable environment from the students who filled in the Socio-demographic Form and the Fagerstrom Test for Nicotine Dependence; the samples were taken by the researchers who were specialized in nursing. This procedure took about 25-30 minutes. *Taking Urine Samples and Analysis.* The researcher gave the students capped urine collection containers and asked them to sample urine. The urine samples were taken to screw-capped urine specimen collection, and the sample urines were centrifuged at 5000 rpm for 10 minutes. After the urine samples were centrifuged, supernatants were taken to the Eppendorf tubes. The cotinine analysis in urine was performed on the same day using the Human Elisa Urine Kit. After the procedures were completed in line with the guidelines, the results were printed using the microplate reader for necessary statistical analyses.

Taking the Blood Samples and Analysis: 2 ml full blood samples taken by three researchers who were experts in the field were taken to biochemical gel tubes and centrifuged at 5000 rpm for 20 minutes after they waited in room conditions for 20 minutes. The volunteer serums from the centrifuged blood samples were taken to Eppendorf tubes and numbered. Vitamin D levels in blood were analyzed on the same day using the Human Elisa Serum Kit. After the procedures were completed in line with the guidelines, the results were printed using the microplate reader for necessary statistical analyses.

Data Analysis

Data were analyzed in the SPSS package program using descriptive statistics, Kolmogocov- Smirnov, and Spearman correlation tests. Statistical significance was set at <0.05.

Ethical Considerations

Before the study was conducted, approval was received from the Agri Ibrahim Cecen University Scientific Research Ethics Committee (Document date and number: 30/01/2018-E.2686), and permission was obtained from the institution where the study was conducted. Written consent was received from the students after they were given information about the purpose of the study.

RESULTS

The average age of the participating students was found at 21.50±2.09. Of all the participants, 71.6% were males, and 62.2% were exposed to the sun between 12 p.m. and 2 p.m. An analysis of the tobacco use of the students showed that the average number of cigarettes smoked daily was 13.52±8.22, the average age for starting smoking regularly was 17.18±2.47 years, the average age of trying smoking for the first time was 14.59±3.72 years, and the average duration of smoking was 4.88±2.82 years (**Table 1**).

Table 1 The Participants' Socio-demographic Characteristics (N=74)

		n	%
Gender	Female	21	28.4
	Male	53	71.6
What time of day are you exposed to the sun more?	8-12	0	0
	12-14	46	62.2
	14-17	28	37.8
	$\overline{X}$ ±SD		
Age	21.50±2.09 (min= 19, max= 27)		
How many cigarettes do you smoke per day?	13.52±8.22 (min= 1, max= 40)		
How old were you when you started smoking regularly?	17.18±2.47 (min= 12, max= 26)		
When did you try smoking for the first time?	14.59±3.72 (min= 5, max= 24)		
How long have you been smoking? (years)	4.88±2.82 (min= 0.1, max= 12)		

The blood Vitamin D level of the study participants was 32.4 ± 15.3 ng/mL. The lowest Vitamin D level was 1.3 ng / mL, and the highest level was 67.3 ng/mL. The urine cotinine level of the individuals was 1.60 ± .32 ng/L, with 2.34 ng /L as the highest level and 1.25 ng/L as the lowest level (**Table 2**).

Table 2 Average Vitamin D and Cotinine Levels

	$\overline{X}$ ±SD	Min.	Max.
Vitamin D Level (serum) (ng/mL)	32.4±15.3	1.3	67.3
Cotinine Level (urine) (ng/L)	1.60 ± .32	1.25	2.34

When the relationship between the participants' cotinine level in the urine and the vitamin D level in the blood was examined, a negative relationship was found. However, no statistically significant association was detected (p>0.05) (**Table 3**).

Table 3 Relationship between the Vitamin D Level in Blood and Cotinine Level in Urine

		Vitamin D Level (serum) (ng/mL)
Cotinine level (urine) (ng/L)	r	-.010
	p	.930

DISCUSSION

Cotinine in urine is one of the commonly used and accepted bioindicators used for identifying tobacco use or exposure (Thomas et al., 2020). While the urine cotinine levels of non-smokers are below 100 ng/ml, the threshold between active and passive smokers ranges between 20 and 100 ng/ml (Haufroid & Lison, 1998). According to the SRNT Sub-Committee on Biochemical Verification, the urine cotinine value that can commonly be used for distinguishing between smokers and non-smokers is 50 ng/ml (Benowitz et al., 2002). A study that identified the urine cotinine cut-off point distinguishing between passive or active smokers reported the average concentrations as 2200 ± 800 µg l−1 for active smokers. The cut-off point to distinguish active smokers in terms of minimal and high amounts of exposure to tobacco smoke was reported to be 2100 µg l−1 in the same study (Zielińska-Danch et al., 2007).

This study found the average cotinine concentration level of the participating individuals as 1.60 ± .32 ng/L in their urine samples. The literature indicates that this value is in the same category as non-smokers. In their study conducted with health professionals with an average age of 30.3 ± 6.6, Temel et al. (2009) found the average cotinine level as 949.5 ng/ml among non-smokers. It was reported that nicotine metabolism varied between individuals. It was affected by diet, age, gender, pregnancy, and use of medicine and the polymorphisms in the CYP 2A+ gene (Holloway, 2014).

An individual's Vitamin D status is identified by analyzing the 25(OH)D level in blood. Values of less than ten ng / mL show severe Vitamin D deficiency, less than 20ng/mL show Vitamin D deficiency, and between 20 and 30 ng/mL show Vitamin D insufficiency. If the 25(OH)D level is higher than 30 ng/mL, the Vitamin D level is

considered to be sufficient, and if this value is more than 150 ng/mL, it is accepted as vitamin intoxication (Fidan et al., 2014; Holick, 2007; Hossein-Nezhad & Holick, 2013; Wacker & Holick, 2013).

The average Vitamin D level of the participants in this study was found to be 32.4±15.3 (ng/mL). In their retrospective study, Solak et al. (2018) found the average serum 25-hydroxyvitamin D level as 15.2 ± 8.8 ng/ml. Other studies investigating the Vitamin D levels also reported that the 25-hydroxyvitamin D level was lower than 20ng/mL (Katrinaki et al., 2016; Mansoor et al., 2010; Yu et al., 2015). This finding of the study is different from the literature, which might result from the studies conducted in other regions and with different age groups.

This study found no relationships between serum Vitamin D and urine cotinine levels. This finding might result from the fact that the urine cotinine level was in the same category as non-smokers. A study conducted with Korean adults reported that the relationship between smoking and Vitamin D level was significant. The researchers also recommended that the causal relationships between smoking and Vitamin D should be investigated through systematic cohort studies (Lee et al., 2019).

Exposure to cigarette smoke was reported to have negative effects on pregnant women. The study reported no differences between the mothers and babies in terms of the serum Vitamin D levels; however, Vitamin D was lower in the group exposed to cigarette smoke (Banihosseini et al., 2013). Also, cotinine blood serum concentrations are reported to affect factors such as gender, ethnicity, dietary supplement intake, exposure to the sun, and Vitamin D concentrations. Actively smoking black women were reported to have the highest Vitamin D deficiency and insufficiency levels than other women (Manavi et al., 2015).

Public health nurses have roles and responsibilities in diagnosing and eliminating the changeable disease risk factors that may affect the health of individuals, families, and societies to protect, maintain and improve health (Bialous et al., 2017). Cigarette use causes diseases and death in many people and is considered to be a changeable risk factor; randomized controlled studies have revealed that nursing practices on the struggle against smoking are effective (Pardavila-Belio et al., 2015; Rice et al., 2017).

Limitation

The primary limitation of the present study is that the urine cotinine level was at a close level with non-smokers. Also, the young age group and small sample size brought some limitations. Future studies are recommended to be conducted with high cigarette exposure groups, more participants, and individuals from various age groups.

CONCLUSION

Smoking causes diseases and death in many people, and it is a changeable risk factor. Nursing practices on the struggle against smoking are effective. This study found no statistically significant relationships between Vitamin D levels in blood and cotinine levels in urine. Similar studies are recommended to be conducted with larger groups and different age groups.

Declaration of Conflicting Interest

The authors report no actual or potential conflicts of interest.

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Author Contributions

All authors contributed to the study conception and design. ABB conceptualized the study. ABB, NU, and MY collected data. ABB and NU conducted the analyses. ABB, NU, and SKA drafted the original version of the manuscript and provided critical revisions. All authors have read and approved the final manuscript.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ORIGINAL RESEARCH

SCHOOL HEALTH PROMOTION: A QUASI-EXPERIMENTAL STUDY ON CLEAN AND HEALTHY LIVING BEHAVIOR AMONG ELEMENTARY STUDENTS IN JAYAPURA, PAPUA, INDONESIA

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Abstract

Background: The Indonesian government has launched a clean and healthy living behavior program as one of the efforts for school health promotion. However, the healthy behaviors of the elementary students remain low.

Objectives: This study aimed to examine the effect of audiovisual-based education on the knowledge and attitudes of clean and healthy behavior in elementary students.

Methods: This was a quasi-experimental study with a pretest-posttest comparison group design conducted from 1 October to 17 October 2018. A total sample of 272 students was selected using purposive sampling, with 136 assigned in an experimental group (audiovisual group) and a comparison group (poster only group). Knowledge and attitudes of clean and healthy living behavior were measured using validated questionnaires. Data were analyzed using a paired t-test and independent t-test.

Results: There was a significant effect of the interventions given in the experimental and comparison group on knowledge and attitude of clean and healthy living behavior (p<0.05). However, the experimental group showed a higher mean score compared to the comparison group in knowledge and attitudes, which indicated that the use of audiovisual-based education was more effective than the use of poster alone in improving the knowledge and attitudes of clean and healthy living behavior.

Conclusion: The students who received audiovisual-based education had higher knowledge and attitudes of clean and healthy living behavior than those who only received poster-based education. This study provides input for pediatric and community nurses to provide better health education for the community, specifically for school health promotion.

KEYWORDS
health education; health behavior; knowledge; attitudes; students; Indonesia; nursing

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BACKGROUND

Clean and healthy living behavior, or called *Perilaku Hidup Bersih dan Sehat* (PHBS), is a set of actions that make a person or family able to help themselves maintain their health (Proverawati & Rahmawati, 2016). Inappropriate PHBS can cause diarrhea and other health problems (Nazliansyah et al., 2016). Besides, according to Danuri et al. (2013) and Koem (2015), lack of physical activity, lack of consuming fruits and vegetables, excessive food portions, and fast food intake in children result in overweight or obesity.

PHBS is one of the programs conducted by the Indonesian government for health promotion. However, based on the Basic Health Research of Ministry of Health of the Republic of Indonesia (2013), elementary children who performed PHBS were low, such as correct handwashing with soap was 47%, consuming risky foods once per day (sweet foods 53.1%, salty 26.2%, fatty 40.7%, burned 4.4%, preserved animals 4.3%, flavoring 77.3%, coffee 29.3%, and caffeine other than coffee 5.6%), and doing physical activity gratified as active was 73.9% and less active was 26.1%. The acceptable standard results of the PHBS criteria are at 32.3%, with the highest proportion of DKI Jakarta (56.8%) and the lowest in Papua (16.4%).

Data from Jayapura City Central Statistics Agency (2013) show that the implementation of PHBS in the Elementary School of Inpres Bertingkat Perumnas 1 Waena was still not optimal. Of 564 existing students, 300 students (53.1%) lacked an understanding of the importance of handwashing correctly and adequately, and 264 students (46.9%) did not do hand washing correctly. There was a lack of students' understanding in choosing snacks at school and a lack of active students in physical activity, indicating poor knowledge.

Knowledge is the result of knowing, which occurs after sensing the object, and is influenced by the intensity of the attention of perception because of understanding (Notoatmodjo, 2010; Tuyen, 2018). Yulianti (2015) found 33 of 64 students had insufficient knowledge about PHBS (51.6%). Based on the PHBS indicators, 24 students (37.5%) did not do hand washing correctly, 30 students (46.9%) did not consume healthy snacks in the school cafeteria, and 30 students (46.9%) did not do regular physical activities. A similar study conducted by Lina (2016) in the Kuranji Padang sub-district that the students had the lowest knowledge of 56.3%.

The results of a preliminary study in 1,169 students at Elementary School of Inpres Bertingkat and Elementary School of Inpres 5.81 Perumnas 1 Waena showed that the implementation of the school health unit (called *unit kesehatan sekolah* - UKS) was still not optimal. As seen from the availability of facilities to wash hands (9 units), most students did not use them properly. From the results of the interviews with the second-grade teachers, it was indicated that among 154 grade IV and V students, only 60 students (39%) did not receive information about handwashing correctly, 75 students (49%) consumed unhealthy snacks outside of school, and 19 students (12%) did not do physical activities every day. This result shows the need for students' understanding of clean and healthy behavior. One factor affecting children's knowledge is attitude (Notoatmodjo, 2010; Sunaryo et al., 2020).

Attitude is the result of object evaluation, expressed in cognitive, affective, and individual behavior or responses obtained from the learning process towards various attributes related to the object (Notoatmodjo, 2010). Research conducted by Lina (2016) shows that the PHBS indicators of students who did not choose healthy snacks in school canteens were 100%. Thus, efforts to improve knowledge and attitudes are needed, one of which is by providing health education.

Health education is a form of business planned to improve individual or community health through mentoring, learning, and training activities to improve knowledge and attitudes physically, socially, and environmentally (Efendi & Makhfudli, 2009; Maulana, 2009; World Health Organization, n.d.). The more information that is known, the higher the ability of students to behave healthy lives. The roles of nurses should be implemented as educators, role models, and at the same time as facilitators in the delivery of education.

Vio et al. (2014) states that students' knowledge and attitudes can be increased after given information. Also, Amaya-Castellanos et al. (2015) revealed that educational media is used to improve students' knowledge and attitudes in doing physical activities and choosing foods that do not cause obesity. One form of education that can be used is through audiovisual media. Audiovisual media is considered effective in increasing knowledge and attitudes (Bruguésa et al., 2016). Audiovisual media in the delivery of PHBS education in the form of videos can present easily understood information. Simultaneously, the poster is a precise visual combination and draws one's attention to act from what is seen (Troseth & Strouse, 2017). Therefore, this study aimed to determine the effect of health education using audiovisuals (videos and posters) on the knowledge and attitudes of PHBS in elementary school students in Jayapura, Papua, Indonesia.

METHODS

Study Design

This was quasi-experimental design research with pretest-posttest with a comparison group design.

Respondents

The respondents in this study were students in grades 4 and 5 from two elementary schools in Waena Inpres State Elementary School, including Elementary School of Inpres Bertingkat Perumnas 1 Waena as an experimental group and Elementary School of Inpres 5.81 Perumnas 1 Waena as a control group. There were 272 students selected using purposive sampling, which 136 students assigned in each group. The inclusion criteria of the respondent were all students in grades 4 and 5, willing to become a respondent, and could write and read fluently. The exclusion criteria were students who did not attend school at the time of the research data collection.

Instrument

The instrument used in this study was questionnaires of knowledge and attitudes of students about PHBS at schools, modified from Listyowati (2012) and Proverawati and Rahmawati (2016), and the Ministry of Health of the Republic of Indonesia (2011). The knowledge questionnaire consisted of 20 questions in the form of multiple check questions (MCQ), using the Guttman scale in the form of right and wrong choices. The highest value of the total answers is 20, with a range of scores from 0 to 20. Knowledge assessment is said to be "good" if the value of the knowledge score is ≥mean and student knowledge is "lacking" if the value of the knowledge score is <mean. The questionnaire consisted of four domains, namely PHBS at schools (definition, benefits, training targets), washing hands with soap (definition, benefits, right time, how to wash hands properly), consuming healthy snacks (definition of healthy snacks, causes of consumption of snacks unhealthy, the definition of balanced nutritious food), and perform daily physical activity (definition, benefits, kinds of physical activity, advantages of doing the physical activity). Person Product Moment test and Cronbach's alpha were used for the validity and reliability of the questionnaire. The results of the validity test showed that the calculated *r*-value of each item statement was above 0.361, and the Cronbach's alpha value was 0.88.

The attitude questionnaire consisted of 15 questions using the Likert scale. Positive statements used favorable answers (1=strongly disagree, 2= disagree, 3= agree, 4= agree) while negative statements used unfavorable responses (4= strongly disagree, 3= disagree, 2= agree, 1= agree), with a range of attitude score values 0 - 60. Attitude assessment is said to be "positive" if the value of the attitude of students is ≥ mean, while attitude is said to be "negative" if the value of the attitude score of students is <mean. The questionnaire consisted of the same domains like the knowledge questionnaire. The questionnaire was valid with the *r*-value of each statement item was above 0.361 and reliable with the Cronbach alpha value was 0.89.

Intervention

The intervention was carried out in the experimental group by providing audiovisual-based education using video and posters about clean and healthy behavior (PHBS) for 45 minutes after the pretest. The health education was done at a different time from the agreement with the control and experimental groups. The video's duration was 4

minutes 57 seconds, for 2 x 5 minutes with the topics of PHBS materials (handwashing correctly, choosing healthy snacks, and doing physical activities at schools). The use of poster media for health education was implemented for 40 minutes. The respondents were asked to study independently for ten days, and the poster was posted in each class.

The comparison group was given only poster-based education about PHBS with the topics including handwashing correctly, choosing healthy snacks, and doing physical activities at school. They were also asked to learn independently for ten days.

Data Collection

Data were collected from 1 October 1 to 17 October 2018 by researchers and six research assistants. The research assistants were diploma nursing students. Their roles included distributing questionnaires, assisting in filling out questionnaires, and checking the completeness of the respondents' answers during data collection. The pretest was done one day before the intervention, while the posttest was done ten days after the intervention.

Data Analysis

Univariate analysis was used on demographic characteristics variable to describe its frequency distribution and proportions such as student age, sex, father and mother education, occupation, ethnicity, and information exposure. As data were normally distributed (>.05 using Kolmogorov Smirnov), Paired sample t-test and independent-sample t-test were used for data analysis.

Ethical Consideration

The research was conducted after receiving an approval letter from the Ethics Committee of the Biomedical Research Ethics Committee, Medical Faculty, Universitas Gadjah Mada (approval Ref: KE / FK / 1041 / EC / 2018 dated 26 September 2018). Each respondent signed informed consent before data collection. Before signing the informed consent, the researchers first explained the purpose of the study and the confidentiality of the data.

RESULTS

Characteristics of the Respondents

The majority of the respondents in the experiment and comparison groups were females, and their parents had higher educations. The father's job was mostly in non-public sectors, and the mother's job was a housewife. The ethnics of being Papua or non-Papua was slightly the same. Most of the respondents had information exposure about PHBS.

Table 1 Characteristics of the Respondents (*N*= 272)

Characteristics	Category	Group			
		Comparison (*n*=136)		Experiment (*n*=136)	
		f	%	f	%
Early school age	7 – 9 years old	24	17.6	27	19.8
Advanced school age	10-13 years old	112	82.3	109	80.1
Sex	Male	58	42.6	62	45.6
	Female	78	57.4	74	54.4
Father's education	Elementary school	7	5.1	12	8.8
	Secondary school	52	38.2	51	37.5
	Higher education	77	56.6	73	53.7
Mother's education	Elementary school	11	8.1	15	11.0
	Secondary school	63	46.3	62	45.6
	Higher education	62	45.6	59	43.4
Father's job	Jobless	9	6.6	9	6.6
	Non-public servant	81	59.6	92	67.6
	Public servant	46	33.8	35	25.7
Mother's job	Housewife	77	56.6	83	61
	Non-public servant	31	22.8	28	20.6
	Public servant	28	20.6	25	18.4
Ethnic	Papua	58	42.6	61	44.9
	Non-Papua	78	57.4	75	55.1
Information exposure					
Heard about PHBS	Never	8	5.9	9	6.6
	Ever	128	94.1	127	93.4
Counseling about PHBS	Never	21	15.4	17	12.5
	Ever	115	84.6	119	87.5
Taught how to wash hand with soap properly	Never	8	5.9	9	6.6
	Ever	128	94.1	127	93.4
Taught how to choose a healthy snack	Never	9	6.6	4	2.9
	Ever	127	93.4	132	97.1
Get information on the importance of physical activity	Never	15	11.0	14	10.3
	Ever	121	88.9	122	89.7
Total		136	100	136	100

Early school age: a student who is five years old when entering grade 1 (young age)
Middle school age: a student who is seven years old when entering grade 1 (appropriate age / according to the rules)

Differences in the Students' Knowledge and Attitudes

Table 2 shows a significant effect of health education on knowledge and attitude among students in the experiment and comparison groups. The use of audiovisual (video and poster) or poster only provided a significant difference in knowledge and attitude before and after the given intervention (p< 0.001*). However, the mean difference in the experimental group was higher than the control group in both knowledge and attitude, and it was statistically significant (p< 0.001*).

Table 2 Differences in the Average of Students' Knowledge and Attitudes in the Pretest and Posttest (N= 272)

Variables	Pretest	Posttest	Mean	*p-value*
	Mean (min-max)	Mean (min-max)	Difference	
Knowledge				
Comparison group	12.22 (3.00 - 19.00)	16.65 (9.00 - 20.00)	4.42	< 0.001**
Experimental group	11.70 (3.00 - 18.00)	17.50 (10.00 - 20.00)	5.79	< 0.001**
p-value[b]		< 0.001*		
Attitude				
Comparison group	41.53 (31.00 - 51.00)	48.58 (38.00 – 55.00)	7.05	< 0.001**
Experimental group	41.77 (31.00 - 48.00)	51.27 (41.00 – 58.00)	9.50	< 0.001**
p-value[b]		< 0.001*		

*significance at <0.05 | [a]paired sample t-test | [b]independent t-test

DISCUSSION

This study aimed to determine the effect of health education using audiovisuals (videos and posters) on the knowledge and attitudes of students in the provision of PHBS compared to the health education using poster only. The results indicated that both techniques of interventions had a significant impact on the knowledge and attitudes of the students. However, those who received audiovisual-based education were significantly higher in their knowledge and attitude than those who only received poster-based education. This indicates that the use of audiovisuals (videos and posters) can effectively improve knowledge and attitudes. Our findings were in line with the study conducted by Oktaviana (2017), who revealed that the students' handwashing attitudes increased after given education using audiovisual media.

In this study, two-dimensional animated images and exciting videos were designed. The information given was short and clear for 45 minutes to increase the enthusiasm of students in receiving the provided education. Troseth and Strouse (2017) stated that videos could present information, describe processes, explain complex concepts, teach skills, shorten the time, can influence attitudes, in this case, pay more attention, understand the contents of the storyline, and can be watched repeatedly. Bruguésa et al. (2016) also stated that video is one of the most effective students learning media in the delivery of information

Knowledge related to learning is influenced by various factors from within (natural) and outside (intervention) directly or indirectly in the form of available information tools (Budiman, 2013). Information provided by using audiovisual makes the students focus more on listening actively during the process of providing education, both the presentation of videos and posters and discussion sessions. This is in line with the research of Bieri et al. (2013) suggest that the use of audiovisual media makes someone easily absorb the messages and experience improvements in health practices and easier to understand compared to paper media (Van Der Meij & Van Der Meij, 2014). Albert et al. (2007) added that audiovisual media in education could convey consistent messages and increase understanding of the material.

It is noted that the poster only was also significant in increasing the students' knowledge and attitude. It is similar to Suirsoka and Supariasa (2012), who revealed that the poster provides a clear visual combination and attracts one's attention to be able to act from what is seen. Maimun and Erawan (2017) also said that the delivery of information using poster media could improve students' knowledge, attitudes, and actions in PHBS in Kendari City, Indonesia.

Although using audiovisual to increase knowledge and attitude of the students is not new; however, this study confirms that the audiovisual media for learning purpose can be generalized. We know that Papua is the eastern part of Indonesia, where a lack of studies was conducted compared to the number of researches conducted in the central and western part of Indonesia. The use of audiovisual as a medium to convey health information is more attractive to the students directly by the senses of sight and hearing. Also, this study serves as an input for pediatric and community nurses to provide better health education for the community, specifically for school health promotion.

Limitations of the Study

Although the use of the comparison group could reduce the bias of the effect of the intervention in this study, and the characteristics of the respondents in both groups had been controlled. However, other factors might influence the knowledge and attitudes of the students, such as culture, teachers' role models, educational institutions (Siagian et al., 2010), or other factors, which should be explored in future studies. In addition, as we asked the respondents to study independently after given a direct intervention, the responses among students might be different, which could influence the results. Besides, the instruments used in this study need further validation, specifically for good psychometric properties.

CONCLUSION

The use of audiovisual and poster-based health education provided a significant effect on knowledge and attitude in the provision of clean and healthy living behavior in the experiment and control group. However, the experimental group showed a higher mean score than the control group, which indicated that audiovisual-based education was more effective than the use of posters alone to increase the knowledge

and attitudes of clean and healthy living behavior. This study serves as an input for nurses, teachers, and parents to teach and facilitate students to maintain the students' clean and healthy living behavior.

Declaration of Conflicting Interest
There is no conflict of interest to declare.

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Authors Contribution
All authors contributed equally in the design and concept, data collection, data analysis, and drafted the manuscript. All authors approved the final version of the article.

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BELITUNG NURSING JOURNAL

PERSPECTIVE

APPRECIATING POSITIVITY OF COVID-19

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Abstract

This article aims to decipher the effects of COVID-19 on humans, thus maintaining the equanimity of life. Ecclesiastes continually radiates its significance these trying times with the operation that everything has its season under heavens. Only an undesirable and existential peril like COVID-19 steered to such profound transformation vastly. The portrayal is considered some of the many obvious outgrowths of the COVID-19 plague. Compared to 2019, levels of pollution have significantly subtracted to 50% because of the measures to ensure the virus is contained. Recognizing health-wealth worth took place when the world watches someone busy picking up the pieces of their lives amidst helpless speculators. In the busyness of life, most, if not all, rarely spend time to slow down, stay home, and go inward. The pandemic teaches us lessons about relationships. The invisible lines that divide people into strata - religion, sex, age, and country have all disappeared as humanity is confronted with this menace as people.

KEYWORDS
COVID-19; pandemic; humanity; environment; nursing

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INTRODUCTION

Aching. Humanity relates to how the world experience today—physical pain for those infected with the disease, and emotional impediment, both family members and support system. On the one hand, front-liners gave their lives, so others continue to live. Everyone has his own tale-to-tell of struggles and survival, while others cry aloud for hope and relief. News all over updates the accelerating rate of deaths and people under investigation against those who survived- their numbers minify. In the Philippines, when its government ordered placing the entire archipelago for community quarantine (National Government of the Republic of the Philippines, 2020), local executive directly implemented the law. The act is geared toward saving constituents from indirect harm since the foe is hardly recognized. The interagency task force was formed, spearheading the endeavor all for greater usefulness. At the initial course of the commission, the majority clamored and exclaimed. Workers fear that the lockdown would destroy more livelihoods than the coronavirus will take lives. The pandemic brought the global loss of jobs. It threatened the subsistence of the majority as businesses and transactions struggle to cope with the restrictions placed to control the spread of the virus—hunger, uncertainty, and the fear of the unknown cover the horizon. Human instincts describe physiologic needs (Tay & Diener, 2011), and people are afraid of that unknown. Expressions of denial, acts of contradiction are found in every corner. However, political will perseveres. With the picture of hopelessness and negation, are still there two sides to the coin? This article aimed at deciphering the effects of COVID-19 on humans, thus maintaining the equanimity of life. Ecclesiastes continually radiates its significance these trying times with the operation that everything has its season under heavens.

APPRECIATING POSITIVITY OF COVID-19

In a matter of months, the world abruptly transformed. Many died, thousands of people have fallen ill. For millions of others who have not acquired the virus, their entire lives, and the way they live have changed by it.

Though most clouds turned darker than its usualness, the direct rays of the sun continue to supply warmth among those who never get tired of banking on their faith. Frequently, we failed to acknowledge that no matter how thin a paper is, it always has two lateral sides. While negativity almost covers the earth, a little ray in a burrow redirects our path. The issue revolves around the fear of getting sick, the unprecedented demand between hospitals and patients, closure of establishments, cancellations of flights, and indefinite suspension of classes. Ugly, it is. But on the lateral hides beautiful opportunities that are produced even in the worse situations. In the same manner, the COVID-19 pandemic also bears good fruit; all we need to do is appreciate. If ever you do not see the positive, then commence creating it.

The portrayal is considered some of the many apparent outgrowths of the COVID-19 plague (**Figure 1**). Reports by Henriques (2020) revealed that compared to 2019, levels of pollution have significantly subtracted to 50% in New York because of the measures to ensure the

virus is contained. A parallel situation is also noted in China as emission fell to 25% during the first quarter of 2020 due to people quarantine. Coal use fell by 40% as this giant nation instructed plant owners and manufacturers to shut down operation since the last quarter of 2019. Further, China's Ministry of Ecology and Environment reported good quality air was almost 12% increase compared to 2019 data to over 330 cities in the country. Identical anecdotes on environmental impacts experienced by Spain, the United Kingdom, while satellite images in Europe confirmed nitrogen dioxide emission fading over northern Italy (Liqiang, 2020).

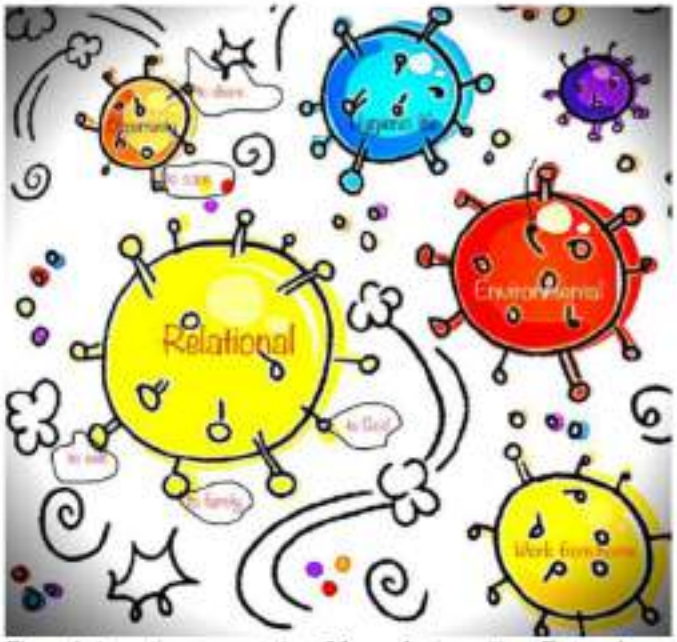

Figure 1. A creative representation of the pandemic positive effects on human lives

Only an undesirable and existential peril like COVID-19 steered to such profound transformation vastly. Mother earth has her way of healing. Florence Nightingale considered an icon of modern nursing to emphasize the fundamental role of the environment in the healing process of a patient (Rafferty & Wall, 2010). Nightingale focused on the utilization of the environment for an expedite healing of the human body. Warmth, the direct sunlight as the immediate needs of patients and keeping the air as pure as the external atmosphere. Even if the habitat is well-ventilated, the existence of organic material created a dirty space.

Cleanliness, as they say, is next to godliness. The recent release of UNICEF (Bender, 2020), the preventive and action controls, especially among school institutions, is hygiene-based. Covering nose and mouth while sneezing, often a practice of proper hand scrubbing with soap and water, and frequent disinfecting touched objects and surfaces constitute virus-free surroundings. Living a hygienic life is neither difficult nor complicated, to begin with. But due to massive industrialization, citizens often overlooked the primacy of the conventional methods to safeguard one's protection. Self- care principle at present periods of crises maintains its salience upon describing how or why people perform care for themselves (Hasanpour Dehkordi, 2012). But on a sad note, value appropriation occurs only when things are gone. It is prompting us of how materialistic our civilization has evolved and how, when in times of drawback, we learn that it is the essentials (food, water, medicine, and care) instead of the luxuries and lavish consumerism that are sometimes unnecessarily given value to. Recognizing health-wealth worth took place when the world watches someone busy picking up the pieces of their lives amidst helpless speculators.

Nurses and other health care providers are now being recognized in terms of their role in nation-building. COVID-19 is not a one-man battle, and it is clear that the need for nurses has never been this greater (Jackson et al., 2020). Unifying efforts from across borders and stakeholders are eminent to procure trajectories from all angles. Noticeable issues such as but not limited to fake news proliferation, and wrong health behaviors had been detected in Vietnam (Tuyen, 2020). These concerns stand for nurses a greater opportunity to share and care as unending expressions of nursing (Acob, 2018). Nurses must educate the villagers on what should and should not do since living for others is the rule of nature (Tuyen, 2020). Proper channeling of concerns, communicating choices, and bilaterally doing the informed options supersedes the life of this global health emergency (Acob, 2020).

Moreover, during the declaration of COVID-19, academicians were contemplating a quick modification of the learning education platform, shifting teaching methodologies from conventional to online course liberation, which accommodates ensuring strategies for maximum student engagement amidst faceless transactions. The work-from-home scheme is making appropriate changes not to cease learning transfer. Such a scheme paved employees and appreciate facts that the delivery of pedagogy can be possible from a home setting. Aside from lessening the traffic of a typically busy street, more time for family, self, and God is achieved.

In the busyness of life, most, if not all, rarely spend time to slow down, stay home, and go inward. The pandemic teaches us lessons about relationships. God is not a placebo. He is as real as death and sorrow. Lots of people are bending knees, crossing fingers in prayer. It reminds people that the world is connected and something that affects one person affected another. The assumption that man is pan-dimensional, possessing his own integrity and manifesting his characteristics that are more than the sum of its parts. All regardless of culture and beliefs, are siblings alike. The invisible lines that divide people into strata - religion, sex, age, and country have all disappeared as humanity is confronted with this menace as people. There is absolutely no difference between you and I. We touch each other though at a safer latitude apart. Protecting yourself infers nurturing others. May they take different paths, and life separates them to some extent, but they forever are bonded by having embarked their voyage in the same boat.

CONCLUSION

The pandemic is giving humanity a course to contemplate. To always see the positive angle in every circumstance, to recognize the shortness of life, and to help others only in sharing, we can meet our needs and be reminded of the importance of family and home life. No matter how enormous a man reckons, a virus can give rise to the world to a standstill because the power of free will is in thy hands.

Declaration of Conflicting Interest
There is no conflict of interest in developing this perspective.

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Author Contribution
J. R. U. A is responsible for the entire process of developing the perspective from its inception until the careful meaning-making, analysis, and implication of the phenomenon to modern times.

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Ethical Consideration
This document does not need ethical clearance, for it only represents the academic perspective of the author.

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CASE STUDY

"SU JOK" THERAPY AND SCLEROLOGY PROFILE MONITORING FOR MANAGING CHEST PAIN AT HOME WHILE AVOIDING HOSPITAL ADMISSION DURING THE COVID-19 PANDEMIC: A CASE STUDY

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Abstract

Background: The COVID-19 pandemic has resulted in people avoiding hospital admission for non-COVID patients and forcing people to seek help via telehealth or alternative medicine.

Case study: A 30-year-old man from Solo, Indonesia, complained of left chest discomfort with an irregular heartbeat. This man sent an inquiry and his left eye sclera profile through WhatsApp on July 20, 2020 to a researcher, who is a nurse and "Su jok" therapist. Protocol for "Su jok" therapy was sent back through WhatsApp, and after applying the treatment for 30 minutes, the patient felt better, and symptoms were less severe. The full protocol to be applied for the following days was then sent to the patient. After three weeks, there was a less sharp red line in the sclera area of the vessel blockage, and he only experienced mild symptoms.

Conclusion: The case study shows that "Su jok" therapy may become an alternative therapy for managing chest pain at home. Sclerology can be a complementary choice to monitor a patient's heart condition. Visiting the hospital, however, is still necessary when the symptoms become worse.

KEYWORDS
Su jok therapy; chest pain; COVID-19; complementary alternative medicine

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INTRODUCTION

The COVID-19 pandemic has caused nearly all resources to focus on managing patients infected with the virus. Because of this pandemic, many cases other than COVID were not handled in a timely way or were too late; for example, new bariatric and metabolic procedures were postponed worldwide during the current pandemic (Rubino et al., 2020). In addition, in one hospital in Italy, 12 cases were late in getting access to health care during March 23-27 in 2020 (Lazzerini et al., 2020).

Other publications show that during the COVID-19 pandemic in Italy, visitation to the emergency room dramatically dropped for non-COVID conditions such as appendicitis, heart attack, and stroke. Patients may avoid seeking medical help for fear of contracting COVID-19 (Ciacchini et al., 2020) and also because of orders to stay at home (Masroor, 2020). This delay can ultimately lead to increased morbidity and mortality. This situation is called "collateral damage" and is caused by the COVID-19 pandemic. Data showed that a 2-day delay in seeking help related to myocardial infarction causes more dangerous conditions for patients (Masroor, 2020).

Regarding the decrease in visits to hospitals, this trend may indicate some of the reasons for the results of a study in the United States that found an increase in telehealth use (Hong et al., 2020). The increase in telehealth can be interpreted as part of the efforts of patients to avoid visiting hospitals and finding solutions to health problems through the help of Internet networks.

This case study discusses how a complementary alternative medicine using "Su jok" was applied through Internet networks. "Su jok", originally from the South Korean language meaning hand and foot, was designed by Prof Park Jae Woo in 1987 (Park, n.d.). Therapy in "Su jok" is done by manipulating the skin on the hands or feet using different methods, such as massage, applying color, seeds, and other treatments (Park, 1987).

In this case study, therapy was performed without direct contact between the practitioner and the patient because the contact was made using social media (WhatsApp). The patient applied the "Su jok" therapy independently. The confirmation and monitoring of the problem experienced by the patient were done using the method of checking through certain points based on the "Su jok" map for the heart organ in the patient's hands, and also by using eye photo reading (sclerology). Sclerology is a science to interpret a person's health and

body condition by checking the blood vessels in the sclera (Berret, 2010).

The use of sclerology to diagnose is usually paired with iridology, but in this case study, the iris profile was hard to obtain without a specific tool or method. Currently, there are different opinions regarding the accuracy of the diagnosis using sclerology and iridology since they are not yet fully accepted as accurate diagnostic tools. While iridology has been called nonsense (Berret, 2010), other researchers claim that iridology and sclerology offer accurate assessments related to a patient's body condition (Wagester, 2018). In this report, sclerology was considered as the easiest choice of monitoring and checking the status of the patient through telehealth. This case study aimed to describe how to manage chest pain using "Su jok" therapy and how sclerology was used to monitor the patient's heart condition.

CASE PRESENTATION

A 30-year-old male from Solo, Indonesia, on July 20, 2020, complained of discomfort in his left chest, stating that his heartbeat was irregular and he felt like it stopped several times a minute. Since during the pandemic COVID-19, it is recommended to stay at home because of the risk of transmission of COVID-19 in the hospital, the patient then sought help from the researcher through social media (WhatsApp). The researchers used the method of checking his condition by asking the patient to search for pain points corresponding to the heart in both of his hands and to share his sclera photos to verify his complaints. The history of symptoms and therapy applied are shown in **Table 1**.

Table 1 The History of "Su jok" Therapy

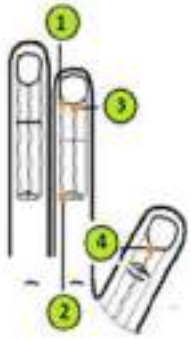
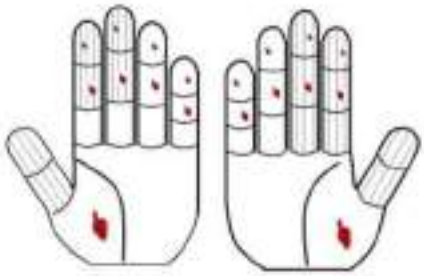
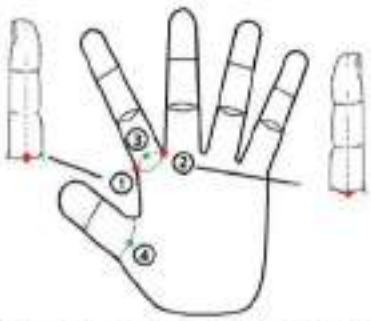
Date	Type of "Su jok" therapy	Explanation	How to do the therapy	Results
July 20, 2020 at 15.50	Energy therapy using (Six Ki's method).	This is therapy to manipulate energy in the body. This energy therapy was done by using color in fingers on the left hand. The goal is to open the blockage in the artery vessel.	 Put orange dot color following the sequence (number 1-4)	After 20 minutes, no improvement.
July 20, 2020 at 16.42-17.01	Correspondence therapy	This is therapy to manipulate organs – in this case, is heart organ. The correspondence of heart organs located in a different area in the hands. This therapy was conducted using massage on the pain point on the hand (where the heart correspondence point is located) and put red color. The goal is to open the blockage in the artery or heart organ.	 Find pain point in the red mark (heart correspondence) on the hand above, then massage until pinkies and then put red color	After 4 minutes of therapy, the chest felt less tight. The patient was asked to do the therapy by himself for the next day.
July 21, 2020 at 09.43	Correspondence therapy	Idem as above		
	Correspondence therapy on the knuckle of hand in which heart correspondence is located (using Triongin concept).	This is therapy on the heart correspondence point, which is located in the knuckle of the finger. This knuckle represents the heart organ. The goal is to reduce (to sedate) "homo" energy in the heart organ. Blockage in the vessel is because of homo energy excess in this organ.	 Put dot color in the area above in sequence (1-4)	

Table 1 (Cont.)

No communication from July 22 to July 25, 2020	
July 26, 2020	The patient contacted the researcher and said that therapies still have been done but not regularly (at least once a day)
July 26, 2020	No communication between researcher and patient.
July 28, 2020	The patient contacted the researcher and said that therapies still have been done but not regularly (at least once a day)

The eye profile showed a problem in the area of the aorta, heart valves and the heart itself. Since the irregular heart rate often stopping in one minute is considered dangerous and potentially life-threatening, the researchers then provided the protocol of "Su jok" therapy for the patient to perform at home. The researchers offered therapeutic suggestions with energy therapy because it can provide a faster effect (Park, n.d), if done correctly. But in the next 20 minutes, there was no change in the patient's heart rate condition; so then, the researcher provided another therapeutic suggestion, namely correspondence therapy. This strategy worked successfully, and the patient felt better in his chest, although the symptoms persisted but were less severe.

The researcher then sent the full protocol to be applied regularly, but the researcher found that the patient did not adhere to applying it regularly. After three weeks, it was found that he only experienced mild symptoms, and the sclera's profile showed progress (see **Figure 1**).

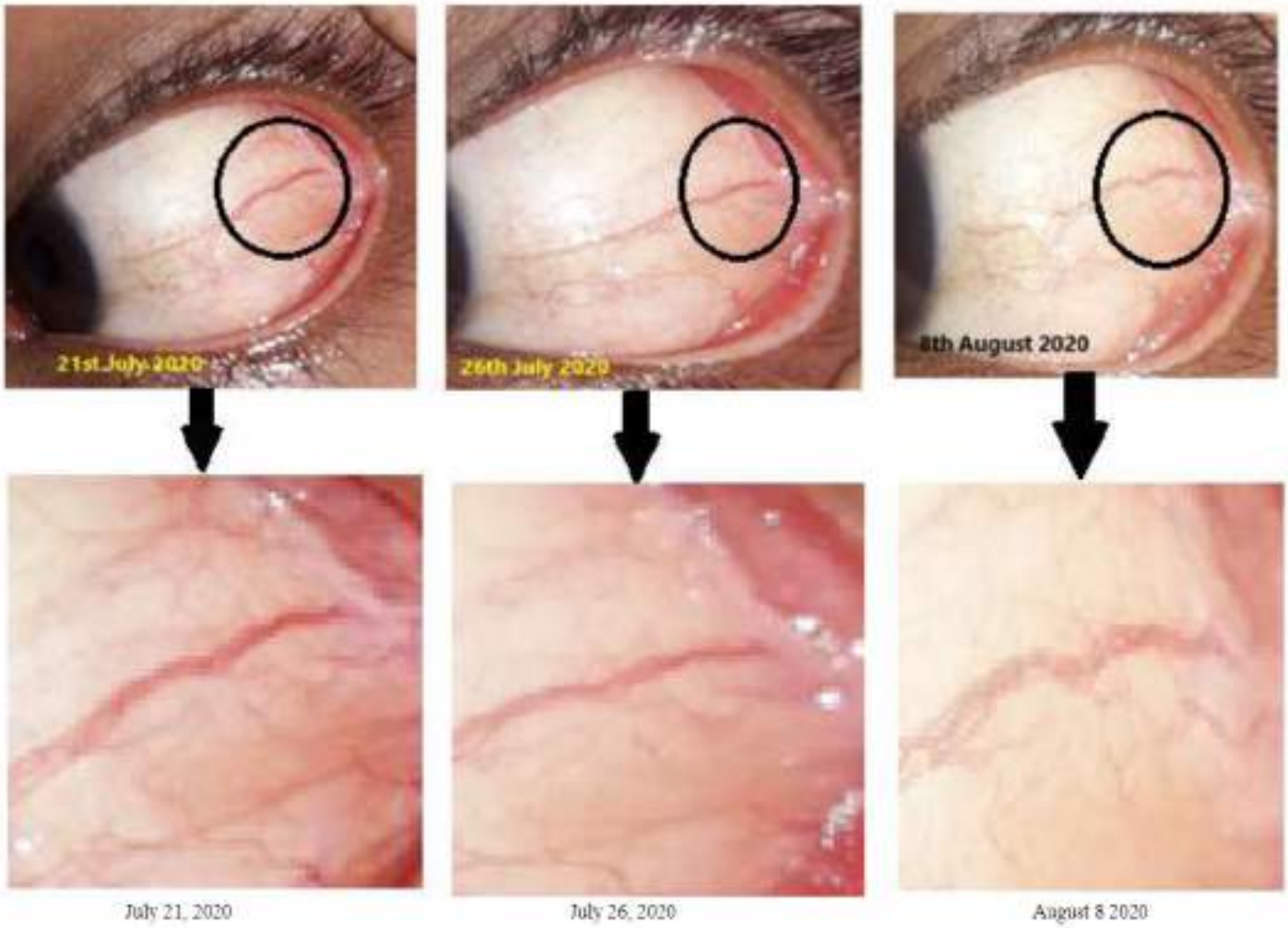


Figure 1 The comparison of the sclera profile between July 21, July 26, and August 8, 2020

DISCUSSION

The focus of "Su jok" therapy is weakening (sedation) the coldness energy (or homo energy) in both the corresponding points and the coldness (or homo energy) sedation in the heart meridians. Coldness (or homo) energy is chosen for sedation because this coldness (or homo) energy is a characteristic of a blockage condition of the heart or blood vessels (Park, 2002).

Based on the case presentation, energy therapy initially did not have any effect on the patient's symptoms. The therapy may not have had an immediate impact because the patient did not put the color dots for energy therapy in an accurate location. Although this energy therapy usually has an immediate effect, the therapeutic effect will not be obtained if the dots are not placed accurately. The proper application of this energy therapy eventually becomes difficult for those who have never studied the location of these energy points.

The correspondence therapy, which is easier to be applied by the patient, however, showed a quick result. The massage and red color were used to reduce (to sedate) the blockage in the blood vessels and to increase the blood flow. The researchers could also check whether the therapy was done correctly in the corresponding area of the target (heart point) through photos of the patient's hands since the instructions were carried out independently by the patient. Even though the symptoms decreased, this outcome still did not reach the optimum goal, since the patient could not apply therapy regularly.

One aspect that caused the patient to stop the therapy was the fact that he already started to feel better and more comfortable. This result shows that even though when "Su jok" therapy was applied irregularly; it can reduce symptoms. The eye sclera profile also showed a progressive change for the better, and the patient felt improvement in his symptoms. The examination using an eye profile, however, has drawbacks. Some disadvantages are that the eye photo is affected by light and the use of different tools when taking pictures of the eyes' sclera. In this regard, the researchers could not directly confirm the use of the same equipment and light conditions since the eye's photo was sent by the patient.

Because the "Su jok" therapy is easier and can be done without any invasive procedures, this therapy can be very useful for nurses to be applied to patients. The implication of this study for nursing is this therapy will be considered as an alternative method to be taught in the nursing curriculum for improving nurse's skills to help their patients. This "Su jok" therapy can also help nurses avoid virus transmission from patients they are caring for remotely via telehealth.

CONCLUSION

"Su jok" can be considered as an alternative therapy for chest pain, and sclerology can be used in monitoring symptoms. Research with more rigorous methods needs to be conducted to gain more benefits from "Su jok" therapy.

Ethical Consideration

Participant agreed to be published without any identification (anonymous).

Declaration of Conflicting Interest

There is no conflict of interest in this publication.

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