The Effect of Work Setting and Demographic Factors on Nurses' Caring Behaviour in Sabah, Malaysia

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Abstract

Background: The uniqueness of nursing profession contributes to the development in knowledge, and experience along with increasing age, education, economy, and position as well as forming a unique gender role throughout the life of this profession. Thus, the development and advancement of the demographic characteristics of nurses developed while in this profession exerts a very large influence on the caring behaviour of nurses. The aim of this study was to identify the effect of work setting and demographic factors on nurses' caring behaviour and to identify the differences in nurses' caring behaviors based on demographic factors between nurses in public hospitals and in public health services in Sabah, Malaysia.

Methods: This research is a cross-sectional study using the survey method. Data were collected from 3,532 nurses in public hospitals and public health services within Sabah, Malaysia. Data were analysed using two-way ANOVA.

Results: The findings reveal that age, education, economy, position, and experience had a significant effect on caring behaviour. Additionally, there are differences in nurses' caring behaviors based on demographics factors between nurses working in public hospitals and public health services.

Conclusion: The present research has provided convergent evidence on the effect of demographic factors on nurses caring behavior and the differences in caring behavior based on demographic factors among nurses in public hospitals and public health services in Sabah, Malaysia.

Introduction

Caring Behavior (CB) is a core value that must be practiced by all staff in Ministry of Health Malaysia (MOH). The application of these values is to realize the vision and mission of MOH, which is to promote and facilitate the use of health care services in the community to achieve optimal health and a high-quality health system (Ghazali et al., 2007). To achieve the objectives of MOH, several efforts have been implemented to improve caring services, such as conducting caring service training from time to time to seniors and those who have just joined the health services department and encourage all staff to exhibit CB while serving patients or clients. Nevertheless, however, there is still dissatisfaction with health care services provided. The MOH receives about 7,000 complaints annually covering various aspects including services and facilities (Shazwani, 2017). Among the complaints received from the public were poor services and communication skills among doctors and nurses, long waiting times before receiving treatment, and inadequate equipment. Apart from that, the ministry has to spend about RM20 million every year as compensation for negligence. In the ministry's efforts to address the problem and provide the best treatment to the community, many initiatives have been taken including providing community simulation laboratories in nursing colleges.

Nurses are the backbone of every health care organization and their presence in every space of the health care services and contribute significantly to the achievement of the objectives of the national health

service. Since caring is the essence of nursing (Huynh et al., 2008), therefore they are more synonymous with CB than other health care workers in influencing patient's satisfaction (Abdullah et al., 2021; Kaur et al., 2015). Nurses are the largest workforce in Public Hospital (PH) and Public Health Service (PHS), and they spend continuous time around the clock with patients in both settings. CB is often described as more often practiced by nurses who work in PH because they care for patients for 24 hours (shift duty). While nurses in PHS with clients only for 9 hours (office hour). It is likely that there are differences in the nurses CB performance due to the differences in the duration of nurses with the patient and client between the two work settings. In addition, nurses in PH take care of critically ill and chronic patients. While nurses in the PHS provide health care services for the community. Therefore, there are differences in workload, workplace environment, and patient and client characteristics between the two settings. Previous studies have identified that factors influencing nurses' CB are workload, job satisfaction, workplace conditions, educational background, as well as the nature of patient characteristics. This condition is considered a major challenge for nurses especially workload and job satisfaction as the main factor influencing their CB (Shalaby et al., 2018). Due to nurses have different demographic backgrounds then the incompatibility of the workplace with the demographic characteristics of the nurses will affect the caring behavior of the nurses.

Apart from the above challenges, there are also several factors that may influence the performance of nurses' CB. Previous studies have confirmed that employee biographical factors are one of the determinants of employee performance that contribute to organizational success. Demographic factors that have an influence on performance include age, gender, education, work experience, and the number of family dependents (Hendrawijaya, 2019). The uniqueness of nursing profession contributes to the development in knowledge, and experience along with increasing age, education, economy, and position as well as forming a unique gender role throughout the life of this profession. Thus. the development and advancement of the demographic characteristics of nurses developed while in this profession exerts a very large influence on the CB of nurses. Therefore, demographic factors make a significant contribution to this profession and should be given attention.

Literature Review

Nurses Caring Behavior

Henderson defined nursing as the unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible (Parker & Smith, 2010). To perform this function, nurses adhere to the values and attitudes of the nursing profession, which is to focus on nursing care and health care. These duties and responsibilities are part of the need to apply a humanistic vision, taking into account the emotional and cognitive aspects of the disease, while respecting the principle of confidentiality, according to a scientific-clinical perspective but beyond the physical sphere (Fernández-Feito et al., 2019). In performing activities that contribute to the health or recovery of the patient is

through the CB of the nurse. The theory of human caring stated that the relationship-focused caring is fundamental for healing practice which honour human holistically besides creating a healing environment. The combination of a caring-healing approach and nursing art is crucial to ensure the focus is on quality of life, inner healing experience, and caring practices that affect the outcome of patient. The existence of human caring value-guided ethic for professional practice and the existing nursing theory is in line with what is required by the public (Watson, 2006).

Nursing has openly evolved as central to the human phenomenon of nursing practice. Nursing's values, ethics, philosophy, knowledge, and practices of human caring require language order, structure, and clarity of concepts and worldview underlying nursing as a distinct discipline and profession. The philosophy and theory of human caring sought to balance the cure orientation of medicine, giving nursing its unique disciplinary, scientific, and professional standing with itself and its public. (Watson, 2009).

CB makes up the philosophical and ethical foundation for professional nursing and is a major focal point in nursing which is regarded as both an art and a science. This underpinning offers a framework that takes up and cuts across art, science, humanities, spirituality and new dimensions of mind-body-spirit medicine. Nurse-patient caring includes dimensions such as respectful deference to others, assurance of human presence, positive connectedness, professional knowledge and skills, attentiveness to the other's experience (Wolf et al., 2003).

Nurses' CB have long received attention abroad. Locally, however, studies on CB focused on nurses are limited (Kaur et al., 2015) especially related to nurses' demographic factors and work setting. Needlessness, Zhang et al. (2021) found that there are differences in nurses' behavior according to where they work, and demographic factors have significant differences between different work environments. In applying CB, nurses give great priority to providing health care to meet the human needs and the environment in which they work (Vujanić et al., 2020). By considering demographic factors, nurses with 15 years of work experience, rated their CB significantly lower than 30 years of work experience. Meanwhile, nurses with a Bachelor of Science in Nursing (BSc) rated lower CB than nurses with basic training. The authors explain that since BSc nurses are oriented on organizational work, management, administrative work, and communication with other healthcare professionals. Therefore, nurses with BSc have less time to interact directly with their patients. Whereas Aupia et al. (2018) found that nurses, patients, and nursing students have similar perceptions of CB. Male students had higher mean scores than female students in knowledge and skills assurance and attention. While students with clinical experience of 8 weeks got higher scores in the domain of CB relationships compared to students with experience of only 4 weeks. While the patient assumes the nurses' CB is more important, despite considering knowledge and skills is crucial (Zhang et al., 2021). By creating a caring environment and improving the nurses' CB can improve the quality of patient care and ultimately increase patient satisfaction (Soliman et al., 2015).

Public Hospital and Public Health Service

Nurses working in PHS have a duty to provide nursing care to injured, sick, and disabled patients. They treat patients individually and even treat several patients at one time. While, in PH, nurses are working in the larger community. In addition to caring for clients individually, they also take care of the entire population and strive to protect the health of the population as a whole. The duties of public health nurses include providing health education to the community regarding potential health problems, promoting health, healthy eating, safety, and good hygiene, and improving community access to health services. These different duties and responsibilities is often seen to have unequal workloads as nurses in the PH are considered to be more often involved with CB all the time compare to nurses in PH. For example, nurses who served in outpatient and inpatient units in hospital observed that when the workload of nurses is less due to nurses performing more unproductive activities resulting in a lack of frequency of nurses performing nursing care that reflects CB. A significant positive relationship between workload and CB through comfort care and the significant positive correlation between work commitment and CB through clinical care indicated that when nurses workload increases and their commitment decreases in achieving organizational goals, therefore can influence the CB of nurses, in turn, will affect patient satisfaction with health services (Fitriani et al., 2019).

Although nurses in PHS were observed to have higher demands for CB, however, nurses in PH also faced their own challenges. McCullough et al. (2020) found that nurses in remote settings considered primary health care to be a holistic social model of care that included caring for the community as well as the individual. However, they find it difficult to provide health care consistently to meet their intentions due to the resource-poor nature of the remote setting. The nurse also did not get inadequate physical resources, limited specialist health services, and lack of time was found to affect the ability of nurses in rural areas to provide better primary health care. In addition, although there has been an increase in health care needs, this does not indicate there has been a reasonable increase in the rate of nurses in primary health care services. This imbalance is related to a decline in the quality of care and patient safety, and also the impact on the health of professional groups. Hence, there is high stress among primary health care nurses, who experience many health changes due to burnout syndrome which contributes to a decline in the quality of care and patient safety (Pérez-Francisco et al., 2020). This situation may add further barriers to the practice of CB of nurses in PHS.

Objectives

The aim of this study is to identify the effect of work setting and demographic factors on nurses CB. The study also aimed to identify differences in nurses' CB based on demographic factors between PH and PHS.

The research question is therefore proposed;

1. Do work setting and demographic factors affect the CB of nurses?
2. Are there significant differences in CB based on demographic factors between nurses in PH and PHS in Sabah?

Methods

Design

This research is a cross-sectional study using the survey method to examine the effect of work setting and demographic factor on nurse' CB and to investigate the difference in CB based on demographic factors (gender, age, education, economic status, position, and experience) between nurses in PH and PHS.

Participants

There are 10,637 registered nurses in Sabah state, encompassing all categories of nurses (Sabah State Health Department, 2021). The location of the study is comprised of PH and PHS (health clinics, maternal and child health clinics, rural clinics, travel clinics, and 1 Malaysia Clinics) throughout the state.

Ethics and data collection

Ethical consideration and approval to conduct the study in hospitals and district health offices had been obtained from the Medical Research and Ethics Committee (MREC) and National Medical Research Register (NMRR) (ref. no: NMRR-14-1226-21410) of Malaysia, Ministry of Health (MOH) and Sabah State Health Director (ref no: JKN(SB)PJNS/32).

Measurement

The questionnaire consists of a demographic information (age, economic status, education level, position, and working experience) section and The 24-item CB Inventory (CBI-24) which is considered to be the third-generation instrument for the measurement of caring (Papastavrou et al., 2011). The current study adopts the CBI-24 by Wu et al. (2006) to explore the perception of the frequency of CB as practiced by nurses. It is based upon a conceptual definition of nurse caring as an interactive and inter-subjective process that occurs during moments of shared vulnerability between nurses and patients (Watson, 2008). This scale consists of four components, namely, "assurance of human presence" (8 items), which deals with patients' needs and security; "knowledge and skill" (5 items), related to nurses as skillful and educated persons; "respectful deference to the other" (6 items), dealing with how nurses show interest in the patients; and "positive connectedness" (5 items), which corresponds to the need for nurses to be ready to help patients (Wu et al., 2006). For each item, respondents are requested to answer using a 6-point Likert scale (1 = never and 6 = Always). The CBI-24 demonstrated good internal consistency, Cronbach's α = .96 (Wu et al., 2006). The researchers translated the CBI-24 into the Malaysian language and requested help from bilingual experts (two Malaysian nursing experts who can read and write in Malay and English) to translate the translated instrument (Malay version) back into the English version using the back-translation technique.

Reliability of the instrument

A pilot study was conducted to ensure the suitability of this instrument in the local context as this instrument is from abroad. Respondents were composed of various categories of nurses from PH and PHS who came to the College of Allied Health Sciences to attend the local preceptor course. A total of 120 questionnaires were distributed before the program started, only 101 questionnaires were returned, only 95 questionnaires were filled in the demographic data section, and 98 questionnaires were filled in the Nurse Behavior Scale section. The results of the reliability evaluation of the 24-Item CB Inventory (CBI-24) instrument, were found to be at the overall level of Cronbach's alpha reliability coefficient of .960. The results of the reliability assessment for each scale found different Cronbach's Alpha values. The highest Cronbach's Alpha coefficients, was the 'assurance' (Cronbach's alpha = .912), followed by the scale of "respectful" to patients scale (Cronbach's alpha = .887), the "knowledge and skills" scale (Cronbach's alpha = .870), and the "connectedness" scale (Cronbach's alpha = .821).

Data sources

This study used multistage cluster sampling to collect data. At the first stage, multistage cluster sampling was used to choose hospitals and district health offices. Followed by selecting the larger hospitals that had many wards and units, and district health offices that had many health clinics, rural clinics, and other units. For PHS, seven district health offices out of 24 in the state were chosen involving 10 health clinics, nine maternal and child health clinics, 73 rural clinics, and three traveling or mobile clinics. As for PHS, a total of 12 hospitals were chosen with a total of 244 wards and units out of 24 hospitals across the state. At the second stage, the sample was clustered according to ward or units in PHS and health clinics, rural clinics, and other units in the PH for distribution of questionnaires.

Before data collection, the researchers met with every hospital director, hospital matrons, area health officer, and district health matrons to discuss the administering of questionnaires. They proposed that the questionnaires be administered by the nursing sister or nurse-in-charge to avoid disruption to the nurses on duty. All personnel involved in the data collection procedure were briefed on how to administer the questionnaire on purpose, confidentiality, how to collect the data, how to respond to any respondents' inquiries and to inform the respondents that they had the right to decline to answer any question for any particular reason or withdraw from the study at any time. Completed questionnaires were kept in sealed envelopes or sealed paper boxes to ensure confidentiality and were not accessible to anyone.

To collect completed questionnaires, the researchers and research assistants re-visited each research site, though some officers, matrons, nursing sisters, and nurses were kind enough to volunteer to send the completed questionnaires by mail or through officially recognized individuals. Nevertheless, some challenges arose in the collection process. First, the geographical location of hospitals throughout the state is such that road access is difficult and takes time, especially for health clinics which are mostly located in remote areas. Also, some of the responsible person for administering the data collection unable to cooperate even though the researchers had explained the purpose of the study along with evidence of ethical considerations. Therefore, the study location was shifted to the nearest hospital or clinic that was willing to participate.

Notwithstanding that, a total of 4000 questionnaires were distributed to the respondents. The response rate was $n = 3867$ (96.68%). However, during the process of data entering, two questionnaires were found not filled, three questionnaires were unusable due to missing data, and three questionnaires had similar responses presumably filled by the same respondent. Next, a straight line was identified in 327 responses in which respondents gave a similarly high response rate in the questionnaire, which was considered a biased response to the data (Hair et al., 2017). This brought the total number of questionnaires that could be used to $n=3532$ (88.3%) which was considered a very high response rate.

Data analysis

IBM Statistical Package for Social Sciences (SPSS) version 26.0 program used for data analysis. Descriptive analysis was used to obtain mean, standard deviation, and frequency to represent demographic profiles such as gender, age, education level, economy, position, and experience. Two- way of ANOVA was used to identify the effect of work setting, and demographic factors on nurses’ CB and to analyze the differences in nurses’ CB based on demographic factors between PHS and PH. The significance level was set at $p<0.05$ and $p<0.001$.

Results

The respondents aged range from 20 - 59 years. The majority level of education was at Diploma level, 2096 (59.3%), followed by Certificate, 1293 (36.6%). More than three-quarters have economic status at the medium level, 2485 (70.3%). The majority of respondents held the position of Staff Nurse U29, 1795 (50.8%), followed by Community Nurse U19, 1072 (30.5%). The majority of the respondents had less than five years of working experience, 1229 (34.8%), followed by 5 to 10 years, 815 (23.1%), and 10 to 15 years, 578 (16.4%) (Table 1). The result of Two-way ANOVA test did not indicate significant effect of work setting on CB. The effect of interaction between work setting and demographic factors did not show a significant effect on nurses CB. The effect of the demographic factors (gender, age, education, economy, position, and experience) had a significant effect on CB (Table 2). The results of estimated marginal means of nurses CB indicate a significant difference in nurses CB between PH and PHS as shown in Figure 1.

Table 1 Demographic profile

Variable	Setting	Mean	SD	N
Age				
20 - 29 years	PH	5.1351	.63808	1102
	PHS	5.1452	.61189	293
	Total	5.1372	.63246	1395
30 - 39 years	PH	5.2161	.66004	736
	PHS	5.2525	.61826	478
	Total	5.2304	.64390	1214
40 - 49 years	PH	5.3299	.60532	381
	PHS	5.3748	.61022	201
	Total	5.3454	.60687	582
50 - 59	PH	5.4264	.60762	230
	PHS	5.3352	.56395	111
	Total	5.3967	.59447	341
Total	PH	5.2171	.64379	2449
	PHS	5.2547	.61426	1083
	Total	5.2286	.63503	3532
Education				
Certificate	PH	5.1440	.67955	606
	PHS	5.2354	.60647	687
	Total	5.1926	.64313	1293
Diploma	PH	5.2329	.63401	1724
	PHS	5.2695	.62923	368
	Total	5.2393	.63318	2092
Bachelor	PH	5.3628	.56244	113
	PHS	5.5224	.57024	26
	Total	5.3927	.56528	139
Master	PH	5.2750	.49965	5
	PHS	5.6458	.02946	2

	Total	5.3810	.44646	7
PhD	PH	5.5417	.	1
	Total	5.5417	.	1
Total	PH	5.2171	.64379	2449
	PHS	5.2547	.61426	1083
	Total	5.2286	.63503	3532
Economy				
Low	PH	5.1156	.67734	142
	PHS	5.1700	.62636	63
	Total	5.1323	.66104	205
Below Average	PH	5.1480	.65050	455
	PHS	5.2076	.61993	166
	Total	5.1639	.64252	621
Medium	PH	5.2241	.63153	1698
	PHS	5.2566	.61416	787
	Total	5.2344	.62614	2485
Above Average	PH	5.4894	.55533	145
	PHS	5.4413	.56121	66
	Total	5.4743	.55629	211
Luxurious	PH	4.6019	1.52953	9
	Total	4.6019	1.52953	9
Total	PH	5.2171	.64379	2449
	PHS	5.2553	.61420	1082
	Total	5.2288	.63503	3531
Position				
Assistants Nurse (AN U11)	PH	4.8778	.74660	15
	Total	4.8778	.74660	15
Assistants Nurse (AN U14)	PH	5.1745	.61260	16
	PHS	4.8403	.67773	6

	Total	5.0833	.63295	22
Community Nurse (CN U19)	PH	5.1140	.68520	506
	PHS	5.2068	.61805	566
	Total	5.1630	.65195	1072
Community Nurses (CN U24)	PH	5.3417	.58876	25
	PHS	5.3062	.57018	123
	Total	5.3122	.57148	148
Community Nurse (CN U26)	PH	5.4688	.52693	8
	PHS	5.2143	.57080	14
	Total	5.3068	.55673	22
Staff Nurses (SN U29)	PH	5.2124	.63031	1518
	PHS	5.2649	.62519	277
	Total	5.2205	.62963	1795
Nursing Sister (NSr U32)	PH	5.3871	.61407	328
	PHS	5.4925	.52780	78
	Total	5.4073	.59929	406
Nurse Supervisor (NSpvr U36)	PH	5.4861	.45170	15
	PHS	5.2639	.77323	15
	Total	5.3750	.63238	30
Head Nursing Matron (NSpvr U41)	PH	5.3583	.61633	5
	Total	5.3583	.61633	5
Nursing Sister (NSr U41)	PH	4.9444	.20972	3
	Total	4.9444	.20972	3
Nursing Matron (NSpvr U41)	PH	5.2500	.63738	4
	PHS	6.0000	.	1
	Total	5.4000	.64590	5
Nursing Matron (NSpvr U42)	PH	5.2431	.79862	6
	PHS	5.7639	.20554	3

	Total	5.4167	.69065	9
Total	PH	5.2171	.64379	2449
	PHS	5.2547	.61426	1083
Experience				
<5 years	PH	5.1164	.64388	991
	PHS	5.1611	.62181	238
	Total	5.1250	.63966	1229
5 - 10 years	PH	5.2223	.64257	530
	PHS	5.1851	.62394	285
	Total	5.2093	.63598	815
10 - 15 years	PH	5.2537	.63457	313
	PHS	5.3006	.61394	265
	Total	5.2752	.62509	578
15 - 20 years	PH	5.2929	.61863	199
	PHS	5.3849	.59968	114
	Total	5.3264	.61243	313
20 - 25 years	PH	5.3108	.62145	131
	PHS	5.4107	.54642	56
	Total	5.3407	.60027	187
25 - 30 years	PH	5.4187	.66592	188
	PHS	5.3167	.52275	65
	Total	5.3925	.63282	253
30 - 35 years	PH	5.4528	.53145	75
	PHS	5.3716	.58814	49
	Total	5.4207	.55362	124
>35 years	PH	5.3371	.50705	22
	PHS	4.9432	.78024	11
	Total	5.2058	.62811	33
Total	PH	5.2171	.64379	2449

	PHS	5.2547	.61426	1083
	Total	5.2286	.63503	3532

Table 2 Two-way ANOVA result

Source	df	Mean Square	F	Sig.	adj. R ²
Variable 1					
Age	3	7.285	18.426	<.001	
Work Setting	1	1.193	.000	.999	
Age * Setting	3	.366	.927	.427	
					.020
Variable 2					
Education	4	1.713	4.268	.002	
Work Setting	1	.575	1.433	.231	
Education * Setting	3	.262	.652	.582	
					.005
Variable 3					
Economy	4	4.068	10.222	<.001	
Work Setting	1	.176	.441	.506	
Economy * Setting	3	.135	.339	.797	
					.013
Variable 4					
Position	11	1.990	5.006	<.001	
Work Setting	1	.191	.482	.488	
Position * Setting	8	.397	1.000	.434	
					.014
Variable 5					
Experience	7	3.101	7.852	<.001	
Work Setting	1	.442	1.119	.290	
Experience * Setting	7	.527	1.334	.229	
					.021

Discussion

The purpose of this study was mainly to examine the effects of work setting and demographic factors on nurses' CB. This study also considers the differences in CB based on demographic factors between nurses in PH and PHS. The results showed that there was no major effect of work setting on nurses' CB. The effect of interaction between setting and demographic factors did not show a significant effect on nurses' CB. The result shows that only the demographic factors (age, education, economy, position, and experience) had significant effects on nurses' CB. Thus the alternative hypothesis for the effect of work setting and demographic factors on nurses' CB is partially rejected. Contrary, Shalaby et al. (2018), found that there was no significant relationship between nurses' CB with demographic factors (age, gender, and marital status). Nevertheless, there is a significant relationship between nurses' CB and their experience and workload for all caring dimensions. In addition to their finding, there was a significant positive relationship between nurses' level of education and feeling expression, environment, and human needs assistant of caring dimension.

The current study found that there were significant differences in nurses' caring behaviors based on demographic factors between nurses working in public hospitals and public health services. Although fewer studies are examining the differences in nurses CB based on demographic factors between settings, Zhang et al. (2021) in their study on the relationship between ethical climates and nursing service behavior in public hospital and private hospitals has proven that there are differences in nurses' behavior according to where they work. They found that the demographic factors (age, work experience, and education level) have significant differences between different work environments. They argue that the work environment climate factors greatly influence the behavior and practice of nurses which greatly influences patient satisfaction and also reflects the image of the health provider organization. For example, in PH, in addition to performing direct nursing care, nurses also perform indirect nursing care which contributes to the workload of nurses. Shalaby et al (2018), found that 80% of military hospital critical care unit nurses perceived factors of workload, job satisfaction, workplace conditions, and educational background, as well as patient characteristic traits, were highly influencing nurses' CB and were a major challenge for nurses. Among these factors, workload and job satisfaction were placed by nurses as the first category factors that influence nurses' CB. Their finding supported Oluma and Abadiga's (2020) study in which they revealed that nurses who had personal satisfaction with their jobs had high CB.

The results of the two-way ANOVA showed that the age factor had a significant effect [$F(3,3524) = 18.43$, $p < .05$] on nurses' CB. The sample aged 20-29 years showed a lower level of CB in PH compared to those in the PHS. The level of CB was found to increase when reaching the age of 40-49 in both settings. However, the nurses' CB will decrease when it reaches the age of 50-59 years for samples in the PHS but continues to increase for samples in PH until they reach the age of 50-59 years. Zhang et al. (2021) identified the group differences in in-role and extra-role service behavior showed that nurses who work in a PH have a high level of in-role and extra-role service behavior were aged above 40 years. This indicates that the above 40-year-old sample has high behavior in performing the required tasks or can fulfill the core duties and responsibilities in caring for patients. They also had a high level of action behavior in performing tasks that were not included in the actual task but were related to their position or role as a

nurse that added value to the client and health care provider (Paulssen et al., 2019). This may be attributed to nurse's maturity in the above 40-year-old and 50-59 years old age group that has more work experience that contributes to more skill full in delivering nursing care in tandem with nurses' CB in the PH setting. While in the PHS nurses in the age category of 50-59 years are senior nurses who are usually among the nurse supervisors or head nurses who mostly perform supervisory duties on junior nurses and perform more administrative duties.

The results of the two-way ANOVA showed that the education factor had a significant effect [$F(4,3523) = 4.26, p < .05$] on nurses' CB. The PH sample showed a lower level of CB compared to the PHS samples for all level of education. There was an increase in the level of CB started from certificate level of education until bachelor level of education, however, the level of CB showed a significant decrease at the level of masters and Ph.D. As Vujanić et al. (2020) argue that this is because nurses with Bachelor of Nursing level of education are oriented towards organizational work, management, administrative work, and communication with other healthcare professionals. Therefore, nurses with a higher level of education have less time to interact directly with their patients. As for the level of CB in the sample of PH, showed a significant increase consistently along with the increase in the level of education.

The results of the two-way ANOVA showed that the economy factor had a significant effect [$F(4,3531) = 10.22, p < .05$] on nurses' CB. The low to medium economic status of the PH sample showed a lower level of CB compared to the sample of PHS. While levels of CB in PHS and PH continue to rise, however, samples in PHS showed higher nurses CB at above-average economic compared to PH samples. Whereas only a sample in PH had a luxurious economic but showed a very significantly decreased level of CB. Putra et al. (2021) found that salaries and rewards received by nurses were found to affect nurses' CB. The results of their study lead to a negative direction that the greater the salary received by the nurses, the lower the CB of the nurses.

The results of the two-way ANOVA showed that the position factor had a significant effect [$F(11,3532) = 5.00, p < .05$] on nurses' CB. The result indicates that the lowest level of CB among all nurses was ANU11 in PH. The ANU14 in the PHS showed the lowest level of CB compared to the PH. Both of these positions have limited qualifications in the field of nursing therefore they usually do indirect nursing care. As for the CNU19 in the PHS showed higher CB levels than in PH. This position has a specialized training certificate in the field of community health nursing. Therefore, their CB is higher in PHS because they are more proficient in their knowledge and skills in PHS. In contrast, CNU24 and U26 in PHS showed lower CB levels than in PH. In addition to having specialized knowledge and skills in the field of community nursing they are also given the responsibility of supervising CNU19, and help prepare the report in PHS. This to some extent attracts part of their time to be with clients. Unlike in PH, they are more involved with direct nursing care. SNU29 and NsrU32, showed a high level of CB in PHS compared to those who work in PH. The categories of these two positions are very important in both settings either with or without the required advanced diploma or post-basic courses. In PHS, their function is to carry out family health care services (Malaysian Civil Service Commission, 2020). This suggests that nurses at PHS are more focused and in control of their clients' health care and only refer to physicians if problems and risks are

identified. While at PH, they conduct nursing care, and assist doctors in patient care. In addition, they also supervise AN, CN, and other subordinate staff. They also assist NsrU32 in ward administration and supervise trainees as well as perform other tasks based on instructions from superiors and other professionals in the patient care team. Therefore, this may cause them to be burdened with indirect nursing care that may affect their job satisfaction as a nurse which may influence CB (Shalaby et al., 2018; Oluma & Abadiga, 2020).

Meanwhile, NSpvrU36 in PHS showed lower CB levels than in PH. This is because this position category is senior and experienced nurses in the field of PHS. They are therefore involved in nursing management to ensure that PHS activities run smoothly. Whereas, in PH they together with junior nurses carry out nursing care on patients because of their extensive knowledge and experience in nursing care therefore they more often apply CB. Meanwhile, NSpvrU41 and NSpvrU42 in PHS showed higher CB than PH. This is because this position category, has their specific nursing qualifications and Bachelor of Nursing in addition to extensive experience in the field of PHS, therefore they also along with junior nurses handle health services on clients. While in PH they are given the task of nursing administration. Similarly, for nurses in the categories of NSpvr U41, NSrU41, SPvr U41, and NPvr U42 posts. Only in PH had Head of NSpvr U41, NSr U41, SPvr U41, and NPvr U42 samples. Therefore, no comparison can be made.

The results of the two-way ANOVA showed that the experience factor had a significant effect [$F(7,3532) = 7.85, p < .05$] on nurses' CB. The samples in PHS with experience below 5 years showed lower CB levels compared to PH samples. The nurses CB in PH increased when they had served between 10 and 35 years. Although there is a slight decrease when work experience exceeds 35 years, nurses in PH remain higher level of CB compared to PHS. Zhang et al. (2021) found that nurses in a PH with work experience of 11-15 years have a high level of in-role behavior and nurses with 16 to 20 years of experience have higher extra-role behavior. In-role performance refers to the behavior of individuals who perform tasks and responsibilities that have been set. While extra-role behavior refers to the performance of behavior beyond the expectations of an employee's role (Zhu, 2013). This suggests that the more experienced the nurses are, the higher their behavioral performance in caring for patients. Therefore, CB between 10 to 35 years of work experience is higher in PH. As Zhang et al. (2021) found that, nurse service behavior will increase with increasing age (aged over 40 years), work experience (11-15 years and 16-20), have a bachelor's degree or master's degree or higher, and had a senior nursing professional title are those who work in PH. Meanwhile, nurses working in PHS showed a decline in CB levels starting after 25 years to more than 35 years. As explained earlier in PHS aged 50 to 59 years has a lower level of CB than the sample in the PH due to this age category is an experienced nurse who holds management and administrative positions and does less clinical work in the PHS. Therefore, CB levels will decrease when nurses have more than 25 to 35 years of work experience in PHS as most of them will be promoted and carry out nurse management roles and responsibilities.

Overall, the results of this study show that demographic factors have a significant effect on the CB of nurses. An alternative hypothesis is partially supported. An alternative hypothesis for differences in nurses' CB based on demographics factors between nurses in PHS and PH is supported. The level of

nurses CB in PHS is higher than nurses in the PH. This is contrary to the argument at the beginning that the CB of nurses in PH is higher than in PHS.

Limitations

Studies in examining the effects of work setting and demographic factors on nurses caring behavior and to identify the differences in nurses' CB based on demographic factors between PHS and PH are relatively lacking. Therefore, it is quite difficult to compare the results of this study with the finding of previous studies. Like other studies, this study also faces limitations. First, the questionnaires were distributed through various levels, which should be distributed through the top management in each PH and PHS. Then distributed to Nursing Matron or Nursing Sister for distribution to wards and units in PH and health clinics, and rural clinics in PHS before distributed to the respondents. This is for the reasons to avoid interference to the nurses who are on duty. Therefore, confidentiality is beyond the control of the researcher as a researchers have no opportunity to collect data face to face. It is recommended that future studies use observation methods on direct and indirect nursing care and caring behavior of nurses. Second, this study was a cross-sectional survey in which no explanation was given to explain the relationship between nurses' CB and demographic factors for both settings. The generalization of the findings of this study is potentially limited, as this study was only conducted in Sabah, Malaysia. It is hoped that the results of this study can be extended by researchers who are interested in studying this matter in the future.

Implications for Nursing Management

The present research has provided convergent evidence on the role of the demographic factors in nurses CB in PHS and PH settings. The results of this study can be used to find the best strategy by considering demographic factors to deliver nursing care with the best CB appropriate to the nurse's work environment. It is hoped that this study can further explore the shortcomings of nurses CB based on their demographic factors in both settings so that remedial action can be taken for the benefit of health care recipients and health care providers especially the nursing workforce.

Conclusion

Nurses form the largest group of workers in PHS and PHS. Overall, the CB of nurses in the PHS was higher than that of nurses in PH as nurses in the PHS had greater control over their duties and responsibilities as nurses. It is hoped that this study can attract the attention of local researchers to explore further related to the perspective of local nurses, especially to determine the relationship between nursing staff, resource adequacy, support, and CB. The results of this study can help to understand the caring behavior of nurses concerning their demographic characteristics to provide quality care with the best patient outcomes and provide satisfaction to health care recipients. This study has added to theoretical contributions in the academic and research fields as well as in practical implications in the field of nursing practice by addressing the effects of demographic factor on CB and the differences in CB

based on demographic factors between nurses in PHS and PH. Through a literature search, this study is the first local study to evaluate the CB based on demographic factors among nurses in PHS and PH.

Abbreviations

CB: Caring behavior; MREC: Medical Research and Ethics Committee; MOH: Ministry of Health Malaysia; NMRR: National Medical Research Register; PH: Public Hospital; PHS: Public Health Service

Declarations

Ethics approval and consent to participate

The ethical approval had been obtained from the Medical Research and Ethics Committee (MREC), and National Medical Research Register (NMRR) (ref. no: NMRR-14-1226-21410) of Malaysia, Ministry of Health (MOH) and Sabah State Health Director (ref no: JKN(SB)PJNS/32). Respondents signed an informed consent before participation. All methods were applied in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available from Ministry of Health Malaysia, but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Ministry of Health Malaysia.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

NA, NAS, DCT, and SSF made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data. NA, NAS, DCT, SSF, CLT, and WS are involved in drafting the manuscript or revising it critically for important intellectual content. NA contributed in data collection. NA, ND, and WW reviewed the statistical methods and sample size calculations. NA, NAS, DCT, SSF, CLT, and WS reviewed the drafts and approved the final version of the article.

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References

1. Abdullah, F. S., Silvernayagam, S., & Tan, E. H. (2021). Perception of nurses on the practice environment: Experience from Malaysia. *Med J Malaysia*, 76(1), 73-79.
2. Aupia, A., Lee, T. T., Liu, C. Y., Wu, S. F. V., & Mills, M. E. (2018). Caring behavior perceived by nurses, patients and nursing students in Indonesia. *Journal of Professional Nursing*, 34(4), 314-319.
3. Fernández-Feito, A., Basurto-Hoyuelos, S., Palmeiro-Longo, M. R., & García-Díaz, V. (2019). Differences in professional values between nurses and nursing students: A gender perspective. *International nursing review*, 66(4), 577-589.
4. Fitriani, R., Yetti, K., & Kuntarti, K. (2019). Analysis of workload and occupational commitment: Their relationship to the caring behaviors of nurses in a hospital. *Enfermeria clinica*, 29, 634-639.
5. Ghazali, R. J. M., Ali, R., Borhan, N. F., & Bidin, N. (2007). *Penerapan budaya korporat dan nilai murni di kalangan anggota Kementerian Kesihatan Malaysia*. Institut Pengurusan Kesihatan: KKM.
6. Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, 45(5), 616-632.
7. Hendrawijaya, A. T. (2019). Demographic factors and employee performance: The mediating effect of employee empowerment. *Media Ekonomi dan Manajemen*, 34(2), 116-136.
8. Huynh, T., Alderson, M., & Thompson, M. (2008). Emotional labour underlying caring: An evolutionary concept analysis. *Journal of advanced nursing*, 64(2), 195-208.
9. Kaur, D., Sambasivan, M., & Kumar, N. (2015). Impact of emotional intelligence and spiritual intelligence on the caring behavior of nurses: a dimension-level exploratory study among public hospitals in Malaysia. *Applied Nursing Research*, 28(4), 293-298.
10. Malaysian Civil Service Commission (2020). *Jururawat Gred U29*. <https://www.spa.gov.my/spa/laman-utama/gaji-syarat-lantikan-deskripsi-tugas/diploma-stp-stpm-stam-hsc/jururawat>
11. McCullough, K., Bayes, S., Whitehead, L., Williams, A., & Cope, V. (2021). We say we are doing primary health care but we're not: Remote area nurses' perspectives on the challenges of providing primary health care services. *Collegian*, 28(5), 534-540.
12. Oluma, A., & Abadiga, M. (2020). Caring behavior and associated factors among nurses working in Jimma University specialized hospital, Oromia, Southwest Ethiopia, 2019. *BMC nursing*, 19(1), 1-7.
13. Papastavrou, E., Efstathiou, G., & Charalambous, A. (2011). Nurses' and patients' perceptions of caring behaviours: quantitative systematic review of comparative studies. *Journal of advanced*

nursing, 67(6), 1191-1205.

14. Parker, M. E., & Smith, M. C. (2010). *Nursing theories nursing practice*. F. A. Davis, Philadelphia.
15. Paulssen, M., Brunneder, J., & Sommerfeld, A. (2019). Customer in-role and extra-role behaviours in a retail setting: The differential roles of customer-company identification and overall satisfaction. *European Journal of Marketing*, 53(12), 2501-2529.
16. Pérez-Francisco, D. H., Duarte-Clíments, G., Del Rosario-Melián, J. M., Gómez-Salgado, J., Romero-Martín, M., & Sánchez-Gómez, M. B. (2020). Influence of workload on primary care nurses' health and burnout, patients' safety, and quality of care: Integrative review. *Healthcare (Basel, Switzerland)*, 8(1), 12.
17. Putra, K. R., Andayani, T., & Ningrum, E. H. (2021). Job satisfaction and caring behavior among nurses in a military hospital: A cross-sectional study. *Journal of public health research*, 10(2), 313-316.
18. Sabah State Health Department. (2021, January 19). *Health facts Sabah 2019*. Retrieved from <http://www.jknsabah.gov.my/v8/muatturun/penerbitan/HealthFacts2019.pdf>
19. Shalaby, S. A., Janbi, N. F., Mohammed, K. K., & Al-harhi, K. M. (2018). Assessing the caring behaviors of critical care nurses. *Journal of Nursing Education and Practice*, 8(10), 77-85.
20. Shazwani, I. (2017, November 4). Health Ministry gets 7,000 complaints, spends RM20mil on compensation annually. *New Straits Times*.
<https://www.nst.com.my/news/nation/2017/11/299206/health-ministry-gets-7000-complaints-spends-rm20mil-compensation-annually>
21. Soliman, H. M. M., Kassam, A. H., & Ibrahim, A. A. (2015). Correlation between patients' satisfaction and nurses' caring behaviors. *J Biol Agric Healthc*, 5(2), 30-41.
22. Vujanić, J., Prlić, N., & Lovrić, R. (2020). Nurses' self-assessment of caring behaviors in nurse-patient interactions: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 17(14), 5255.
23. Watson, J. (2006). Caring theory as an ethical guide to administrative and clinical practices. *JONA'S healthcare law, ethics, and regulation*, 8(3), 87-93.
24. Watson, J. (2008). *Assessing and measuring caring in nursing and health sciences*. Springer Publishing Company, LLC, New York
25. Watson, J. (2009). Caring is the essence and science of nursing and health care. *Mundo saúde*, 33(2), 143-149.
26. Wolf, Z. R., Miller, P. A., & Devine, M. (2003). Relationship between nurse caring and patient satisfaction in patients undergoing invasive cardiac procedures. *MedSurg Nursing*, 12(6), 391-397.
27. Wu, Y., Larrabee, J. H., & Putman, H. P. (2006). Caring behaviors inventory: A reduction of the 42-item instrument. *Nursing Research*, 55(1), 18-25.
28. Zhang, N., Li, J., Bu, X., & Gong, Z. X. (2021). The relationship between ethical climate and nursing service behavior in public and private hospitals: a cross-sectional study in China. *BMC nursing*, 20(1),

1-10.

29. Zhu, Y. (2013). Individual behavior: In-role and extra-role. *International Journal of Business Administration*, 4(1), 23–27.

Figures

Figure 1

Estimated Marginal Means