The Impact Of Excess Number Of Nurses On The Frequency Of Personal Activities: Evidence From An Oncology Hospital In Indonesia

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Abstract

Objective: The number of nursing education graduates is higher than the available jobs, making many hospitals in Indonesia have an excess number of nurses. While understaffing is well documented in the literature, research into its impact of overstaffing is lacking. We aim to conduct observations that focus on identifying the impact of an excess number of nurses on the personal activities of nurses.

Materials and method: we observed three inpatient wards at a cancer hospital in Indonesia. The three wards were classified as few (13 people), medium (18 people), and height (20 people) excess nurses. Observation were made once an hour on three nurses for each ward for seven days. Observations were made in the last week of March 2022. Data were analyzed using paired samples test.

Results: Nurses' activity in a room with a high number of nurses was significantly different from a room with a few excess nurses ($p < 0.010$) when the shift was used as a control. When the day of the week was controlled, the personal activity in a room with a high number of nurses was significantly different from a room with a slight excess of nurses ($p < 0.050$) and a room with a moderate excess of nurses ($p < 0.100$). There is no significant difference when working days and work shifts are controlled simultaneously.

Discussion: This finding provides evidence that an excess number of nurses is good because it can increase the time nurses spend on providing personal attention, which would not be sufficient if there were fewer nurses. The finding reinforces the job demands-resources theory that decreased job demands will increase performance on high job demands in another task.

Conclusion: Further research is needed to validate the findings of this study in a broader context with more thorough observations and a more significant number of participants.

Key Words: low job demands, nurses, work shift, personal activities, job demands-resources

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INTRODUCTION

Indonesia is one of the countries with an excess number of nurses. The number of nurses produced by higher education institutions is larger than the number of nurses needed by the available health care facilities. The job competition for nurses is very high. Reports show that 100,000 new nurses per year graduate from 352 undergraduate nursing programs, and only about half are absorbed by the private sector.1 It is not surprising that many hospitals in Indonesia have nurses exceeding their needs.So far, research on the behavior of nurses and the impact of an excess number of nurses on health services is still very minimal. Nursing research is much more productive on the other side of this phenomenon, namely the situation when a health care facility lacks sufficient nurses.2

Research shows that this impacts the occurrence of burnout and high turnover intention.3 On the other hand, it is unknown what will happen if a hospital has an excess of nurses.

Two hypotheses have been put forward

regarding the impact of over-nurse.4 The productive hypothesis says that this allows nurses to have more quality time to care for patients.5 Personal services for patients are of higher quality because physical needs and the patient's psychosocial needs are also met.6 This hypothesis is reflected in the burnout case where the shortage of nurses impacts the lack of individual attention to patients and the lack of time for nurses to care for patients with compassion.7 In general, literature in HR shows that excessive employee ownership can lead to innovation and company competitive advantage.8 The counterproductive hypothesis says that an excessive number of nurses leads to problems of idle time and counterproductive behavior.9 Nurses will relax more and do activities that do not provide economic value for the hospital.10 This hypothesis is logically put forward, considering that nurses who have excess workload feel excessive pressure to do work.11 Without a workload, the pressure disappears, and nurses consume time that should be used for productivity.12 In general, studies in HR also show that when the company does not have strategic changes or is in a stable condition, excess HR will lead to labor costs and decreased performance.13

Nurse behavior is undoubtedly influenced by many factors, including personal factors such as attitudes and institutions, not only by the availability of free time or the ratio of the number of existing nurses to the workload.14 Even so, research needs to be done to look at the behavior patterns of nurses in dealing with situations of less workload so that it is symmetrical between the empirical understanding of excessive and reduced workloads in current nurses. The current study aims to determine the behavior patterns of nurses in light workload situations due to the excess number of nurses.

Theory

According to the conservation of resources (COR) theory, psychological assessment of job demands and work resources leads to assessing and interpreting job-related stress, leading to burnout.15 Work demands positively impact nurse burnout, while work resources harm burnout.16 In this case, work demands are physical, social, or organizational aspects of work that require physical or psychological effort.17 High work demands consume the psychological and physical resources of employees and lead to increased stress, leading to health problems and adverse organizational outcomes.18

Jimmieson et al. proposed that low job demand in one job can be a buffer for another, higher job demand.19 Studies in the context of nurses show that low job demand in the form of lower work pressure than usual can reduce the association between job demand and stress in other contexts.20 The nursing profession has a dual task: the executor of scheduled daily tasks and a loving caregiver. The findings of Jimmieson et al. and Riedl and Thomas mean that when one of the two tasks' demands is low, he can be a supporter to meet higher job demands. If nurses must work hard daily to fulfill physical tasks, then low demands for ethical and compassionate behavior can help them cope with these daily tasks. Likewise, when work demands are regularly low, as in the case of an oversupply of nurses, nurses have the power to fulfill another, more demanding task, namely providing personal love and care to patients.

Studies also show that nurses with low job demands are more likely to behave in good health than those with high job demands.21 Giving personal attention to patients can also be seen as a healthy behavior because it fosters the psychosocial health of nurses. The study also found that nurses with low job demands had lower stress levels.22

Based on the above theory, it can be predicted that nurses who are in situations of excessive nurses will spend less time on personal interests than nurses who are in situations of nurses who are not too excessive.

Methods

This research was conducted in Dharmais Cancer Hospital Jakarta. Darmais hospital has 29 work units and 533 nurses as of 2022, with inpatient installation consisting of 11 work units (wards). The study was conducted in three of the 11 inpatient work units, namely the Cempaka Room (60 beds), Rose I room (36 beds), and Orchid II Room (42 beds). The bed occupancy rate (BOR) for the Cempaka room is 74%, the Rose I room is 73%, and the Orchid

room 2 is 72%. The number of existing nurses is 52 in the Cempaka room, 33 in the Rose I room, and 43 in the Orchid II room. The calculations in Table 1 show that the Cempaka room has 18 nurses surplus, the Rose I room has 13 nurses surplus, and the Orchid II room has 20 nurses surplus. The Orchid II ward is classified as a ward with high nurse excess, Cempaka has moderate nurse excess, and Rose I ward has low nurse excess. The number of hours of treatment needed per patient per day is set at four hours because it is classified as a partial patient.

The research team then randomly selected three nurses from each shift and each room so that nine nurses became participants. The research team observed the nurse's activities for seven days. Observations start at 07.30 and are carried out every hour until the last one is 21.30. Researchers recorded the activities carried out by nurses when the observations were made and classified them into direct care activities, indirect care activities, and personal activities.

Table 1. The Calculation of Nurse Needed

		Cempaka	Rose I	Orchid II
a	Number of hours of care required per patient/day	4	4	4
b	Number of weeks	52	52	52
c	Number of days per week	5	5	5
d	Beds total	60	36	42
e	BOR	74%	73%	72%
f	Number of effective days	212	212	212
g	Number of effective weeks	42	42	42
h	Number of hours per week	37.5	37.5	37.5
	a x b x c x d x e	49,177	29,108	33,494
	g x h	1,590	1,590	1,590
	Nursing staff needs	31	18	21
	Anticipation	10%	10%	10%
	Total	34	20	23
	Existing nurses	52	33	43
	Nurse excess	18	13	20

Data analysis was performed using a paired-samples t-test by comparing pairs of treatment rooms. Three analyzes were carried out, namely, analysis based on shift (n = 4 involving total shift), based on day (n = 7), and based on shift and day (n = 21). Paired samples t-test was used because it was able to compare differences between groups with a low sample size.23

Results

The observation process showed that the number of indirect activities reached the most significant proportion in all rooms. Activities in the Cempaka Room as many as 360 (56%) are indirect activities, while direct activities are 221 (34%) and personal activities are 67 (10%). The proportion of personal activities in the Rose I room is the same as in the Cempaka room, with 10% (64 activities). Indirect maintenance activities were 322 (50%), while direct care activities were 262 (40%). The proportion of activities in the Orchid II room is more balanced, with indirect activities of 311 (48%) and direct activities of 291 (45%). The remaining 46 activities (7%) are personal.

Table 2. The proportion of Activities by Wards

	Direct activities	Indirect activities	Personal activities
Cempaka	34%	56%	10%
Rose I	40%	50%	10%
Orchid II	45%	48%	7%

Table 3. The proportion of Activities by Shift

	Direct activities	Indirect activities	Personal activities
Morning Shift	41%	55%	4%
Afternoon Shift	42%	48%	10%
Night Shift	29%	49%	23%

From the results of observations for seven days consisting of 3 shifts, there were 774 direct activities carried out by nurses consisting of 60 types of activities. Meanwhile, there were 993 indirect activities carried out by nurses consisting of 29 types of activities for indirect activities. Personal activities occurred 177 times, divided into seven types of activities. The ten activities with the highest frequency are shown in Tables 4, 5, and 6.

Table 4. Ten direct nursing activities with the highest frequency

Direct activities	Frequency	Percent
Giving chemotherapy drugs	94	12.1
Giving injections	70	9.0
Measuring blood pressure	68	8.8
Controlling/ counting/ replacing infusion fluids	63	8.1
Insert/ remove/ maintenance infusion	52	6.7
Take blood/urine/fluid for examination	52	6.7
Orientation of the room to the patient	40	5.2
Give oral medication	36	4.7
Provide education to patients	31	4.0
Caring for cancer wounds	26	3.4

Table 5. Ten indirect nursing activities with the highest frequency

Indirect activities	Frequency	Percent
Doing nursing documentation using eMR	457	46.0
Handover of patients between shifts	177	17.8
Doing nursing documentation manually	70	7.0
Briefing	53	5.3
Prepare patient medication	49	4.9
Contact the doctor	32	3.2
Collaborating with other health workers	26	2.6
Prepare tools for nursing action	24	2.4
Preparing the patient to go home	23	2.3
Handover of new/transferred patients	17	1.7

Table 6. Personal activities

Personal activities	Frequency	Percent
Eat and drink	54	30.5
Salah (Islamic prayer)	54	30.5
Sit at the nurse station/rest	52	29.4
Prepare *takjil* (food for Islamic fasting)	6	3.4
Toilet	5	2.8
Looking for training information	4	2.3
Go to the employees' clinic	2	1.1

Furthermore, the analysis was carried out by comparing the proportion of personal activities based on shifts (Table 7). Paired samples test showed that the difference between Rose I and Orchid II is significant with $p < 0.010$. The proportion of personal activities in the Cempaka and Rose rooms I and between the Cempaka and Orchid II rooms did not differ significantly (Table 8).

Table 7. The proportion of Personal Activities by Ward and Shift

Shift	Cempaka	Rose I	Orchid II
Morning	5%	5%	3%
Afternoon	10%	12%	8%
Night	29%	21%	18%
All-day	10%	10%	7%

Table 8. Paired samples test controlling shift (n = 4)

Pair	Mean difference	Std. Deviation	t	p
Cempaka – Rose I	0.020	0.047	0.85	0.460
Cempaka – Orchid II	0.048	0.047	2.07	0.131
Rose I – Orchid II	0.028	0.005	11.00	0.002

Next, the analysis was carried out by comparing the proportion of personal activities based on the day of the week (Table 9). Paired samples test showed that the difference between Rose I and Orchid II is significant with $p < 0.100$. The difference between Cempaka and Orchid II was also significant, with $p < 0.050$. The proportion of personal activities in the Cempaka and Rose I rooms was not significantly different (Table 10).

Table 9. The proportion of Personal Activities by Ward and Day

	Cempaka	Rose I	Orchid II
Monday	8%	10%	7%
Tuesday	20%	19%	16%
Wednesday	11%	13%	5%
Thursday	3%	2%	4%
Friday	10%	6%	5%
Saturday	11%	10%	5%
Sunday	6%	6%	4%
All-week	10%	9%	6%

Table 10. Paired samples test controlling day in a week (n = 7)

Pair	Mean difference	Std. Deviation	t	p
Cempaka – Rose I	0.004	0.019	0.59	0.575
Cempaka – Orchid II	0.033	0.026	3.37	0.015
Rose I – Orchid II	0.029	0.031	2.39	0.054

Finally, we test the difference by controlling shift and day. Hence we have 21 sets of data. Differences between groups were no longer significant (Table 11). Even so, Orchid II is still the space with the lowest proportion of personal activity, indicated by a positive sign in the mean difference involving Orchid II as a partner in Table 11.

Table 11. Paired samples test controlling shift and day (n = 21)

Pair	Mean difference	Std. Deviation	t	p
Cempaka – Rose I	-0.006	0.051	-0.45	0.659
Cempaka – Orchid II	0.021	0.062	1.30	0.215
Rose I – Orchid II	0.028	0.059	1.74	0.105

Discussion

The most important finding of this study is that nurses who work in an excess number of nurses

have fewer personal activities than nurses who work in a less excessive number of nurses. This finding is especially the case when the nurse's workload is controlled in terms of the working days of the week. This study found that nurses who worked in the Orchid II room, which had an excess of 20 nurses, had fewer personal activities, i.e., between 4% and 16% of all their activities, than other rooms. In the Rose I room, the proportion of personal activities is 2% to 19% a week, while 3% to 20% in the Cempaka room. If the nurse's shift is controlled, the nurses in the Orchid II room also significantly differ from the nurses in the Rose I room in terms of time for personal activities, but not from the nurses working in the Cempaka room. For nurses who work in the Orchid II room, morning, afternoon, and evening, personal activities are 3%, 8%, and 18%, respectively.

In contrast, in the Rose I room, the proportion of personal activities is 5% in the morning, 12% during the day, and 21% at night. Significant differences disappeared when shifts and workdays were controlled simultaneously. On average, the nurses' activities in the Orchid II room were lower than in other rooms, namely 5% vs. 8% for the Cempaka room and 7% for the Rose room. This finding is in line with the theory of conservation of resources and job demands-resources,24 especially those further developed by Jimmieson et al. and empirical studies by Riedl and Thomas.19,20 Both studies imply that decreasing work demands on one task will encourage increased performance on other tasks with higher work demands in multiple tasks. As a result, this study rejects the hypothesis that a decrease in workload will make nurses lazy and have much idle time. The study results do not show that nurses in the Orchid II ward have more personal activities than in the other two rooms.

Conclusion

From an individual, organizational, and social point of view, nurses need to understand whether they will be more compassionate or neglect their duties and responsibilities when work demands are low. This study reveals that patients' most outstanding service activities will be obtained if they have more time to carry out their duties and responsibilities. The treatment room with more excess nurses has less time to do personal activities. This low proportion of personal activity does not mean they have little time to rest. Their rest time is the same for all wards because the government owns the hospital under study, with standard rest periods regardless of the number of nurses. The low proportion of personal activities is caused by nurses spending much time with patients to provide consultation and affection needed by patients as psychological support for them.

Managers in health care settings need not worry about the loss of quality if the number of nurses they have exceeds the ideal number needed. If the quality of care is prioritized, the more nurses per patient, the better. This implication is due to the low work demands that nurses get, in line with the supporting resources in the hospital. Good quality of care contributes to patient health and decreased hospital stay. This reduction in residence time allows for better hospital performance due to rapid patient turnover.

However, this research is still limited in terms of scope. As only three wards were studied, the statistical analysis options available were minimal. Regression analysis can be done if the number of wards and the observation time is longer. Further research can consider the excess nurse variable as a determinant of the quality of nursing services to patients and other performance variables such as financial performance.

In addition, this study focused on nurses' activities, which were detected discretely at an interval of one hour, rather than conducting continuous observations. Data collection was also carried out without measuring the activities' duration. Further research needs to carry out observations continuously or in a narrower time interval. In addition, further research should also measure the duration of activities carried out by nurses so that more precise indicators can be obtained to measure the percentage of direct care activities, indirect care, and personal activities.

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