Analysis of Nursing Workload at Islamic Hospital Surabaya

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Abstract--- *An easy access to receive health services through BPJS (The Healthcare and Social Security Agency) will increase the number of patients coming to a hospital for both inpatient and outpatient medical treatments. The increasing number is dominated by the elderly (70%). This condition has impacts on the nurses' workload. This study aimed to analyze the correlation between the types of hospital wards, nurses' work shift and workload in the in-patient wards of Rumah Sakit Islam Surabaya. This condition affects their workload. This study aimed to analyze the correlation between the types of hospital wards, nurses' work shift and workload in the in-patient wards of Rumah Sakit Islam Surabaya. This study used a descriptive analytic research design with a cross-sectional approach. The population of all nurses in the in-patient wards of the stated hospital totaled 109 nurses of whom 83 respondents were chosen using a cluster random sampling technique. The variables included the types of wards, nurses' work shifts and workloads. The data were collected using an observation sheet. The data were analyzed using a Chi-square test with a level of significance α = 0.05. The Chi-square test revealed that there was a correlation between work shift and workload in which ρ (0.036) < α (0.05), whereas the types of wards did not correlate with workload shown by the result that ρ (0.341) > α (0.05). In conclusion, work shift correlates with workload. Therefore, proportional work scheduling should be considered to fulfil the patients' needs and prevent tiredness due to high workload.*

Keywords--- *Workload; Work shift; Direct action; Types of wards.*

I. INTRODUCTION

National Health Insurance (JKN) is the government's healthcare program dedicated to all Indonesian people working under the insurance system managed by The Healthcare and Social Security Agency (BPJS). Some private hospitals do not collaborate with the agency. Islamic Hospital Surabaya is one of the private hospitals providing medical services in collaboration with BPJS. Having collaboration with the agency, more patients come and go, including those who need hospitalization. Consequently, the bed occupancy rate (BOR) increases. Prior to the collaboration, the BOR ranged from 50-55%. At present, it is at 67%. The BOR varies in each ward ranging from 49% to 92%. However, more than 70% of the patients visiting Islamic Hospital Surabaya are elderly (at ≥ 60 years) with various health problems. Therefore, the increasing patient rate, BOR, and their conditions will affect the nurses' workload. Moreover, the difference in BOR in each ward also influence their workload [1], [2], [4].

Workload is the amount of work that must be carried by a position at work or organizational unit and is a product of the amount of work and time available to do it [5]. Workload is an effort that must be made by someone to fulfill the job [6]. Nursing workload is influenced by the number of patients, the patient's condition, the average day of care, measurement of direct care, indirect care and health education, the frequency of actions needed by the patient

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and the average time needed to carry out the actions [7], [1] Workload is an element which needs to be considered to achieve suitability and high work productivity. High workload overwhelming the nurses' capacity may have a negative impact on work productivity [8]. Workload also affects the services given to the patients, as stated by [4]. There is a direct correlation between nurses' workload and their quality of services. Furthermore, workload also affects the patients' safety and cost. The failure to provide patient safety leads to high cost. The average cost for blood circulation infection (phlebitis) treatment may reach USD 45,000. The cost for giving treatment for an injury due to an accident from falling is USD 14,000 on average [9], [10]. In addition, workload may also affect the nurses' psychological condition, as it may cause stress at work [11], [12].

The results of nurses' workload analysis can be used as the basis to find out: 1) the proportion of time spent on productive or unproductive activities, 2) the workload pattern of nurses related with time and work schedules, and 3) the amount of nurses needed at hospital [7], [3]. Based on the preliminary observation, the types of hospital wards and work shift will have an impact on the number of activities carried out by nurses in providing nursing care. The purpose of this study was to analyze the correlation between the types of hospital wards, nurses' work shifts and workload in the in-patient wards of Islamic Hospital Surabaya.

II.   METHODS

This study used a descriptive analytic research design with a cross-sectional approach [13]. The population of all nurses in the in-patient wards of the above-stated hospital totaled 109 nurses of whom 83 respondents were chosen using a simple random sampling technique [13]. The inclusion criteria involved nurses who were willing to be respondents, whereas the exclusion criteria included nurses taking maternity leave. The independent variables were the types of wards, nurses' work shifts and the dependent variable was workload.

Data collection was carried out using observation sheets. Before conducting an observation, the respondents received an explanation about the title of this study, purposes, voluntary participation, and data confidentiality. Moreover, the respondents signed the informed consent after receiving the explanation. The nurses were told to work as usual under observation conducted by recording the time to finish the work. The nurse's code and wards where they work were written on the observation sheet, for example surgical medical ward, pediatric ward or maternity ward. The wok shift was also identified. Observation of workload was done using work sampling [13]. The steps in conducting observations using work sampling were as follows: 1) determining nurses to be observed, 2) recording the activities done by nurses during working hours, 3) identifying those activities to determine their correlation with the functions and duties during working hours, 4) calculating the proportion of working hours used for productive or unproductive activities, 5) identifying the nurse's work pattern related to the time and schedule of working hours.

The preliminary data were analyzed using univariate analysis by using percentage. Further, they were analyzed using the Chi-Square test with a significance level of $\alpha = 0.05$. This research was ethically reviewed by the research ethics committee of Universitas Nahdlatul Ulama Surabaya (ref: Certificate No.176/EC/KEPK/UNUSA/2019) and was certified ethically eligible.

III. RESULTS

This study was conducted in the in-patient wards of Islamic Hospital Surabaya: surgical medical ward (Mina room, Multazam room, Shofa-Marwa room, and Makkah room), pediatric ward (Madinah room and Hijr Ismail room) and maternity ward (only in Thaif room). The highest BOR (bed occupancy ratio) in Islamic Hospital Surabaya was shown in the surgical medical ward at 90.3%, whereas the lowest BOR was shown in the maternity ward at 49%. The surgical medical ward consists of 4 rooms, namely Mina, Multazam, Shofa-Marwa and Makkah. Makkah room has

the most beds of all, even though the BOR was the lowest of all at 75%. Based on the BOR shown in the pediatric ward, Hijr Ismail room was higher (93.3) as shown in Table 1.

Table 1 Description of research site

Wards	TT	The number of nurses	Average BOR (%)
Surgical medical ward	81	59	90.3
Shofa-Marwah	21	14	92.3
Multazam	15	12	86.34
Mina	18	14	92.3
Makkah	27	19	75
Pediatric ward	44	33	78.7
Hijr Ismail	16	13	93.3
Madinah	28	20	64.10
Maternity ward (Thaif)	17	17	49
Total	142	109	67

The results showed that nearly all respondents (87.9%) were females, most of them (47%) were between 26 and35 years of age, most (55.4%) had a D3 Nursing degree, most (65%) had been working for less than 6 years, and most (54.2%) were married as shown in Table 2.

Table 2. Frequency distribution of the respondents based on sex, age, latest educational background, length of service and marital status

Variable	Frequency(n)	Percentage (%)
Sex		
Female	73	87.9
Male	10	12.1
Total	83	100.0
Age (in year)		
17-25	26	31
26-35	39	47
36-45	10	12
46-55	8	10
Total	83	100.0
Latest educational background		
Diploma 3	46	55.4
Diploma 4	4	4.8
Ners	33	39.8
Total	83	100.0
Length of service		
Short duration of service (<6 years)	54	65
Intermediate duration of service (6-10 years)	9	10
Long duration of service (>10 years)	20	25
Total	83	100.0
Marital status		
Single	38	45.8
Married	45	54.2
Total	83	100.0

The characteristics of respondents based on the types of wards, work shift and workload showed that nearly half of the respondents (49.4%) had a high workload, most of them (54.2%) worked in the surgical medical ward, and most (36%) worked in the morning shift as shown in Table 3.

Table 3 Frequency distribution based on the types of wards, work shift and workload

Variable	Frequency (n)	Percentage (%)
Workload		
Low	42	50.6
High	41	49.4
Total	83	100.0
Types of wards		
Surgical medical ward	45	54.2
Pediatric ward	25	30.1
Maternity ward	13	15.7
Total	83	100.0

Variable	Frequency (n)	Percentage (%)
Work shift		
Morning shift	30	36.2
Afternoon shift	28	33.7
Night shift	25	30.1
Total	83	100.0

Nursing actions are classified into direct actions, indirect actions, and non-productive actions. The respondents conducted direct actions for 191 minutes on average or 40% of the total workload, as shown in Table 4.

Table 4. Characteristics of respondents based on nursing care

Variable	Average time (minutes)	Percentage of workload (%)
Direct actions	191	40
Indirect actions	182	38
Non-productive actions	105	22
Total	478	100

The correlation between the types of wards and workload is presented in Table 5 illustrating that explained that among 45 respondents working in the surgical medical ward, most of them (53.3%) had a high workload; of 25 respondents working in the pediatric ward, most of the respondents (52%) had a high workload; and among 13 respondents working in the maternity ward, most (69.2 %) had a low workload. The result of the Chi Square test showed that ρ (0.341) > α (0.05) which meant that H_0 was accepted. Therefore, it was shown that there was no correlation between the types of wards and workload.

Table 5. Cross tabulation of the types of wards and workload

Types of wards	Workload				n	%
	Low		High			
	n	%	n	%		
Surgical medical ward	21	46.7	24	53.3	45	100
Paediatric ward	12	48.0	13	52.0	25	100
Maternity ward	9	69.2	4	30.8	13	100
Total	42	50.6	41	49.4	83	100
			$\rho = 0.341$			

The correlation between work shift and workload was presented in Table 6 showing that of 30 respondents working on the morning shift, most of them (63.3%) had a high workload. Among 28 respondents working on the afternoon shift, most (53.6%) had a high workload. Further, among 25 respondents working on the night shift, most (72 %) had a low workload. The result of the Chi Square test showed that $\rho = 0.029 < \alpha$ (0.05) which meant that H0 was rejected. Therefore, it showed a correlation between work shift and workload.

Table 6. Cross tabulation of work shift and workload

Work shift	Workload				n	%
	Low		High			
	N	%	n	%		
Morning shift	11	36.7	19	63.3	30	100
Afternoon shift	13	46.4	15	53.6	28	100
Night shift	18	72.0	7	28.0	25	100
Total	42	50.6	41	49.4	83	100
			$\rho: 0.029$			

IV. DISCUSSION

Based on Table 3, nearly half of the nurses working in Islamic Hospital Surabaya (4.4%) had a high workload, whereas most of them (50.6%) had a low workload. The average productive work time of respondents was 79%, meaning that it is still included in the criteria of low workload because it was less than 80% [1]. The balanced

workload will maintain nurses' health that will affect the quality of service [4]. High workload leads to tiredness and stress [14], [11], [12], and may result in dissatisfaction and burn out. When the nurses experience burn out, other nurses must substitute their jobs. Consequently, the hospital management needs to spend more on training new employees [4]. In contrast, nurses with a low workload may cause cost inefficiency because of their low productivity [8]. The imbalanced workload also affects the patient's safety [10], [4].

Most of the nursing activities done in the hospital were categorized as direct actions and they needed to spend 191 minutes (3 hours and 18 minutes) on average to perform nursing care as shown in Table 4. The direct actions cover doing observations, helping patients in the restroom, bathing patients, giving medicines, giving IV (intravenous) solutions, performing wound care, delivering patients to the operation room and taking them back to their rooms, taking patients to a lab for an X-ray examination, maintaining a comfortable environment, such as changing bed linen, performing blood glucose examination, and meeting any care needs of the patients. Most of the time, they spend 30 minutes of each shift taking observations. The second activity is to fulfill the patient's need for a comfortable environment; that is bed cleaning. Direct actions include independent actions, observational actions, collaborative actions and education [15], [16]. Despite the technological advancements, the independent nursing interventions fulfill the patients' needs for comfort, such as changing linen and maintaining cleanliness and these must still be done. As noted by Florence Nightingale, nurses also need to maintain the patient's physical environment, such as room hygiene, ventilation, lighting, availability of clean water, and so on [17], [4].

Nursing interventions consist of both direct and indirect interventions [18]. Indirect interventions done by the nurses in Islamic Hospital Surabaya are documenting the nursing interventions, handing over the shift, preparing patients for hospital discharge, accompanying doctor's visits, consulting with doctors, mixing medicines, and entering data in the billing system. They spend 182 minutes (3 hours and 3 minutes) performing the indirect interventions on average, and this represents 38% of the total activities in a shift. This condition is considered high because [19] states that the average hour for doing indirect interventions is 35 minutes per patient. If a nurse has responsibility for taking care of 5 patients in a shift he/she needs 175 minutes or 2.9 hours. Among the indirect interventions, he/she spends most of the time on documentation. The average hour spent by the nurses to do nursing documentation is 1 hour. The time used for documentation is considered long because the documentation system applied in Islamic Hospital Surabaya is still manual so it requires longer time compared to operating an online system. This is in line with the study conducted by [4] claiming that calculating the workload involved many factors as the indicators, such as, direct and indirect actions.

The result of this study showed that the average non-productive time spent by the nurses was 105 minutes (1.8 hours). Based on the observation, they spent their time eating, drinking, praying, taking short rests for those on night shift, using mobile phones, and communicating with friends. The time for non-productive activities is considered high because the standard time for doing non-productive activities should be 1 hour [20]. Thus, the result of observing the workload is that it is low so that the productivity is also low. In fact, the BOR in the ward is high so the nurse's responsibility for the jobs needs to be evaluated [21].

The result of the Chi square test on the workload based on the types of wards in which the respondents worked showed that $\rho = 0.341$, which meant that H_o was accepted because $\rho > \alpha$. Therefore, there was no relationship between the types of wards and workload. Table 3.5 shows that the majority of respondents working in the surgical medical wards had a high workload, followed by pediatric and maternity wards. This is different from the results of the research conducted in Thailand and the Philippines that the average number of hours of treatment in a pediatric ward is 4 hours, while in the surgical medical ward it is 3.4 hours. This means that in Thailand and the Philippines, the pediatric ward has a higher workload than the surgical medical ward [22]. The high workload in the surgical medical

ward in Islamic Hospital Islam Surabaya is shown by some activities, such as wound care and routine blood sugar testing because patients with diabetes mellitus need more treatment and should be examined periodically. This happens because most of the patients ($\geq$ 70%) are elderly (aged 60+). Both the number of patients and their dependency level affect the workload [4], [8], [23]. The dominant activities in the pediatric ward are mixing up medicines and using a nebulizer for patients who need airway clearance. Whilst, most nurses working in the maternity ward have a low workload since post-partum patients are included in the category of minimal dependency level because most of their activities can be carried out independently by themselves, nurses provide support and education to improve their abilities in self-care independence including caring for newborns [22], [7].

Based on the results of this study, there is a correlation between work shift and workload in which ρ (0.029) < α. Nurses working in the morning service have a higher workload in percentage than those in the afternoon and night shifts. The high workload on the morning shift is related to the daily activities on the morning shift being more than those are on the afternoon and night shifts. Many examinations are done in the morning, as well as doctor's visits, and many other activities. This is in line with the formula for calculating energy proposed by Douglas in 1983, stating that the multiplication in the morning service is higher than the afternoon and night service [2], [1], [24]. Cumulatively, the morning shift has a higher workload than the afternoon and night shifts, but if we look closely at each ward, it turns out that the pediatric ward has its own uniqueness. The workload in the pediatric ward on the afternoon shift can be higher than the morning and night shifts. This relates to the fact that many children are admitted in the late afternoon. When applied to children, infusion takes longer than in adults, and this will also affect the workload of nurses because workload is an effort that must be expended by someone to fulfill the job [6]. The work factors that can influence the workload are the length of working hours, work shift, night-shift work, wage systems, work systems, delegation of duties, responsibilities and authority, and so forth [7], [19], [1], [23], [4], [25], [24].

V. Conlusion

Nearly half of the nurses at Islamic Hospital Surabaya have a high workload. Most of them working in the surgical medical ward have a high workload, whereas the lowest workload is seen in the maternity ward. Hence, there is no relationship between the types of wards and workload. Conversely, there is a correlation between work shift and workload as shown by the evidence that more nurses on the morning shift have a high workload than those on the afternoon and night shifts.

Conflict Of Interest

Authors declare there is no potential conflict of interest.

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