ORIGINAL RESEARCH

Effect of employee labor expenses on the response time in Emergency Department of Sampang Hospital, Indonesia

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ABSTRACT

Background: The Emergency Department (ED) has the main purpose of receiving, triageing, stabilizing, and providing acute health services to patients, including those who require resuscitation and emergency patients to some degree. An indicator of the success of medical treatment of emergency patients is the speed of providing adequate assistance both in daily routine situations or during disasters. Factors that influence nurses' motivation to work, especially implementing triage at the Emergency Department include the characteristics of nurses such as age, sex, education, length of work and training. **Objective**: To analyze the effect of workload of the medical staff of the Emergency Department on the response time in the Emergency Department of Sampang Hospital, Indonesia. **Materials and Methods**: Observational analytic research with cross-sectional design. Sampling was performed with total sampling method to 24 people who met the criteria. Data collection was done by questionnaire and observation. Data were analyzed using the Chi-square correlation test and Fisher's exact test. **Results**: There was a significant influence between workload and response time of triage P1 of Emergency Department staff at Sampang Hospital, Indonesia (p=0.015), whereas in triage P2 and P3 there was no effect of workload of staff on response time (p>0.05). **Conclusion**: In Emergency Department of Sampang Hospital, Indonesia, the response time in all categories of emergency (P1/red, P2/yellow, and P3/green) is fast. Workload correlates significantly with response time in P1/red category, while in P2/yellow and P3/green categories the workload has no effect on the response time.

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BACKGROUND

Hospital is a health service institution which provides complete individual health services that provide inpatient, outpatient and emergency services (Law no. 44 of 1999). Hospital is also a place for implementing health efforts that is every activity to improve health, to maintain health, and also to achieve an optimal health degree for the community (Bahrampour, et al., 2018)

An emergency is a situation that occurs suddenly resulting in a person or many people requiring immediate help or treatment carefully, precisely and quickly. If they do not receive such help, they will be dead or disabled. Triage is a concept of sorting or assessing that is fast, precise, and focused in a way that allows the most efficient use of human resources, equipment and facilities. Emergency handling has a philosophy, "Time Saving's Live Saving" which means that all actions taken during an emergency must be truly effective and efficient. Stop breathing for 2-3 minutes in humans can cause fatality (Lindskou., et al., 2019).

According to World Health Organization [WHO] (2012) there are several emergency diseases and the largest contributor to death in the world, including ischemic heart disease 7.4 million (13.2%), stroke 76.7 million (11.9%), chronic obstructive pulmonary disease 31 million (5.6%), respiratory infections below 3.1 million (5.5%), and cancer 1.6 million (2.9%).

One indicator of the success on medical treatment for emergency patients is the speed of providing adequate assistance to emergency patients, both in daily routine situations or during disasters (Considine, et al., 2013). The response time is where the patient comes for the initial emergency action until the emergency action is completed. A good response time for patients is less than 5 minutes (Ministry of Health, Republic of Indonesia, 2009).

Based on a preliminary study conducted by researchers on June 15-16, 2019, the number of health workers was 24 people. It consisted of 22 nurses and 2 doctors. The lowest education level was Diploma (D3) as many as 5 people, then Bachelor (S1) as many as 18 people, and the highest education level was Postgraduate (S2) as many as 1 person. The number of patients from January to May 2019 was 7878 people.

There are several factors that affect the motivation of nurses to work, especially implementing triage in the Emergency Department which are the characteristics of nurses such as age, gender, education, length of work and training. Both workload factors are a situation where a person is faced with a task that must be completed at a certain time (Nurhanifah, 2015).

If the workload of a nurse is high, it has a very big influence in providing services in the Emergency. Department because the nurses potentially make mistakes that will put patient safety at risk. If the nurse is incorrect in sorting or making the patient's top priority, then the patient will be at risk of experiencing disability and even death. According to Nurhanifah (2015) the impact of the workload felt by nurses is that they often feel tired, cannot relax, the nape muscles and back are tense. Sometimes they are irritable, have difficulty in sleeping, and have difficulty in concentrating. In addition, the nurses' workload is less responsive and they do not pay attention to the psychological and emotional aspects of the patient.

OBJECTIVE

The purpose of this study was to determine the effect of the workload of Emergency Department workers on the response time in implementating triage at Sampang Hospital, Indonesia.

MATERIALS AND METHODS

This study was an analytic observational study because it aimed to determine the effect of the workload of doctors or nurses on response time in conducting triage P1, P2, and P3 in the Emergency Department of Sampang Hospital, Indonesia. The research sample was taken from total population sampling, where the data source took as many as workers who worked in the Emergency Department in Sampang Hospital, Indonesia. The number of samples used in this study were 24 respondents. Data were collected using a questionnaire and observation then it was analyzed in Statistical Package for the Social Sciences (SPSS) application using Fischer exact correlation test, with α=0.05.

RESULTS

Characteristics of Emergency Department health workers in Sampang Hospital, Indonesia

Gender

Among 24 workers in the Emergency Department at Sampang Hospital, Indonesia, most of them were male, as many as 20 people (83.3%), while the rest was only 4 people or 16.7% was female

Table I. Frequency distribution of respondents by gender

Gender	Frequency	Percentage (%)
Male	20	83.3
Female	4	16.7
Total	24	100

Respondent Age

Almost half of the Emergency Department workers in Sampang Hospital, Indonesia were between the ages of 31-40 years, namely 11 people or 45.8%, while those aged over 40 years were only 4 people or 16.7%.

Table 2. Frequency distribution of respondents by age group

Age Group (years)	Frequency	Percentage (%)
21-30	9	37.5
31-40	11	45.8
41-50	4	16.7
Total	24	100

Highest education

Most of the workers in the Emergency Department of Sampang Hospital, Indonesia had Bachelor's degree, namely 18 people or 75.0%, even 1 person or 4.2% had reached postgraduate level of education, while only 5 people or 20.8% had a Diploma level of education.

Table 3. Frequency distribution of respondents based on latest education

Latest education	Frequency	Percentage (%)
Diploma	5	20.8
Bachelor	18	75
Postgraduate	1	4.2
Total	24	100

Work shift

Among the 24 Emergency Department workers of Sampang Hospital, Indonesia, 9 people or 37.5% worked in the morning shift, 7 people or 29.2% worked in the afternoon shift and 8 people or 33,3% worked at night shifts.

Table 4. Frequency distribution of respondents based on work shift

Work Shift	Frequency	Percentage (%)
Night	9	37.5
Afternoon	7	29.2
Night	8	33.3
Total	24	100

Work period

Among the 24 Emergency Department workers in the Sampang Hospital, Indonesia, 9 people or 37.5% had worked for ≤ 5 years, 7 people or 29.2% had a working period of > 5 - 10 years, 5 people or 20.8% had a working period of > 10 to 15 years, and even found as many as 3 people or 12.5% who have worked in the Emergency Department for more than 15 years.

Table 5. Frequency distribution of respondents based on work shift

Work Period (year)	Frequency	Percentage (%)
≤ 5	9	37.5
> 5 -10	7	29.2
> 10 - 15	5	20.8
> 15	3	12.5
Total	24	100

Description of workload for Emergency Department medical workers at Sampang Hospital, Indonesia

Among the 24 respondents, most of the respondents had a moderate workload (18 people or 75.0%), as many as 6 people or 25.0% had a heavy workload and none of the respondents had a light category of workload.

Table 6. Frequency distribution of respondents based on workload

Workload	Frequency	Percentage (%)
Light	0	0
Moderate	18	75
Heavy	6	25
Total	24	100

Description of response time for Emergency Department medical workers in Sampang Hospital, Indonesia

In P1 category (Red), among the 24 respondents, 15 people or 62.5% did the response time in the fast category (<5 minutes) and 9 people (37.5%) did the response time in the slow category (> 5 minutes). While on triage Category P2 (Yellow) it was obtained as many as 20 people (83.3%) did the fast category response time (<15 minutes) and 4 people or 16.7% did the slow response time (> 15 minutes). Then, on triage Category P3 (Green) it was obtained as many as 21 people or 87.5% who did the fast category response time (<45 minutes) and as many as 3 people (12.5%) did the slow category response time (> 45 minutes).

Table 7. Frequency distribution of respondents based on work shift

Triage	Response Time				Total
	Fast.	Percentage	Slow	Percentage	
P1	15	62.5	9	37.5	24
P2	20	83.3	4	16.7	24
P3	21	87.5	3	12.5	24

Analysis of the effect of workload on response time of Emergency Department workers in Sampang Hospital, Indonesia

Table 8 shows a tendency that a heavy workload affects triage P1 response time that is slow in the Emergency Department of Sampang Hospital, Indonesia. Based on the research results, it was found that 18 respondents' workload was moderate, most of them (77.8%) had a fast response time and 22.2% had a slow response time. Meanwhile, for workers whose workload was in the heavy category, most (83.3%) had a slow response time and only 16.7% had a fast response time.

Table 8. Distribution of respondents frequency based on workload (P1)

Workload	Response Time			
	Fast.	%	Slow	%
Moderate	14	77.8	4	22.2
Heavy	1	16.7	5	83.2
Total	15	62.5	9	37.5

The results of statistical tests showed that there was a significant relationship between workload and triage P1 response time of workers in the Emergency Department of Sampang Hospital, Indonesia ($p=0.015 < \alpha=0.05$). Based on contingency coefficient (C_c) value it was noted that the value of $C_c=0.480$, so it can be concluded that the effect of workload on response time was in the medium category, and because C_c value was positive so that it could be explained that the heavier the workload for workers, the slower it was in reaching the response time at triage P1, and, vice versa, the lighter the workload for health workers, the faster it was in reaching the triage P1 response time.

Table 9. Distribution of respondents frequency based on workload (P2)

Workload	Response Time			
	Fast.	%	Slow	%
Moderate	15	83.3	3	16.7
Heavy	5	83.3	1	16.7
Total	20	83.3	4	16.7

Table 9 shows the impact of the respondent's workload on triage P2 response time in the Emergency Department of Sampang Hospital, Indonesia. Based on the results of the study, it was known that 18 respondents whose workload was moderate, most (83.3%) had a fast response time and 16.7% had a slow response time. Likewise on workers whose workload was in the heavy category, most of them (83.3%) had a slow response time and 16.7% had a fast response time.

The results of statistical tests showed no significant correlation between workload and triage P2 response time of workers in the Emergency Department of Sampang Hospital, Indonesia ($p=1,000> \alpha=0.05$).

Table 10. Frequency distribution of respondents based on workload (P3)

Workload	Response Time			
	Fast.	%	Slow	%
Moderate	15	83.3	3	16.7
Heavy	6	100	0	0.0
Total	21	87.5	3	12.5

Workers' workload did not appear to have an impact on triage P3 response time for Emergency Department workers in Sampang Hospital, Indonesia, where for workers whose workload was moderate, 83.3% of the response time was in the fast category and 16.7% was in the slow category, while for workers whose workload was in the heavy category, all 100.0% was in the fast category response time. The results of statistical analysis showed no significant correlation between workload and triage P3 response time for Emergency Department workers at Sampang Hospital, Indonesia ($p=0.546 > \alpha=0.05$).

DISCUSSION

Characteristics of Emergency Department workers in Sampang Hospital, Indonesia

The results of the research on 24 employees who worked in Emergency Department at Sampang Hospital, Indonesia found that most of the respondents were male, as many as 20 respondents (83.3%), this was because working in the Emergency Department of a hospital requires physical readiness and concentration, provides services to patients, because the patient is in an emergency condition. Naturally, the physical ability of men is greater than that of women which allows most respondents to have a

moderate workload. In addition, the average age of the respondents was 31-40 years old. The age of the respondent affects the workload received because when the age range is getting older, a person has decreased muscle strength, sensory and motor skills so that the workload given also needs to consider a person's age category (Keller & Engelhart, 2014).

Most of the Emergency Department respondents at Sampang Hospital, Indonesia had an undergraduate degree as many as 15 people. It can also be a determining factor for the burden on the respondent. Respondents with an undergraduate level of education were more theoretical than nurses with a Diploma level of education because they were practical and better trained in treating patients so that education was also possible for uncontrolled stressor. Emergency medical workers in carrying out an emergency must have 3 elements of readiness, including the readiness of knowledge and skills because it is closely related to patient handling efforts (von Harbou, et al., 2020).

The work shift in the Emergency Department of Sampang Hospital, Indonesia was divided into three, namely morning, afternoon, and night shifts. Morning shift had a higher number, namely 9 respondents, this also affected the workload in doing triage, because in the morning shift the number of patients tends to be more than it is in the other shifts. The more the medical workers, the easier it will be to implement patients' triage and can reduce the workload of respondents (Ningsih, 2018).

The <5 years working period is 9 respondents, which indicates that the respondent is inexperience which can cause an increase in workload due to the respondent's unpreparedness in handling stressors so that it takes time to adapt to the Emergency Department so that the respondent will get used to it and be easy to implement triage quickly and precisely (Kasmarani, 2012).

Description of workload for Emergency Department medical workers at Sampang Hospital, Indonesia

The results of this study indicated that 18 Emergency Department respondents at Sampang Hospital, Indonesia had a moderate workload. This was because the Emergency Department is a unit in the hospital where patients who are in an emergency will visit for the first time.

The workload faced by Emergency Department medical workers fluctuates depending on the number of patients admitted to the Emergency Department and the severity of each patient which will affect the type of medical action that must be given to patients. In addition to the fluctuating workload, nurses at the Emergency Department also had various additional tasks that are sometimes carried out by medical workers in the Emergency Department. These things can be stressor for medical workers in the Emergency Department. If this is allowed to do so, with such conditions of duty and workload, it is feared that Emergency Department workers will experience this burnout if the workload they receive has exceeded their work capacity. Mandasari (2014). This is as expressed by Barbosa et al. (2012) that high workloads and repetitive routine tasks can cause burnout.

This research was sin line with Madjid et al. (2014), the observation results showed that the percentage of nurses with a heavy workload was greater than the percentage of nurses with a light workload. This was influenced by external factors, namely the organization and work environment, staff placement had not been regulated and nurses had not been divided by nurses for patients who are included in surgical and non-surgical Emergency Department and 1 nurse hold 4 patients in the full bed time. Thus, the workload of nurses in the Emergency Department was heavy.

This was in accordance with a research by Portoghese et al., (2014) which states that the more additional tasks that must be done by a health worker, the workload will increase and vice versa. Meanwhile, respondents with heavy workload were 6 people. This was because a person has not been able to accept stressor and the assignment given, each person has his respective abilities in dealing with a pressure on the job so that a good coping mechanism is needed in order to reduce the workload received.

Suci (2017) who states that in analyzing workloads, an institution/company certainly has hopes that the burden that is handled by an employee is not burdensome and is in accordance with the ability/competence of an employee in general. For this reason, institutions should pay attention to factors that affect workload, including: 1) Internal factors which include gender, age, health status, motivation, and perceptions 2) external factors which include: work environment, facilities and infrastructure at work, and work organization (Suci, 2017).

Description of response time for Emergency Department health workers in Sampang Hospital, Indonesia

Emergency service response time based on P1 triage in the Emergency Department in Sampang Hospital, Indonesia, namely, fast as many as 15 people (62.5%) and slow as many as 9 people (37.5%). This was because most of the medical workers from Emergency Department at Sampang Hospital, Indonesia were already trained in dealing with emergency patients and have received BTCLS training and it is still valid, so that in handling P1 triage service response time is mostly less than 5 minutes.

This research was in line with Suratmi (2016) showing that nurses at the Emergency Department of UPTD Puskesmas Ampah, showing that as many as 15 respondents (88.2%) performed response time according to existing standards, and as many as 2 respondents (11.8%) had not yet performed response time based on the existing standards.

This research was in line with Ningsih, et al. (2018) showing that nurses in the Emergency Department of Ratu Zalecha Martapura Regional Hospital, as many as 18 respondents (78.3%) performed fast response time, and as many as 5 people (21.7%) performed slow response time. Ministry of Health, Republic of Indonesia (2009) also states that the indicator of response time in doing triage in emergency patients in the Emergency Department should be <5 minutes.

Emergency service response time based on P2 triage in the Emergency Department in Sampang Hospital, Indonesia, namely, fast as many as 20 respondents (83.3%) and slow as many as 4 respondents (16.7%). This was because the respondents have a high level of knowledge that have received training on emergency situations and hasve sufficient work experience in doing this P2 triage.

This was because the respondents have been trained in conducting patient service response time by P2 triage category, the number of respondents have attended BTCLS training so that they were responsive in treating patients, they had work experience while they were in the Emergency Department and a working period of more than 5 years. P2 triage category was considered an emergency measure but not an emergency.

Emergency service response time based triage P3 in the Emergency Department in Sampang Hospital, Indonesia, namely, fast as many as 21 respondents (87.5%) and slow as many as 3 respondents (12.5%). This was also because the respondent already had a high level of knowledge which had also received training about emergency services and sufficient work experience in the Emergency Department in conducting triage P3.

This research was also in line with Ningsih, et al. (2018) showing that nurses at the IGD of the Ratu Zalecha Martapura Regional Hospital in doing triage P3 as many as 22 respondents (95.7%) did it quickly, and as many as 1 respondent (4.3%) did it slowly.

Analysis of the effect of workload on response Time

The results of statistical tests show that there is a significant influence between workload and P1 triage response time of workers in the Emergency Department of Sampang Hospital, Indonesia ($p=0.015 < \alpha$ 0.05). Based on contingency coefficient (C_c) value, it was noted that the value of $C_c=0.480$, so it could be concluded that the effect of workload on response time was in the medium category, and because the value of Cc was positive so that it could be explained that the heavier the workload for medical workers, the slower it will be in reaching the response time at P1 triage, vice versa, the lighter the workload for medical workers, the faster it will be in reaching the response time at P1 triage.

The results showed that there was a tendency that a heavy workload had an effect on the P1 triage response time that was slow in the Emergency Department of Sampang Hospital, Indonesia. Based on the research results, it was known that 18 respondents whose workload was moderate, most of them (77.8%) had a fast response time and 22.2% had a slow response time. Meanwhile, for medical workers whose workload was in the heavy category, most (83.3%) had a slow response time and only 16.7% had a fast response time.

The results of this study were in line with research conducted by Kambuaya, et al (2016) showing that there was a relationship between the workload of medical workers and the response time based on the patient perceptions in the Emergency Department at the Sorong Regional Hospital (14). In addition, Jalili et al.'s study (2013) also stated the number of patients admitted to the unit every day/month/year, the average length of time the patient stays in the Emergency Department, direct and indirect nursing actions, the frequency of actions and the average time needed to carry out the action which were the factors that affect the workload.

The results of statistical tests showed no significant effect between workload and P2 triage response time of the medical workers in the Emergency Department of Sampang Hospital, Indonesia (p=1.000> α 0.05). Based on value of contingency coefficient (C_c) it was noted that the value of C_c=0.000 so it can be concluded that the effect of workload on response time was categorized as very weak. This was because the nursing service response time on P2 triage was quite long with a classification that does not require emergency action.

This research was in accordance with the research conducted by Purwanti Ningsih, in the Emergency Department of the Ratu Zalecha Martapura Regional Hospital in 2018. The results also concluded that there was no relationship between workload and response time based on P2 triage category at Emergency Department of Ratu Zalecha Martapura Regional Hospital. This was because the nursing service response time on P2 triage is quite long with a classification that does not require emergency action.

The results of this study are also in line with the theory Christ et al. (2016) which states that P2 triage is a life threatening condition if not treated in a short time. Patients labeled yellow are patients with minor wound infections, appendicitis, fractures, minor burns. Abdominal injury is without shock.

The workload of medical workers has no impact on P3 triage response time for Emergency Department medical workers in Sampang Hospital, Indonesia, where for health workers whose workload is moderate, 83.3% of the response time is in the fast category and 16.7% is in the slow category, while for health workers whose workload is in the heavy category, all 100.0% is in the fast category response time. The results of statistical analysis using Fischer exact test shows that there is no significant relationship between workload and P3 triage response time for Emergency Department medical workers at Sampang Hospital, Indonesia (p=0.546 > α 0.05). Based on value of contingency coefficient (Cc) it was noted that the value of Cc=0.213 so it could be concluded that the effect of workload on response time was categorized as weak. This was because the nursing service response time on triage priority 3 is long enough with the patient that is awake, no ABC (Airway, Breathing, and Circulation) disorders and can be given further action to the polyclinic.

This research was in line with the theory Christ et al. (2016) which states that handling priority 3 does not need to be immediate and transfers are final and should not be late. The implementation of triage is the efforts to quickly sort injury cases according to injury severity and chance of survival through prompt medical intervention. Those triage system must be adjusted to the nurses' expertise.

CONCLUSION

Most of medical workers in the Emergency Department of Sampang Hospital, Indonesia were male (83.3%), the average age was 33.0 ± 6.93 years, with a Bachelor level of education (75.0%) and the average working period was 8.756.65 with the longest working period 25.0 years. The average workload for medical workers reached 69.79 ± 5.27. Most had a moderate workload (18 people or 75.0%). In the triage of P1 (red) category, most (62.5%) medical workers performed fast response of less than 5 minutes, in P2 (yellow) category, most (83.3%) also performed fast response in less than 15 minutes, and in P3 (green) category, majority of the respondents of 97.5% performed fast response of less than 45 minutes as well. There was a significant correlation between workload and P1 triage response time of the medical workers in the Emergency Department of Sampang Hospital, Indonesia (p=0.015 < α=0.05), while at P2 and P3 triage it was concluded that there was no effect of the workload of medical workers on the response time (p>0.05). In the triage of P1 (red) category, most (62.5%) medical workers performed fast response of less than 5 minutes, in P2 (yellow) category, most (83.3%) also performed fast response in less than 15 minutes, and in P3 (green) category, majority of the respondents of 97.5% performed fast response of less than 45 minutes as well.

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