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The Relationship Between The Level of Knowledge and The Way of Handling Burns In Employees of The Fire Department of Palembang City

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Abstract

Burns are injuries characterized by damage to skin tissue due to direct contact with a source that conducts heat. Some action activities that have a high risk of burns are firefighters. This reflects that the level of knowledge and handling of burns is very important and becomes the main focus as a firefighter. This study aims to determine the relationship between the level of knowledge and how to handle burns on fire department employees in Palembang. This study was an observational analytic study with a case series approach. with a sample of Fire Department Employees in Palembang. The data used is primary data derived from questionnaires. Researchers recorded data such as age, gender, education, level of knowledge of burns, and knowledge of how to treat burns. 180 people met the research criteria. The dominating characteristics were age 26-35 years (58.3%), male (81.7%), female (18.3%), the level of knowledge about burns was in the good category (40.5%). And knowledge of how to handle burns is in the good category (61.7%). Analysis using bivariate analysis found that there was a significant correlation between the level of knowledge and how to handle burns (p=0.000; r=0.452). Most respondents in this study were aged 26-35 years, male and had a Diploma / Bachelor's degree. The level of knowledge about burns and how to handle them was mostly in the good category. In the correlation test, there was a significant correlation between the level of knowledge and how to handle burns.

Keyword: Burns, Knowledge Level, Handling Method

1. Introduction

Burns are injuries characterised by tissue damage to the skin resulting from direct contact with a source that conducts heat.[1] Approximately 86% of burns are thermal injuries, 4% are electrical and 3% are chemical.[2] Medical care for burn patients requires a multidirectional approach, expertise and management, encompassing both surgical and deeply understood pharmacological approaches. According to the latest World Health Organisation (2018) data, there are approximately 265,000 deaths reported annually from fires, with more deaths from electrical burns, burns due to boiling water spills, while non-fatal burns are the most common cause of morbidity, including disability, prolonged hospitalisation, and disabilities that often lead to trauma.[1]

The prevalence of burns in Indonesia according to Riskesdas (Basic Health Research) 2018 is 1.3%, while the prevalence of burns in South Sumatra is slightly higher at 1.4%. Based on data at Cipto Mangunkusumo General Hospital, 309 burn patients were hospitalised during 2014-2015 with an average stay of 15 days and a mortality rate of 26.65%.3 The highest cause of burns due to hot objects was 24 cases.[4]

Burn injuries are associated with long-term challenges, and can limit a person's ability to fulfil previous social roles, one of which is employment. For many survivors, returning to work is one of the key success factors of burn injury recovery. There are various factors such as burn size, physical

ability, and psychological issues, which can be barriers to community participation and can lead to significant work disruption post-injury. Therefore, a good knowledge of burn injury causes, severity, prevention and management is essential in preventing burn injury morbidity and mortality.[2,5-7]

It is important to provide burns with treatment that is appropriate to the severity of the injury. Adequate knowledge about burns and how to treat them can reduce the impact of injury. Several studies have evaluated the awareness levels and attitudes of various global populations regarding burn injury management. Despite the ease of treatment, most studies have shown that there is a lack of knowledge about burn management.[8-9] Most people use various types of topical agents for burns that have no scientific basis. The most widely used ingredients include ice, herbal remedies, oil, honey, vinegar, flour, toothpaste and eggs. In addition, in second-degree burns, some people tend to break the blisters caused by the burn without knowing the consequences. The use of inappropriate treatments can increase post-burn complications.[10-11]

One action activity that has a high risk of burns is firefighting. Firefighter safety is a serious concern when carrying out suppression operations because occupational injury events such as burns can occur. Firefighting is a high-risk occupation due to exposure to traumatic events.[12-13]Several studies have been conducted around the world to demonstrate the adequacy of burn knowledge and management, covering a wide range of ages and groups. The data obtained showed that factors such as an individual's educational status, previous knowledge of burn first aid, and having attended a first aid course/training were associated with higher knowledge scores in each study.[13-14]

Over the past five years, Palembang City has experienced a significant number of fires, causing both material and non-material losses. Although standard operating procedures (SOPs) have been carried out appropriately in handling fires, unfortunately there are still many firefighters who experience accidents when carrying out these SOPs. Based on information from the Palembang City Fire Department (2022), it was found that in 2020 there were 125 fire incidents where there were minor injuries which included burns around 3-16%, scratches, cuts, and other injuries that did not result in permanent physical disability. And there was one employee who died due to an electrical attack while working.[9-11]

This reflects that the level of knowledge and management of burns is very important and also the main focus as firefighters. This study emphasises the importance of early prevention of burns and raising awareness of the risks posed.10 Thus, researchers are interested in analysing the level of knowledge and awareness of burns management among firefighters, especially in Palembang City.

2. Methods

The type of research used in this study is observational analytic with a case series approach using quantitative analysis of corretional research to detect the extent to which variations in a factor are related to variations in other factors based on the correlation coefficient between the level of knowledge and how to handle burns in Palembang City Fire Department employees during November to December 2023 using primary data obtained directly from filling out questionnaires. Respondents of fire department employees who were selected met the inclusion criteria and did not fall into the exclusion criteria. Sampling in this study used probability sampling method, namely multistage random sampling. Respondents who met the inclusion criteria and did not fall into the exclusion criteria as operational

officers at the Palembang City Fire Department with a minimum sample size in this study of 180 people. The required inclusion criteria are: (1) Palembang City Fire Department operational officers; (2) Respondents who are willing to be sampled and sign informed consent.

3. Results

This study obtained 180 employees of the Palembang City Fire Department who met the inclusion and exclusion criteria. The results of data processing are then presented in the form of tables and narratives as follows.

3.1. Characteristics of Respondents of Palembang Fire Department Employees

Data on the characteristics of employees of the Palembang City Fire Department are presented in Table 1.

Table 1. Characteristics of respondent employees Palembang City Fire Department

Characteristic (N = 180)	Total (n)	Percentage (%)
Age		
17 – 20	24	13,3
21 – 25	52	28,9
26 – 35	104	57,8
Gender		
Female	32	17,8
Male	148	82,2
Education		
Elementary	-	-
SMP	-	-
SMA	-81	-45
D3/S1	94	52,2
S2	5	2,8

Based on table 1. it is known that most of the respondents are in the age category of 26-35 years, namely 104 people (57.8%), 148 respondents are male (82.2%) and 32 others are female (17.8%).

3.2. Results of Univariate Analysis

Before conducting univariate analysis, the data obtained were pre-analysed, namely the data normality test. The results of the data normality test in this study can be seen in Table 2.

Table 2. Normality Test Results Variable level of knowledge and how to handle burns on employees of the Palembang City fire department

Variable	Pvalue*	Interpretation
Level of knowledge about burns	0.000	Data not normally distributed
How to treat burns	0.000	Data not normally distributed

*Kolmogorov Smirnov test, normal distribution if p>0.05

In table 2. all research variables are not normally distributed. The correlation analysis that will be carried out next uses the spearman rank correlation test.[15-16] Next, a statistical description of the variables of this study is described. The description includes the mean, minimum, maximum, and standard deviation values. In the variable level of knowledge and how to handle burns on employees of the Palembang City fire department can be seen in the table below.

Table 3. Statistical Description of the Variable Level of Knowledge and How to Handle Burns on Employees of the Palembang City Fire Department

Variable	N	Median	Min-Max	Mean	SD
Level of knowledge about burns	180	70	25-95	68.8	18.7
How to treat burns	180	80	15-100	77.9	14.9

Based on table 3. The results of this study show that the median level of knowledge of the research respondents is 70 with the lowest value is 25 and the highest is 95. The median way of knowledge of research respondents is 80 with the lowest value is 15

and the highest is 100.

3.3. Bivariate Analysis Results

This analysis aims to determine the correlation (relationship) between two variables in this study, namely the level of knowledge and how to handle burns on employees of the Palembang City fire department can be seen in the following table.

The p value is 0.000 and the correlation coefficient is 0.452. This means that there is a significant correlation between the level of knowledge and the way of handling burns in Palembang City Fire Department Employees.[15-16]

Table 5. The age distribution on the level of knowledge about burns

Age group	Level of knowledge of burns			Total
	less	moderate	good	
17-20	12	8	4	24
21-25	19	14	19	52
26-35	20	34	50	104
Total	51	56	73	180

The data in the table 5 shows that respondents aged 17-20 years are included in the category of less knowledge level as many as 12 people, 8 people in the sufficient category and 4 people in the good category. Respondents aged 21-25 years were included in the category of less as many as 19 people, 14 people in the moderate category and 19 people in the good category. While respondents aged 26-35 years were included in the category of less as many as 20 people, 34 people in the moderate category and 50 people in the good category.

Based on gender, it is known that male respondents are included in the category of less knowledge level as many as 35 people, 43 people in the moderate category and 70 people in the good category. Respondents of female gender are included in the category of less as many as 16 people, 13 people in the moderate category and 3 people in the good category (table 7).

Table 7. The gender distribution of the level of knowledge about burns

Gender	Level of knowledge of burns			Total
	less	moderate	good	
Male	35	43	70	148
Female	16	13	3	32
Total	51	56	73	180

Tabel 8. The gender distribution on how to treat burns

Gender	How to treat burns			Total
	less	moderate	good	
Male	20	32	96	148
Female	2	15	15	32
Total	51	47	111	180

Based on the table 8, it is known that respondents who are male are included in the category of less knowledge level as many as 20 people, 32 people in the moderate category and 96 people in the good category. Respondents of female gender are included in the category of less as many as 2 people, 15 people in the moderate category and 15 people in the good category.

Tabel 9. The distribution of education on the level of the knowledge about burns

Education Group	The level of knowledge about burns			Total
	less	moderate	good	
SMA	37	26	18	81
Bachelor degree	14	27	53	94
Magister	-	3	2	5
Total	51	56	73	180

Based on the table 9, it is known that respondents who come from high school education are included in the category of less knowledge level as many as 19 people, 21 people in the sufficient category and 41

people in the good category. Respondents who came from Diploma / Bachelor's education were included in the category of less as many as 3 people, 22 people in the moderate category and 69 people in the good category. While respondents who came from master's education were not included in the category of less, 4 people in the moderate category and 1 person in the good category.

4. Discussions

The results showed that the age of respondents at the age of 17-20 years with a total of 24 people (%) the age of respondents 21-25 years with a total of 52 people (28.9%) the age of respondents 26-35 years 104 people (%). So it can be concluded that most of the respondents' ages are at the age of 26-35 years. Based on Sahrani's research age is closely related to the process of working, thinking, and one's intellectual abilities.[17] The more mature a person is, the more developed the way of thinking and a person's capacity to catch.[18] The majority of respondents aged 26-35 years who have good knowledge. With increasing age, a person's capacity to catch and think will develop further.[18-19]

Based on the results of the study, it is known that the gender of male respondents with a total of 147 people (81.7%) and for the gender of female respondents with a total of 33 people (18.3%). The level of knowledge based on the percentage of the number of points obtained by female employees is 15.08% and men are 84.92%. So it can be concluded that the level of knowledge of male respondents has a higher percentage. It is known that men tend to have better knowledge than women. Although in Pambudiono's research which says that women's brains receive 20% more blood flow and have more neural connections, women's brains are more likely to have better knowledge than men.[20]

The percentage of correct numbers of respondents with a high school education was 40.3%, respondents with a Diploma / Bachelor's education were 56.1% and respondents with a Master's education were 56.1%. According to the results of research by Sari et al., [21]respondents with a high school education are considered capable of digesting various knowledge information, especially regarding burn wound management. Based on research Kusuma et al., that respondents who have had education during their lifetime can more easily capture knowledge. Education is what encourages a person's cognitive component to develop.[19]

The results of data analysis showed that most of the respondents' knowledge level about burns was in the good category as many as 73 people (40.5%). Based on the correct number of the results of filling out the questionnaire, the respondents who were in the good category were respondents aged 17-20 years as many as 4 people (5.5%), aged 21-25 years as many as 17 people (23.3%) and aged 26-35 years as many as 52 people (71.2%).

In the study of Kattan, et al, 2016, the number of respondents who received low knowledge will have an impact on the level of knowledge of respondents so that it can result in low awareness to take steps to prevent burns and can increase the possibility of respondents to continue using traditional ingredients that are still deviant and do not seek medical treatment in further health care so that appropriate treatment can be given to burns experienced.[22]

From the results of data analysis, it is known that most of the respondents' knowledge about how to handle burns is in the good category as many as 111 people (61.7%). So, it can be concluded that the way of handling burns on employees of the Palembang City fire service is in the good category. Based on the age of the respondents, it was found that respondents who were in the good category in the age

range of 17-20 years were 11 people (9.9%), 21-25 years old were 37 people (33.3%) and 26-35 years old were 63 people (56.8%). Based on gender, respondents who were in the good category with female gender were 16 people (14.4%) and 95 people (85.6%) were male. Meanwhile, based on education, respondents who were in the good category with high school education were 41 people (36.9%), Diploma / Bachelor as many as 69 people (62.2%) and Masters as many as 1 person (0.9%).

This is in line with the results of research conducted by Kusuma et al. (2021) which obtained the highest value for respondents who had a good level of knowledge, namely 60%. Someone who understands an object or material will be able to explain, mention and so on. A person with good knowledge is supported by age, occupation and education. The more age, the more knowledge a person has, as well as work and education. The higher a person's level of education, the better their knowledge will be because they are able to receive wider information.[19]

5. Conclusions

From the results of research and discussion, it can be concluded that based on the characteristics of age, gender and education, respondents regarding how to treat burns were found to be in the category of low level of knowledge, generally aged 26-35 years, male and with a high school education. In the fair and good categories, they are generally aged 26-35 years, male and have a Diploma/Bachelor's degree. The results of the study showed that the level of knowledge of respondents regarding burns was in the good category at 40.5% The results of the study showed that respondents' knowledge regarding how to treat burns was in the good category at 61.7%. There is a significant correlation between the level of knowledge and how to treat burns among Palembang City fire department employees. (p= 0.000 r=0.452).

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