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THE INFLUENCE OF EDUCATION, KNOWLEDGE, AND BEHAVIOR FOR MEDICATION ON DELAYED ARRIVALS OF ACUTE CORONARY SYMPTOMS (ACS) PATIENTS AT EMERGENCY UNIT OF SANGLAH PUBLIC HOSPITAL IN DENPASAR, BALI ISLANDS, INDONESIA

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ABSTRACT

Acute coronary syndrome (ACS) is an emergency condition that requires fast and precise actions, but delayed arrival of the patient at the emergency unit is still imminent. Educational factors, knowledge and behavior of treatment are major causes of the delayed arrival of the patients. The purpose of the study is to determine the relationship between the educational, knowledge and behavior for medication factors with the delayed arrival patients at the emergency unit of Integrated Heart Service at the Sanglah Hospital in Denpasar Bali. This research is a quantitative research by nature with cross sectional design, and data collection technique was using purposive sampling with 292 patients. The result shows that 48.6% of patients have higher education degree, 71,6% of the patients do not have information related to ACS and 191% of patients rest when experiencing ACS. The delayed arrival of the ACS patients might be closely related to the patients' education, knowledge upon the ACS and the patients' behavior who prefer to rest when experiencing ACS. Medical staffs need to provide counseling to the patients and families about the symptoms of ACS, healthy lifestyle, and the importance to come to emergency when ACS emerges.

KEYWORDS: ACS, education, knowledge, behavior, delayed arrival.

INTRODUCTION

Acute Coronary Syndrome (ACS) is a clinical sign and symptom of myocardial ischemia and one of the manifestations of coronary heart disease (CHD). In Indonesia, the prevalence of acute coronary syndrome in 2013 is 0.5% or an estimated 883,447 people, while based on the doctor or symptom diagnosis of 1.5% or an estimated 2,650,340 people. In 2008, there were 17.3 million cardiovascular deaths with more than 3 million deaths occurring under the age of 60 years. Hypertension becomes major cause 45% of the deaths from heart disease and 51% due to stroke, and an estimated 23.3% increase in acute coronary syndrome would be by 2023.[18] In 2013, the number of patients with acute coronary syndromes in Bali based on symptoms was about 12,272 people (1.3%). The prevalence of ACS according to the highest diagnosis is found in three regencies, e.g. Tabanan 0.6%, Karangasem 0.6% and Klungkung 0.6%.[19]

The guidelines of the American College of Cardiology Foundation and the American Heart Association[1] explain that the standard time from the heart attack to the arrival at the emergency should be 120 minutes, and the patient is said to be late when arriving more than the recommended time.[15,8] The number of ACS patients as stated by the Sanglah Hospital in Denpasar in 2016 reached 570 patients (33.08%), where factors related to delayed arrival of ACS patients at the emergency unit were correlated by educational factors, knowledge and behavior for medication of the ACS patients.

Patients with higher education background will affect their knowledge, meaning they will learn and gain information related to the disease they experienced.[13] Knowledge factors on the ACS will largely determine the behavior of both patients and families to seek treatment for a nearby healthcare services in case the heart attack. The delay in arriving at the emergency occurs when the patient and family do not understand the characteristics of ACS properly, so as the symptoms worse, they patients and families assume the symptoms as common pains, thinking it may disappear by resting or believing it will be healed by taking any medication

purchased at the nearest pharmacy.[11] Such behavioral factors of the patients and also the accompanying family prefer to seek alternative treatments and postpone their decision to come to the hospital for medical treatment.[11] The study conducted by[6] explains that the behaviors of seeking alternative medicine in ACS patients are like requesting the help of the nearest persons (60%), seeking medical help (15.6%), lying (resting) (11.1%), buying medicine at near pharmacy (7.8%), performing alternative (traditional) medication (4.4%) and doing nothing (1,1%).

The purpose of this research is to know the correlation of the following factors, e.g. education, knowledge and behavior upon treatment on the delayed arrival of the patients at emergency Sanglah Hospital in Denpasar. This study is expected to be significant as the evaluating material for nurses in providing health information to patients and families of ACS to reduce the delayed arrival of the patients at the emergency unit.

METHOD

This quantitative research employed observational analytic design with cross sectional approach. The populations involved 292 patients who were the entire classification of ACS patients who came to emergency installation at the Integrated Heart Service, Sanglah Hospital in Denpasar, Bali.

The sampling technique used non-probability sampling with purposive sampling technique. Inclusion criteria are namely: 1) patients with first-time history of ACS, 2) patients with rapid and persistent chest pain whom are diagnosed by the patient or family who are aware with the symptoms, 3) stable condition ACS patients with no chest pain, stable hemodynamic (systolic blood pressure is 90-140 mmHg; diastolic blood pressure in the range is 60-90 mmHg; heart pulse is 60-10x/min with warm acral; respiration rate is 16-24x/min). The exclusion criteria are namely: 1) ACS patients who died at the emergency, 2) patients who have experienced ACS previously, and 3) patients who refused to be the respondents.

Research instrument in this study was in the form of structured interview sheets. The instrument was employed for data collection which was done by short interview to ACS patients and accompanying family and conducted by the researcher during at the time of the research.

This research has obtained ethical approval from Medical Faculty, University of Udayana Bali / Sanglah Public Hospital in Denpasar with Decree Number 2600/UN.14.2/KEP/2017. This research was conducted in December 2017 to January 2018. The collected data were analyzed through analysis management anddata presentation, discussion and conclusion. Data analysis used was univariate analysis which is to describe each variable and bivariate analysis conducted on socioeconomic variable using Spearman test and knowledge variable using coefficient of contingency test.

RESULTS

The following is the data obtained through the research:

Table 1: Data on Respondents' Characteristics.

CHARASTERISTICS		FREQUENCY	PERCENTAGE
Sex	Male	207	70.9%
	Female	85	29.1%
Age	≤ 35	23	7.9%
	36-45	36	12.3%
	46-55	79	27.1%
	56-65	80	27.4%
	> 65	74	25.3%
Occupation	State officers	26	8.9%
	Entrepreneurship	74	25.3%
	Private sector /employees	123	42.1%
	Unemployed	26	8.9%
	Retirement	41	14%
	Police/Army	2	0.7%
Address	Denpasar	121	41.4%
	Badung	63	21.6%
	Tabanan	18	6.2%
	Gianyar	31	10.6%
	Klungkung	12	4.1%
	Bangli	4	1.4%
	Singaraja	19	6.5%

	Karangasem	18	6.2%
	Jembrana	5	1.7%
	Nusa Penida	1	0.3%
Types of acute coronary symptoms	UAP	112	38.4%
	NSTEMI	14	4.8%
	STEMI	166	56.8%
Marital status	Married	289	99.0%
	Single	3	1.0%

According to the information related with the characteristics of the respondents in Table 1 shows that the majority of respondents were male (20%) (70.9%), and the majority of respondents were in the range of 56-65 years old (27.4%). The majority of the respondents were private employees 123 (42.1%), the majority of respondents reside in Denpasar the number of 121 (41.4%) and with the highest ACS of 166 (56.8%) and 289 (99.00%) were married.

Table 2: Respondents' Univariate Data.

Charasteristics		**Frequency**	**Percentage**
Education	Elementary school	33	11.3%
	Junior high school	7	2.4%
	Senior high / equals	110	34.9%
	University / college	142	48.6%
Knowledge	Informed	83	28.4%
	Not informed	209	71.6%
Behavior for medication	To emergency installation at the Integrated Heart Service	43	14.7%
	Local clinics	21	7.2%
	Rest	191	65.4%
	Taking medicine from local pharmacy	34	11.6%
	ContactingFamily	3	1.0%

The results of univariate obtained from the variable of socioeconomic show that the majority of patients had education level of university (college) of 142 respondents (48.6%). The other educationbackground was senior high school amounted to 110 respondents (34.9%), elementary school as many as 33 respondents (11.3%) and junior high school education as many as 7 respondents (2.4%). Most of the patients did not have sufficient knowledge related to acute coronary symptoms amounting to 209 (71.6%), while the rest 83 respondents have had information about the symptoms (28.4%). In terms of medical behaviors for treatment, most of the patients preferred to rest upon the symptoms amounting to 191 respondents (65.4%), 43 respondents went to emergency unit of integrated heart services (14.7%), 34 respondents admitted to buy medicine at the nearby pharmacy (11.6%) and 21 respondents went to the local clinics (7.2%). The other 3 patients preferred to inform the family (1.0%) for further recommendation.

Table 3: Respondents' Bivariate Data.

Variables		**Delayed arrivals**		**Total**	***P***	**Correlation coefficient (r)**
		>120 minutes	**≤120 minutes**			
		F	**f**			
Education	Elementary school	30	3	33	0.000	0.220
	Junior high school	7	0	7		
	Senior high / equals	94	16	110		
	University / college	99	43	142		
Knowledge	Informed	36	47	83	0.000	0.479
	Not informed	194	15	209		
Medical behaviors for treatment	To emergency installation at the Integrated Heart Service	3	40	43	0.000	0.669
	Local clinics	3	18	21		
	Rest	188	3	191		
	Taking medicine from local pharmacy	33	1	34		
	Contacting Family	3	0	3		

The results of Sperman test on the education variable showed P 0,000 <α = 0.05 and r = 0.220, meaning the hypothesis is accepted. That indicates that there is a weak relationship between educational demographic factor and the decelerated arrival of the patients to the emergency unit at Sanglah Hospital in Denpasar.

In terms of knowledgeable variable, it was obtained by test of contiguity coefficient of P 0,000 <α = 0.05 and r = 0.479, thus the hypothesis is accepted, that there is relation between knowledge factor and patients' delayed arrival at the emergency unit at Sanglah Hospital in Denpasar.

Variable of behavior for medical treatment was tested for the coefficient of contingency, it was obtained P 0.000 <α = 0.05 and the score of r = 0.669. This means the hypothesis is accepted that there is strong relation between behavioral seeking factor and patients' delayed arrival at emergency unit at Sanglah Hospital in Denpasar.

Table 4: P. Value multivariate.

VARIABLES	P VALUE
Education	0.002
Knowledge	0.000
Behavior for medication	0.000

The resultof P Value of multivariate selection was obtained that p value of education was 0.002, p value was 0.000 knowledge and p value of treatment behavior was 0.000.

Table 5: Analysis of Multivariate Odd Ratio.

VARIABEL	OR
Information	0,218
Treatment behavior	
Buying medicine at local pharmacy	0,006
Resting	0,003
Going to local clinics	1,144
Informing families	0,000

The analysis through Odds Ratio (OR) to the variable of behavior for medication was 1.1, which means behavior pattern in seeking for medical treatment was in the form of going to secondary level of clinics will cause delayed arrival of ACS patients at emergency unit for 1 times higher than patients who have direct decision of going to emergency unit at the hospitals, buyingmedicine, and informing family after controlling the variables of education and knowledge.

DISCUSSION

1. The Correlation between Education and Delayed Arrivals of ACS Patients

According to[4] the education background of the patients will determine the pattern of treatment behaviors. A person who has higher education level will be more precise in seeking medical treatments. If the education background is not followed by proper behavior for medical treatment, however, it may cause delayed arriving of the patients at the emergency unit. In this research, the results obtained show that 99 of 142 patients with college education have experienced delayed arrivals at the emergency unit. In addition, 94 of 110 patients with high school education diploma have experienced delayed arrived; 7 patients with junior high school diploma have experienced delayed arrivals at the emergency unit. These results clearly show that the higher education background, if it is not equipped with information related to the acute coronary symptoms, their delayed decision on going to the emergency in seeking the treatment remains.

According to[7] explains that the education background of the patients will be able to influence their decisions in seeking medical services. The higher the education, they are more knowledgeable on the coronary disease, so that when the heart attack occurs, the patients will soon come to primary health services. There were 43 respondents with college degree did not experience delayed arrival at the emergency, while patients with high school diploma amounted to 16 respondents were not late at the emergency unit. It can be concluded that the higher the education of the patients, the lower patients who are not late at the emergency unit.

Another study conducted by[14] reveals that patients who have experienced delayed arrival at emergency unit have higher education level, having completed college degree, high school, and profession. This might be because they ignore the coronary symptoms they had so these did not disrupt their daily routine at work; such patients experiencing acute coronary symptoms or heart attack prefer to take rest. The results in this study in terms of education level were in line with the theory that patients (99 of 142) with higher education have experienced delayed arrivals compared with patients with high school diploma (94 of 110).

In addition, the results of this research also found that 3 patients with elementary education level did not experience delayed arrival at the emergency unit. The respondents with elementary education asserted that they were not late because they have sufficient information about ACS obtained from electronic media. As they have already known the characteristics of the symptoms, they are able to take correct actionsby coming to the emergency unit. According to[13] who explains that a person's knowledge about health will increase when someone would be open to health information, either provided in the form of printed media and electronic media.

Education is believed as one of the important components in influencing the patient'smedical behavior to seek for treatment. If the higher education background is not followed with good knowledge and awareness with

the symptoms, the highed education cannot guarantee to reduce the cases of patients' delayed of arrival at the emergency unit. This phenomenon should be followed up by the government officers and medical workers to re-socialize the symptoms related to coronary disease, both the patients and families continuously so that patients and families are able to identify the symptoms better. It is expected that this may reduce the cases of delayed arrival at the emergency unit of the hospitals.

2. The Correlation between Knowledge and Delayed Arrivals of ACS Patients

According to[2] who explain that the knowledge, attitudes, and beliefs of the patients will be able to influence the patients' action in taking the decision to come to the emergency when heart attacks emerging. The results also explain that in Jordan, patients do not have the knowledge, attitudes, and beliefs well; therefore, the patients cannot behave properly and healthily in relation to the coronary symptoms. Patients with acute coronary symptoms are unable to perceive the symptoms so they believe that pain they are experiencing is common indigestion and fatigue. The results of this research have proven that patients with ACS who did not have knowledge (194 of 209 respondents) have experienced delayed arrival at the emergency for medical treatment. The delay in arriving at the emergency unit was mainly caused by misperception either by the patients or the families that ultimately have weak awareness of the importance of coronary symptoms treatments and thus resulted in delayed arrival of ACS patients at the emergency unit.

The study also found 15 respondents who did not have knowledge about ACS did not experience delayed arrival as they were experiencing the heart attack, the patients immediately decided to go to the hospital for medical treatment as the intolerable chest pain felt by the patients. This condition was to keep the patients coming soon to get treatment at the emergency unit and comforting from the symptoms of perceived pain.

In addition, this study also found of 83 respondents who know the information about the coronary symptoms, 36 respondents have experienced delayed arrivals. Patients know the signs and symptoms of SKA in the form of chest pain, but patients misperceived the pain as it was perceived as heartburn, so they preferred to take medication from nearby pharmacy and take rest.

Research conducted by[20] describes that knowledge is an important component that should be improved in order to reduce the cases of delayed arrivals at the emergency unit. Increasing the knowledge should be conducted by providing health education to the patients as well as the families related to acute coronary symptoms; such socialization should be prioritized to the women with lower education and works as housewives at home. Health education could be in the form of medical counseling by medical personnel, and the result of research is known that the knowledge, attitude and awareness of the patients related to ACS finally increased, and as the results, decreasing the number of delayed arrival cases of patients at the emergency unit.

3. The Correlation between Behavior for Medication and Delayed Arrivals of ACS Patients

Resting is the most frequent decision taken by the respondents when they experienced chest pain. 181 of 191 respondents who had decided to take rest have experienced delayed arrivals at emergency unit. Behavior in seeking medical treatment is an attitude and response from the patients who experience ACS to decide in seeking medical treatment.[8] The success of treatment in patients with ACS depends on initial intention of the intervention from the onset of symptoms until the patients arrive at the emergency unit for medical services. Patients without an awareness of the symptoms will be able to decide not to come to health services because the perceived the symptoms are considered common fatigue as a result of daily activities.[7]

Research by[16] concludes that taking rest may cause 1.9 times delayed arrivals at the emergency unit. The study also explains that a false perception upon the perceived symptoms can make mistakes in the treatment action and cause delays in arriving at the hospitals.[17] explains that in Indonesia, the decelerated arrival of the patients at the emergency unit is mainly caused by misperception on the ACS such as fatigue, weakness, heartburn, cold sweat and tightness; the actions taken by the patients are mainly resting, buying medicine from local pharmacy, informing family and going to local clinics.

Buying drugs and self-medication may also affect the delayed arrivals at the emergency. The act of self-medication is an effort to respond to chest pain symptoms that have been felt in order to maintain and maintain the stability of the physiological function of the body without direct instructions from medical personnel.[5] The results at Sanglah Public Hospital in Denpasar showed that buying medicine at nearby pharmacies and self-medication taken by 34 respondents, and 33 of them were late at the emergency unit. Drugs purchased and taken are Enervon-C (11 people), anti-hypertensive (4 people), analgesic (3 people) and ulcer (16 people) and after taking the medicine the patient will rest. The average time of the onset of symptoms to arrive at the IGD of 138 minutes.

The study also found 97 respondents (33.2%) were referral patients from Public Hospital (RSU), Regional Public Hospitals (RSUD) and Private Hospitals located throughout Bali; there were 55 respondents who experienced delays. The decision of the Directorate General of Health Strategies of the Ministry of Health of the Republic of Indonesia in 2013 explains that health workers are required to promptly check the patients in accordance with the applicable procedures, establish the diagnosis of the illness experienced by the patients,

perform the initial treatment, stabilize the patients' condition and communicate with the higher referral facilities. Referral systems in Indonesia from secondary hospitals to tertiary hospitals are currently not well organized, especially in the emergency management of the cardiovascular system.[3] Patients with cardiovascular emergencies arising from referrals also still experience delayed arrivals at the emergency unit, this is related to the awareness of the patients and families who lack of understanding of signs and symptoms of acute coronary symptoms compounded by the process of diagnosis, intervention and observation as well as the preparation process of referrals; these all also take a long time and procedures, coupled with the distance and traffic congestion, so as evidenced from the research results obtained, there was still delayed arrived of the patients at the emergency unit at the Denpasar Hospital amounted to 55 respondents, with an average delayed time of 132 minutes.

Research conducted by[12] explains that a person may change the behavior that was previously believed if the pain experienced does not improve. The result showed from 4 of 228 respondents who were not late at the emergency due to their previous behavioral experience in relation with self-medication and taking rest instead of directly going to the emergency unit. As they concluded that self-medication and resting did not improve, they changed their behavior in seeking for medical treatment from delaying to directly visiting emergency unit.

Behavior in seeking for medical treatment is also associated with the lifestyle of local community who have a tradition of eating unhealthy foods with high cholesterol, such as consuming pork and local beers in Bali becomes tradition at any family gathering or any events, such as wedding celebrations, deaths, the existence of community activities such as religious ceremonies and thanksgiving will serve foods containing pork and alcoholic beverages. The lifestyle of the people in Bali at the end cannot be separated from the high level of acute coronary symptoms. This is in accordance with research conducted by (10) to see the habits of alcohol consumption and high cholesterol foods in Minahasa, and the results concluded that the habit may increase the chances of 2.76 times the coronary symptoms. Based on the results of multivariate analysis in this study obtained the behavior in seeking medical treatment by patients who are not directly to the hospital instead of local clinics will be obviously come late the emergency unit at the public hospitals.

The appropriate pattern of seeking medical treatment will be closely related to the patient's punctuality at the emergency unit.[9] The delayed arrivals also depend on the patient and family as well as the pre-hospital relief readiness.[20] Therefore, interventions to modify the behavior of seeking simple medical treatment can be done by providing continuous counseling. In addition, first-level health services (local clinics and doctor's clinics) and second-level health services (public hospitals) should be able to more quickly in intervention, observation, diagnoses, and promptly make referrals when experiencing problems related to means of infrastructure to the tertiary hospitals.

CONCLUSION

The result of this research is there is significant correlation with positive direction between education, knowledge, and behavior for medication factors on the patients' delayed arrival at the emergency unit at Sanglah Hospital in Denpasar. Nursesand medical workers are expected to provide counseling to patients and families in order to recognize the signs of acute coronary symptoms, perform healthy lifestyles, and the importance of coming to the emergency unit for medical treatment as the symptoms occur. The involvement of traditional villages throughout Bali is needed to cooperate in improving healthy lifestyles by not consuming alcoholic beverages and reducing the consumption of foods with high cholesterol.

CONFLICT OF INTEREST

The authors declare the have not competing interests. Each authors of this paper has completed the ICMJE Conflict of interest statement.

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