Knowledge and Socioeconomic Status as The Factors of Pre-hospital Delay in Patients with Acute Coronary

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Abstract   Acute Coronary Syndrome (ACS) is a cardiac emergency condition that requires fast and precise action while a pre-hospital delay in a patient to come to the ED is still common. This pre-hospital delay is related to the socioeconomic and knowledge factor. The purpose of this study is to determine the relationship of socioeconomic and knowledge with the pre-hospital delay of ACS patients to come to Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar. This research is a quantitative research with cross-sectional design and purposive sampling as data collection technique with 292 patients. The results showed that 55.8% of patients have low socioeconomic status and there are 71.6% of patients who do not know ACS. The pre-hospital delay, in this case, is associated with low socioeconomic status and knowledge of ACS so that health workers need to provide counseling to patients and families about ACS signs and symptoms, healthy lifestyles, and the importance of coming to the emergency department when signs of ACS are felt.

Introduction

Acute Coronary Syndrome (ACS) is clinical signs and symptoms of myocardial ischemia and one manifestation of Coronary Heart Disease (CHD). There are three types of ACS such as *Unstable Angina Pectoris* (UAP), *Myocardial Infarction Non-ST-Segment*, and *Myocardial Infarction ST-Segment* which is the most serious emergency condition causing death in patients (Depkes RI, 2006). The data from the *World Health Organization* (WHO), 2013 revealed that from 49 countries, there are 4 million deaths per-year due to ACS. In developed countries, one-third of deaths occurred with an onset of age more than 35 years (Nichols M, et al., 2014; Gomar A, et al., 2016).

The phase of pre-hospital delay includes two things 1) symptom *onset*, and 2) patient transport time to ED (Perkin Porras L, et al., 2009; Xie L, et al., 2015). The pre-hospital period is the time calculated from the *onset* of acute symptoms until the patient arrives at the hospital (Mussi F.C, et al., 2014; Xie L, et al., 2015). The delay of pre-hospital is the time extension calculated from the onset of symptoms until the arrival of the patient to the Emergency Installation or as a time of symptom *onset* (George, 2013). Based on the guidelines of the *American College of Cardiology Foundation and the American Heart Association* (ACCF/AHA) in 2013, it is explained that the standard time of symptoms to arrive at the ED is a maximum of 120 minutes (O'Gara P.T, et al., 2013). The same statement was also expressed by Goldberg R, et al., (2009) and Peng Y.G, et al., (2014) that ACS patient is declared to be late if the patient exceeds the

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recommended time to arrive at the ED (>120 minutes). The study conducted by Youssef G.S, et al., (2017) revealed that the delay is divided into two: less than 2 hours and more than 2 hours.

In Indonesia, the prevalence of acute coronary syndrome in 2013 is 0.5% or 883,447 people. Based on a doctor diagnosis or symptom, the prevalence is 1.5% or 2,650,340 people. In 2008, there were 17.3 million cardiovascular deaths with more than 3 million deaths occurred under the age of 60 years. Hypertension causes 45% of deaths due to heart disease and 51% due to stroke. It is estimated that there will be an increase by 23.3% in acute coronary syndrome by 2023 (RISKESDAS, 2013). In 2013, the number of patients with theacute coronary syndrome in Bali based on symptoms is as many as 12,272 people (1.3%). ACS prevalence according to the highest diagnosis is found in Tabanan by 0.6% followed with Karangasem by 0.6% and Klungkung by 0.6% (RISKESDAS BALI, 2013). In 2016, the number of ACS patients according to Sanglah General Hospital, Denpasar reached 570 patients (33.08%). It is said that the factors related to the pre-hospital delay of ACS patients in the ED are connected by socioeconomic factors as well as the knowledge of the patient and family.

Patients with unknown economic status are more likely to postpone coming to ED when ACS attacks occur because they will have anxiety about high medical costs that cannot be reached because of the low economic status (Wechkunanukul K, et al., 2017; Fathi M, et al., 2015; Darawad M.W, et al., 2016)

Education level is closely related to knowledge because good knowledge can help to determine how individuals recognize and understand the symptoms experienced. Based on this understanding, it can be explained that ACS patients will have an appropriate response when the onset of symptoms is felt. Knowledge also affects the delay of the patients to come (McSweeney J.C, et al., 2009). Many research has been widely conducted saying that knowledge is one of the important factors of patient's delay time related to the lack of knowledge in recognizing signs and symptoms of ACS (Perkins Porras L, et al., 2009).

This research is to find the correlation of factor of socioeconomic status and knowledge with a pre-hospital delay of patients in Emergency Department of Sanglah General Hospital, Denpasar. This study is expected to be the evaluation material for nurses in providing health information to ACS patients and families in order to reduce the pre-hospital delay to come to ED.

It is important to know that the pre-hospital delay of the patient will worsen the patient's condition and may increase the risk of complications and death. The research conducted by Makam R.P., et al. (2016) found that the postponing of ACS patient to arrive at the hospital would be able to cause complications of arrhythmias (22.9%), heart failure (37.9%), atrial vibration (24.6%), ventricular tachycardia (10%), and cardiogenic shock (4.6%). The study from Tabriz A.A., et al., (2012 in Spain also revealed that the delayed arrival time of the patient would increase mortality by 9.8%.

Materials and methods

This research was quantitative research, specifically analytic observational research with *cross sectional* approach. The research population is the entire classification of ACS patients who come to the Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar, Bali with 292 respondents as samples.

The sampling was carried out by using *non-probability sampling* with *purposive sampling* technique. There are three inclusion criteria: 1) Patients who suffer ACS for the first time, 2)

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Patients who experience chest pain quickly and permanent and diagnosed by the patient or family who know, 3) The condition of ACS patients which has been stabilized with no complaints of chest pain and hemodynamically stable (systolic blood pressure by 90 - 140 mmHg, diastolic blood pressure by 60 - 90 mmHg, pulse by 60 - 10 x/minute, warm acral, and respiration rate by 16 - 24 x/minute. Meanwhile, the exclusion criteria are: 1) ACS patients who died in the Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar, 2) Patients who had suffered ACS previously, and 3) Patients who refused to be respondents.

The instruments used in this study were structured interview sheets. The data was collected by a short interview with the ACS patients and families conducted by the researchers during the study period.

This research has obtained an ethical approval from Faculty of Medicine, Udayana University/Sanglah General Hospital, Denpasar registered with the number of 2600/UN.14.2/KEP/2017. This research was conducted in December 2017 until January 2018. The data that has been obtained then brought to be managed, analyzed, presented, discussed, and concluded. The techniques of data analysis used are a univariate analysis that is to describe each variable and bivariate analysis to assess the socioeconomic variable by using *Spearman* test and knowledge variable by using the coefficient of contingency test.

Results and discussion

Based on the results of the research, the data obtained are as follows:

Table 1. The Characteristics of Respondents

	CHARACTERISTICS	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	Civil Servant	26	8.9%
	Entrepreneur	74	25.3%
	Private	123	42.1%
	Unemployed	26	8.9%
	Pensionary	41	14%
	Police/Indonesian National Armed Forces	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%

CHARACTERISTICS		FREQUENCY	PERCENTAGE
	Jembrana	5	1.7%
	Nusa Penida	1	0.3%
Type of ACS	UAP	112	38.4%
	NSTEMI	14	4.8%
	STEMI	166	56.8%
Marital Status	Married	289	99,.0%
	Single	3	1.0%

The data of respondents' characteristics in Table 1 illustrates that the majority of respondents are male as many as 207 (70.9%), in the age of 56 - 65 years (27.4%), with the majority of private sector employees by 123 people (42.1%), are in Denpasar by 121 people (41.4%) followed by STEMI as the highest type of ACS (166 case or 56.8%) and 289 people (99.0%) were married.

Table 2. Respondents' Univariate Data

CHARACTERISTICS			FREQUENCY	PERCENTAGE
Socioeconomic Status	Low	: 0-1.5 million	163	55.8%
	Medium	: 1.6-2.5 million	91	31.2%
	High	: 2.6-3.5 million	11	3.8%
	Very High	: >3.5million	27	9.2%
Knowledge	Know		83	28.4%
	Not-knowing		209	71.6%

The univariate results obtained from the variable of socioeconomic status showed that 163 patients (55.8 %) have low socioeconomic status, 91 patients (31.2%) have moderate economic status, 11 patients (3.8%) have high economic status, and 27 patients (9.2%) have very high economic status. On the other hand, the variable of knowledge showed that as many as 209 patients (71.6%) do not have knowledge about ACS and 83 patients (28.4%) have knowledge about ACS.

Table 3. Respondents' Bivariate Data.

Variable		Delayed Time		Total	P	Correlation Coefficient (r)
		>120 minutes f	≤120 minutes f			
Socioeconomic Status	Low : 0-1.5 million	146	17	163	0.000	0.432
	Medium : 1.6-2.5 million	79	12	91		
	High : 2.6-3.5 million	3	8	11		
	Very High : >3.5 million	2	25	27		
Knowledge	Know	36	47	83	0.000	0.479
	Not-knowing	194	15	209		

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The result of Spearman test from the variable of socioeconomic status was P 0.000 < α = 0.05 and r = 0.432. By that, the research hypothesis was accepted that there is a relationship between the demographic factors such as socioeconomic status and the late arrival of patients in the Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar.

From the test of contingency coefficient, the variable of knowledge is known to be P 0.000 < α = 0.05 and r = 0.479 thus the research hypothesis was accepted that there is a moderate correlation between knowledge and the late arrival of thepatient in the Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar.

1. The Economic Status and Pre-hospital Delay of ACS Patients

Bali Province is part of the country that has many occupations in the field of tourism because it has tourism nature and culture to become a holiday destination for both domestic and foreign tourists. This tourism sector makes Balinese citizens mostly work in tourism so that the socio-economic status of the patients depends on the condition of tourism. This is in accordance with the data characteristics showing that the majority of patients' occupation is a private employee in hotel and villa as many as 123 people (42.1%). The socio-economic status of patients is dominant with low economic status (0 - 1.5 million) because they work as *house-keeping.* Their salary is in accordance with the work hours given by each hotel and villas meaning when there are a lot of visitors, the working time will be added according to the condition of the hotel and villas.

According to Darawad M.W, et al., (2016), a socioeconomic status is something that can prevent patients to come to the ED when ACS attacks occur because they are burdened with the medical expenses despite having health insurance. A health insurance does not cover all medical expenses so that the patient postponed their desire to get health services especially go to thehospital to get medical help.

The results of the research showed that the higher the socioeconomic status, the lower the opportunity of delay to occur. This is in accordance with the results that as many as 146 respondents with low income (0 - 1.5 million), 79 respondents with moderate income (1.6 million - 2.5 million), 3 respondents with high income (2.6 million - 3.5 million), and 2 respondents with very high income (> 3.5 million) experienced a pre-hospital delay to come to the ED.

It is also found that respondents who have low socioeconomic status (0 - 1.5 million) did not experience adelay as many as 17 respondents and respondents who have moderate income (1.6 million - 2.5 million) did not experience adelay as many as 12 respondents. This is because when the ACS attacks occur, the patient is aware and immediately visits the nearest hospital to get help; the medical expenses of the patient will be taken care of by the family. Bali Province uses patrilineal lineage system where men (male) have an obligation to ensure the health of both parents so that he will bring the parents to the ED and responsible for completing all health administration.

Moreover, there are 3 respondents with high income (2.6 million - 3.5 million) and 2 respondents with very high income (> 3,5 million) experiencing a pre-hospital delay at the ED. This was not caused by the income but due to the patient's awareness in seeking treatment when ACS attacks occur in which the patient decides to rest, buy non-prescribed medications, and the presumption that the perceived symptoms are common so that particular treatment is not necessary.

2. The Knowledge and Pre-hospital Delay of ACS Patients

Alfasfos N, *et al.,* (2016) believed that knowledge, attitudes, and beliefs of respondents are able to influence the

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respondents to come to the ED when ACS attacks occur. The results also explain that in Jordan, patients who have no knowledge, attitudes, and beliefs cannot behave healthily. Patients who experience ACS symptoms are not able to perceive these symptoms so that they assume that the pain occurs due to regular indigestion and fatigue. The results proved that from 209 patients, as many as 194 respondents with ACS did not have knowledge so that they experiencing a pre-hospital delay to come to the ED. The delay is caused by a false perception of the patient and family thus generating low awareness of the importance of ACS treatment in which will cause a pre-hospital delay.

The study also found that 15 respondents who do not have knowledge about ACS did not experience a delay because when the attacks occur, the patients immediately went to the hospital to get help due to the intolerance of chest pain felt by the patients. This makes the patients come soon in order to get treatment and comfort from the symptoms.

It is known that from 83 respondents who know the symptoms of ACS, there are 36 respondents who still experience a pre-hospital delay. The patients are aware that one of the signs and symptoms of ACS is in the form of chest pain but they misperceive the pain as heartburn so that they get wrong in making decisions by buying non-prescribed medication and just take a rest.

A research from Silber (2010) described knowledge as an important component to be improved to reduce the pre-hospital delay of the patients at the ED. Knowledge improvement can be realized by providing health education to ACS patients and families especially to women who have low education and who work as housewives. What is meant by health education in this research is a health counseling performed by medical personnel. From the results of the research, it is known that knowledge, attitude, and awareness of ACS patients are finally increased and able to reduce the number of pre-hospital delay of patients at ED.

Conclusions

Based on the results, it can be concluded that there is a significant and positive relationship between the factor of socioeconomic status and knowledge to the pre-hospital delay of patients in the Integrated Heart Service in Emergency Department of Sanglah General Hospital, Denpasar. Nurses are expected to provide counseling to patients and families so that they will be able to recognize ACS signs and symptoms, have a healthy lifestyle, and know the importance of coming immediately to ED to get treatment when the symptoms of ACS occur.

Acknowledgements

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