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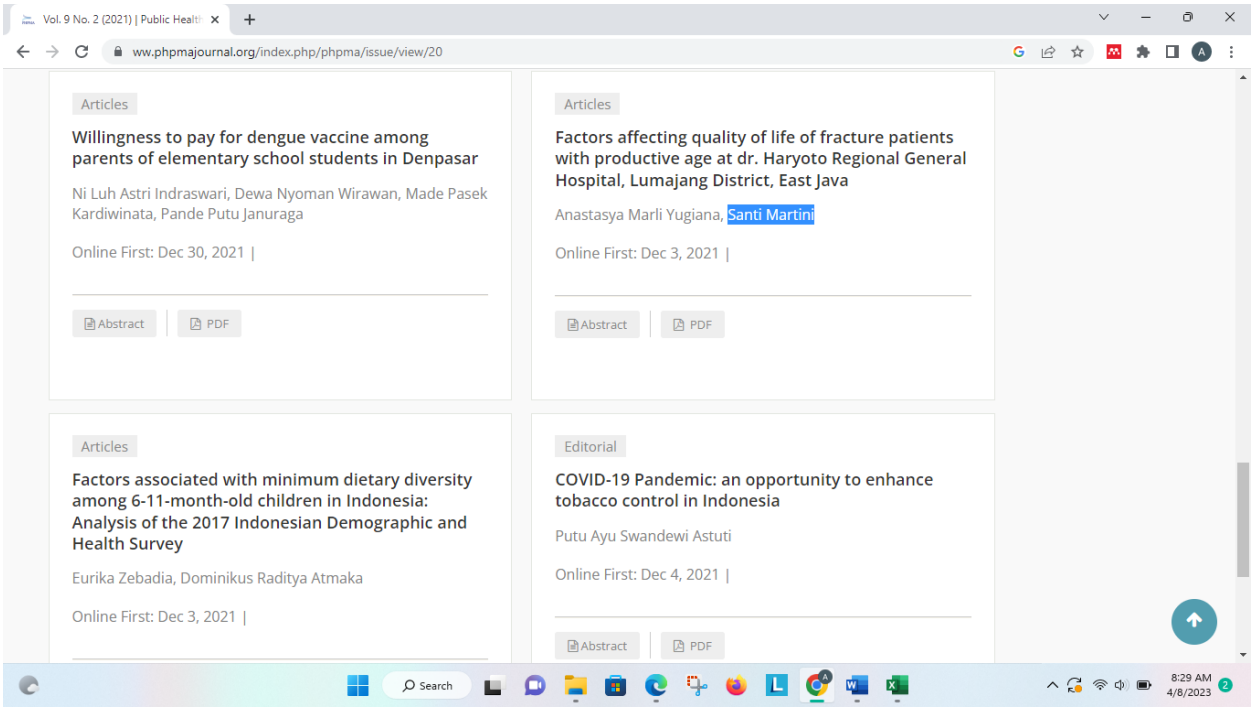
PREVENTIVE MEDICINE
ARCHIVE
E-ISSN : 2960-2556 P-ISSN : 2303-1816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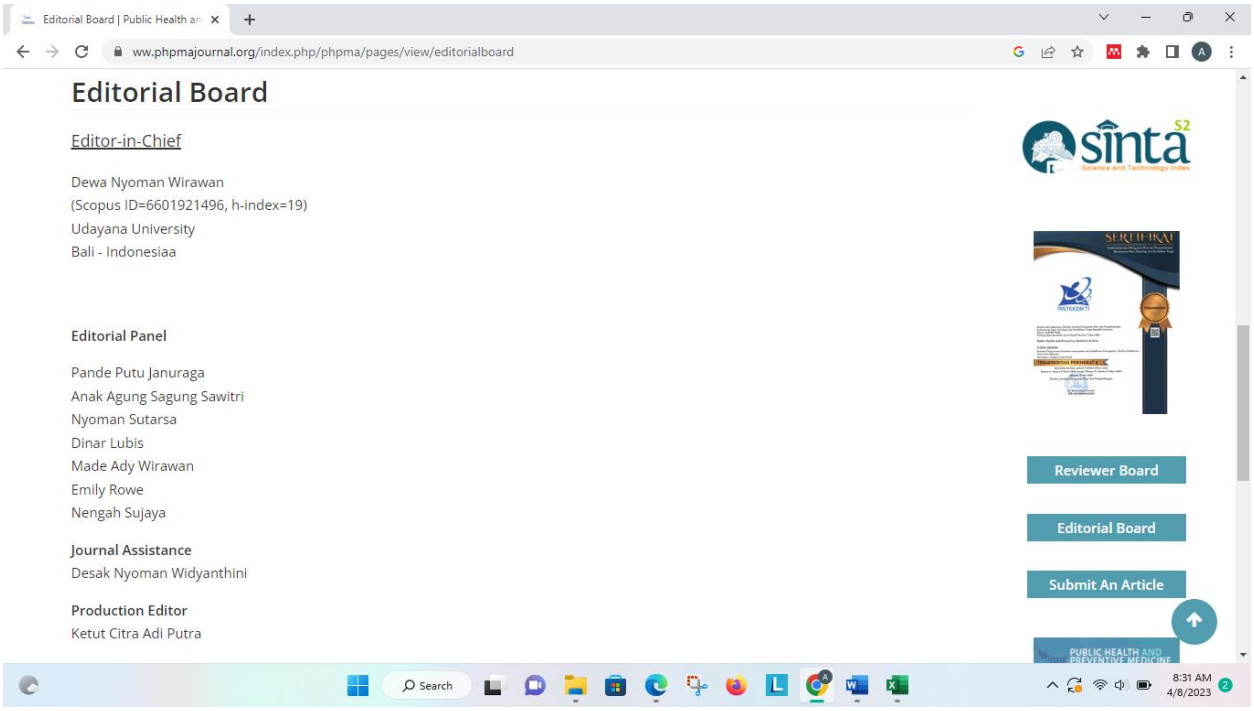
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Public Health and Preventive Medicine Archive (PHPMA) 2021, Volume 9, Number 2: 126-131
E-ISSN: 2503-2356

PHPMA
Published by
Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University

Factors affecting quality of life of fracture patients with productive age at dr. Haryoto Regional General Hospital, Lumajang District, East Java

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ABSTRACT

Background and purpose: Fractures can affect activity and productivity due to delayed time of returning to work. It may have impacts on the patient's physical, psychological, social, and environmental conditions that can influence the quality of life. The purpose of this study was to explore factors associated with the quality of life of fracture patients with productive age.
Methods: This research used a cross sectional approach conducted at the Orthopedic Clinic of dr. Haryoto Regional General Hospital, in Lumajang District, East Java from October 2020 to February 2021. The study involved 84 patients whom were selected using simple random sampling. Data was collected with interview using the WHOQOL-BREF questionnaire which can assess a person's quality of life. The data were analysed using univariable, bivariable and multivariable analysis with Chi-square and Logistic Regression.
Results: Most respondents were aged 20 to 60 years, male, have worked, completed secondary education, and married. Most of them had health insurance, experienced fractures in lower extremity with open fracture type, had severe condition since more than 12 months and had an accident on the highway. Factors associated with quality of life were family support with OR=0.631 [95%CI: 0.524-0.760; p=0.004], duration of fracture with OR=0.333 [95%CI: 0.123–0.900; p=0.049] and fracture severity with OR=11.00 [95%CI: 3.261–37.106; p=0.00]
Conclusion: Family support, duration of fracture, and fracture severity were associated with quality of life of productive aged fracture patients. Special attention and family support are needed for fracture patients during the healing period to improve their health status.

Keywords: quality of life, fracture, WHOQOL-BREFF, family support
Cite This Article: Yugiana, A.M., Martini, S. 2021. Factors affecting quality of life of fracture patients with productive age at dr. Haryoto Regional General Hospital, Lumajang District, East Java. *Public Health and Preventive Medicine Archive* 9(2): 126-131. DOI: 10.15562/phpma.v9i2.343

INTRODUCTION

Fracture is a condition when there is a broken bone structure that can be in the form of cracks. Fractures can be caused by traumatic events such as traffic and non – traffic accidents.[1] Often the fracture healing process will be disrupted due to various factors such as delayed union to totally non – union, which cause prolonged hospitalization period that can cause discomfort, disrupted activities, and increased treatment costs.[2]

Based on The 2018 Basic Health Research, home environment contributed to the highest number of injuries (44.8%) compared to roads (31.8%), workplace (9.1%), and school (6.5%). These facts signify the important roles of house environment in injury prevention and control. The proportion of injuries that caused disrupted daily activities in East Java Province was as much as 9.12%, and fractures was accounted for 5.8%. In Lumajang District, East Java, the proportion of injuries that interfere daily activities reached 12.10%, higher than the provincial figure which also placed this district at the 8th highest in East Java.[3]

Fracture can affect activity and productivity because fracture patients cannot return to work for a long time, require many medical visits, and result in high economic burden. Disorders of the musculoskeletal system have an impact on individuals, families, communities, and countries because they can reduce individual productivity. The prolonged and increased cost will have an impact on the patient's economic condition and social relationships which can affect the quality of life.[4]

Quality of life consists of four domains including physical well-being, social well-being, emotional well-being, and productivity well-being. Physical well-being includes physical health, fitness, mobility, and safety. Social welfare includes personal relationships, family or home life and relatives, activities, acceptance and support. Emotional well-being includes positive effects, status or respect, mental health or stress, sexuality, fulfillment, confidence, and self-esteem. Productivity well-being includes competence, independence, choice and control, productivity or contribution, work, household life or household work, recreation and education. Quality of life is an individual's perception of his position in cultural life, the value system in which they are located, life goals, expectations, standards and others related. Besides,

the quality of life includes problems of physical health, psychological status, level of freedom, social relationships and the environment in which they are living.[5]

Based on WHO 2003, WHOQOL consists of six aspects, namely physical health, psychological well-being, level of independence, social relations, relationships with the environment, and spiritual state. WHOQOL is then developed into an instrument named WHOQOL–BREF where the six aspects are narrowed down to four aspects namely physical health, psychological well-being, social relationships and relationships with the environment.[6]

Physical health can affect an individual's ability to do activities. Activities carried out by individuals will provide new experiences which are the capital of the development of the next step.[6] The psychological aspect is related to the mental state of the individual. Mental state refers to whether or not the individual is able to adapt to various developmental demands according to his abilities, both internal and external demands. Psychological aspects are also related to the physical aspect, where individuals can do activities properly if the individual is mentally healthy. Psychological well-being includes bodily image and appearance, positive feelings, negative feelings, self-esteem, spiritual/religious personality, thinking, learning, memory and concentration.[6]

The aspect of social relations is the relationship between two or more individuals where individual behavior will influence each other, change, or improve the behavior of other individuals. Social relationships include personal relationships, social support and sexual activity.[6]

The environmental aspect is the place where the individual lives, the availability of a place to live to do all activities, including advice and infrastructure that can support life. Relationships with the environment include financial resources, freedom, physical security and safety, health care and social care including accessibility and quality, home environment, the opportunity to get a variety of new information and skills, participation and have the opportunity to engage in recreational and pleasurable activities in spare time, physical environment including pollution/noise/water conditions/climate, and transportation.[6]

METHODS

This research is an observational study with a cross sectional approach. It was conducted at the Orthopedic Clinic, dr. Haryoto Regional General Hospital, Lumajang District, East Java from October 2020 to February 2021. The population in this study were all fracture patients who underwent treatment at the Orthopedic Clinic, dr. Haryoto Regional General Hospital, Lumajang District.

The inclusion criteria were productive aged fracture patients who underwent outpatient treatment at the above hospital, with lower or upper extremity fracture. According to the Central Bureau of Statistics, productive age is ranged from 15 to 64 years old. Those who declined to participate were excluded from the study. The sample size was calculated based on the estimated proportion of fracture incidence of 0.058, with 95% confidence level and 5% absolute precision, resulted in a minimum sample size of 84. Then, the samples were selected with simple random sampling method.

The dependent variable was the quality of life of fracture patients. This data was obtained through interviews with the Indonesian version of the WHOQOL-BREF questionnaire. The assessment is subjective by asking the respondent how much they assessed the quality of life based on their feeling of the fracture. The questionnaire contains 4 domains, namely physical, psychological, social and environmental conditions with a Likert Scale ranged from "very bad" with a score of 1 to "very good" with a score of 5. The quality-of-life was divided into 2 categories, 1) "Good quality of life" if the total score was 80% of the maximum score or more and 2) Poor quality of life if the score was below 80% of the maximum score.

The independent variables in this study were age, gender, working status, education level, marital status, ownership of health insurance, fracture location, fracture type, duration of fracture, fracture severity, and the location where respondents experienced an incident that caused the fracture. This information was obtained through interviews with questionnaire. Age was categorized into adolescents (15-19 years), adults (20-60 years) and the elderly (>60 years). Gender was categorized into male and female. Working status was categorized into working and not working/retiring. The level of education was categorized into basic (elementary school), secondary (junior high school and high school) and advanced (college). Marital status was categorized into married and unmarried/divorced. Health insurance ownership was categorized into having and not having.

The fracture sites were categorized into upper limb fractures and lower limb fractures. Types of fractures were categorized into open fractures and closed fractures. Fracture duration was categorized into 12 months and <12 months. Fracture severity was categorized into non-severe (Grades 0 and 1 in closed fractures, Grades I and II in open fractures), severe (Grades 2 and 3 in closed fractures, Grade III in open fractures). The place of the accident that cause fracture was categorized into roads, houses and workplaces. All variables were measured by interview with a questionnaire.

The family support data was also obtained through interviews with respondents. The questionnaire used was the family support questionnaire adopted from study by Kurniawan (2016) and had been tested for validity (0.4821) and reliability (0.950). Aspects of family support were measured in 3 domains, namely, informational support, instrumental support, emotional support and appreciation. Each family support domain consists of 4 questions with a Likert Scale from "always" with score of 3 to "never" with score of 0. The family support variable was then categorized into two, namely score 13 or above as positive family support and score <13 as negative family support.

Data analysis was performed using univariable, bivariable and multivariable analysis. In bivariable analysis, we used the chi-square test which can be used to see the relationship between two variables with a significance level of 0.05. If the 2x2 table meets the requirements, then

the chi-square test results read is those with continuity correction, but if the 2x2 table does not meet the requirements, the Fisher's Exact Test is interpreted. If the p value <0.05, it means that there is an association between the independent and the dependent variable, and if the p value is ≥0.05, it means that there is no significant association. Multivariable analysis is useful to determine the dominant independent variable associated with the dependent variable. The independent variables used in the multivariable analysis was the significant independent variables from the results of the previous bivariable analysis. For the multivariable analysis, logistic regression was performed. The analysis was conducted on IBM SPSS Statistics 25 software.

This study was approved by the Ethics Committee at the Universitas Airlangga, Faculty of Dental Clinic, Number 314/HREC.FODM/VI/2021, granted on 17th June 2021.

RESULTS

Of the 84 fracture patients, most of them, 60 respondents (71.4%), positioned their quality of life as poor. The majority of the patients (88.1%) were in the adult age category of 20-60 years old, more than half (57.1%) were male and most of them were with secondary level of education (83.3%) and employed (76.2%). As much as 63.1% of the respondents were married, most respondents (77.4%) stated having positive family support and similarly, 77.4% of them were having health insurance.

Most of the patients (61.9%) had fractures at the lower limb and an open fracture (67.9%). More than half of them had fractures for 12 months or more and most of the fractures were severe (79.8%). The majority of the patients (64.3%) experienced incidents that caused fractures on the road (highway), followed by incidents at home (26.2%) and at workplace (9.5%) (Table 1).

Based on the bivariable analysis that has been carried out using the chi-square test, it was found that there are three independent variables associated with the quality of life of fractured patients with productive age, including family support with OR=0.631 [95%CI: 0.524–0.760, p=0.004], duration of fracture with OR=0.333 [95%CI: 0.123–0.900; p=0.049)], and fracture severity with OR=11,00 [95%CI: 3,261–37,106; p<0.001]. Other variables were not significantly associated with quality of life.

These three variables met the inclusion criteria for multivariable analysis which is p<0.25. Therefore, these three variables were included in the multivariable analysis. Based on the results of the multivariable analysis (Table 3), the only variable that independently associated with the quality of life of fracture patients is fracture severity. From this result, it can be interpreted that patients with severe fractures will have 35 times likelihood of having a poor quality of life than those with non-severe fractures.

Table 1. Characteristics, type of fractures and quality of life of fracture patients

Variable	Frequency	Percentage (%)
Quality of life		
Good	24	28.6
Poor	60	71.4
Age (years)		
Adolescent (15 – 19)	8	9.5
Adult (20 – 60)	74	88.1
Elderly (>60)	2	2.4
Gender		
Male	48	57.1
Female	36	42.9
Work		
Working	64	76.2
Not Working/Retired	20	23.8
Education level		
Basic	10	11.9
Secondary	70	83.3
Advance	4	4.8
Marital status		
Married	53	63.1
Unmarried/divorced	31	36.9
Family support		
Positive	65	77.4
Negative	19	22.6
Health insurance		
Having	65	77.4
Not having	19	22.6
Fracture sites		
Upper limb fracture	32	38.1
Lower limb fracture	52	61.9
Fracture type		
Open	57	67.9
Closed	27	32.1
Fracture duration		
≥12 months	44	52.4
<12 months	40	47.6
Fracture severity		
Not severe	17	20.2
Severe	67	79.8
Place of accidents		
Roads	54	64.3
House	22	26.2
Working place	8	9.5

Published by Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University | *PHPMA 2021*; 9(2): 126-131 | doi: 10.15562/phpma.v9i2.343

Table 2. Crude association between independent variables and quality of life

Variable	Quality of Life				OR	95%CI OR		p*
	Good		Poor			Lower	Upper	
	n	%	n	%				
Age (years)								
Adolescent (15 – 19)	2	25.0	6	75.0	-	-	-	0.795
Adult (20 – 60)	21	28.4	53	71.6				
Elderly (>60)	1	50.0	1	50.0				
Gender								
Male	16	33.3	32	66.7	1.75	0.65	4.70	0.383
Female	8	22.2	28	77.8				
Work								
Working	18	28.1	46	71.9	0.91	0.30	2.48	1.000
Not working/Retired	6	30.0	14	70.0				
Education level								
Basic	2	20.0	8	80.0	-	-	-	0.786
Secondary	21	30.0	49	70.0				
Advance	1	25.0	3	75.0				
Marital status								
Married	16	30.2	37	69.8	1.24	0.46	3.36	0.858
Unmarried	8	25.8	23	74.2				
Family support								
Positive	24	36.9	41	63.1	0.63	0.52	0.76	0.004
Negative	0	0.0	19	100.0				
Health insurance								
Having	17	26.2	48	73.8	0.61	0.21	1.80	0.536
Not having	7	36.8	12	63.2				
Fracture sites								
Upper limb fracture	17	26.2	48	73.8	0.97	0.36	2.56	1.000
Lower limb fracture	7	36.8	12	63.2				
Fracture type								
Open	15	26.3	42	73.7	0.71	0.26	1.93	0.684
Closed	9	33.3	18	66.7				
Fracture duration								
≥12 months	8	18.2	36	81.8	0.33	0.12	0.90	0.049
<12 months	16	40.0	24	60.0				
Fracture severity								
Not severe	12	70.6	5	29.4	11.00	3.26	37.10	0.000
Severe	12	17.9	55	82.1				
Place of accident								
Roads	17	31.5	37	68.5	-	-	-	0.725
House	5	22.7	17	77.3				
Working place	2	25.0	6	75.0				

*Chi-Square Test

Table 3. Factors associated with quality of life on multivariable analysis

Significant Independent Variable	Odd Ratio	95% CI OR		p
		Lower	Upper	
Family Support	1.463	1.232	1.738	0.998
Fracture Duration	1.644	0.473	5.716	0.435
Fracture Severity	0.028	0.003	0.242	0.001

DISCUSSION

Fracture is a condition when there is a broken bone structure. The healing of fracture is often disrupted due to various factors such as delayed union of bones to totally non – union, which cause prolonged hospitalization period that can result in discomfort, disrupted activities and increased treatment costs.[2] The longer healing process needed by fracture patients, the higher possibility it may affect their quality of life.

Quality of life consists of four aspects namely physical health, psychological well-being, social relationships, and relationships with the environment.[6] During their healing time, fracture patients often have to rely on others even for basic needs, thus this may influence their physical and social functions which belong to the quality-of-life domain.[4]

Family is the main source of strength that contributes to the resilience of each family member.[7] Family support is a form of support provided by families who live at home with patients including emotional support, appreciation and information. While the function of the family is as a social relationship which includes five points, namely adaptation, partnership, growth, affection and togetherness. The results of our study showed that there is an effect of family support on the quality of life of the fracture patients. Family support has an impact on physical and mental health so that it will affect the quality of life of other family members. Family support is acceptance of family members which is manifested by attitudes and actions. Family members are seen as an inseparable part of the family environment. Family members view that family is the closest person, supports each other and is always ready to provide help if needed.[8]

The results also showed that there is an effect of fracture duration and fracture severity on the quality of life in fracture patients. The duration of the fracture also has an economic impact on the patient and family which can affect the quality of life of fracture patients.[4] The duration of fracture healing depends on the severity of the fracture suffered by the patient. The severity of the fracture can add to the pain experienced by the patient. This can cause the patient's quality of life to decrease

because they cannot carry out their usual activities for a long time and require high treatment costs which can be a burden for the patients.[9]

Respondents in this study were in the age ranged from 16 to 62 years where the age of 27 years was the most. The productive age has the highest likelihood of experiencing accidents due to their high level of activities and mobilization.[4] We, however, found no association between age and quality of life and similarly for gender. This is not in accordance with research conducted by Indrayani and Ronoatmodjo S (2018) which found that the quality of life is related to gender,[10] while Hamzah (2016) stated that women have a lower quality of life compared to men because women have responsibilities for household tasks compared to men which will have an impact on health recovery.[11] However, Platini (2020) states that fractures experienced by men of reproductive age will have an economic impact since patients cannot return to work for a long time, require many medical visits, and result in high social costs.[4]

Persons who are employed have responsibilities to perform their jobs. Injuries can affect a person's performance at work. This is related to trauma that can interfere their activities which then reduce their productivity.[12] Other studies also mention that disabled workers who have low independence, 72.9% of them have low quality of life.[5] However, we cannot support this association based on the evidence in our study.

We also found no association between education level on the quality of life in fracture patients. This is not in accordance with the theory put forward by Notoatmodjo which says that education affects a person's behavior in attitude motivation and affects behavior in seeking treatment for the disease he suffers. Thus education is a means to improve a person's quality of life.[12]

Similarly, there was no association between marital status and the quality of life in fracture patients. This is not in accordance with research conducted by Sulistiyaningsih (2016) which states that patients who are divorced or do not have a life partner tend to have low physical and psychological health values and are prone to depression compared to married patients. This can be related to family support because married patients will get support from their spouse and children,[9] as what mentioned above that family support was associated with the quality of life in this study.

The inferior or lower extremity is a part of the body that is often injured. Most trauma from accidents result in inferior fractures and have high rates of hospitalization, length of stay, and surgery. Patients with lower extremity injuries will have difficulty standing, walking, squatting, and lifting weights. This is in contrast to patients with upper extremity fractures.[4] The results of this study show that there is no influence of fracture location on the quality of life in fracture patients, hence further exploration is needed in the future.

Severe trauma will result in an open fracture and may require a longer hospital stay. This will have an impact on the economic condition of the patient because he cannot return to work for a long time besides that the patient cannot carry out activities as usual and inhibits social activities that can affect the quality of life in fracture patients. Fractures with open wounds are associated with more severe trauma than closed fractures, this can be seen from the longer inpatient care.[4] Type of fracture was not independently associated with quality of life since it is likely to be associated with the severity of fracture which was found to be associated above.

We found no association between location where the incident was happened with the quality of life, which may be indirectly associated with severity of fractures. Home and its environment are the biggest contributors to the occurrence of injuries, including fractures. The number of fracture accidents in the world will increase along with the increase in the number of vehicles because productive age is more prone to fracture due to traffic accidents.[3]

CONCLUSION

Family support, duration of fracture, and fracture severity affect the quality of life of productive age fracture patients, whilst fracture severity is the dominant factor that affects the quality of life of productive age fracture patients in dr. Haryoto Regional General Hospital, Lumajang District. Prompt treatments to shorten the length of healing duration and to fasten recovery is essential to improve quality of life. Meanwhile, optimizing family engagement and support to provide information about the results of examinations and treatment; to remind to control, take medication, exercise, and eat regularly; and remind about behaviors that can worsen the patient's condition. It is essential to provide time and facilities for patient treatment needs, and also love and care for the patient's condition.

ACKNOWLEDGEMENT

The researcher would like to thank the Director of the dr. Haryoto Regional General Hospital, Lumajang District and all respondents who have contributed to this research.

AUTHOR CONTRIBUTION

AMY collected and analyzed the data, prepared the manuscript. SM involved in the conception of the study, review and conducted thorough edits on the manuscripts.

CONFLICT OF INTEREST

The authors declare no conflict of interest

FUNDING

The study was self-funded by the authors

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