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Range of Motion (ROM) Early Affecting The Ability of Activities Daily Living (ADL) Patients Post Operation Femur Fracture

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***Abstract*— Fractures can cause various disorders of body functions. Most fractures are caused by trauma where there is excessive pressure on the bone. One of the most common fractures is a fracture of the femur. In postoperative patients, fractures (fracture of the femur) have increased in activity so that it needs to be gradually restored through joint mobilization, namely Range of Motion (ROM) exercises to restore the patient's Activity Daily Living (ADL) ability. Objective to investigate and see the effect of ROM at early age on the ADL ability of patients after femoral fracture surgery. This study is a quasi-experimental study with a post-test control only design method. A sample of 24 respondents divided into two groups, namely the treatment group and the control group, each of 12 respondents. Respondents who were the subject of the study were postoperative patients with independent and dependent categories of femoral stem fracture. The data collection tool is the ADL observation sheet in the form of the Katz Index after the 4th day. The collected data were analyzed by independent T-test. The results of the analysis obtained that the value of Ho (null hypothesis) is rejected and Ha is accepted, which means that there is an effect of patient ADL between the control group and the treatment group. This means that ROM is needed to restore the ADL ability of patients after femoral fracture surgery.**

Keywords*— Range of Motion (ROM), Activity Daily Living (ADL), Femur Fracture*

I. INTRODUCTION

The mobility of humans who want to be fast paced can cause quite serious problems, namely the increasing number of traffic densities. So that resulted in an increase in traffic accidents. From PT Jasa Raharja's data in 2010, there were 14,790 vehicles involved in accidents and 73.2% of them were motorbikes (Putu, 2016). These accidents can cause injuries, both minor, serious, disability and even death. One of them is a fracture of the femur [1]. The high number of accidents causes a high incidence of fractures, and one of the most common fractures is a fracture of the femur [2].

The emergency fracture requires immediate action to save the client from physical disability. Meanwhile, physical disabilities can be gradually restored through joint mobilization, namely Range of Motion (ROM) exercise, which is an important activity in the postoperative period to restore the patient's Activity Daily Living (ADL) ability [3]. Exercises done to improve the level of perfection in the ability to move joints normally [3]. By giving Range of Motion (ROM), it can increase a person's ability to carry out activities of daily life independently [4]. These activities include: eating, bathing, dressing, using the toilet, mobility in bed, walking, etc. (Hidayat, 2012).

Based on the results of observations at RSUI Kustati Surakarta, in the postoperative period of fracture (fracture of the femur), the patient was carried out by ROM. It is this problem that encourages the authors to further investigate the effect of early ROM on the ADL ability of postoperative femoral fracture patients.

II. METHOD

Research design

This research is a quasi-experimental research with the method of post-test control only design. In this design, after the treatment subject is given to one group (treatment group), and the other group is not given treatment (control group). After the 4th day, both variables were observed [5].

Place and time of research

This research was conducted at RSUI Kustati Surakarta in the Orthopedic Surgery Room, Az Olive and As Salwa Ward.

Population and Sample

The population in this study were all patients who had undergone fracture surgery of the femoral trunk who were treated in the surgical ward of Az Zaitun and As Salwa wards Kustati Surakarta Hospital.

The sampling technique was using Accidental Sampling. With a sample of 24 respondents. Because it uses the treatment group and the control group, the number of sample members is 12 respondents each.

Inclusion criteria in this study :

1) The patient is a pure femur stem fracture and is willing to be a respondent.
2) Femur trunk fracture patients without complications or other diseases.
3) Able to communicate well.
4) There is no physical disability.

The exclusion criteria in this study were patients who were unwilling to become respondents.

Research Instruments

1. Range of Motion (ROM)
   The measuring instrument used is a check list.
2. Activities Daily Living (ADL)

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The instrument used was a standardized observation sheet in the form of the Katz Index.
This observation sheet is used to observe the patient's ADL which consists of bathing, dressing, going to the toilet and moving / transferring.
The range of values is: independent, if it can perform ≥ 2 functions and depends, if it can perform ≤ 3 functions

Data analysis

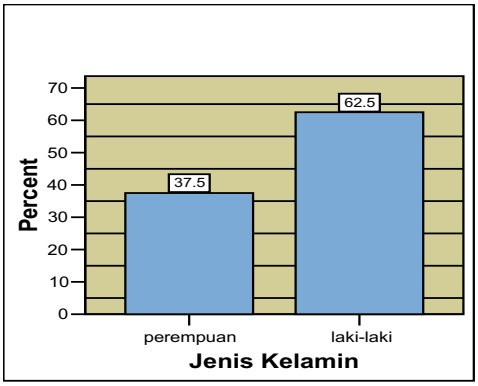
This study wanted to know the differences in ADL in postoperative femur fracture patients who had ROM and those who did not do ROM after 24 hours of postoperative femur fracture. Data were analyzed by Independent T-test.

III. RESULT

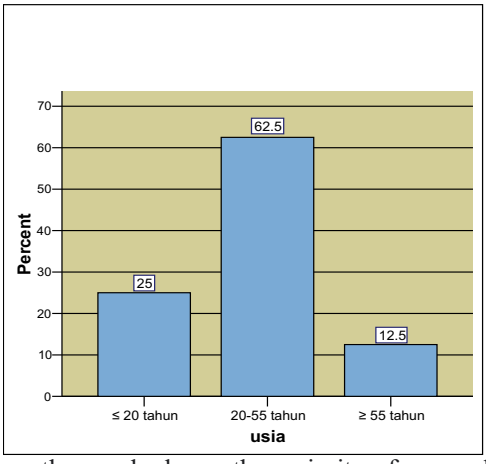
A. Respondent Description

To find out the characteristics of respondents, it can be seen in the following graph :

1. Characteristics of Respondents by Gender



2. Characteristics of Respondent to Age



Based on the graph above, the majority of respondents are aged 20-55 years (62.5%), more than those aged <20 years (25%) and aged> 55 years, only 12.5%.

B. Univariat Analysis of Patient Activity Daily Living (ADL) Level

Table 1 Patient ADL Cross Tabulating

Group	Category	n	(%)	Mean	SD
Control	Independently	3	25,0	3,00	0,000
	It Depands	9	75,0	1,56	0,527
Experiment	Independently	8	66,7	3,38	0,518
	It Depands	4	33,3	2,00	0,000
Jumlah		24			

Based on the ADL level table, the patient shows that in the control group with the independent category there were 3 respondents (25%), while in the treatment group 8 respondents (66.7%). In the control group with the dependent category there were 9 respondents (75%), bigger than the treatment group, namely 4 respondents (33.3%).

C. Bivariat Analysis

1. Patient ADL cross tabulating result by gender, the results of the observation show that the biggest difference between male respondents and the independent category in the control group is 16.7% lower than the treatment group, namely 50%. Meanwhile, the category depending on the control is 50% higher than the treatment, namely 8.3%. Respondents who were female in the independent category in the control were 8.3% and 16.7% for treatment. Meanwhile, the category depends 25% on control and treatment.
2. Patient ADL cross tabulating results according to age showed that the biggest difference in respondents aged 20-55 years with the independent category was 16.7% for the control, while the treatment was higher, namely 41.7%. Meanwhile, respondents aged ≤ 20 years with the independent category on the control were 8.3% and 16.7% for treatment. Respondents aged ≥ 50 years were categorized as independent in treatment, namely 8.3%, while in control there were no respondents who were included in the independent category (0%).
3. Normality test

Table 2 Normality Assumption Test For ADL

Variabel	Kolmogorov Smirnov	p-Value	Sig. 2 tailed	Interpretasi
ADL patient score control group	0,726	0,668	ρ>0,05	Normal
ADL patient score eksperiment group	0,726	0,668	ρ>0,05	Normal

The test results in the table above show that the Kolmogorov-Smirnov value in the data group has a probability value (ρ) greater than the 5% significance level (ρ> 0.05). This means that the data distribution of the two groups is normally distributed

4. Hypothesis Testing about ROM with ADL in Postoperative Femur Fracture Patient

Table 3 Normality Assumption Test For ADL

	t_{hitung}	t_{tabel} 5%	Information
ADL control group with eksperimaen group	3,604	2,074	Ho rejected and Ha be accepted

Note: t_{table} is at the 5% significance level with dk = $n_1 + n_2 - 2 = 22$

The results of data analysis obtained the value of $t_{hitung} > t_{table}$ at a significance level of 5%, namely 3.604 > 2.704. So that Ho (null hypothesis) is rejected and Ha is accepted, which means that there is a difference in patient ADL between the control group (not done with ROM) and the treatment group (done with ROM)

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D. Discussion

The purpose of this study was to determine the effect of Range of Motion (ROM) and Activities Daily Living (ADL) in postoperative femur fracture patients at RSUI Kustati Surakarta. Of the 24 samples taken, the majority of respondents' characteristics were male. This is because at the time of the study, the majority of postoperative femoral stem fracture patients treated at Az-Zaitun and As-Salwa RSUI Kustati Surakarta were male. The male respondents are more than female, indicating that the accident rate for males is higher than that of females. This is due to the activities of men as breadwinners and the higher intensity of activities outside the home, activities such as climbing, driving motorized vehicles, sports and others that can increase the risk of injury (Syaiful, 2010). It is also in accordance with the opinion of Charlene [6] that fractures are more common in men than in women with a ratio of 3: 1.

Meanwhile, in terms of age, the majority of respondents were 20-55 years old. Meanwhile, there were 6 respondents aged ≤ 20 years and the rest aged ≥ 55 years. This is because at the time of the study, the majority of postoperative femoral stem fracture patients treated at Az-Zaitun and As-Salwa RSUI Kustati Surakarta were 20-55 years old. According to Sigit [7], the career cycle is divided into five stages: 1) Age growth stage from birth to 14 years, 2) Exploration stage for ages 15-24 years, 3) Ability or productive stage of 25-50 years old. At this stage a person is actively working and the mobility is relatively high so that traffic accidents and work accidents are relatively high, 4) The maintenance stage is 50-64 years old, 5) The age reduction stage is> 65 years.

Clinical features of femoral trunk fracture most of the patients are young adults (> 30 years). Meanwhile, fractures of the femur in other parts, such as those in the proximal (neck, intertrochanteric, head of the femoris) and the supracondyle, are more common at the age of 60 years and over. Although it does not rule out also in adults or in children [8].

The results of univariate analysis of the patient's ADL level showed that respondents who performed early ROM, namely 24 hours postoperative, the majority of femur fractures were independent categories, while in the control group the majority were dependent categories. According to Wallace [9] dependence is a reduced ability to fulfill needs and desires to be independent. The degree of dependence of fracture patients varies depending on the severity of the disease. In accordance with the previous research conducted by Suhardi (2017), the dependence of patients in doing ADL can be caused by fractures they suffer, namely in patients with fracture of the femur in fulfilling ADL needs, they experience limitations because of the pain they feel

Based on the results of the bivariate analysis that ADL patients or the daily activities of postoperative femur fracture patients who had ROM, showed a significant difference in terms of gender differences. From the results of observations, male patients with the independent category are higher than women. According to Moekijat [10] that the behavior between men and women has differences, this happens due to hormonal influences and physical structures. Therefore, men tend to be more motivated to do something because they are physically strong.

While the results of the bivariate analysis of cross-tabulation of ADL patients according to age, the level of patient independence at the age of 20-55 years or productive age was higher than that of children and the elderly. In RSUI Kustati Surakarta, men of productive age (20-55) years have high motivation to exercise range of motion so that their ADL skills can be accelerated. According to Nurul [11] that at productive age have good joint flexibility. In old adulthood, flexibility tends to decrease in activity level and muscle strength. So that it can reduce the range of motion of the joints. Based on the results of cross-tabulation of the patient's ADL level, it was found that the patient's ADL after ROM showed a significant difference compared to the control group. Respondents who belong to the independent category in the control group are lower than the treatment group. In contrast, respondents who belong to the dependent category of the control group have a higher rate than the treatment group.

The results of statistical analysis proved that there were differences in the patient's ADL level between the control group and the treatment group. The existence of these differences proves that doing early ROM in postoperative femur fracture patients can increase ADL or the daily activities of postoperative femur fracture patients, such as walking, going to the toilet without assistance, dressing, etc. The mean ADL score of patients who underwent ROM (3.08) was higher than the mean ADL value of patients without ROM (1.92). Hypothesis testing shows that there is a significant effect of patient ADL between the control group and the treatment group. This means that ROM has an effect on the recovery of ADL ability in postoperative femoral fracture patients. In accordance with the opinion of Potter & Perry [3], that the range of motion (ROM) is an activity to restore the ability of the patient's daily living (ADL) activities

The phenomenon that occurs in RSUI Kustati Surakarta is that ROM is carried out in postoperative fracture patients (fracture of the femur). As when the patient has finished the operation, then gibs and traction are installed. This includes activities to recover the patient from the effects of anesthesia. In addition, it can stimulate muscle tone to become active again because the blood collected in the lower extremities will move and increase venous flow. So that after range of motion exercises or ROM, the circulatory system will return to smooth and directly lead to increased muscle strength [12]. The increased muscle tone was evidenced by the patient being able to perform ROM and move his legs independently on the second day, although on the first day he was still helped to do range of motion exercises. After the third day the patient can move out of bed and learn to walk. On the fourth day, the patient was able to walk independently even though he still used crutches and was able to carry out his daily activities independently. This is supported by the results of research conducted by Erna (2013), which states that there is a decrease in the level of dependence of patients in fulfilling ADL on days two and five. It can be said that the patient has progressed in terms of independence in carrying out daily activities or ADL.

In general, postoperative fracture (femur fracture) patients at RSUI Kustati Surakarta can return to their activities independently after the fifth day. However, in this

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study, ROM was performed 24 hours postoperatively and patient ADL was observed on day four, both in the control group and in the treatment group. Based on the analysis of the observation sheet of the respondent's ADL level, it shows that the majority of respondents are independent categories in the treatment group and depend on the control group. This is in line with the opinion of David [1] that joint motion training is able to increase the movement of each joint according to normal movement, either actively or passively. Because ROM is able to increase or maintain muscle flexibility and strength, it is able to maintain heart function, and prevent stiffness in the joints. So that after ROM, the patient is able to perform ADL independently as early as possible. Based on the above analysis, it can be concluded that early ROM can affect ADL in postoperative femur fracture patients, especially in femur fracture patients at RSUI Kustati Surakarta

IV. CONCLUSION

1. ADL ability in the majority treatment group is included in the independent category.
2. ADL ability in the majority control group is categorized as dependent.
3. There is a significant effect between early ROM and ADL in postoperative femoral fracture patients. This means that ROM is required for ADL recovery in postoperative femoral fracture patients

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