

# Description of Orthopaedic Trauma and Non-Trauma Cases in Emergency Unit of RSUD H. Boejasin 2017–2022

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## Abstract:

Orthopedic cases are still considered as the biggest cause of mortality and morbidity in developing countries. An understanding of epidemiology, expected to help related parties to plan better management. The aim of this study was to determine the prevalence and characteristics of trauma and non-traumatic cases in orthopedics. This research is a retrospective descriptive study. Data collection was carried out retrospectively from the medical records of orthopedic patients admitted to Emergency Department of H. Boejasin Hospital from 2017-2022. There were 137 samples that met the inclusion criteria. A total of 128 patients (93.43%) were categorized as trauma and 9 patients (6.56%) were non-trauma. Orthopedic patients are dominated by males with age in the range of 18-60 years, namely 84 patients (61.32%). 77 patients (56.20%) used BPJS as financing. Trauma is the most frequent cause of patients being brought to the emergency department, which is dominated by men of reproductive age. Health insurance plays an important role in helping patients pay for treatment.

**Keywords:** Epidemiology; orthopedic cases; trauma and non-trauma.

## Introduction

Trauma injury becomes major defiance in health service system around the world. According to the World Health Organization (WHO), trauma itself is one of the main causes of death in the world, with 90% of cases estimated to occur in developing countries.<sup>1,2</sup> Trauma is also one of major cause for death in the world, with the percentage of 90% cases in developing country. Trauma is also the fifth leading cause of morbidity worldwide.<sup>3</sup> Most traumatic injuries are orthopedic cases, in the form of damage to the musculoskeletal system which includes bones, ligaments, joints, tendons, muscles, and nerves. Orthopedic cases themselves can be categorized into traumatic and non-traumatic injuries. Fractures are the most common injuries.<sup>2</sup>

Fractures are the main reason for someone to be admitted to the orthopedic department as an inpatient, but there are also many other problems such as tumors, infections, deformities, and so on that may require hospitalization.<sup>4</sup> Approximately 9% of deaths worldwide are caused by trauma and constitute a threat to health care systems worldwide.<sup>5</sup> Orthopedic patient care, not only for trauma cases, is also very important, both for cases of bone tumors, bone pain, bone infections, congenital or post-traumatic defects, post-burn contractures, and so on because they have an impact on a country's economic system.<sup>1</sup> Epidemiological studies comparing traumatic and non-traumatic orthopedic cases are still very rare.

This study aims to provide an overview of trauma and non-trauma cases in orthopedic patients in the Emergency Room of H. Boejasin Hospital in 2017-2022. Specifically to determine the differences between trauma and non-trauma cases in orthopedic patients based on age, gender and type of financing used.

## Method

### Research Design

This study is descriptive research with retrospective data collection, using medical record data from orthopedic surgery patients treated through the Emergency Room of H. Boejasin Pelaihari Regional Hospital.

### Population and Sample

The population in this study were orthopedic surgery patients. The research sample was taken from medical record data of orthopedic patients which were grouped into trauma and non-trauma cases using total sampling technique. The inclusion criteria were basic data of orthopedic patients treated through the Emergency Room of H. Boejasin Pelaihari Hospital, including age, gender, and type of health financing used.

### Data Analysis

The characteristics of orthopedic patients in this study were analyzed descriptively by displaying the data in the form of a frequency distribution table.

## Result

Based on Table 1, it was found that orthopedic patients recorded as inpatients from the Emergency Room of H. Boejasin Pelaihari Regional Hospital during 2017–2022 had an average age of  $34.88 \pm 19.24$  with the largest proportion of 61.32% in the 18-60 year group. These results are comparable to the study by Toy, et. al. who divided orthopedic patients at the Orthopedics and Traumatology Polyclinic into four age categories with an average age of  $33.90 \pm 20.36$  years (range 0-110). The number of patients in the children group (age: 0-17) was 3495 (22.60%); the young adult group (age 17-44) was 7213 (46.70%); the number of middle-aged patients (age: 40-64) was 3316 (21.50%); and the elderly group (age 65-110) was 1428 patients (9.20%).<sup>2</sup> Amako et. al's research comparing

trauma and non-trauma cases in the Japanese Air Force, found that from 22,340 patients with musculoskeletal disorders, the average age was  $35.2 \pm 10.8$  years (age range 15-60 years). However, during the study period, traumatic injury cases occurred in only 10,442 people (38.9%), less than non-traumatic disorders 16,395 people (61.0%).<sup>6</sup> This difference occurred because the research conducted focused on outpatients at the local military polyclinic.

The total number of patients in the study was 137 people, dominated by male gender, 94 people (68.61%), while only 43 people were female (31.39%). This shows that musculoskeletal disorders are more often experienced by men with a ratio of 2.18:1. Epidemiological research by Velpula, et. al

stated something similar, orthopedic cases occurred more frequently in men, 623 patients (61.07%) compared to women, 297 patients (38.93%) with a ratio of 1.56:1.<sup>1</sup> Most orthopedic patients, both trauma and non-trauma cases treated at H. Boejasin Pelaihari Regional Hospital, are covered by BPJS Kesehatan (56.20%) as the main financing or insurance. Research on the type of orthopedic case insurance by Takura, et. al found that around 48% and 36% of funding sources for medical costs related to orthopedic care, such as surgery, came from public insurance and public funding (from taxes), respectively. Meanwhile, patients who use personal funding (out of pocket expense) and general private insurance are 14% and 2%.<sup>7</sup>

**Table 1** Subject Characteristic of Description of Orthopaedic Trauma and Non-Trauma Cases in Emergency Unit of RSUD H. Boejasin 2017–2022

| Variable                   | Qty                          | Proportion (%) |
|----------------------------|------------------------------|----------------|
| Orthopaedic Case (n = 137) |                              |                |
| Trauma                     | 128                          | 93,43          |
| Non-trauma                 | 9                            | 6,56           |
| Age (n = 137)              | <i>Mean±SD = 34,88±19,24</i> |                |
| <18 y.o                    | 34                           | 24,81          |
| 18-60 y.o                  | 84                           | 61,32          |
| >60 y.o                    | 19                           | 13,87          |
| Gender (n = 137)           |                              |                |
| Man                        | 94                           | 68,61          |
| Women                      | 43                           | 31,39          |
| Insurance Type (n = 137)   |                              |                |
| BPJS                       | 77                           | 56,20          |
| Non-BPJS                   | 60                           | 43,80          |

**Table.2** Description of Trauma and Non-Trauma Case based on Age Group on Orthopaedic Patients in Emergency Room RSUD H. Boejasin Pelaihari 2017–2022

| Category   | Age Group      |                  |                |
|------------|----------------|------------------|----------------|
|            | <18 y.o, n (%) | 18-60 y.o, n (%) | >60 y.o, n (%) |
| Trauma     | 31 (24,22)     | 84 (65,62)       | 13 (10,16)     |
| Non-trauma | 4 (44,44)      | 3 (33,33)        | 2 (22,23)      |

**Table 3** Description of Trauma and Non-Trauma Case based on Gender on Orthopadeic Patients in Emergency Room RSUD H. Boejasin Pelaihari 2017–2022

| Category   | Gender      |               |
|------------|-------------|---------------|
|            | Male, n (%) | Female, n (%) |
| Trauma     | 90 (70,31)  | 38 (29,69)    |
| Non-trauma | 4 (44,44)   | 5 (55,56)     |

**Tabel 4** Description of Trauma and Non-Trauma Case based on Insurance Type on Orthopadeic Patients in Emergency Room RSUD H. Boejasin Pelaihari 2017–2022

| Category   | Insurance Type |                 |
|------------|----------------|-----------------|
|            | BPJS, n (%)    | Non-BPJS, n (%) |
| Trauma     | 64 (50)        | 64 (50)         |
| Non-trauma | 8 (88,89)      | 1 (11,11)       |

After tabulating the age group of orthopedic trauma cases which were divided into 3 categories: age <18 y.o, 18-60 y.o and >60 y.o (Table 2), the results showed that trauma was more often experienced by the productive age group of 18-60 y.o with a proportion of 65.62%. While non-trauma cases are mostly experienced by those under 18 years of age with a proportion of 44.44%. Based on a study by Rohilla, et. al. who examined the demographics of musculoskeletal trauma patients, overall, the most frequently affected age group was 25-44 years (42.2%). The age group that most often experiences trauma in male patients is 25-44 years old (45.1%). While in women, the age group that is most often affected is 45-64 years (35.2%).<sup>3</sup>

Another study by Toy, et. al stated that before the COVID19 pandemic, non-trauma cases were more often experienced by young adults, namely 28.9%, followed by children with a proportion of 12.2% of the total cases. Post-pandemic, there was a decrease in non-trauma orthopedic cases found as much as 14.3% in young adults and 5.3% in children.<sup>2</sup>

Based on gender (Table 3), more trauma cases were experienced by men, 90 people (70.31%). Farr, et. al in a study of the incidence of fractures due to trauma in a group of young adults reported a population of 1,447 men and 1,035 women, of whom 91% were white

people. The age-adjusted annual fracture incidence for women was 1,007 per 100,000 (95% CI, 945–1,069) compared with 1,567 per 100,000 (95% CI, 1,486–1,648) for men. From the incident rate, the ratio of men : women according to age was 1.6:1. Overall, 2,200 subjects (87% men and 91% women) had only one type of fracture, while 215 had two fractures, 37 had three fractures, and 30 subjects had four or more fractures (with proportions of 10%, 1% and 2% in men and 7%, 2% and <1% in women, respectively).<sup>8</sup> In the non-trauma group studied, 5 women (55.56%) and 4 men (44.44%) were found to be sufferers. This result is in contrast to the study by Amako, et. al where men were found to have more non-traumatic musculoskeletal disorders as many as 15,138 cases (92.6%) compared to women 1140 cases (7%).<sup>6</sup>

Table 4 shows the number of trauma patients using government health insurance (BPJS) equivalent to non-BPJS, which is 64 people. While in the non-trauma group, more people use BPJS as financing during hospitalization at the hospital (88.89%). So far, there has been no research comparing the types of financing used by orthopedic patients due to trauma and non-trauma. One of the studies by Abdurrob, et. al. which compared various types of insurance used in orthopedic cases in the United States reported that patients with commercial insurance (n =

6,455, 60.1%) were the largest insurance group. Medicare and Medicaid insurance users were 3,518 and 680 cases respectively, while labor/motor vehicle insurance patients (n = 41, 0.04%) were the group with the smallest population.<sup>9</sup>

## Discussion

Orthopedic conditions and trauma contribute significantly to surgical cases and are the second leading cause of disability globally. For 26 years, musculoskeletal cases had been increased by 61,6% from 1990 to 2016. This problem becomes the reason to improve orthopaedic and trauma treatment quality and also universal health insurance.<sup>10</sup> Trauma cases are more often experienced by men than women, which is related to the tendency of men to be more involved in outdoor activities. Differences in behavior and social activities between men and women are one of the main factors.<sup>3</sup>

It should be noted that of all injury patterns, elderly patients are at greater risk of dying after trauma than younger patients.<sup>11,12</sup> Length of stay and outcome of trauma patients differ significantly by age. Older patients with fractures are more susceptible to recurrent fractures than younger patients. Younger patients are also less likely to undergo surgery or be treated at a higher level of care.<sup>13</sup>

Musculoskeletal trauma has relatively few complications and rarely requires immediate life-threatening intervention, unless severe complications and potential long-term deformity are present.<sup>14</sup> In general, nontraumatic musculoskeletal disorders also require medical and surgical interventions, resulting in higher public and private costs. To prevent expenditure and reduce the number of people with more severe conditions requiring surgery, it is important that public policy is based on clinical evidence. Such evidence can guide health promotion and

health service management actions to reduce morbidity, mortality, and the economic impact of orthopaedics.<sup>15</sup>

## Conclusion

Orthopaedic trauma cases are more experienced by the productive age group of 18-60 years old, while non-trauma cases are mostly experienced by those under 18 years of age. Men experience trauma more often. While women experience more non-trauma cases. The number of trauma patients using government health insurance (BPJS) is equivalent to non-BPJS, which is 64 people. While the non-trauma group uses BPJS more as health insurance.

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