

REVIEW ARTICLE

Description of injury to the victim of motorcycle traffic accident

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ABSTRACT

Road accidents are events that can lead to injury or death. The number of fatalities from traffic accidents is the eighth highest in the world. In Southeast Asia, up to 316,000 people die each year in road accidents. Motorcycles are the type of vehicle with the highest number of accidents compared to other types of vehicles. The increase in motorcycle purchases in Indonesia is associated with an increase in road accidents. Road accident injuries can occur on multiple parts of the body and can cause different types of injuries. The purpose of this study is to determine the description of the victims of motorcycle traffic accidents in Southeast Asia. This research is a descriptive study using literature study method by searching various literature that uses electronic databases such as Google Scholar, ResearchGate, PubMed, NCBI, WHO, Ministry of Health, ScienceDirect, and Springer to search related literature. Keywords used when searching for items are injuries, car accidents, motorcycles, and Southeast Asian descriptions. A total of seven articles were selected for analysis using synthetic matrices, and the results showed that working-age and male gender were most frequently involved in motorcycle road accidents. Extremities injuries are the most common site of injury and the majority of injuries obtained are soft tissue injuries. In order to add data on the most common types of injuries to motorcycle traffic accident victims in Indonesia, this study needs to be further conducted in Indonesia on the most common types of injuries to motorcycle traffic accident victims.

Keyword: Pattern of injury, traffic accidents, motorcycle

INTRODUCTION

Traffic accidents are one of the incidents that causes the victim to suffer injuries and can lead the victim to die. The death from traffic accidents is one of the highest causes of death.^{1,2} In 2016 the average number of deaths due to traffic accidents in Southeast Asia and Africa was the highest compared to other continents, according to WHO the average number of deaths in Africa reached 26.6 per 100,000 population and in Southeast Asia it is 20.7 per 100,000 population.¹ The number of traffic accidents in Indonesia is increasing every year. The number of traffic accidents in Indonesia is associated with the increasing number of motorcycle sales. The increase in the number of motorcycles become the highest among the other types of motorized vehicles.³

The most common risk that causes traffic accidents is the human factor as a motorcycle rider.⁴ On motorcycles, there are no seat belts or cabs, so the safety depends on driver skills, visibility, protective clothing, and head protection. For example, a driver in sleepy or drunk condition becomes less alert and does not focus on riding his motorcycle.²² The slim shape of the motorcycle allows the rider to overtake other vehicles in a zig-zag maneuver which can make a greater risk of accidents.⁵ Victims of traffic accidents motorcyclists usually suffer injuries due to being hit or hit by road asphalt and blunt objects in the area of the accident. The most cases of traffic accidents nowadays are motorcycle accidents with head injuries with a prevalence of up to 50.1% and head injury is the most common trauma.⁶

The results of Singh's study in 2009 in India found that the most injuries occurred in the upper extremity area, amounting to 216 (26.93%) then followed by injuries to the lower extremity area amounting to 210 (26.18%), and injuries to the head/neck amounting to 163 (20.32%). Also, there were 19 (2.37%) thoracic injuries, 13 (1.62%) abdominal injuries, and 11 (1.37%) back injuries.⁶ Meanwhile a study conducted at Dr. M. Djamil Hospital, Padang, the results showed that most injuries were abrasions with

the most common location in the head area and the most fractures were in the lower extremity area.⁷ Based on the background that has been described, the researcher wants to research through a literature study the characteristics of age, gender, and description of injuries to victims of motorcycle traffic accidents.

METHODS AND SUBJECT

The method used in this research is descriptive. This study uses a literature study to obtain data. Literature study is a method used to conclude from various sources that have been put forward by experts with relevant data in the form of research journals, health literature, and government health publications. Data collection in this study was obtained from various literature sources that are relevant to the research and are in accordance with the inclusion criteria. The data is not referred to as a sample and literature searches are carried out through search engines via Google on the internet with keywords: Traffic Accident, Motorcycle, Pattern of Injury, Age, and Gender. After the searching process via search engines such as google scholar, ResearchGate, PubMed, NCBI, WHO, Ministry of Health, ScienceDirect and Springer with the first keyword that is Pattern of injury, motorcycle, Traffic accidents modified by adding two keywords; the first one is "in" and the second one is "Southeast Asia". After collected by the researchers, there are seven journals that meet the inclusion criteria. The search was carried out in October – December 2021. The first search used keyword 1 and the journal period 2011 – 2021 used the google search engine. The researcher conducted several searches and data selection using inclusion criteria and exclusion criteria so that a total of 24 articles were obtained, but many articles were not researched in the Southeast Asia area, so a search was carried out using keyword 2 with several searching steps so that the search results were obtained as many as 12 articles.

Then the researchers made a selection using inclusion and exclusion criteria. A total

of 4 articles were excluded because they discussed accident victims not only motorcycle victims but also other types of vehicles. This article makes the data used ambiguous and does not specifically discuss the victims of motorcycle accidents. Then the seven articles that included the inclusion criteria were analyzed using a synthetic

matrix.

DISCUSSION AND RESULTS

This study obtained a total of seven articles whose data were processed and presented in the form of tables and narratives. Characteristics by age group of motorcycle accident victims are described in table 1.

Table 1 Age Group of Victims of Motorcycle Traffic Accident Victims

No.	Victim's Age Group	Total Article
1.	< 15 years old	0
2.	15 – 64 years old	6
3.	≥ 65 years old	1
Total		7

The results of this study indicate that the victims of motorcycle traffic accidents are dominated by victims aged 15-64 years or can be categorized as productive age.⁸ Productive age according to the Great Dictionary of Indonesian Language (KBBI) can be interpreted as the age when a person is still able to work and produce something. This can be caused at productive age, work activities

are still carried out daily so that the use of vehicles, especially motorbikes, increases. There is one research article that only examines the age of 65 years and does not present data on young victims because it has a research focus on different ages.

The results of data processing from seven articles regarding the characteristics of victims based on gender are written in table 2.

Table 2. Characteristics by Gender

No.	Gender	Total Article
1.	Male	7
2.	Female	0
Total		7

The results from the table show that the victims of motorcycle traffic accidents are dominated by men. This is because the majority of men are higher in mobilization or their daily activities so they use motorbikes more often than women. This is also related to the majority of victims who are in their productive age because in general workers are usually a man, so apart from needing a vehicle that can be highly mobilized, the price of motorbikes is also affordable for various

groups. The increase in motorcycle sales is also one of the reasons for the increase in motorcycle traffic accidents. In 2017 – 2019, there was an increase in unit purchases from 5,886,103 units to 6,487,460 units.⁹ A similar study conducted by Singh et al at RSUP Dr. Mohammad Hoesin Palembang in 2011 – 2013 stated that the most victims of traffic accidents occurred at the age of 21 – 30 years (34.4%) and the victims were male (78.35%).¹

The results of data processing based

on body regions injured due to motorcycle traffic accidents are written in table 4.3

Table 3 Description of Injuries Based on Body Region

No.	Body Region	Total Article
1.	Head	2
2.	Spinal	0
3.	Thorax	1
4.	Abdomen	0
5.	Hip	0
6.	Ekstremities (Two journals specific to the lower extremities and one jurnal not specific mentioning the upper/lower ekstremities)	3
7.	Multiple	1
Total		7

Injury is damage to structures or tissues of the body due to impact (trauma) or physical pressure.¹¹ Injuries based on the region are divided into head injuries, spinal injuries, thorax injuries, abdominal injuries, pelvic and lower extremity injuries and upper extremity injuries.¹² Three journals stated that the most common site of injury was injuries to the extremities. The results of this study are different from the results of research conducted by Riyadina (2007) at the ER Fatmawati Hospital, South Jakarta which stated that victims of motorcycle traffic accidents most often suffered head injuries, namely 55.1% followed by the lower extremities.¹³ Injuries to the extremities can be related to the mechanism of injury when the victim falls from the vehicle to the road, there will be injuries due to the collision between the victim and the road. Lower extremity injuries can occur to the femur and patellar bone when a motorcyclist falls onto the road or is hit by the front of a four-wheeled vehicle bumper. Meanwhile, injuries to the tibia bone are the most common injuries because the tibia bone is only covered by skin,

so it is easy to get injured.^{12,14} However, it is possible for victims of motorcycle traffic accidents to suffer injuries in two parts of the body, as research by Rafael (2013) found that injuries occurred on the face and extremities. In Rafael's research (2013) it is also stated that the majority of victims of motorcycle traffic accidents do not use helmets when driving, only 11 victims were found to be wearing helmets when the accident occurred. It was also found that one of the risk factors for motorcycle traffic accidents among victims of motorcycle traffic accidents either as drivers or victims as passengers, namely alcohol consumption. An example of a head injury that often occurs when the head hits the asphalt road is an *Epidural Hematoma*, which is a condition of damaged blood vessels from the middle meningeal artery branching caused by a fractured skull and damaging the blood vessels causing bleeding above the *dura mater*.¹⁵

The results of data processing based on the type of injury most experienced by motorcycle accident victims are listed in table 4.

Tabel 4. Injury Types of Motorcycle Accident Victims

No.	Types of Injury	Total Article
1.	Soft-Tissue Injuries	5
2.	Hard-Tissue Injuries	1
3.	Soft and Hard Tissue Injuries	1
Total		7

The most common types of injuries in motorcycle traffic accident victims are soft tissue injuries. This is in line with research conducted by Isnu Lucky (2015) at Dr. M. Djamil Padang Hospital which stated that abrasions were the most common type of injury experienced by traffic accident victims.⁷ However, this does not rule out the possibility of two types of injury. Based on research by Rafael (2013) which states that in addition to trauma to the face and head, the other most common types of injury are fractures of the lower extremities or upper extremities. Examples of soft tissue injuries include abrasion, blister, contusion, bruise, hematoma, cut, laceration, and puncture wounds.¹⁹ Meanwhile, in general, hard tissue injury or fracture is a bone discontinuity or a broken bone structure unit. Fractures can be categorized into two types; Open fracture is a fracture condition that penetrates into the soft tissue near the fracture site and Closed fracture is a fracture condition in the bone but does not penetrate into the soft tissue.¹¹

This research is limited by using articles that discuss motorcycle traffic accidents in Southeast Asia in Indonesian and English and published in the last 10 years. In addition, a lot of the data included in the article is incomplete and some articles have different inclusion criteria. Thus, it makes it difficult to find the articles needed and not all articles write information about ethical studies before researching.

CONCLUSION

Based on the literature study in the Southeast Asian region, it can be concluded that the victims of motorcycle traffic accidents based on the majority age are 15-64 years old or are in productive age and male. This is because at that age there are many activities

that require vehicles with high mobility and are generally carried out by men. Then, the region of injury in motorcycle traffic accident victims mostly occurred in the extremities, followed by the head and multiple body parts, with the majority being soft tissue injuries, followed by hard and multiple tissue injuries.

Based on the limitations of the research conducted, we suggest that further research is needed in Indonesia regarding the most common types of injuries in motorcycle traffic accident victims, because there are still few articles that specifically discuss the types of injuries in motorcycle traffic accident victims. So that in the future, Indonesia will have data on the types of injuries that most often occur in victims of motorcycle traffic accidents.

DECLARATION OF INTERESTS

There is no conflict of interest in the making of scientific articles or research carried out.

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