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Characteristics Of Head Injured Patients : Literatur Review

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ABSTRACT
According to the World Health Organization (WHO) report, every year around 1.2 million people die diagnosed with serious head injuries, namely as a result of traffic accidents (KLL). Head injuries are one of the leading causes of death and disability worldwide. The study of the characteristics of patients with head injuries is an important aspect in efforts to better understand this condition and improve patient management and care. The aim of this literature review is to determine the characteristics of head injuries in patients. The research method used in this research is Literature Review or literature review. The keywords used are "head injury patients". Internet searches for this research article were carried out by accessing Google Scholar, Pubmed, and ScienceDirect. The results of the study showed that from 15 journals, the characteristics of head injury patients based on age showed significant variations, with the late teens and young adults (aged 17-25 years) being the groups most vulnerable to head injuries, caused by risky behavior such as accidents. traffic.

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INTRODUCTION

Head injuries are one of the leading causes of death and disability worldwide. Studying the characteristics of patients with head injuries is crucial in efforts to better understand this condition and improve patient management and care. Head injuries can occur in various contexts, ranging from traffic accidents, sports, workplace accidents, to physical violence. Therefore, the characteristics of head injury patients can vary greatly depending on the cause of the injury. For example, patients who sustain head injuries from traffic accidents may have different injury patterns from those injured due to physical violence.

Demographic factors such as age and gender also play a significant role in determining the characteristics of head injury patients. Studies show that children and the elderly may be vulnerable to head injuries with symptoms and mechanisms different from those of young adults. Additionally, differences between men and women in terms of head injury characteristics have also been a significant focus of research.

The clinical characteristics of patients, such as level of consciousness, injury severity, and the presence of additional injuries, also influence the management and prognosis of head injury patients. Careful evaluation of these clinical characteristics allows medical professionals to make appropriate decisions in patient management, including the selection of suitable

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treatments and interventions.

Prognostic factors are also important to consider, as they relate to the evaluation of short-term and long-term prognosis for head injury patients, such as the level of recovery of consciousness, risk of complications, and permanent disability. Understanding these factors enables doctors to provide more accurate estimates regarding the potential outcomes for patients and to plan optimal care according to their individual conditions.

Based on research by Siahaya et al. (2020), it can be concluded that head injury cases most commonly found based on the Glasgow Coma Scale (GCS) are Moderate Head Injuries (MHI) at 46.84%. Head injuries are most prevalent in the 15-24 age group, male gender, with the most common cause being traffic accidents. Most patients admitted with head injuries do not have additional diseases. The mortality rate for head injury patients at Dr. M. Haulussy General Hospital, Ambon, in 2018 was 10.81%, with the highest number of cases in patients with Severe Head Injuries (SHI).

According to the World Health Organization (WHO) report, approximately 1.2 million people die each year with a diagnosis of severe head injury resulting from traffic accidents (Awaloei et al., 2016). By understanding the various factors affecting the characteristics of head injury patients, we can enhance patient management and clinical outcomes. Through ongoing research and studies, it is hoped that there will be advancements in our understanding of head injuries and the best ways to treat patients affected by them.

METHODS

The research method used in this study is Literature Review. Literature review is a method used to collect data or sources of information that are relevant to a particular topic. This data or information source can come from various types of publications such as journals, books and other libraries. In conducting this literature review, the keyword used is "head injury patients". The selected articles must meet the predetermined inclusion criteria, namely the journal publication period up to the last 8 years (2016-2024), use Indonesian or English, and be original articles (research articles).

To collect relevant research articles, searches were carried out through various information sources such as Google Scholar, Pubmed, and ScienceDirect. Through internet access, searches are carried out using predetermined keywords to find articles that match the research topic. This step allows researchers to obtain the latest and most up-to-date data or information relevant to their research topic.

RESULTS

After searching for scientific articles via Google Scholar, PubMed, and ScienceDirect, 15 articles were found that met the inclusion criteria from a review of 24,840 clinical and research articles published between 2016 and 2024. The article selection process was carried out carefully to ensure that the articles were selected according to the research focus and meets the established quality standards. Of the total number of articles, only 15 articles managed to meet the previously established inclusion criteria. This search step provides a solid foundation for researchers to gather relevant, quality information to support the analysis and findings in their research

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Table 1. ResultsReview Article

No.	Writer's name	Year	Article Title	Location	Research design	Results	Conclusion
1.	Insil Pendri Hariyani, Puji Rizki Rasyid, Dian Ayu Hamama Pitra	2023	Description of Head Injuries in Accident Victims Traffic in the Surgical Department of RSUP Dr. M. Djamil Padang 2019-2020	RSUP Dr. M. Djamil Padang is a referral center hospital in West Sumatra province	Categorical descriptive research	Based on the data provided, it can be concluded that the characteristics of the sample in this study were the majority male (75.7%) with an age range of late teens (51.4%) and the majority not working (62.9%). This finding is in line with the results of previous research which shows that head injury patients, especially those resulting from traffic accidents, tend to be dominated by men. Previous studies have also shown that men have a higher risk of head injury than women, perhaps due to higher activity and occupational risks. Apart from that, previous research also shows that head injury patients resulting from traffic accidents are generally teenagers to young adults. This can be caused by the lifestyle of teenagers and young adults who tend to be more susceptible to risky behavior, such as riding motorbikes at high speed and lack of alertness. Factors like these can influence the severity of the injury experienced. From data regarding the type of injury and location of head injury, it can be concluded that head injuries resulting from traffic accidents are often accompanied by injuries to other parts of the body, especially the extremities. In some cases, victims also experience more serious head injuries such as skull fractures and intracranial bleeding. The most frequently found location of head injuries is the temporalis region, which is an area that is vulnerable to head injuries in motorcyclists.	In this study, it was found that men in their late teens had a greater risk of experiencing head injuries in traffic accidents. The victim suffered a moderate head injury, with the location of the injury in the temporalis area, accompanied by a lower extremity fracture. Most of the victims experienced abrasions, with the type of head injury suffered being intracerebral hemorrhage (ICH).

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2.	Megan Landes, et al	2017	*Epidemiology, clinical characteristics and outcomes of head injured patients in an Ethiopian emergency center*	Ethiopia region, Africa	Prospective cohort study	Overall, there were 204 head injury patients included in the cohort, of whom, the majority were less than 30 years old (n = 104, 51.0%) and male (n = 177, 86.8%). Among 201 patients with a recorded mechanism of injury, traffic accidents (RTAs) accounted for more than 40% of all head injuries in the cohort (n = 82, 41.0%), with pedestrians struck by vehicles being the most common type of RTA (n = 50, 61.0%). Twenty (10.0%) patients experienced a head injury at their workplace, either as a result of a fall (n = 9, 45%) or as a driver in an RTA (n = 4, 20%). A significant number of patients had at least one indicator of serious injury at presentation: 51 (25.0%) had a GCS < 9, 53 (26.0%) had multi-system trauma, 95 (46.6%) had at least one abnormal vital sign , and of 133 patients with complete data available, 37 (27.8%) had a Revised Trauma Score (RTS) < 6. Patients injured by RTA were more likely to have indicators of serious injury compared with patients with other mechanisms, including multi-system trauma (odds ratio (OR) 3.2, 95% CI 1.7–6.2, p = 0.00) , GCS < 9 (OR 3.7, 95% CI 1.8–7.4, p = 0.00), at least one abnormal vital sign (OR 2.5, 95% CI 1.4–4.6, p = 0.00), or RTS score < 6 (OR 3.6, 95% CI 1.6–8.1, p = 0.00). Patients injured in falls	The results of this study provide a picture that is consistent with findings from previous research, that head injuries resulting from traffic accidents generally occur in males aged teenagers to young adults, with varying levels of severity. This research also shows that head injuries are often accompanied by injuries to other parts of the body, and can have long-term impacts on the victim's quality of life.

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						or assaults have a significant rate of acute pathology visible on CT scan compared with those injured in RTA.	

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3.	Elsawati Badolo, et al	2023	Characteristics of Head Injury Sufferers	UPT General Hospital Banggai Regency area	Retrospective	From the analysis of the distribution of head injury sufferers based on gender, age and education level in Table 4.1, it can be seen that the number of male head injury sufferers was 38 people (54.3%), while the number of female sufferers was 32 people (45.7%) . Early teens had the highest number of head injury sufferers, namely 12 people (17.1%), while seniors had the least number of sufferers, only 3 people (4.3%). Judging from the level of education, the highest number of head injury sufferers were those with high school/MA education, as many as 21 people (30.0%), while only 2 people had not gone to school (2.9%). Furthermore, Table 2 shows the distribution of head injury sufferers based on level of work, cause of head injury, and severity level based on the Glasgow Coma Scale (GCS) value. The majority of head injury sufferers worked as students, as many as 17 people (24.3%), while laborers were the smallest occupational group with only 1 person (1.4%). Traffic	Based on the results of descriptive research on medical record data of head injury sufferers, the prevalence of head injuries is higher in men compared to women and is dominated by the early teenage age group, and in terms of occupation, the majority are students and household workers. The most common cause is traffic accidents. Mild head injuries have the highest frequency compared to the severity of other head injuries.

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						accidents were the most common cause of head injuries, with the number of sufferers being 37 people (52.9%), followed by falls at 24 people (34.3%). In terms of severity level based on GCS, the majority of head injury sufferers had mild GCS (13-15), namely 64 people (91.4%).	
4.	Yuni Khairani & Tri Makmur	2021	The Relationship Between Head Injuries and the Occurrence of Vertigo at Dr. Hospital Pirngadi Medan January-December 2019 period	Dr Pirngadi Medan Central General Hospital	Quantitative with cross sectional design	From the description of patient characteristics, it can be concluded that the majority of patients seeking treatment are aged between 15-22 years (30%), with the proportion of men being greater than women, namely 60% and 40% respectively. The high school education level is dominant, reaching 61.7%, while the most common type of work is unemployed or student, at 28.3%. In the description of the patients' clinical symptoms, the majority of patients experienced dizziness (76.7%), nausea (63.3%), vomiting (53.3%), and pain (70%). Meanwhile, the majority of patients experienced decreased consciousness with moderate GCS, reaching 65%. In the CT scan results of the patients, it was found that the majority of patients did not have contusions, subdural hematomas, or intracerebral hematomas. However, there were patients with epidural hematoma (21.7%), subarachnoid hematoma (5%), and infarction (5%).	1. The majority of patients who sought treatment after a head injury felt pain in the head, as many as 42 people (70%) and those who experienced vertigo were 43 people (71.7%). 2. There is a significant relationship to the occurrence of vertigo in head injury patients in the Dr Pirngadi Medan area.

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						The majority of head injury rates are moderate, reaching 65%. Meanwhile, 71.7% of patients experienced vertigo. Bivariate analysis showed a significant relationship between head injury and the occurrence of vertigo ($p < 0.05$), where most patients with moderate injuries also experienced vertigo.	
5.	Muhammad Riduansyah, et al	2021	Description of the Level of Consciousness of Head Injured Patients Using the Glasgow Coma Scale (GCS)	Ulin Regional Hospital Emergency Room Banjarmasin	Descriptive observational approach cross-sectional	The results of this study showed that the majority of patients who experienced head injuries at Ulin Banjarmasin Regional Hospital were male (83.3%). This study found that the highest incidence of head injuries was in the 36-45 year age group. Respondents in this study mostly experienced mild head injuries. This research revealed that the majority of respondents had a level of compensatory awareness (30%). The results of this study show that the majority of respondents have eye responses that are still spontaneous, verbal responses are still oriented, and motor responses are still able to follow commands. The GCS score is the sum of three eye, verbal and motor response components, but in head injury patients, the motor response component has the best predictive value, because eye and verbal responses in certain conditions cannot be assessed, such as having an endotracheal tube installed,	Based on the results of this research, it was found that the majority of respondents were male with an age range of 36-45 years and the majority of respondents had a level of compensatory awareness. Apart from that, the most eye response is spontaneous, the most verbal response is good orientation, the most motor response is following commands.

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						aphasia, and palfebral edema. There is a strong association between abnormal motor responses and worsening of the condition and high mortality. The worse the motor response, the higher the worsening of the patient's condition and mortality. In contrast, a good motor response score (score>4) indicates better recovery and lower mortality.	
6.	Widya Narti, et al	2023	Characteristics of Head Injured Patients at Ibnu Sina Hospital Makassar in 2022	Ibn Sina Hospital Makassar	Observational Descriptive	Based on univariate analysis using the data provided, several things can be concluded: 1. Patient Age: The majority of head injury patients at Ibnu Sina Hospital Makassar are in their late teens (17-25 years), followed by the early elderly and the elderly. 2. Patient Gender: More than half of head injury patients are men, with a percentage of 52%, while the percentage of women is 48%. 3. Cause of Injury: The majority of head injury patients were caused by traffic accidents (52%), followed by non-traffic accident causes (48%). 4. Severity Level: The majority of head injury patients have mild severity, with 88% of the total patients. Moderate and severe levels only accounted for 8% and 4% respectively. 5. CT-Scan Features**: CT-Scan results show that the majority of patients (68%) do not show intracranial lesions. The most common intracranial lesion is ICH (Intracerebral	Based on research conducted regarding the description of head injury patients at Ibnu Sina Hospital Makassar, it was concluded that the majority of head injury patients at Ibnu Sina Hospital Makassar were aged 17–25 years (28%). This research also shows that the majority of head injury patients at Ibnu Sina Hospital Makassar are male (52%) and the most common cause is traffic accidents (52%) and the most frequent is the mild category with a GCS of 13-15 (88%) and it was

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						Hemorrhage) with a percentage of 20%. 6. Length of Hospitalization: The majority of patients were hospitalized for 1-5 days (56%), followed by 6-10 days (28%), and only a small percentage required hospitalization for more than 11 days (16%).	found that most CT-Scan images showed no lesions (68%) and most often required hospitalization for 1-5 days (56%).
7.	Rahayu Ramadani, et al	2020	Prediction of Mortality in Head Trauma Events Using the Revised Trauma Score in the Emergency Room	Ulin Regional Hospital Emergency Room	Descriptive analytics using a cohort research design	Analysis of the characteristics of head trauma patient respondents showed that the majority of them were men, reaching 83.3% of the total respondents. Most patients had mild head injuries, followed by moderate and severe injuries. The average age of respondents was 33.67 years. In addition, assessment of the Revised Trauma Score (RTS) shows that there is a significant correlation between the RTS value and mortality in head trauma patients. Patients with low RTS values tend to have higher mortality rates. Of a total of 30 respondents, 26.7% experienced death due to head trauma, but patients with mild and moderate head injuries had a higher survival rate. In the context of treatment, fast referral times and appropriate treatment can influence patient mortality rates. Therefore, RTS assessment is an important key in evaluating the severity and prognosis of head trauma patients, allowing for more appropriate and rapid treatment measures to reduce mortality.	Based on research conducted in July 2019, it was found that the incidence of head trauma was dominated by 25 male patients (83.3%) and 5 female head trauma patients (16.7%).), there were 11 people with mild head trauma (36.7%), while there were 10 respondents with moderate head trauma (33.3%) and 9 people with severe head trauma (30%). The average patient was alive with a score of 18.89 and the patient died with an average score of 6.19. The respondents who died

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							were 8 people with moderate to severe trauma classification with a Revised Trauma Score < α (0.05) which means Ha was received. .
8.	Teuku Aditya Kemal & Suariatu Laila	2021	Prevalence of Head Injuries After Traffic Accidents at Meuraxa Regional Hospital, Banda Aceh	Meuraxa Regional General Hospital	Descriptive method with a cross sectional approach.	Based on the distribution of head injuries based on gender, data shows that the majority of patients diagnosed with head injuries after traffic accidents are men, reaching 86%, while only 14% are women. This ratio is in line with previous research findings in the United States, which showed that traffic accidents caused the majority of head injuries, with a male to female ratio reaching 6:1. According to other studies, boys have almost twice the risk of having a traffic accident compared to girls. The distribution of head injuries is also influenced by the age factor, where the 10-19 year age group is the most vulnerable to experiencing head injuries after traffic accidents, followed by the 20-29 year age group. Other research shows that head injuries occur most often in men between the ages of 15 and 25. In conclusion, head injuries after traffic accidents are a major health problem throughout the world, especially in young populations, and men have a higher risk than women. The distribution of head injuries is also influenced by severity classification, where the majority of patients	From the research results, 173 people diagnosed with head injuries after traffic accidents met the sample criteria. With the number of men being 149 people (86%), and women being 24 people (14%). The characteristics of the dominant age group who experienced head injuries after traffic accidents were the 10-19 year age group, 55 people (32%). The number of patients with mild head injuries was 129 people (75%), 33 people had moderate head injuries (19%). and Severe Head Injuries as many as 11 people (6%).

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						have mild head injuries, followed by moderate and severe head injuries. Appropriate handling and effective prevention need to be implemented to reduce the number of traffic accidents and head injuries that occur.	
9.	Imran	2017	Characteristics and Outcomes of Neurological Disease Patients	Rumah Sakit Umum dr Zainoel Abidin Banda Aceh	Observasional deskriptif	This study evaluated the characteristics and outcomes of neurological patients treated in the Neurology Room at RSUDZA Banda Aceh for approximately 3 months. Of the total 406 patients treated, the majority were men (55.9%) compared to women (44.1%). This study recorded 20 types of diseases treated, with ischemic and hemorrhagic strokes and head injuries being the dominant cases. Stroke patients tend to be older, while head injury patients tend to be younger. However, there are age variations within certain disease groups, such as older patients with dementia and hydrocephalus. In general, male patients dominate almost all types of disease.This study also highlighted differences in patient outcomes, with the majority of patients (94.8%) surviving, while 5.2% died during treatment. Deaths were mainly related to ischemic stroke, hemorrhagic stroke and severe head injuries. Factors such as erythrocyte sedimentation rate and blood glucose levels can influence the outcome of stroke patients. Neurologic sequelae, such as focal neurologic deficits, hearing loss, and cognitive	1. There were 406 patients treated in the nerve room at RSUDZA Banda Aceh during the study period, consisting of 227 men (55.9%) and 179 women (44.1%). 2. There are 20 types of disease in sequence, namely: ischemic stroke, mild head injury, moderate head injury, severe head injury, hemorrhagic stroke, cephalgia, myelopathy, vertigo, braintumor, epilepsy, lumbar radiculopathy, Guillain Barre Syndrome, meningitis, hypertensive

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						impairment, frequently occur after bacterial meningitis. In the context of global epidemiology, the incidence of neurological diseases such as stroke and head injury is recorded to be quite high, with men affected more often than women. These data provide valuable insight into the profile of neurological patients at RSUDZA Banda Aceh and emphasize the importance of effective management of neurological disease to improve patient outcomes.	emergency, hydrocephalus, encephalitis, Transient Ischemic Attack, dementia, meningoencephalitis, spinal cord trauma. 3. There are 5 types of diseases which are the dominant diseases that cause patients to be treated in the neurological room sequentially, namely a) ischemic stroke, b) mild head injury, c) moderate head injury, d) severe head injury, and e) hemorrhagic stroke. 4. The 21 patients who died (5.2%) consisted of 7 patients with ischemic stroke (1.7%), 6 patients with hemorrhagic stroke (1.5%), 3 patients with

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							severe head injury (0.7%) and 1 patient each with meningitis, cephalgia, hydrocephalus, and encephalitis (0.2%).
10.	Titah AC Kumoro, et al	2019	Correlation of Marshall CT Score as a Predictor of Mortality in Head Injury Patients at Dr Abdul Aziz Singkawang Regional Hospital	Dr Abdul Aziz Hospital, Singkawang City	Analytical in nature using a cross-sectional approach	This research highlights RSUD DR Abdul Aziz Singkawang City as a referral center for head injury patients in West Kalimantan. Despite having only one neurosurgeon, the hospital has treated a large number of head injury cases. Data from January 2016 to May 2017 shows that the majority of patients were male (60.3%) and the majority had mild head injuries (72.8%). Although the survival rate is high (89.8%), mortality due to head injury is still significant (10.2%). This research also recorded the use of CT-Scans starting in 2016 at DR Abdul Aziz Hospital, Singkawang City, where previously patients were referred to Santo Vincentius Hospital, Singkawang City. The research data involved 66 samples, with the average age of the research subjects being 36.27 years and most of them were men (71.21%). This study only monitored GCS values in patients with moderate and severe head injuries, with an average GCS value of 9.67. The mortality rate reached 42.42%, and the majority of patients had good	1. There is a very strong positive correlation between the Marshall CT Score and mortality in sufferers of moderate and severe head injuries at DR Abdul Aziz Hospital, Singkawang City, where the higher the Marshall score, the higher the mortality rate. 1517 Cerebellum Journal. Volume 5. Number 4A. November 2019 2. The highest GCS score in research subjects was 12. 3. The highest Marshall CT Score value in the

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						outcomes. Analysis of the Marshall CT Score shows that there is a very strong positive correlation between the CT score and mortality in patients with moderate and severe head injuries. The higher the Marshall score, the higher the mortality rate. This research provides an important overview of the management of head injury patients at DR Abdul Aziz Hospital, Singkawang City, by emphasizing the importance of quick and accurate treatment of patients with moderate and severe head injuries.	sample was in the diffuse injury II category, and the highest mortality percentage was in the non-evacuated mass lesion (VI) category. 4. The death rate for patients with moderate and severe head injuries was 26 people.
11.	Gusti Ayu Agung Diah Cahya Prabandari, et al	2023	The Relationship between Violation Levels and Head Injuries in Traffic Accident Cases in Denpasar City	Denpasar City	Analytical with a cross sectional approach	Based on the research results, the number of patients with head injuries due to traffic accidents who met the inclusion criteria at Sanglah Hospital, Denpasar was 68 people. The age distribution shows that most head injury patients are found in the 15-24 year age group, with the majority of patients being male. In general, head injuries resulting from traffic accidents tend to be experienced by young individuals and are more common in men. The level of violations is mostly minor, followed by moderate and serious violations, indicating that accidents that cause head injuries are generally minor. Head injury patients resulting from traffic accidents most often experience mild head injuries, with brain hemorrhage as the most common	Based on the results of research on the influence of the level of violations on head injuries due to traffic accidents in the city of Denpasar in 68 patients who met the inclusion criteria, it was concluded that patients with head injuries due to traffic accidents at Sanglah General Hospital Denpasar in 2020 mostly occurred in the age group

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						head injury morphology. Bivariate analysis showed a significant relationship between the level of offense and the severity of head injury, with the highest proportion of serious head injuries occurring in serious offenses. However, the Chi-Square test showed that only the level of serious violations had a significant relationship with serious head injuries, while the levels of light and moderate violations were not significant for mild and moderate head injuries. This shows the importance of the violation level factor in determining the severity of head injuries resulting from traffic accidents.	15- 24 years old with a percentage of 38.2%, the majority of patients were male at 83.8%, and had the highest GCS score at a GCS score of 13-15, namely 48.6%, the level of violation that was most often found was a minor violation level with percentage of 33.8%, the most common type of head injury based on the patient's GCS value was mild head injury, namely 48.5% with bleeding morphology of 79.4%, the highest level of serious violations caused serious head injury with a percentage of 15%, and it was found Chi-Square test results p = 0.024 for severe head injuries, which shows that there is a significant relationship between serious head

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							injuries and the level of violations committed by motorcyclists, both light, medium and serious.
12.	Made Bhuwana Putra	2019	Characteristics of head injury patients at the Umbu Rara Meha Waingapu Regional General Hospital (RSUD) for the period 1 January 2017 – 31 December 2018	Umbu Rara Meha Waingapu Regional Hospital	Retrospective research design	This study presents medical record data from 190 head injury patients between January 2017 and December 2018, with 186 of them meeting the inclusion criteria. The distribution of cases according to gender shows that the majority of patients are male (67.7%). In terms of age, late adolescent patients (17-25 years) were the largest group (25.3%). The majority of head injury patients worked as students (28.0%) and farmers/fishermen (32.3%). Traffic accidents were the most common cause of head injury (82.2%), followed by falls (11.3%). Most patients had intracranial head injuries (53.2%), with a small proportion having other head injuries (46.2%). The majority of patients had mild GCS (13-15) (67.7%) and the majority were discharged as outpatients (95.7%). The median length of stay based on GCS severity is 2.00 days for mild GCS, 3.00 days for moderate GCS, and 5.00 days for severe GCS. Of the 190 patients, 4 people died (2.2%) and 13 people went home at their own request (1.6%).	This study shows a higher prevalence of head injuries in men compared to women and is dominated by the late teenage age group, although in terms of occupation, the majority are farmers or fishermen. The most common cause of this case is accident, with the type of intracranial injury. Mild head injuries have the highest frequency compared to the severity of other head injuries, with an average length of stay of 2 days and after treatment in hospital patients are generally allowed outpatient care.
13.	Noviyanter Siahaya, et	2020	Prevalence of Head Injury Cases Based	Dr. Hospital M. Haulussy	Descriptive research	This study provides an overview of the types of head injuries, patient characteristics based on age, gender,	Several things that can be concluded based on this

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No.	Writer's name	Year	Article Title	Location	Research design	Results	Conclusion
	al		on Classification of Degree of Severity in Inpatients at RSUD Dr. M. Haulussy Ambon in 2018	Ambon		etiology, comorbidities, and mortality rates at Dr. M. Haulussy Ambon in 2018. Based on the data collected, the most common type of head injury is moderate head injury (CKS), followed by severe head injury (CKB), and the least common is mild head injury (CKR). Most head injury patients are in the age range 15-24 years, with the majority of patients being male. Road accidents are the most common cause of head injury, while head injuries caused by falls and violence are also significant. The majority of patients had no comorbidities, with neurological disorders being the most common comorbidities. Mortality rate of head injury patients at Dr. M. Haulussy Ambon in 2018 was 10.81%, with the highest number occurring in patients with severe head injuries.	research include the most common head injury cases found based on GCS, namely CKS of 46.84%. Head injuries most often occur in the 15-24 year age group, male gender, with the most common cause being traffic accidents. Most patients admitted with head injuries do not have comorbidities. Mortality rate of head injury patients at Dr. M. Haulussy Ambon in 2018 was 10.81% with the most cases in CKB patients
14.	Ragiel Pramana & Yudhisman Imran	2019	Relationship between Head Trauma and Cognitive Function in Young Adults	RSAL Dr. Mintohardjo, Jakarta	Observational analytical study with a cross-sectional approach	This study provides an overview of the characteristics of head injury patients at RSAL Dr. Mintohardjo in March-July 2017, which includes age, education level, level of head injury, and cognitive function. The majority of head injury patients are aged 26-55 years with a high school-university education level. The most common level of head injury is mild head injury, while the majority of patients experience abnormal cognitive function.	There is a significant relationship between the level of head injury and cognitive function. However, there was no significant relationship between age and level of education and cognitive function.

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						The analysis showed that there was no significant relationship between the age of head injury patients and impaired cognitive function. Likewise, the level of education did not have a significant relationship with impaired cognitive function. However, there is a significant relationship between the level of head injury and cognitive function, where patients with severe levels of head injury have a higher risk of experiencing impaired cognitive function compared to patients who experience mild or moderate head injuries. These findings highlight the importance of appropriate monitoring and intervention according to the level of the patient's head injury, especially in patients with severe head injuries to prevent or reduce the risk of more serious impairment of cognitive function.	
15.	Maria L. Rawis, et al	2016	Profile of moderate and severe head injury patients treated in ICU and HCU	RSUP Prof. Dr. RD Kandou, Manado.	retrospective descriptive	The majority of head injury patients are men over 25 years of age. There are more patients with severe head injury (CKB) than moderate head injury (CKS). The most common complication is systemic inflammatory response syndrome (SIRS), followed by pneumonia, acute renal failure (AKI), and sepsis. The majority of patients are treated for 1-7 days, but severe head injury (CKB) patients tend to have a longer length of stay, especially after 15 days. The mortality rate for	Based on the results of a retrospective study of medical record data from patients with moderate head injuries and severe head injuries who were treated in the ICU and HCU at Prof. Hospital. Dr. RD Kandou, Manado, for

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						patients with severe head injury (CKB) is much higher than for patients with moderate head injury (CKS), with an increase in mortality occurring along with an increase in length of stay. Therefore, intensive care and management of complications should be given special attention, especially in patients with severe head injuries, to reduce mortality and improve overall clinical outcomes.	the period September 2015 to August 2016 it can be concluded that there were 15 and 25 patients with moderate head injuries and severe head injuries with a total of 40 patients. The majority of cases are male, SIRS complications, patient length of stay is 1–7 days, and the highest number of patients who die during this length of stay. The mortality rate is high in severe head injuries, and most patients die after > 48 hours in the ICU and HCU.

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Discussion

Patients with head injuries have varying characteristics, depending on the severity and type of injury experienced. The most common symptom is a change in level of consciousness, ranging from impaired consciousness to coma. This may be accompanied by other neurological symptoms such as confusion, dizziness, or vomiting(Rawis et al., 2016). Along with this, the patient's motor skills can also be affected, with some patients experiencing difficulty in moving or even losing certain motor functions, depending on the location and severity of the injury to the brain.(Pramana & Imran, 2019).

In patients with severe head injuries, the symptoms that appear can be more serious, including a drastic decrease in level of consciousness, difficulty speaking, and vision or hearing problems.(Siahaya et al., 2020). These symptoms are often signs of danger and require immediate treatment. In addition, changes in behavior and emotions are also often observed in head injury patients(Putra, 2019). They may become irritable, depressed, or experience excessive anxiety, as a result of the physical and psychological changes they experience as a result of the head injury.

In the diagnosis process, additional examinations such as a head CT scan or MRI are often needed to evaluate the injury in more detail and determine appropriate medical treatment. Management of head injury patients includes various aspects, from condition stabilization and pain management to physical and cognitive rehabilitation. The ultimate goal is to improve the patient's brain function and reduce the long-term impact of the injury. In some cases, head injury patients may require intensive care in a neurological care unit for close monitoring and appropriate medical intervention.

Characteristics of Head Injured Patients Based on Age

Head injury patients show characteristics that vary by age. In general, late adolescents and young adults (aged 17-25 years) are the groups most vulnerable to head injuries. This is caused by a tendency to risky behavior such as riding a motorbike at high speed and being involved in traffic accidents. Men predominate in the number of head injury patients in this age range. However, head injury patients can also come from other age ranges, including early adulthood and old age. Although fewer in number, head injuries in this age group remain significant. In addition, there are age variations within certain disease groups, such as strokes which generally occur at older ages, while head injuries tend to affect younger ages. Therefore, understanding the characteristics of head injury patients based on age can help in the appropriate treatment and prevention of head injuries in various age groups.

This is in line with research conducted byHariyani, et al (2023) the majority of head injury patients are late teens. Strengthened by research fromBadolo, et al (2023)Head injury patients mainly consist of the young age group, with traffic accidents being the main cause of injury. However, this is different from the research conducted byKhairani & Makmur (2021)that the prevalence of head injuries is high in the early adolescent age group, especially students.

Overall, research shows that younger age groups, especially late to early teens, have a higher risk of experiencing head injuries. This is understandable because at this age, individuals tend to be more active and susceptible to risky behavior, including driving or other activities that involve potential head injuries.

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However, it should be noted that differences in the age ranges examined by each study may influence the results. For example, the first study focused on late adolescents while the third study placed more emphasis on early adolescents. This suggests that more age-range specific research could provide deeper insight into the characteristics of head injuries in narrower age groups.

Characteristics of Head Injury Patients Based on Gender

The compared studies highlight the characteristics of head injury patients based on gender, age, education level, and other factors associated with head injuries resulting from traffic accidents. From research conducted at Dr. Central General Hospital. Pirngadi Medan byKhairani & Makmur (2021), the majority of patients are male (60%) with an age range of 15-22 years. This research also shows that head injury patients generally have a high school education level (61.7%) and the majority do not work or are still students (28.3%).

Similar findings were also seen in other studies, such as those conducted byHariyani et al. (2023)at Dr. RSUP. M. Djamil Padang. This research shows that the majority of head injury patients are male (75.7%), with an age range of late teens (51.4%) and the majority do not work (62.9%). Factors such as gender and age are consistently seen as dominant characteristics in head injury patients.

Apart from that, research at the Meuraxa Regional Hospital in Banda Aceh by(Kemal et al. (2021)also revealed that the majority of head injury patients after traffic accidents were male (86%), with the majority of them aged between 10-19 years (32%). These findings are consistent with other studies showing that traffic accidents tend to affect young populations, especially men.

In the context of global epidemiology, research at RSUDZA Banda Aceh byImran (2017)showed that neurological diseases such as stroke and head injury have a fairly high incidence, with men affected more often than women. This reflects similar findings in other studies highlighting the high prevalence of head injuries in the male population. Overall, these studies confirm that head injuries, especially those caused by traffic accidents, tend to affect young men. Factors such as gender and age are dominant characteristics in the profile of head injury patients, which can provide important insights for further prevention and treatment efforts.

Characteristics of Head Injury Patients Based on Etiology (Cause)

The causes of head injuries can vary depending on various factors, including environment, physical activity, and individual habits. One of the main causes of head injuries is traffic accidents. Study conducted byHariyani et al. (2023)shows that traffic accidents are the main cause of head injuries, especially in the late teenage age group, with certain types of injuries such as skull fractures and intracranial hemorrhage. Similar findings were also revealed in research byBadolo et al. (2023), where traffic accidents are also the dominant cause, followed by falls.

Likewise with research conducted byPrabandari et al. (2023), which highlights the prevalence of head injuries resulting from traffic accidents, especially in young individuals with generally mild severity. Other research, such as that carried out byLandes et al. (2017), also confirmed that traffic accidents are the main cause of head injuries, with pedestrians hit by vehicles being the most common type of accident.

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Apart from traffic accidents, falls are also a common cause of head injuries. This is especially true in children and the elderly, where motor coordination may not be as good as that of the average adult. Other risk factors include unsafe environmental conditions, such as slippery floors or steep stairs, as well as habits such as walking while texting or walking in dark places.

Sports activities can also cause head injuries, especially in contact or extreme sports. Football, rugby and boxing players have a high risk of experiencing head injuries due to impacts or falls while playing. Even sports that are considered lighter such as cycling or skiing can result in serious head injuries if appropriate protection, such as a helmet, is not used.

Environmental factors may also play a role in causing head injuries. For example, natural disasters such as earthquakes or floods can cause head injuries due to building debris or being hit by heavy objects. In addition, unsafe workplace conditions can also increase the risk of head injury, especially in sectors such as construction or heavy industry where contact with heavy or sharp objects is common.

However, there are also studies that focus on specific aspects, such as the relationship between head injuries and vertigo, as presented by the researchKhairani & Makmur (2021). Thus, a deep understanding of the causes of head injuries is the key to effective prevention and treatment efforts. In an effort to reduce the incidence of head injuries, it is important to understand their causes well and take appropriate preventive measures. This includes improving road infrastructure, providing education about the use of helmets and safety belts, increasing awareness of the dangers of falls, and tightening workplace safety standards. With these steps, it is hoped that we can reduce the number of head injuries that occur and improve the overall welfare of society.

Characteristics of Head Injury Patients Based on Degree of Severity

Based on medical research, head injuries can occur in various levels of severity, from mild to severe. Mild head injuries are often the most common, with the majority of patients experiencing relatively mild symptoms such as dizziness, nausea, or confusion shortly after a traumatic event. This is in line with research byKemal et al. (2021) that the number of patients with mild head injuries was 129 people (75%), 33 people had moderate head injuries (19%), and 11 people had severe head injuries (6%). In line with research conducted by Ramadani et al. (2020), there were 11 people with mild head trauma (36.7%), while there were 10 respondents with moderate head trauma (33.3%) and 9 people with severe head trauma (30%).

Likewise, research by Nurlan et al. (2022) shows that the majority of head injury patients at Ibnu Sina Hospital Makassar based on the highest level of severity are mild, GCS 13-15 (88%) and moderate (8%), and severe (4%). Also in line with research conducted by Riduansyah et al. (2021) that the majority of patients experienced mild head injuries with a percentage of 36.7%. At this level of severity, the majority of patients remain conscious and their motor responses are normal. Although often taken for granted, minor head injuries can also impact a patient's quality of life, with some cases experiencing post-traumatic symptoms such as sleep disturbances or mild cognitive impairment.

On the other hand, moderate and severe head injuries show more serious and potentially life-threatening symptoms. In moderate head injuries, patients may experience

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temporary impaired consciousness or loss of memory of the events that caused the injury. Research conducted by Khaairani & Makmur (2021) found that the majority of patients seeking treatment had a "moderate" level of head injury, namely 65%. Research shows that moderate head injuries often require more intensive medical care, including close monitoring of the patient's condition and management of possible complications such as brain hemorrhage.

This research is in line with research conducted by Hariyani et al. (2023) that moderate head injury is the type of head injury most frequently experienced by victims of head injuries resulting from traffic accidents (38.6%). Meanwhile, serious head injuries are the most serious condition and require immediate treatment in the intensive care unit. Patients with severe head injuries often lose consciousness for significant periods of time and may experience severe neurological disorders, such as seizures or hemiplegia. The prognosis for severe head injuries is often more uncertain, with a risk of long-term complications such as persistent cognitive impairment or permanent physical disability.

Although there are variations in the severity of head injuries, prevention efforts remain key in reducing the incidence. Public awareness campaigns about the importance of wearing a helmet when cycling or motorbike riding, as well as safety practices in the workplace and sports, can help reduce the risk of head injury. In addition, educating the public about the symptoms of head injuries and appropriate first aid steps can also speed up detection and intervention in cases of head injuries that occur.

Other Factors (Mortal Rate and Employment/Education)

Based on the studies analyzed, the majority of their studies did not provide specific mortality figures. However, of the two studies that reported mortality rates, there were significant differences. Research by Ramadani et al. (2020) found that 26.7% of a total of 30 respondents experienced death due to head trauma. Meanwhile, research by Kumoro et al. (2019) found that the mortality rate for patients with moderate and severe head injuries was 42.42%. This highlights the variation in mortality rates associated with head trauma and shows the complexity of the condition as well as differences in management and patient care between the studies.

The significant differences between these two studies highlight the complexity of head trauma and possible variations in patient management and care between different medical contexts. This suggests a need for a deeper understanding of the factors influencing head trauma-related mortality and the development of more effective treatment strategies to reduce mortality rates.

Overall, these studies provide a more comprehensive picture of head trauma-related mortality rates, although there are differences in the reported rates. Further efforts are needed to conduct broader and in-depth research to understand the factors that contribute to head trauma patient mortality and develop more effective treatment approaches to increase patient safety and survival rates.

From a number of studies discussed, there are several consistent findings related to the characteristics of head injury patients based on work or education. The majority of head injury patients are men, with a percentage varying between 51% and 86%. The age range of patients tends to be young, predominantly in the adolescent to young adult group, although

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there are variations in age distribution depending on the study location. Traffic accidents are the main cause of head injuries in most studies, with the percentage of traffic accidents varying between 41% and 52%.

Patient employment is also a factor to consider, with the majority of patients not working or still being students. Education is also a factor, where the majority of patients have varying levels of education, but there is a tendency to occur in groups with high school/MA education or those who have not yet attended school. Research also shows that head injuries are often accompanied by injuries to other parts of the body, with clinical features varying from mild to severe. However, most patients have mild severity. Research also indicates that appropriate treatment and effective prevention can influence the prognosis and outcome of head injury patients.

CONCLUSION

The characteristics of head injury patients based on age show significant variations, with the late teens and young adults (aged 17-25 years) being the groups most vulnerable to head injuries, caused by risky behavior such as traffic accidents. However, head injuries can also affect other age groups, including early adulthood and old age. Research also highlights age differences in certain disease groups, such as strokes tending to affect older ages, while head injuries tend to occur at younger ages. This conclusion is strengthened by findings from various studies that late adolescents are dominated by head injury victims, especially as a result of traffic accidents. Therefore, an in-depth understanding of the characteristics of head injury patients based on age is very important in effective prevention and treatment efforts.

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