

Effectiveness Of Canadian Bleeding Scores (CAN BLEED)

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Abstract

Data from World Health Organization (WHO) shows that cases of internal bleeding due to accidents are 5.8 million deaths per year worldwide (Dahlan et al., 2021). Early awareness of internal bleeding is very important so that nurses can immediately take anticipation to prevent unwanted things (Damayanti, 2022). This literature study aims to determine the effectiveness of the CAN BLEED score for early detection of internal bleeding emergencies in trauma cases. The research method uses a literature review study design using PICOS. Article search through publish or perish 8 application with keywords "early detection AND internal bleeding AND trauma" from Pubmed, Crossref, and Google Scholar search databases based on the year of publication 2018-2022. The results of the article search found 4 articles relevant to the main topic. The results showed Canadian Bleeding (CAN BLEED) score is effective for determining internal bleeding in trauma cases

Keywords: Canadian bleeding score, Internal Bleeding, Trauma

INTRODUCTION

The increasing physical mobility and the advancement of transport technology of humans in driving on the road has become a problem in health. One of them is the problem of accidental deaths. A total of 1.2 million people worldwide die each year from traffic accidents, and between 20 and 50 million people are injured (Dahlan et al., 2021). The number of trauma cases in Indonesia due to traffic accidents reached 116,411 with a death rate of 25,671 victims followed by 12,475 victims of serious injuries and 137,342 victims of minor injuries (Badan Pusat Statistik, 2019).

Trauma cases due to accidents have a lot of impact both psychologically and physically. The physical aspect is the third leading cause of death and disability in the world because trauma cases usually result in bleeding, both internal and external (Saudin & Rajin, 2020). Internal bleeding is bleeding that occurs in a closed wound, making it difficult to identify, whereas external bleeding is bleeding from an open wound, making it obvious that it is bleeding (Yuliati, 2017). The condition of internal bleeding can vary greatly in each instance. Such conditions may appear slowly and are more dangerous and even fatal due to undetected excessive blood loss. (Eldridge, 2022).

The way to know whether a patient has internal bleeding or not can be simply by assessing the signs and symptoms of internal bleeding including mild headache, pain, shortness of breath, rapid heartbeat, decreased blood pressure, cyanosis, decreased haemoglobin levels and others (Adiyanto et al., 2020). These symptoms can manifest wherever the bleeding occurs, but there are a number of other symptoms that may be experienced based on the specific

location of the bleeding source, such as bruising around the umbilicus or pelvis with abdominal bleeding (Kassavin et al., 2014).

The management of internal bleeding cases requires a professional action that is fast, precise, careful and accurate both at the scene (pre-hospital), during transportation until definitive action in the hospital in handling internal bleeding cases. Nurses who are at the forefront of emergency care in trauma cases must play an active role and be highly vigilant in providing services to help clients overcome the problems they feel from both psychological and physiological aspects comprehensively. Early awareness of internal bleeding in critical patient conditions due to trauma is very important so that nurses can immediately take anticipation to prevent unwanted things (Damayanti, 2022). Based on the description above, the author is interested in raising the theme of effectiveness of Canadian Bleeding (CAN BLEED) scores

METHOD

The study design used literature review. The initial stage was to determine the keywords in the literature search, namely Canadian Bleeding (CAN BLEED) scores AND internal bleeding AND trauma. The second stage is determining the journal search database. The databases used by the author in searching for articles/journals include: Pubmed, Crossref, and Google Scholar. The inclusion criteria used were (1) studies that focused on patients with internal bleeding in trauma cases (abdomen, thorax, pelvis and femur), (2) articles with study design cases study, case report, meta analysis, phenomenological, quasy experiment, (3) articles with full text publication type and open access research articles, (4) articles published from 2019 to 2022, (5) articles using English and Indonesian languages.

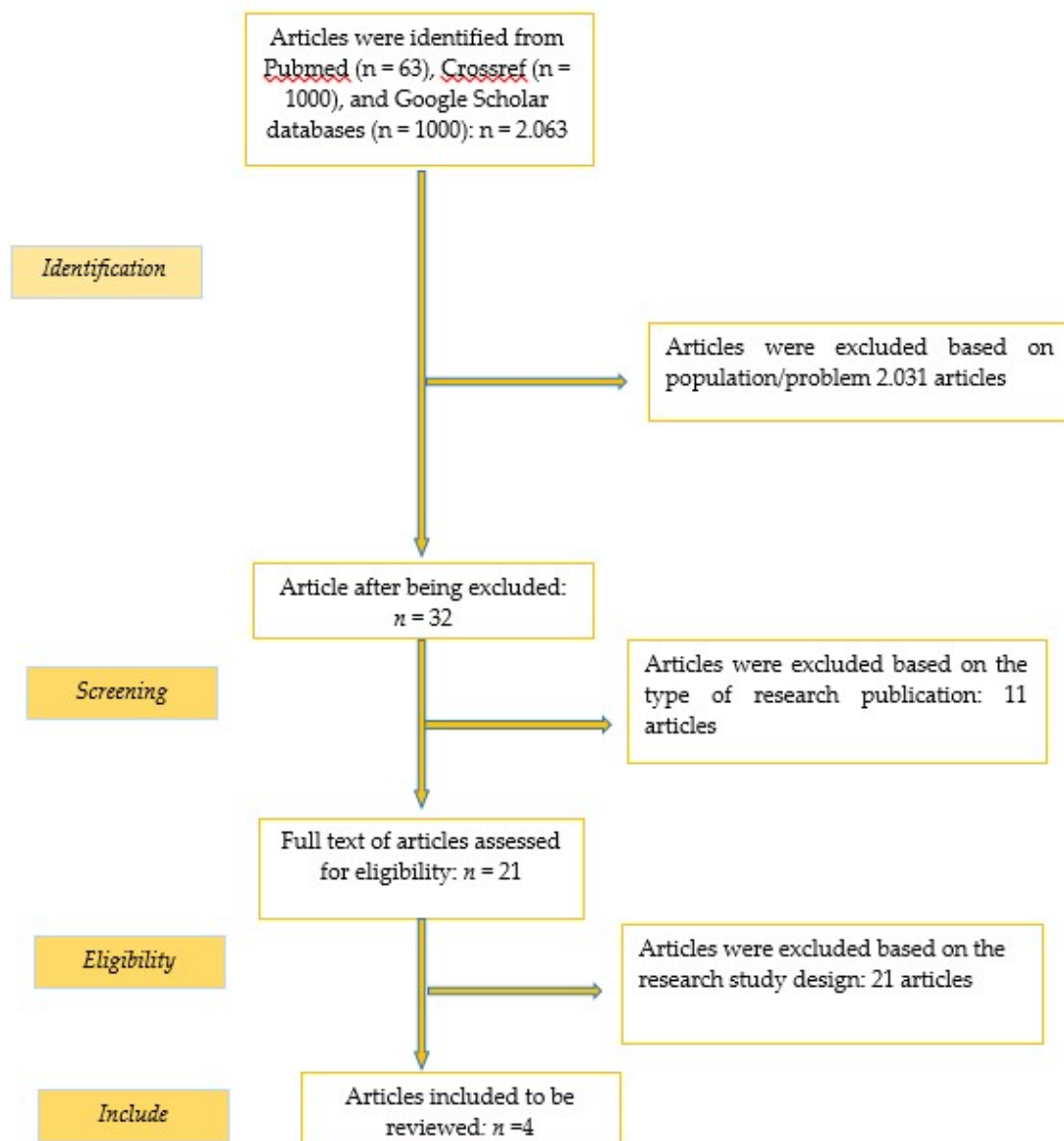
Meanwhile, the exclusion criteria are (1) studies that review external bleeding patients, , bleeding due to surgical procedures, cerebral hemorrhage, bleeding in obstetrics and gynecology cases, head trauma, thrombotic disorders, (2) articles with study design systematic review, literature review, over view, protocol for a single centre, prospective observational study. In the third stage of screening in the search for articles regarding inclusion criteria and exclusion criteria using PICOS (Population / Problem Intervention Comparison Outcome Study Design).

RESULT

Analysis of PRISMA

Researchers extracted data using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow chart in Picture 1. Article searches using Pubmed, Crossref, and Google Scholar search databases through the Publish or Perish 8 application obtained 4 final articles that met the inclusion criteria and research objectives. Detailed article searches with the keywords " canadian bleeding score AND internal bleeding AND trauma" on 15 October 2023 based on the publication year 2019-2022 found a total of 2,063 articles with details of 63 journals from Pubmed, 1000 journals from Crossref, and as many as 1000 journals from Google Scholar.

In the identification process, several articles met the exclusion criteria based on the population/problem, namely (1) oncology 300 articles, (2) thrombotic disorders 380 articles, (3) internal bleeding due to surgical procedures 196 articles, (4) internal bleeding due to haemorrhoids 294 articles, (5) internal bleeding due to head trauma 328 articles, (6) a total of 451 articles discussing mental health, (7) cerebral hemorrhage 33 articles, (8) trauma without internal bleeding 29 articles, (9) obstetrics and gynecology 13 articles. The remaining 32 articles were then screened. A number of articles were excluded that met the exclusion criteria based on the type of publication, namely (1) not open access research articles, 8 articles, and (2) abstract only, 3 article, leaving 21 articles. At the eligibility stage, a total of 17 articles met the exclusion criteria based on the research study design including (1) literature review 4 articles, (2) systematic review 14 articles, (3) 1 article using the Protocol for a Single Centre, Prospective Observational Study. The final total obtained was 4 articles that could be analysed.



Picture 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Journal Article Search Results

This literature review uses 4 articles that focus on the discussion of internal bleeding in trauma cases. In general, these articles clarify the early detection of internal bleeding emergencies in trauma cases as shown in Table 1.

Table 1 Journal Article Search Results

No	Author and year	Methods	Results	Research Limitations
1	(Noh et al., 2021)	This study used a case report study design on a thoracic trauma patient with blunt trauma	Initial examination with chest x-ray showed left pneumothorax. Examination using FAST (Focused Assessment with Sonography for Trauma) showed no bleeding. The patient experienced a decline in general condition and a decrease in vital signs, then 2 units of red blood cells were resuscitated and a Computed Tomography (CT) examination was found to have left Internal Thoracic Artery (ITA) bleeding. The patient was successfully saved by performing a thoracostomy and tying the proximal part of the left ITA.	Internal Thoracic Artery (ITA) rupture cannot be detected by examination using chest x-ray and Focused Assessment with Sonography for Trauma (FAST).
2	(Lim et al., 2021)	This study uses a case report study design in a patient with morel-lavalle lesion in femur trauma	On clinical examination, there was a reddish discoloration of the proximal to mid thigh, one hour later the patient experienced a decrease in systolic blood pressure, the patient experienced a decrease in consciousness accompanied by dyspnea and lactate and other blood tests were carried out. Referring to the Canadian Bleeding Score (CAN BLEED) using systolic blood pressure parameters, clinical examination, FAST (Focused Assessment with Sonography for Trauma), lactate level, and CT imaging, it was determined that the patient had a morel-lavalle lesion.	The diagnosis of morel-lavalle lesions is very difficult to establish, requiring precise examination. Clinical decisions based solely on the patient's initial vital signs and FAST can be dangerous if the mechanism of injury is not considered.

No	Author and year	Methods	Results	Research Limitations
			Emergency embolization was performed on the patient to stop the bleeding and then a pressure dressing was applied to the proximal thigh.	
3	(Kim, 2021)	This study used a case report study design on a patient with blunt abdominal injury	In this case, the patient complained of right upper quadrant and chest wall pain after a motor vehicle collision. The examination continued referring to the Clinical Abdominal Scoring System (CASS) scoring with GCS 13, and the FAST examination showed a positive result. Contrast-enhanced CT abdomen showed liver laceration with gallbladder hemorrhage due to injury. The patient was successfully rescued with angioembolization for bleeding control.	The determination of internal bleeding takes a long time, with liver laceration and gallbladder hemorrhage not recognized until the third day of hospitalization after close observation in the intensive care unit.
4	(Seo et al., 2021)	This study uses a case report study design in patients with abdominal trauma	The results of the American Association for the Surgery of Trauma (AAST)-Organ Injury Scales (OIS) showed grade II. Follow-up examination with CT Severity Index (CTSI) at the beginning of the examination, the bleeding area did not show a direct relationship with the spleen. After the CT sequence was reconstructed, the scan showed that the bleeding area was directly related to the splenic injury.	The need to accurately read CT image images to ensure that the focus of hemorrhage.

DISCUSSIONS

Internal bleeding in trauma cases is one of the emergency cases that requires immediate action, failure to identify bleeding quickly in trauma patients causes great morbidity and mortality. Internal bleeding is more difficult to detect than external bleeding. The signs and symptoms of internal bleeding are not obvious and can only be recognized after a period of time. The skin becomes blistered in the affected area. Soft tissues are painful, swollen or hard to touch.(Umarova, 2023). Internal bleeding should not be dismissed as mere bruising. Patients need to be examined to determine whether their internal organs are severely damaged or not. The initial management of emergency internal bleeding in trauma patients for nurses is rapid stabilization and identification of life-threatening injuries. Primary survey follows the pattern: Airway, Breathing, Circulation, Disability (neurologic status), and Exposure. The main principle of internal bleeding emergencies is to find the source of bleeding and stop the bleeding. In some cases, such as patients with severe pelvic fractures, angiography may be necessary to control bleeding and stabilize the patient (Clarke & Khurana, 2023).

Early detection of internal bleeding can be done using ultra sonography (USG) modality. Focused Assessment with Sonography for Trauma (FAST) is an assessment score to assess the presence of fluid in the pericardium or abdomen (hemopericardium or hemoperitoneum, respectively). Four examination views consisting of subxiphoid views of the heart and pericardium, right and left upper quadrant windows, and pelvis should be examined freely in the evaluation of trauma patients (Grace, 2023). FAST management should consider additional clinical information including hemodynamic stability and clinical suspicion of injury including (1) Pericardial FAST (a) positive: emergency surgical intervention is recommended, median sternotomy is preferred if the patient is stable. Otherwise, use left anterolateral thoracotomy, (b) undecided: pericardial window or formal transthoracic echocardiography (TTE) is recommended, (c) negative: close clinical monitoring or discharge is recommended, according to clinical suspicion of injury, (2) Abdominal FAST (a) positive: in unstable patients, emergency exploratory laparotomy is recommended. In stable patients, Computed Tomography (CT) imaging is recommended, (b) doubtful: in unstable patients, Diagnostic Peritoneal Aspiration (DPA) is recommended. In stable patients, Computed Tomography (CT) imaging is recommended, (c) negative: in unstable patients, Diagnostic Peritoneal Aspiration (DPA) is recommended if there is clinical suspicion of intra-abdominal bleeding. In stable patients, CT scan, close clinical monitoring, or discharge is recommended, according to clinical suspicion of injury (Grace, 2023).

In addition to FAST, the Canadian Bleeding Score (CAN BLEED) can be used by nurses for early detection of trauma patients that may result in internal bleeding. CAN BLEED is a simple model that performs very well as a screening tool for trauma patients with bleeding, especially internal bleeding, which is very difficult to establish with the naked eye and can also be used as a reference for determining the appropriateness of initial inter-hospital transfer to a specialized trauma center (Steyerberg, 2020). The Canadian Bleeding Score (CAN BLEED) uses parameters of systolic blood pressure, clinical examination, FAST (Focused Assessment with Sonography for Trauma), lactate level, and CT imaging. A score ≥ 2 indicates bleeding following the mechanism of injury (Steyerberg, 2020). Objective information is needed to predict morbidity and mortality in trauma cases, especially cases of internal bleeding in trauma cases.

Another early detection tool that can be used to determine internal bleeding in abdominal trauma cases is the Clinical Abdominal Scoring System (CASS) scoring system. CASS is an excellent physiological scale to predict whether laparotomy is needed in patients with abdominal trauma (Jang, 2023). The total score was classified into three categories: (1) low risk up to 8, (2) moderate risk 9 to 11, (3) high risk 12 and above. For management, the patient was observed for 1 week whether the patient needed action for laparotomy or was managed conservatively (Vanitha & Graduate, 2018).

In addition to CASS, there are other ways of detection, especially in internal organ injuries, namely the American Association for the Surgery of Trauma (AAST) established the Organ Injury Scale (OIS) consisting of experts in trauma surgery, orthopedic surgery, urology, and neurosurgery, to create a more comprehensive classification. The first AAST-OIS guidelines published in 1989 classified injuries to the spleen and liver (Jones, 2021).

In addition to AAST-OIS, advances in imaging techniques have led to the development of several radiologic classification systems for splenic and hepatic blunt injuries. CT Severity Index (CTSI) has been shown to better predict patients requiring splenic artery embolization or surgical management compared to using AAST-OIS (Morell-hofert et al., 2020).

CONCLUSSIONS

Internal bleeding that takes place in the tissues or organs of the body is a condition that is difficult to detect. One of the reasons internal bleeding is so dangerous is because the bleeding itself is invisible. Early surgical intervention is the most important step to save patients with trauma that causes hemorrhagic shock due to internal bleeding. Early surgical intervention can be done with proper diagnosis. Based on the journal literature search that the

author researched, it can be concluded that there is a scoring for early detection of internal bleeding emergencies in trauma cases in an effort to reduce mortality in the emergency room. Patient mortality due to internal bleeding can be prevented with accurate diagnosis. Apart from the clinical signs and symptoms presented by the patient, the use of early detection scoring for internal bleeding plays an important role in determining which internal organ is bleeding.

Based on the 4 journal articles that the researchers studied, it was concluded that there was one study using FAST to diagnose internal bleeding. One study described the diagnosis of internal bleeding using the CAN BLEED score method. One study used CASS and FAST. One study used AAST-OIS and CTSI. The authors concluded that CAN BLEED score is the most accurate scoring in early detection of internal bleeding. Proper and immediate diagnosis is needed for further treatment for the safety of the patient's life. It was very difficult to find a journal with a direct patient experiment methodology. All articles referred to the case report study design. The best scoring according to the author that can be applied based on the completeness of parameters and can be used in various cases of internal bleeding is the Canadian Bleeding (CAN BLEED) score. However, supporting literature that discusses internal bleeding scoring, especially the Canadian Bleeding (CAN BLEED) score, is still very rare, so further research is needed on the effectiveness of the CAN BLEED score in early detection of internal bleeding emergencies in trauma cases.

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