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HOW SHOCK INDEX HELPS THE ASSESSMENT OF HYPOVOLEMIC SHOCK : A SCOPING REVIEW

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ABSTRACT

Shock is a life-threatening condition that can result in death. The need for fast and accurate treatment to identify the severity of shock patients. One of them is by using the Shock Index (SI). If not treated immediately, there will be a risk of death within 24-48 hours. Studies This made For see shock use Index as Predictor of Outcome for Hypovolemic Shock Patients in the Emergency Room. The method used in this study is the Scoping Review in a manner systematic based on PRISM. Determination say key article search use PICO, And say key Which used is shock index OR hypovolemic shock AND emergency department. The process of searching for articles was carried out in several databases, namely ProQuest, EBSCOhost, and PubMed. Research result 12 articles were obtained that met the inclusion criteria and were synthesized. The articles were then reviewed. The shock index (SI) serves as an assessment tool to identify high-risk patients and assist the medical team in providing appropriate management for patients. IS also serves to provide prognostic information to patients and families

Keywords: Emergency Department ; Shock Index; Shock Hypovolemic

ABSTRAK

Syok merupakan kondisi yang mengancam nyawa seseorang yang dapat mengakibatkan kematian. Perlunya penanganan yang cepat dan akurat untuk mengidentifikasi tingkat keparahan pasien-pasien syok. Salah satunya dengan penggunaan Shock Index (SI). Jika tidak diatasi segera maka akan menimbulkan resiko kematian dalam waktu 24-48 jam. Studi ini dibuat untuk melihat penggunaan Shock Index sebagai Predictor Outcome Pasien Shock Hypovolemic di Instalasi Gawat Darurat. Metode yang digunakan pada studi ini adalah Scoping Review yang dilakukan secara sistematik berdasarkan PRISMA. Penentuan kata kunci pencarian artikel menggunakan PICO, dan kata kunci yang digunakan adalah shock index OR shock hypovolemic AND emergency department. Proses pencarian artikel dilakukan pada beberapa database yaitu ProQuest, EBSCOhost, dan PubMed. Hasil Penelitian diperoleh sebanyak 12 artikel yang sesuai dengan kriteria inklusi dan disintesis. Artikel-artikel tersebut kemudian dilakukan review. Shock index (SI) berfungsi sebagai alat penilaian untk mengidentifikasi pasien yang beresiko tinggi dan membantu tim medis dalam memberikan manajemen yang tepat untuk pasien. SI juga berfungsi untuk memberikan informasi prognostic kepada pasien dan keluarga

Kata Kunci: Emergency Departement ; Shock Index; Shock Hypovolemic

INTRODUCTION

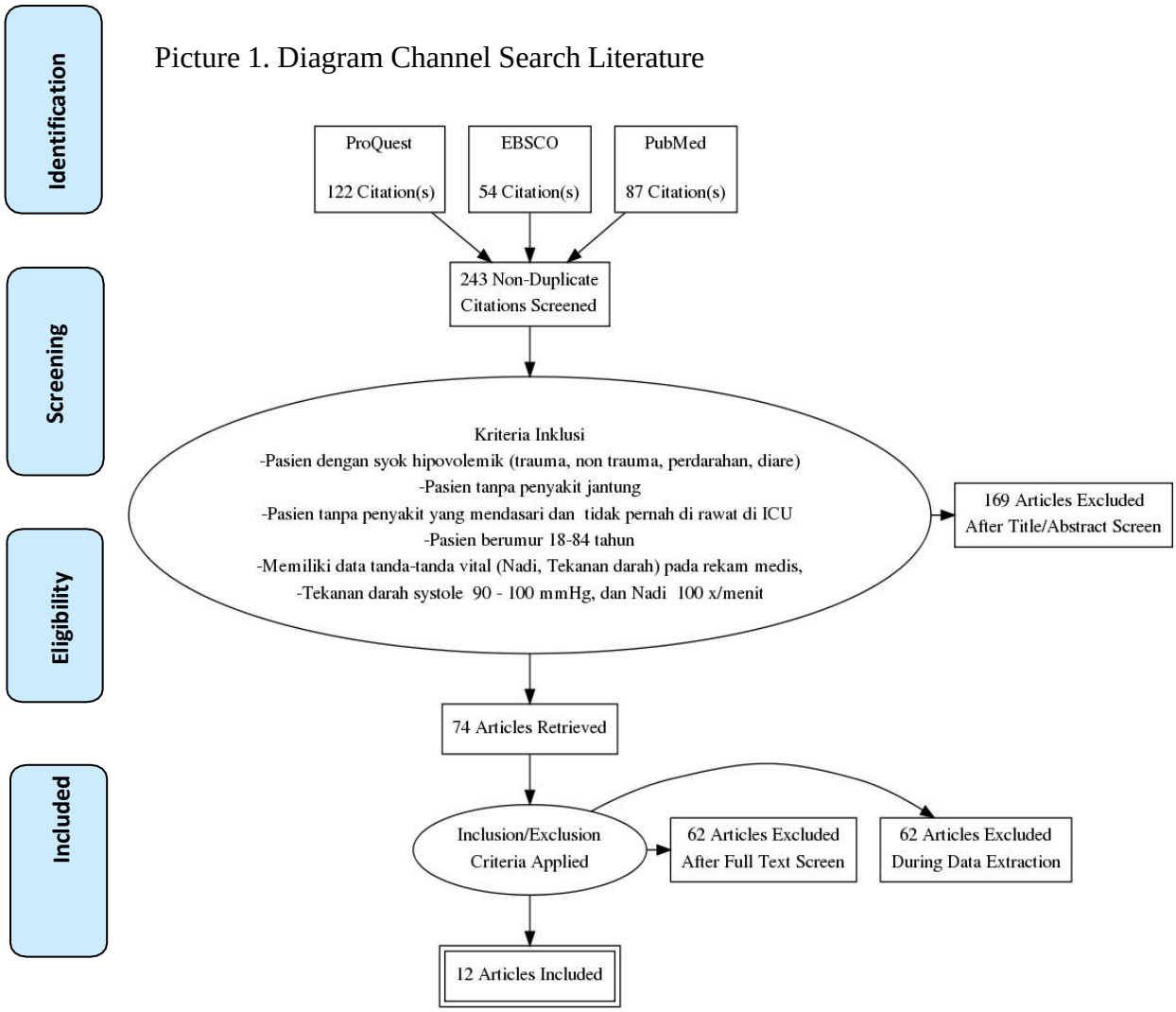
Shock is a life-threatening condition that can result in death (Guo *et al*., 2017) . There are various cases of shock that occur in both trauma and non-traumatic cases, including hypovolemic shock, cardiogenic shock, obstructive shock and distributive shock (Standl *et al*., 2018). Hypovolemic state of shock is problem bad emergency the most second Which found in the ER And failure in managementa on patient shock hypovolemic has a negative effect, namely organ failure and death (Gitz Holler *et al*., 2019).

Case death Which caused shock consequence bleeding around 10% of the total deaths in the world (Demuro *et al*., 2013). Many cases of death occur in uncontrolled bleeding and diarrhea in children (Republic of Indonesia Ministry of Health Data and Information Center, 2019) . The death stems from the loss of a large amount of fluid or blood that occurs within 24 hours or so The first 48 hours since being admitted to the emergency room (Junaedi *et al*., 2016) .
Height case death consequence shock in ER require power medical agar can rate and identify signs shock in a manner fast and accurate. One way that can be used is the use of non parameters invasive *shock index* (SI) (Koch *et al*., 2019). *Shock index* (SI) is mark which obtained from the calculation of *heart rate* (HR) shared with pressure systolic blood pressure (SBP) used to evaluate the hemodynamic stability of acute patients (Torabi, Mirafzal, *et al*., 2016) .
SI can used for status monitoring dynamics patient so that can evaluate results clinical And predict patient mortality bad emergency, so that can help in management on right time while the patient is in the ER (Pomalango, 2016) . Research conducted by Torobi (2016) explains that S1 > 0.9 will cause death at <24 hours and 48 hours (Torabi, Moeinaddini, *et al*., 2016) . The benefits of SI in several studies are superior for evaluation level severity shock hypovolemic compared to with standard vital signs. Based on description on writer interested do review of the use of shock index (SI) as a predictor of outcome in hypovolemic shock patients in the Emergency Department.

METHODS

The method used in this literature review is *scoping review*. The process of developing a review focus and article search strategy, using the format PICO, that is Population (P) is patient with condition shock hypovolemic, Intervention (I) is measuring vital signs, namely the ratio between pulse and systolic blood pressure, Comparison (C), namely the shock index value is seen based on mark minimal, Outcomes (O) that is level mortality (ICU, die).
Based on say key This, writer formulate question the research that will be used in this *scoping review* is "how is the use of *the shock index* as a clinical prediction of *hypovolemic shock patients* in the Emergency Room?". Writer Then do search article on three databases namely ProQuest, EBSCO And PubMed from year 2012 until 2023 with using some predefined keywords in English. "s*hock index* ", OR, "s*hock hypovolemic* ", AND, "emergency department". Phrase Booleans used during process search use keyword combination. Articles were selected according to predetermined inclusion criteria, and carried out systematically based on PRISMA. Relevant articles from the list of included literature references were also retrieved to obtain more comprehensive search results.
Articles obtained from the search process are then filtered for eligibility use a number of criteria inclusion And exclusion. Criteria Inclusions were patients with hypovolemic shock (trauma, non-trauma, bleeding, diarrhea), patients without heart disease, patients aged 18-84 years, patients without underlying disease and never on take care in the ICU, have data signs vitals (Nadi, Pressure blood) on record medical, Pressure blood systole < 90 - 100 mm Hg, and pulse > 100 x/minute.
Authors use mendeley citation manager to collect and filter search results. Authors independently filter articles by title and abstract after removing duplicates. Full text articles were then screened for eligibility based on inclusion and exclusion criteria. Data analysis from this study was carried out using narrative synthesis. Where the author sees whole contents from every that article reviewed, then by specifically the author analyzes the results of the study and also the discussion of the article on the use of *shock idex* as *a clinical predictor of hypovolemic shock* patients in the installation bad Emergency. After That writer discuss matter the discussed.

Picture 1. Diagram Channel Search Literature



RESULTS

The number of articles that the author got from searching the database is 263 article, Where 122 article obtained from from databases ProQuest, 54 article from EBSCO and 87 articles from PubMed. Furthermore, the authors conducted *a screening* by looking at the suitability of the title and abstract of the article with the topic in this study , seeing if there were duplicate articles. From the screening process, 20 duplicate articles were obtained. And 169 article Which No in accordance so that writer find 74 article. Then the writer do *screening* back for read the whole contents of each selected article. In the end, the total number of articles that the author used in this study was 12 articles.

Table 1.
Characteristics article Which synthesized

No	Researcher (Year)/ Country	Research Objectives	Method Study	Intervention	Results Study
1	Californian (Ayadi *et al*., 2016)	To establish optimal vital signs in mothers who experience shock hypovolemic due to postpartum hemorrhage, and for develop a threshold value limit shock Index for intensive monitoring.	- Study This using design quantitative with secondary analysis of data based on hypovolemic pregnant/postpartum women. - research sample was n = 958	By using analysis evaluates the predictive ability of the pulse, blood pressuresytolic, diastolic blood pressure, shock index, mean arterial pressure.	- The shock index consistently shows the patient's clinical outcome , namely death and organ failure . - The ability of the shock index is superior in predicting the death rate than the calculation of ordinary vital signs.
2	San Diego (Balhara *et al*., 2017)	The purpose of this research is to use shock index in predicting the clinical outcome of patients presenting to the ED	- Using a retrospective study design from all patient adults (≥18 years) who present to the ED for 12 month - *Sample n* = 58336 person.	- Use record medical electronics, HealthMatics The ED (HMED) inputs accurate vital signs data .	- Initial SI recorded in the ED shows promise as a clinical sign in patients at IGD with criteria can death occurred especially in mark SI > 1,2
3	USA (Al Jalbout *et al*., 2019)	For determine is it possible that the SI value is related to inpatient mortality and hospital admission.	- Studies retrospective by design cohort take visiting patients to ER since year 2005 to 2010.	- Use UGD national database in America United States (US) namely NHAMCS	- SI value >1.3 shows a clinically significant increase in patients who will be hospitalized.
4	turkey (Kocaoghlu & C etinkaya, 2021)	To find out the advantages of the shock index which can be easily calculated in triage ER due to bleeding GIS, MSI And age SI.	- Studies retrospective - patients diagnosed with GIS bleeding in the ED	- Use Sign vital time triage is used to calculate SI, MSI, and age SI	- Use SI can detect critical patients with GIS - SI (p = 0.013) And MSI (p = 0.024) to predict adverse patient outcome .

5	Japan (Shibahashi *et al*., 2019)	For know whether SI can become predictor of early death older trauma patients and evaluating the clinical usefulness of age in the interpretation of SI.	- Retrospective cohort study using data from Japan traumatized Data Bank (JTDB),	- For For each eligible patient, SI was calculated by dividing HR admission (bpm) by systolic BP (mmHg).	- The performance of SI to predict death after trauma is significant more bad on older patient. - Even if the cut-off value SI is adjusted according to age, performance degradation is not sufficiently prevented.
6	Matthias Frohlich., et al (2016)/ Germany	For determine Does the SI-based classification of hypovolemic shock apply in the presence of TBI in predicting transfusion requirements in patients with or without TBI.	- Prospective study by collecting data from the prehospital, emergency room and ICU. - Data collection from 2002 to 2013 was inputted into Trauma DGU register.		- Classification of hypovolemic shock based on SI is possible quick check and assessment that reliable from shock hypovolemia in the emergency department. - SI as a viable tool for assessing patients at risk for transfusion product blood, even as is TBI heavy.
7	USA (Koch *et al*., 2019)	To summarize and evaluate role SI in the ER to provide context For size usage SI in triage and management on critically ill patient.	- Studies literature reviews. - Articles were selected from PubMed using the following search terms: shock index in combination with trauma, hemorrhage, myocardial infarction, pulmonary embolism, sepsis, obstetrics, ectopic pregnancy, or pediatrics.		- Enhancement SI (>0.7) has been shown to be correlated with an increased likelihood of hospitalization, and death.

8	China (Kurt & Bahadirli, 2021)	To compare the use of SI, MSI, heart rate and blood pressure in predicting clinical outcomes patient emergency in ER.	- Retrospective study - Collection database on 1 January until 31 December 2009 with the number of samples 21.161 .	Collection of patient data on age, sex, vital signs, level of consciousness, complaints that arise, And SI And MSI	- There is a significant relationship between the death of emergency department patients and the patient's vital signs obtained at the hospital table triage (HR>120 beats/minute, TD systolic <90).
9	London (Nathan *et al*., 2016)	Objective from study this is For define range normal SI patient , besides BP, pressure mean artery (FOLDER) And HR in time One hours after born on woman by blood normal .	- Prospective observational cohort study - Data were collected for 1 year at 1 hour post partum women	- Evaluate sign- Vital signs collected within one hour in postpartum mothers with guess lost blood (EBL) <500ml (316 woman)	- Demographic and obstetric factors are shown. 90% lower reference point for systolic - BP and upper 90% reference point for HR according to triggers used to recognize shock in midwifery practice, as is the upper 90% reference point for systolic and diastolic blood pressure for triggers for obstetric hypertension. The upper limit of SI is 0.89 in normal postpartum women .
0	Korea (Kong *et al*., 2021)	- To evaluate the clinical usefulness of DNI as an indicator of disease severity based need for massive transfusion in patients with primary PPH admitted to the ED.	- This observational cohort study was conducted retrospectively based on prospective enrollment - Patients presenting with PPH at the Severance Hospital ER between January 2011 and December 2019.	-	- DNI and SI can be measured routinely and easily in the ED at no extra cost or time and therefore, can be considered a suitable parameter for initial risk stratification of patients with primary PPH.

11	US (Wu *et al*., 2019)	To evaluate performance of SI in predicting the need for MT in trauma patients with pressure blood stable in ER	- Retrospective study - Collection databases 1 January 2009 until 31 December 2016. - Samples of all trauma patients over 20 years.	-	- Study This show that, in trauma patients with stable blood pressure in the ED, accuracy prediction MT requirement by SI is low. However, size delta is significantly related to the need for MT and its lack enhancement SI patients in the ER compared with in the field significantly improve possibility n need MT.
12	China (Rau *et al*., 2016)	The purpose of this research is to investigate the potential of SI and modified SI derivatives different as a predictor of need for MT on trauma patient in the ER center traumatized level I over a period of six years.	- This retrospective study review data from all 20.106 patient take care that stay registered in Trauma Registry System level I regional trauma center from 1 January 2009,until December 31 2014	-	- Studies This disclose that SI is quite accurate in predicting MT requirements. However, this predictive power can be compromised patients with hypertension, DM or CAD. Additionally, the more complex MSI and Age SI calculations fail. - To provide differentiation Which more Good than SI.

DISCUSSION

Shock is a clinical syndrome that occurs due to hemodynamic and metabolic disturbances characterized by failure of the circulatory system to maintain adequate perfusion to the organs of the human body (Fachrurrazi *et al*., 2022) . Shock is state of organs and peripheral tissues that experience perfusion and are categorized based on the etiology of each shock, namely hypovolemic, cardiogenic, obstructive And distributive (Kislitsina *et al*., 2018) . Shock can occur if the body's tissues cannot use oxygen properly and oxygen levels are insufficient. Clinical manifestations of shock include organ decompensation, changes in mental status, organ dysfunction, lactic acidosis, and decreased blood pressure (Pottecher *et al*., 2016) .

Hypovolemic shock is a condition of inadequate organ perfusion caused by loss of intravascular fluid volume in the form of blood and plasma fluids (Qi *et al*., 2020) . Hypovolemic shock is divided into four types, namely hemorrhagic shock (resulting from acute bleeding without soft tissue injury), traumatic hemorrhagic shock (resulting from acute bleeding with soft and deep tissue injury), traumatic hypovolemic shock (due to a critical reduction in circulating plasma volume without acute bleeding, due to soft tissue injury and release of mediators system immune), And Shock hypovolemic narrower sense (result from reduction critical in pliasma Which circulate volume without bleeding acute) (Standl *et al*., 2018) .

Pathogenesis, pathophysiology of hemorrhagic shock and traumatic hemorrhagic shock is bleeding. The difference lies in the degree of soft tissue damage. Clinically the most significant cause of hemorrhagic shock is bleeding I from injury isolated to vessels blood big, gastrointestinal bleeding, nontraumatic vascular rupture (eg, aortic aneurysm), obstetric hemorrhage (eg, uterine atony), and bleeding in the ear, nose, and throat area (vascular erosion) (Standl *et al*., 2018). A typical example of this type of shock is polytrauma, most commonly caused by traffic accidents and fall from height, Bleeding diffuse, hypothermia, And acidosis cause coagulopathy death (Al Aseri *et al*., 2020)

Typical causes of traumatic hypovolemic shock are burns and chemical burns. Hypovolemic shock in a sense narrow and traumatic hypovolemic shock lost fluid Which significant without bleeding (Can *et al*., 2019) . Narrower sense hypovolemic shock , namely external or internal fluid loss coupled with inadequate fluid intake (Daş *et al*., 2020) . This can be caused by hyperthermia, vomit And diarrhea persistent (for example, cholera), or lost fluid due to uncompensated renal impairment (eg, diabetes insipidus, hyperosmolar diabetic coma) (Standl *et al*., 2018)

Blood loss of more than 20% was reported as the only criterion for life-threatening conditions in acute hypovolemia (Can *et al*., 2019). Clinical manifestations of hypovolemic shock do not coexist in the patient's symptoms clinical seen clear If volume circulation reduce more from 15% (Gupta & Nature, 2021) . If Hypovolemic shock is not treated immediately, it can result in hypoxia, decreased consciousness due to reduced blood supply to the brain, irreversible tissue damage and death and ends in death (Kislitsina *et al*., 2018) .

Table 2.
Stadium Shock Hypovolemic And Manifestation Clinical

Signs and Checks Clinical	Stadium I	Stadium II	Stadium III	Stage IV
Loss (%)	15%	15- 30%	30- 40%	>40%
Awareness	A little Worried	Worried	Confused	lethargy
Pulse	< 100 x/min	>100-120 x/min	> 120 - 140 x/min	> 140 x/min
Respiration	14-20 x/min	20-30 x/min	30- 40x/min	>35 x/min
CRTs	Slow	Slow	Slow	Slow
Pressure Systolic Blood	< 90 mm Hg	< 90 mm Hg down	< 90 mm Hg down	< 90 mm Hg down
Production Urine	>30ml/Hour	20- 30ml/Hour	5-15ml/Hour	The least

Source : Pomalango (2020)

These four categories of hypovolemic shock are based on estimates of blood volume loss, vital signs (blood pressure, pulse, respiration), mental state, shock index (SI) and the appropriate Glasgow Coma Scale which can show the assessment of hypovolemic shock as in the ATLS classification (Frohlich, 2016). However, regular blood pressure and pulse checks are lacking effective in monitoring status hemodynamics patient. By Because it is necessary to modify this assessment, namely the use of SI (Shock Index), because SI is superior in predicting the severity of shock experienced by patients (Torabi, Mirafzal, *et al*., 2016) .

A new classification of hypovolemic shock based on the shock index (SI) was proposed in year 2013. classification four class shock And show correlation Which both with acidosis, need for blood products and death (Frohlich, 2016). The Shock Index (SI) is a ratio obtained by dividing the heart rate (HR) by the systolic blood pressure (SBP). This is used to determine changes in cardiovascular performance before the body experiences systemic hypotension (Kurt, 2021).

Shock Index is known as hemodynamic stability. The shock index (SI) is used to assess the severity of hypovolemia (hypovolemic blood loss). And degrees shock hypovolemic) And level severity shock other (Frohlich, 2016) **.** SI is indicator classic Which more sensitive than sign vital traditional method for evaluating shock (Qi, 2020). An increase in the shock index (SI) indicates a decrease in left ventricular output and circulatory insufficiency which, if not treated promptly, will increase the patient's risk of death. An increased SI also reflects vascular and myocardial dysfunction related to the organ perfusion index which is reflected in the oxygen saturation tool and lactate concentration (Gupta & Alam, 2021) .

Many studies explain the advantages of using SI in predicting mortality in trauma patients, pneumonia, ectopic pregnancy, pulmonary embolism and predicting prognosis in acute myocardial infarction (Tseng & Nugent, 2015) (Lie, 2021). The shock index has also been proven to be accurate in emergency obstetrics and gynecology. In a study of postpartum hemorrhage patients who lost 1500 mL of blood, score SI correlated with results study the that is : SI <0.9 convincing, and SI 1.7 requires immediate intervention (Aseri, 2020). SI is useful in predicting ICU requirements and in-hospital mortality in COVID-19 patients admitted to the emergency department (Kurt, 2021

Table 4.
Classification Shock hypovolemic based on mark shock Index

	class I	class II	Class III	class IV
shock	No shock	Mild shock	Moderate Shock	Severe shock
SI	< 0.6	>0.6 – 1	>1 - < 1.4	> 1.4
Blood Preparation	Observe	Consider using of blood products	Prepare transfusions	Prepare massive transfusions

Source. Torobi (2016), Koch (2019) and Lie (2021)

Research by Torobi (2016), Koch (2019) and Lie (2021) identified emergency department patients whose shock severity could be measured to predict mortality between other SBP (Systole Blood pressure) < 90 mm Hg, DBP (*Diastolic Blood Pressure*) < 60 mmHg, ages 18 – 85 years, and Pulse > 100 x/minute.

Table 5

Description shock Index as predictors outcome on patient emergency.

Researcher & Year	Parameters & samples	Outcomes
Mohammad G, Aly 2016	shock Index & MAP	predictions Mortality OR 5,599; 95% CI 4.128-8.15 ; *P* =0.0015 predictions MACE (Major Adverse Cardiac Events) OR 11,506 ; 95% CI 10.54-21.5664 ; p = 0.022
Ye-cheng Liu 2012	shock Index modified Shock Index	predictions Mortality OR 1.3 ; 95% CI 0.8- 1.7 ICU OR 4.2 Mortality 1.8 MSI >1.3 OR 4.9 ; 95% CI 3.6- 6.6
toobi 2016	shock Index	prediction ICU OR 0.97, p.s = 0.019
Alison M. El Ayadi 2016	shock Index	death 0.87 (0.80–0.94) severe maternal outcome 0.80 (0.73–0.87) severe maternal outcome or critical intervention 0.76 (0.71–0.8

Source. Ayadi (2016), Lie (2021).

Study Ayadi (2016) with title study "Vital sign Predictions of Adverse Maternal Outcomes in Women with Hypovolemic Shock: The Role of Shock Index explain that SI is predictors most Good To view and assess the severity of hypovolemic shock and obstetric bleeding in pregnant women with and SI has great potential in early diagnosis and management. shock And For reduce risk severity on obstetrics. lie (2021) explained that the shock index is used as an early detection of patients with hypovolemic shock

SI score >0.9 is the most sensitive cutoff value for predicting critical bleeding in trauma patients. SI 0.8 increases the sensitivity to detect bleeding and the need for hemostatic intervention (Pottecher *et al*., 2016) . SI also predicts death in polytrauma patients, with an SI score of 0.9 predicting mortality. In geriatric trauma patients, an SI score of 1 is related to level morbidity And the mortality higher geriatric (Al Aseri *et al*., 2020) . A high SI score has prognostic significance in cases of trauma and cardiovascular events such as acute myocardial infarction and stroke. A higher SI can also predict

poor clinical outcomes from death, ICU, and disability (Myint, 2018).
SI value is often used as an indicator of severity and poor prognosis on patient traumatized. Although SI is measurement non-invasive, This is an important measurement marker for the initial evaluation of hemodynamics and tissue perfusion (Myint *et al*., 2018). Although term shock index at first investigated in condition shock, has been studied as a prognostic tool in other critical illness conditions (Tseng & Nugent, 2015) . SI values are normal is between 0.5 And 0.7. Mark SI> 0.9 defined as predictor early shock hemorrhagic, mortality, And transfusion (Gitz Holler *et al*., 2019). SI Also has studied as predictor of hemodynamic instability, morbidity, and predictor of death (pneumonia, myocardial infarction, gastrointestinal bleeding. Patients with an SI higher than 1.3 over risky For treated in ICU And happening death (Kurt & Bahadirli, 2021)

CONCLUSIONS

The shock index (SI) serves as an assessment tool to identify high-risk patients and guide the medical team in providing management Which appropriate for patient. SI Also function for give prognostic information to patient and family. With use shock Index as detection early or screening beginning and monitoring can help identify level severity shock and level mortality on patient as well as help medic (nurse) in prepare What is will needed patient Accordingly, patients can be treated in the emergency room, ICU or in the treatment room, and the main focus is staff during 24 O'clock - 48 O'clock For maintenance patient Which intensive, so that the patient does not fall into a more severe condition. Shock Index is recommended as a non-invasive parameter to detect the patient's hemodynamic status earlier and can be used in triage of patients in the Emergency Room. The need for more in-depth research and research methods by direct observation of shock patients in the Emergency Room using a *shock index.*

Potential conflict of Interest

The author says that there is no possible conflict of interest between writing this article and getting it published.

REFERENCES

Al Aseri, Z., Al Ageel, M., & Binkharfi, M. (2020). The use of the shock index to predict hemodynamic collapse in hypotensive sepsis patients: A cross-sectional analysis. *Saudi Journal of Anesthesia* , *14* (2), 192–199. https://doi.org/10.4103/sja.SJA_780_19

Al Jalbout, N., Balhara, KS, Hamade, B., Hsieh, YH, Kelen, GD, & Bayram, JD (2019). Shock index as a predictor of hospital admission and inpatient mortality in a US national database of emergency departments. *Emergency Medicine Journal* , *36* (5), 293–297. https://doi.org/10.1136/emermed-2018-208002

Ayadi, AME, Nathan, HL, Seed, PT, Butrick, EA, Hezelgrave, NL, Shennan, AH, & Miller, S. (2016). Vital sign prediction of adverse maternal outcomes in women with hypovolemic shock: The role of shock index. *PLoS ONE* , *11* (2), 1–12. https://doi.org/10.1371/journal.pone.0148729

Balhara, KS, Hsieh, YH, Hamade, B., Circh, R., Kelen, GD, & Bayram, JD (2017). Clinical metrics in emergency medicine: The shock index and the probability of hospital admission and inpatient mortality. *Emergency Medicine Journal* , *34* (2), 89–94. https://doi.org/10.1136/emermed-2015-205532

Can, I. O., Koker, M., Solmaz, D., Kavakly, U., Bayram, B., Karabag, G., Unuvar, U., Arysoy, Y., & Ozkara, E. (2019). Revision of the medicolegal assessment criteria in hypovolemic patients. *Medicine (United States)* , *98* (11). https://doi.org/10.1097/MD.0000000000014799

Das, M., Bardakci, O., Siddikoglu, D., Akdur, G., Yilmaz, MC, Akdur, O., & Beyazit, Y. (2020). Prognostic performance of peripheral perfusion index and shock index combined with ESI to predict hospital outcome. *American Journal of Emergency Medicine* , *38* (10), 2055–2059. https://doi.org/10.1016/j.ajem.2020.06.084

Demuro, JP, Simmons, S., Jax, J., & Gianelli, SM (2013). Application of the shock index to the prediction of the need for hemostatic intervention. *American Journal of Emergency Medicine* , *31* (8), 1260–1263. https://doi.org/10.1016/j.ajem.2013.05.027

Fachrurrazi, F., Nashirah, A., & Awaludin, LRP (2022). Management of Shock Patients due to Bleeding. *GALENICAL: Malikussaleh Student Journal of Medicine and Health* , *1* (3), 42. https://doi.org/10.29103/jkkmm.v1i3.8923

Gitz Holler, J., Jensen, HK, Henriksen, DP, Rasmussen, LM, Mikkelsen, S., Pedersen, C., & Lassen, AT (2019). Etiology of Shock in the Emergency Department: A 12-Year Population-Based Cohort Study. *Shock* , *51* (1), 60–67. https://doi.org/10.1097/SHK.0000000000000816

Guo, S. Bin, Chen, YX, & Yu, XZ (2017). Clinical characteristics and current interventions in shock patients in chinese emergency departments: A multicenter prospective cohort study. *Chinese Medical Journal* , *130* (10), 1146–1154. https://doi.org/10.4103/0366-6999.205862

Gupta, S., & Alam, A. (2021). The shock index is better than conventional vital signs for assessing higher levels of care and mortality in severe sepsis or shock. *American Journal of Emergency Medicine* , *46* , 545–549. https://doi.org/10.1016/j.ajem.2020.11.014

Junaedi, Sargowo, J., & Nasution, TH (2016). Shock Index (Si) and Mean Arterial Pressure (Map) as Predictors of Mortality in Hypovolemic Shock Patients at Gunung Jati Hospital, Cirebon. *Hesti Wira Sakti Journal of Health* , *4* (April), 45–59. https://jurnal.poltekkes-soepraoen.ac.id/index.php/HWS/article/view/141

Kislitsina, ON, Rich, JD, Wilcox, JE, Pham, DT, Churyla, A., Vorovich, EB, Ghafourian, K., & Yancy, CW (2018). Shock – Classification and Pathophysiological Principles of Therapeutics. *Current Cardiology Reviews* , *15* (2), 102–113. https://doi.org/10.2174/1573403x15666181212125024

Kocaoğlu, S., & Çetinkaya, HB (2021). Use of age shock index in determining severity of illness in patients presenting to the emergency department with gastrointestinal bleeding. *American Journal of Emergency Medicine* , *47* , 274–278. https://doi.org/10.1016/j.ajem.2021.05.008

Koch, E., Lovett, S., Nghiem, T., Riggs, RA, & Rech, MA (2019). Shock index in the emergency department: Utility and limitations. *Open Access Emergency Medicine* , *11* , 179–199. https://doi.org/10.2147/OAEM.S178358

Kong, T., Lee, HS, Jeon, SY, You, JS, Lee, JW, Chung, HS, & Chung, SP (2021). Delta neutrophil index and shock index can stratify risk for the requirement for massive transfusion in patients with primary postpartum hemorrhage in the emergency department. *PLoS ONE* , *16* (Oct. 10), 1–13. https://doi.org/10.1371/journal.pone.0258619

Kurt, E., & Bahadirli, S. (2021). The usefulness of Shock Index and Modified Shock Index in predicting outcome of COVID-19 patients. *Disaster Medicine and Public Health Preparedness* . https://doi.org/10.1017/dmp.2021.187

Myint, PK, Sheng, S., Xian, Y., Matsouaka, RA, Reeves, MJ, Saver, JL, Bhatt, DL, Fonarow, GC, Schwamm, LH, & Md, EES (2018). Shock index predicts patient-related clinical outcomes in stroke. *Journal of the American Heart Association* , *7* (18). https://doi.org/10.1161/JAHA.117.007581

Nathan, HL, Cottam, K., Hezelgrave, NL, Seed, PT, Briley, A., Bewley, S., Chappell, LC, & Shennan, AH (2016). Determination of normal ranges of shock index and other haemodynamic variables in the immediate postpartum period: A cohort study. *PLoS ONE* , *11* (12), 1–10. https://doi.org/10.1371/journal.pone.0168535

Pomalango, ZB (2016). *Shock Index (SI) and Modified Shock Index (MSI) as Outcome Predictors in*

Emergency Patients: Systematic Review . *2* (2), 1–23.

Pottecher, J., Ageron, FX, Fauché, C., Chemla, D., Noll, E., Duranteau, J., Chapiteau, L., Payen, JF, & Bouzat, P. (2016). Prehospital shock index and pulse pressure/heart rate ratio to predict massive transfusion after severe trauma: Retrospective analysis of a large regional trauma database. *Journal of Trauma and Acute Care Surgery* , *81* (4), 713–722. https://doi.org/10.1097/TA.0000000000001191

Center for Data and Information of the Ministry of Health of the Republic of Indonesia. (2019). Shock Cases in Indonesia. In *InfoDATIN* (p. 12).

Qi, J., Ding, L., Bao, L., & Chen, D. (2020). The ratio of shock index to pulse oxygen saturation predicting mortality of emergency trauma patients. *PLoS ONE* , *15* (7 July), 1–10. https://doi.org/10.1371/journal.pone.0236094

Rau, CS, Wu, SC, Kuo, SCH, Kuo, PJ, Hsu, SY, Chen, YC, Hsieh, HY, Hsieh, CH, & Liu, HT (2016). Prediction of massive transfusion in trauma patients with shock index, modified shock index, and age shock index. *International Journal of Environmental Research and Public Health* , *13* (7), 1–11. https://doi.org/10.3390/ijerph13070683

Shibahashi, K., Sugiyama, K., Okura, Y., Hoda, H., & Hamabe, Y. (2019). Can the shock index be a reliable predictor of early mortality after trauma in older patients? A retrospective cohort study. *Acute Medicine & Surgery* , *6* (4), 385–391. https://doi.org/10.1002/ams2.427

Standl, T., Anneke, T., Cascorbi, I., Heller, AR, Sabashnikov, A., & Teske, W. (2018). Nomenclature, Definition und Differentenzierung der Schockformen. *Deutsches Arzteblatt International* , *115* (45), 757–767. https://doi.org/10.3238/arztebl.2018.0757

Torabi, M., Mirafzal, A., Rastegari, A., & Sadeghkhani, N. (2016). Association of triage time Shock Index, Modified Shock Index, and Age Shock Index with mortality in Emergency Severity Index level 2 patients. *American Journal of Emergency Medicine* , *34* (1), 63–68. https://doi.org/10.1016/j.ajem.2015.09.014

Torabi, M., Moeinaddini, S., Mirafzal, A., Rastegari, A., & Sadeghkhani, N. (2016). Shock index, modified shock index, and age shock index for prediction of mortality in Emergency Severity Index level 3. *American Journal of Emergency Medicine* , *34* (11), 2079–2083. https://doi.org/10.1016/j.ajem.2016.07.017

Tseng, J., & Nugent, K. (2015). Utility of the shock index in patients with sepsis. *American Journal of the Medical Sciences* , *349* (6), 531–535. https://doi.org/10.1097/MAJ.0000000000000444

Wu, SC, Rau, CS, Kuo, SCH, Hsu, SY, Hsieh, HY, & Hsieh, CH (2019). The increase in shock index from the field to the emergency room is associated with higher odds of massive transfusion in trauma patients with stable blood pressure: A cross-sectional analysis. *PLoS ONE* , *14* (4), 1–11. https://doi.org/10.1371/journal.pone.0216153