Scientific Research Publishing

Open Journal of Nursing, 2023, 13, 824-838
https://www.scirp.org/journal/ojn
ISSN Online: 2162-5344
ISSN Print: 2162-5336

A Review of Nurses' Perceptions of Traumatic Haemorrhagic Shock Management in Emergency Nursing

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How to cite this paper: Amponsem-Boateng, C., Boakye-Yiadom, J. and Amertil, N.P. (2023) A Review of Nurses' Perceptions of Traumatic Haemorrhagic Shock Management in Emergency Nursing. *Open Journal of Nursing*, **13**, 824-838.
https://doi.org/10.4236/ojn.2023.1311055

Received: September 29, 2023
Accepted: November 26, 2023
Published: November 29, 2023

Abstract

Haemorrhagic shock (HS) is a subset of hypovolaemic shock in which there is minimal to massive loss of blood either internally or externally in trauma or injured patients. Data from the World Health Organization (WHO) affirm that injuries account for over 5 million fatalities globally every year, and by 2030, injury mortality is predicted to rise severely. Public health research typically uses the KAP models, which may be divided into three parts: acquiring accurate knowledge, forming an attitude, and adopting behavior, to analyze people's health behaviors and explain changes in them. This review is about the nurses' perspectives of the concept of Knowledge, Attitude, and Practice (KAP) Model of hemorrhagic shock in trauma patients and assesses clinical practice tools used by nurses to keep an eye on patients who have the condition. Nurses' knowledge of indications of shock is either high or very high. The knowledge of nurses was related to their training before working in accident and emergency units. The nurses' attitude is considered significant, commendable, appropriate, and pertinent to the provision of care for a patient experiencing hemorrhagic shock. And the nurse's practice of early patient identification, prompt and continuous monitoring, control of the bleeding source, maintenance of hemostasis, and the correction of significant blood loss that can occur quickly to cause death, are the strengths of management.

Keywords

Trauma, Perspective, Hemorrhagic Shock, Nursing

1. Introduction

Trauma is one of the top causes of death and disability worldwide. Traumatic

injuries are responsible for almost 10% of the worldwide illness burden [1]. Uncontrolled post-traumatic bleeding is the leading cause of possibly avoidable death in injured patients [2]. Outcomes from severe hemorrhage continue to be poor, with fatality rates surpassing 50% for patients requiring immediate treatment for hemorrhagic shock [3] [4]. For more than 30 years, the link between traumatic hemorrhage and bad outcomes has been well established, and it applies globally, in both civilian and military settings. Every year, 60,000 people die in the United States as a result of traumatic hemorrhage, and 1.5 million people die worldwide as a result of physical trauma [5] [6]. Approximately 60% and 25% of all trauma-related deaths are attributed to immediate and early mortality, respectively, while the remaining 10% to 30% of deaths are attributed to late mortality [7]. According to data from the World Health Organization (WHO), injuries account for over 5 million fatalities globally year, and by 2030, injury mortality is predicted to rise sharply. During the productive years (less than 45 years old), injuries rank among the top causes of death, resulting in large financial losses. Furthermore, 8.3% of age-standardized disability-adjusted life years (DALYs) are attributed to injury. Over half of all deaths worldwide attributable to injuries occur in Asia, where injuries are the cause of one out of every 10 deaths [8]. From the standpoint of public health, injuries continue to be the primary cause of death, accounting for 59% of all fatalities among those under 45 years [9] [10]. Annually, injuries generate more than $406 billion in medical expenses and lost productivity in the country [9].

Trauma causes a large burden of disease in Africa, with around 10 million individuals living with disabilities as a result of traumatic injury [11] [12]. In trauma or injured individuals, hemorrhagic shock is a subtype of hypovolemic shock in which there is minimal to substantial blood loss either internally or externally [13]. Once a certain threshold level is exceeded, intravascular blood loss and subsequent cell changes caused by hypoxia result in tissue and organ malfunction, leading to death [14] [15]. Correctional delays in medical and surgical care, as well as poor hemorrhage management, generally result in the death of injured people [5]. According to studies, hemorrhagic shock (HS) accounts for 80% of trauma deaths within the first hour and 50% within the first 24 hours following injury [16] [17]. This means that patients with catastrophic injuries require immediate care once they arrive at the hospital. Severe injury causes a 25% loss of blood volume in a short period of time, resulting in irreparable shock. HS in trauma patients predicts poor outcomes and early mortality [18]. According to studies, bleeding is the cause of at least 40% of traumatic patient deaths, with approximately half of them dying before arriving at the hospital [19]. Haemorrhagic shock usually progresses within the first few hours. Early identification of patients, rapid and continuing monitoring, control of the bleeding source, maintenance of homeostasis, and correction of the effects of large blood loss that can swiftly lead to death from hemorrhagic shock are thus the mainstays of care [20]. Current care focuses on detecting bleeding, which can lead to occult tissue

hypo perfusion due to decreased circulating volume, preventing the deadly triad (hypothermia, coagulation, and acidosis), and controlling damage [3] [4].

The initial assessment of a critically injured polytrauma patient is a difficult undertaking, because every minute can mean the difference between life and death. It has been demonstrated that reducing the time between damage and diagnosis and treatment reduces mortality [21]. Because emergency nurses are the traditional first line of defense for patients with polytrauma, significant bleeding, and shock, they must be well-versed in assessing and managing patients with hemorrhagic shock. A research to examine nurses' knowledge in challenging areas found that the most questions that nurses failed to answer or missed were about trauma and shock (hemorrhagic shock) [22] [23]. Another study [24], concluded that improving nurses' knowledge and comprehension of hemorrhagic shock management is necessary to lower hemorrhagic shock-related fatalities. Nurses are typically the first line of care and management for hemorrhagic shock. Therefore, for nurses to effectively assess and manage patients in HS and significantly reduce errors, both are essential for patient survival. In this context, this review is about nurses' perspectives on the concept of Knowledge, Attitude and Practice (KAP) Model of hemorrhagic shock in trauma patients and assesses clinical practice tools used by nurses to keep an eye on patients who have the condition.

2. Haemorrhagic Shock

Haemorrhagic shock (HS) has a short time to kill. Stopping the bleeding and increasing the amount of blood that is circulated are the main objectives at the emergency department of hospitals. Management should be based on the rate of bleeding and changes in hemodynamic parameters, such as blood pressure, heart rate, cardiac output, central venous pressure, respiratory rate, and oxygen saturation [25] [26].

Resuscitation is dependent on the estimated severity of the hemorrhage. The major cause of potentially avoidable death among this patient population is undiagnosed or uncontrolled hemorrhage, therefore understanding early indications of bleeding and how to treat it is crucial [27].

At the emergency room, nurses typically assess the patient's level of consciousness, respiration rate, heart rate, blood pressure, and random blood sugar. According to the seriousness of the case, injured patients are accurately and quickly assessed at triage and in the appropriate color-coded wards. Patients with open fractures or overt bleeding are triaged higher (SATS score of 6 to orange), whereas patients with blunt abdominal injuries who may be compensating at the time of triaging are triaged lower (SATS score of 4 to yellow). The conventional vital signs are generally within normal ranges despite the fact that HS produces severe physiological harm up until the point where the body's defense mechanisms are overworked [28].

The heart rate, blood pressure, oxygen saturation, and breathing rate alone are

not adequate to inform the emergency department (ED) nurse of the need for prompt care [29] [30]. In order to recognize HS, the nurse must be well-versed in more sensitive physiological evaluation measures. Additionally, the emergency nurse is a crucial member of the team that treats patients who have suffered serious trauma and are in shock as a result of bleeding, therefore they need to be knowledgeable about how to treat these patients.

3. The Concept of Knowledge, Attitude and Practice (KAP) Model

The KAP models—which may be broken down into three parts: gaining accurate knowledge, developing an attitude, and adopting behavior—are frequently utilized in public health research to examine people's health habits and explain their changes [31]. Furthermore, promoting knowledge as the foundation for conduct and attitude as the driving force behind behavior encourages people to take action in order to accomplish their goals. In quantitative investigations, a conceptual framework is viewed as a road map for comprehending the connections between and among the variables [32]. The Knowledge, Attitude, and Practice (KAP) model, which Schwartz constructed on the basis of cognitive, affective, and behavior theory [33], serves as the conceptual foundation for this investigation. The KAP model was created as a tool to explore what people know, think, and do with regard to a certain topic. Since its initial development in the 1950s for population studies, the KAP model has been widely applied in research as a framework to direct KAP surveys [34]. It's also referred to as a knowledge, attitude, behavior, and practice survey. A KAP survey is intended to be a representative sample of a target community, with the goal of eliciting what is known (knowledge), believed (attitude), and done (practiced) in the context of the issue of interest [35] [36].

Important reasons for conducting KAP surveys include identifying baseline knowledge, myths, misconceptions, attitudes, beliefs, and behaviors in relation to a specific health-related topic; understanding, analyzing, and communicating about field topics or situations of interest; and providing information on needs, issues, and barriers related to the development of effective, locally relevant public health interventions [37] [38]. KAP surveys should ideally come before an awareness program or an intervention program [39], in order to assess post-intervention changes and the efficacy of intervention programs that were designed to correct and change health-related knowledge, attitudes, behaviors, and practices. The outcomes often offer the inputs required for creating a successful program as well as the starting point information for future program success assessments. Thus, before developing and implementing educational or interventional programs in the community of interest, KAP surveys can be used to measure the baseline levels of awareness about healthcare-seeking practices [40]. It's important to remember that a KAP survey is only required if there have been no prior surveys of the community of interest and/or if there are knowledge gaps

notwithstanding prior surveys [38] [41].

The KAP model, a logical approach to health education, is predicated on the idea that developing one's own knowledge will have an impact on behavior modification [42]. Therefore, the KAP model proposes that a gain in knowledge influences attitude and subsequently Practice [36] [37] [42]. This is based on the link between Knowledge, Attitude, and Practice. However, the KAP model was used in this study as a conceptual framework to evaluate nurses' knowledge, attitudes, and practices about the management of hemorrhagic shock among trauma patients in the emergency room. The KAP model can be used to accomplish or evaluate goals such characterizing the knowledge, attitude, and practices of the existing population, identifying problems, planning interventions, and evaluating results when designing pre- and post-test studies. The KAP model is helpful in studies to comprehend nurses' behavior generally. Therefore, to evaluate nurses' understanding, attitudes, and practices regarding hemorrhagic shock (early indicators and management techniques) this model is necessary (**Figure 1**).

4. Overview of Haemorrhagic Shock

After trauma, bleeding continues to be the greatest cause of avoidable death [43]. The physician's or nurse's first priority in treating an acute hemorrhage is to put an end to the bleeding as soon as feasible. According to the World Health Organization [44], hemorrhagic shock is a pathologic condition in which intravascular volume and oxygen delivery are compromised. In order to prevent tissue hypoxia, inflammation, and organ damage while this bleeding is uncontrolled, the nurse must sustain oxygen delivery [45]. To prevent or treat traumatic coagulopathy, this approach entails blood transfusion, the use of vasopressors, and fluid resuscitation [45].

Regarding the choice of fluid for resuscitation, the focus of hemodynamic goals for bleeding control, and the best prevention of traumatic coagulopathy, the best resuscitative technique is debatable. The primary therapeutic action in acute hemorrhagic shock should ideally be fluid resuscitation [45]. According to

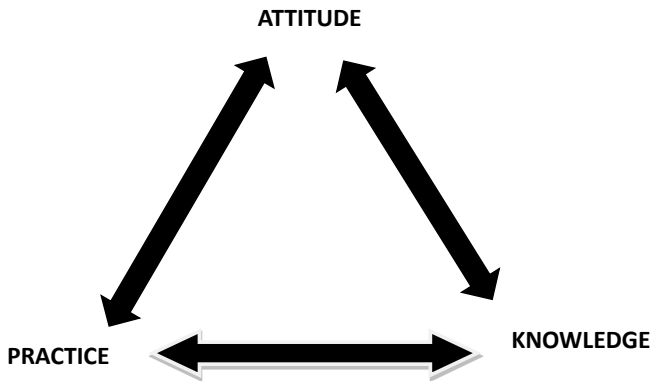

Figure 1. Knowledge attitude practice model [38].

studies, there is no superior fluid for trauma patients when compared to another fluid type [46]. Colloids have the most significant benefit over crystalloids in that they can create a more rapid and lasting plasma expansion due to an increased oncotic pressure and they can quickly accomplish circulatory aims. Colloids do not improve survival, despite the fact that they are less expensive than crystalloids, according to studies. However, resuscitation with a lot of crystalloids has been linked to hyperchloremic metabolic acidosis, abdominal compartment syndrome, and tissue oedema [46].

There is no evidence to suggest that resuscitation with colloids reduces the risk of death compared to resuscitation with crystalloids, according to a review of the Cochrane library among critically sick patients (patients with trauma) [46] [47]. According to recommendations from European guidelines for the management of bleeding after severe injury, patients who are bleeding due to trauma should be treated with crystalloids at first, and patients who are hemodynamically unstable should consider the addition of colloids [48] [49].

Given the hazards of AKI and coagulation changes, it is advised to utilize colloids like hydroxyethyl starches (HES) or gelatin solutions within the guidelines [50]. In addition, hypertonic saline (HTS) is a useful treatment for hemorrhagic shock due to trauma. The main advantage of HTS is that, especially when combined with a colloid, it rapidly increases blood volume with the injection of a little volume. In addition, patients with increased intracranial pressure may benefit from the use of HTS as a hyperosmolar drug [45].

Even when fluid expansion is ongoing and hypovolemia has not yet been addressed, vasopressor medications may also be temporarily necessary to maintain tissue perfusion in the midst of prolonged hypotension in addition to fluid resuscitation [51]. This is important because, tissue perfusion is inversely related to blood viscosity and directly correlated with driving pressure, vessel radius, and capillary density [52].

The preferred medication for treating septic shock is currently norepinephrine (NE), which is frequently used to restore arterial pressure in hemorrhagic and septic shock [53]. The sympathomimetic drug NE primarily has vasoconstrictive effects. NE stimulates the adrenergic system both arterially and venously. In addition to its action on artery vasoconstriction, NE also causes venoconstriction, which elevates pressure in capacitance arteries and actively moves the volume of venous blood to the systemic circulation [54]. The venous unstressed volume, or the blood volume that fills the blood vessels without causing an intravascular pressure, may be recruited by this venous adrenergic stimulation [55]. Physicians and nurses may use the mean arterial pressure, which indicates the perfusion pressure of all organs (apart from the heart), as a target for early fluid delivery.

Preventing a potential increase in bleeding by a too forceful resuscitative procedure is a crucial component in the resuscitation of the patient with hemorrhagic shock [45]. By diluting coagulation components and encouraging hypo-

thermia, fluid resuscitation may worsen coagulopathy. Additionally, by limiting clot formation, an elevated mean artery pressure (MAP) can encourage bleeding [56]. It's still unclear what blood pressure should be at during the hemorrhagic shock patient's resuscitation [20]. The initial goals are to quickly stop the bleeding and keep the arterial pressure as low as possible to prevent tissue hypoxia [57].

Restoring arterial pressure when bleeding is uncontrolled puts the patient at risk for more bleeding or for preventing clot formation [58]. In order to prevent subsequent brain injury when acute hemorrhagic shock is accompanied by severe brain injury, cerebral perfusion pressure must be maintained by increasing arterial pressure [59]. It is tough and challenging to treat trauma patients who are in hemorrhagic shock [24]. The doctor's job is to prevent tissue hypoxia, inflammatory response, and organ malfunction while yet maintaining oxygen delivery [60]. In order to stop hemorrhage in these patients, the doctor or nurse must simultaneously treat the coagulopathy and keep the bleeding under control [61].

5. Knowledge of Early Symptoms of Haemorrhagic Shock by Nurses

Mortality among injured patients is typically caused by correctable delays in medical and surgical care as well as by inadequate hemorrhage management [62]. According to studies, haemorrhagic shock (HS) causes 50% of trauma deaths within 24 hours after injury and 80% of trauma deaths within the first hour [63] [64] [65] [66]. This implies that after they are admitted to the hospital, trauma sufferers require quick care. In the past, emergency care nurses have evaluated patients with HS using vital indicators such heart rate, systolic blood pressure, and respiration rate. These markers frequently appear normal throughout the shock's compensatory phase, but [67]. Age, the usage of medications like beta blockers, and comorbidities like hypertension can all affect how the body reacts to shock, thus delaying care. As early indicators of HS, various physiological markers including the shock index, mean arterial pressure, and urine output must thus be thoroughly understood by the emergency room nurse [68].

Studies on nurses' knowledge of the early warning signs of hemorrhagic shock have produced conflicting results; some have shown that nurses are adequately knowledgeable about these signs, while others have shown that they are not [24] [69] [70] [71]. Regarding a study by Nshutiyukuri *et al.* [72], to evaluate nurses' understanding of emergency care for victims of motor vehicle accidents, the study found that nurses' knowledge of indications of shock is either high or very high. The knowledge of nurses was related to their training before to working in accident and emergency units [72]. According to a study conducted in Iran in 2019 to evaluate emergency nurses' knowledge of managing bleeding in trauma patients, respondents had a moderate understanding of managing bleeding in trauma patients [73] [74].

A descriptive study conducted to evaluate nurses' knowledge of patients in shock, revealed that, more than half of the study participants had adequate understanding of trauma patients in shock [75]. Further research to evaluate nurses' shock knowledge revealed that nurses had sufficient shock knowledge [76].

6. Nurses Attitude towards Monitoring of Traumatic Haemorrhagic Shock Patient

In nursing practice, attitude is essential. It can be described as how nurses view patient care-related concerns and decide what is considered significant, commendable, appropriate, and pertinent [77]. It is important to not undervalue the nurse's attitude toward her or his fear of bleeding, the significance of hemorrhage control and monitoring, and her or his confidence in providing care for a patient experiencing hemorrhagic shock [74]. An investigation into the impact of trauma care simulation on undergraduate nursing students found that good attitudes toward care were based on reflections from personal experiences [78].

According to a study conducted in Rwanda to evaluate nurses' attitudes regarding providing emergency care to victims of traffic accidents, the majority of nurses (73.7%) had a favorable attitude toward providing emergency care to patients who were experiencing hemorrhagic shock [72]. On a study to evaluate nurses' attitudes about traumatic patients, respondents had a positive attitude toward the fear of bleeding and the significance of bleeding management [74].

7. Nursing Practices for Patients with Traumatic Haemorrhagic Shock

The fifth highest cause of mortality in Australia is still traumatic injury, and many deaths are due to hypovolemic shock despite major improvements in the management of trauma sufferers. Acute blood loss after injury depresses immune system activity as well as essential organ function. This frequently develops to multiple organ failure and death.

Therefore, early patient identification, prompt and continuous monitoring, the identification and control of the bleeding source, the maintenance of hemostasis, and the correction of significant blood loss that can occur quickly to cause death are the mainstays of management [79].

Current management strategies focus on preventing the fatal trifecta of hypothermia, coagulation, and damage control. Studies on nurses' treatment strategies for trauma patients who suffer hemorrhagic shock have revealed a wide range of approaches taken by nurses while treating these patients [80]. A study found 66% participants had practices that were satisfactory for treating patients who were in shock [81].

To evaluate the stress that acute care nurses feel at work and their experiences with seeing patients' trauma and suffering, researchers conducted a qualitative study in British Columbia. According to study participants, caring for and man-

aging trauma patients who are in shock might be difficult [82]. After conducting a non-systematic literature search on care for polytrauma patients using PubMed and the Cochrane Database Roger F Shere-Wolfe [83], found that most medical professionals had satisfactory procedures in place for treating polytrauma patients who were in shock.

In Ghana, Oteng *et al.*'s [84], investigation to ascertain the preventable trauma-related mortality rate (PDR) at the Komfo Anokye Teaching Hospital in Kumasi revealed that a sizable portion of medical staff had unsuitable habits for the management of patients in shock. In most of the previous studies reviewed, the researchers had indicated the presences of the lack of understanding in the practice of management of hemorrhagic shock trauma patients; the few studies could relate the lack of mistakes to gaps in knowledge of the nurses. However, most of the studies agreed that a better assessment in the knowledge and practice of the nurses could help improve on the management of hemorrhagic shock in trauma patients at the hospitals.

8. Conclusion

The Knowledge, Attitude, and Practice (KAP) model, which Schwartz constructed on the basis of cognitive, affective, and behavior theory, serves as the conceptual foundation for this investigation. This was reviewed along with the clinical practice tools that nurses employ to monitor patients who are suffering from the illness. The understanding of shock symptoms among nurses is either extremely high or high. Before working in accident and emergency units, nurses received training that affected their level of understanding. The nurses' approach to providing care for a patient who is experiencing hemorrhagic shock is regarded substantial, admirable, suitable, and pertinent. Additionally, the nurse should identify patients as soon as possible, monitor them continuously, control any bleeding, maintain hemostasis, and stop any considerable blood loss that could swiftly result in death.

Ethical Statement

Not Applicable.

Author Contribution

CAB, JBY, and NPA: conceptualization, design, drafting, revised for important intellectual content, final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All have approved the final draft before submission.

Acknowledgements

Authors would like to acknowledge Retired Pastor Dr. and Mrs. Dr. Opoku Boateng, for their encouragement and support.

Funding Sources

Authors declare that they did not receive any external funding.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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