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Appreciating the Golden Hour: A Comparative Interdisciplinary Study

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APPRECIATING THE GOLDEN HOUR: A COMPARATIVE
INTERDISCIPLINARYSTUDY.

by

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A thesis submitted in partial fulfillment of the requirements
for Honors in the Major Program in Nursing
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and in the Burnett Honors College
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Abstract

Within the health care, many medical professionals know about the critical time restraints for provisions of care within their discipline, but do not know the term "The Golden Hour". The Golden Hour is a term indicating the universal time restraint found within every area of health care and more specifically, every area of nursing. The term and concept represented by it should be recognized to better the outcomes of our patients. Although the Golden Hour typically indicates a 60-minute period of time, various settings recognize shorter and longer periods during which specific actions must be taken to assure positive patient outcomes. To meet this aim, this thesis will review studies related to outcomes as associated with time critical interventions that could be categorized by "The Golden Hour". To meet the goal, a search of CINAHL, MEDLINE, PsychINFO, and ScienceDirect databases was conducted. Findings of the search revealed that while the term is not widely used, the concept of time sensitive care is found in many areas of Health Care and, specifically, within multiple sub-disciplines of nursing.

Dedication

I would like to thank my Fiancé, Max Saindon for always being there for me whenever I needed you. Thank you for supporting everything I do, telling me that I can do it and that you always believed in me.

Thank you to my parents for allowing me the opportunity to be the best version of my self and for always supporting my decisions and my education.

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Thank you to UCF College of Nursing and Burnett Honors College for allowing me to see what I am capable of and allowing me to reach my full potential. I am so appreciative for all the experience I was able to gain from participation in the honors in the major program.

Table of Contents

Table of Figures

Introduction

The author of this thesis performed this comparative study due to the perception of a lack of knowledge of the Golden Hour within the nursing field. The author has previous experiences in emergency services as an emergency medical technician where instructors and coworkers were all taught and exposed to the concept of the Golden Hour. Once in nursing school, there was no mention of the Golden Hour. This made the author consider that there may be a lack of knowledge in other healthcare specialties that should be mindful of this concept. Further research was performed to educate and expose how this concept is used in different disciplines.

Pollak, Barnes, Ciotola and Gulli (2011) refer to the Golden Hour as a golden period. They state that this golden period is the time from injuries to definitive care, but also informed that best survival is within the first 60 minutes. After this time, the body begins to decompensate and the ability to survive drastically drops. In the past, it seemed as if looking at that first hour from injuries to the crucial and direct administration of care was the best way to portray this idea (Lerner & Moscati, 2001). Are further reviews now necessary to deepen the understanding of the Golden Hour? In previous years, the Golden Hour did not relate to many other fields and disciplines. McMurtry and Nelson (1983) use the term "Golden Hour" but define it as the need for immediate care without the mention of the first hour or any type of time limitation other than the present. They refine the term allowing the idea of the Golden Hour as becoming a golden period referring to any critical event that may require a limitation of time for when care should be administered. When looking at different specialties within nursing, one can see how the Golden Hour can have many different terms and titles depending on the specific area of healthcare.

1

Problem

The Golden Hour exists in many areas within healthcare but is not always referred to in those words. This author believes that as a result, there may be a communication barrier due to the lack of knowledge of the Golden Hour. This communication barrier may impact the respective disciplines that experience these golden periods if the discipline specific time limitations are not introduced and their importance are not stressed enough. Decreased nursing knowledge regarding this concept and the resulting potential communication barrier can also negatively impact patient outcomes. Overall, the Golden Hour is an important topic of which every healthcare professional should be aware. Although some professionals may be familiar with the time restraints mentioned throughout this thesis and not the term, "Golden Hour", all professionals should be educated that they are one in the same to be sure there is nothing standing between the caregiver and the patient receiving what could be lifesaving care.

Problem Significance

The problem significance of the Golden Hour is that the existing lack of knowledge may negatively impact the caregiver's sense of urgency and, subsequently, patient outcomes. The Golden Hour stresses the importance of rapid care delivery. Without this concept being engrained in a provider's practice habits as a result of being unfamiliar with the concept, care delivery may not occur in a timely manner. Delayed care in such situations as trauma, resuscitation efforts and newborn care may result in negatively impacted patient outcomes. Whereas professionals who are well informed as to the concept of a Golden Hour may possess an increased sense of urgency in time limited patient situations.

2

Purpose

  The purpose of this thesis is to investigate the literature available on the concept of the Golden Hour and to assess whether the time limitations for various disciplines are present. This thesis assesses the state of the science to identify extant literature and how synonymous terms are used within different healthcare disciplines. This paper also clarifies the concept of the Golden Hour and refines the idea as a universal indicator of time restraint in the delivery of nursing care.

Method

A literature review was conducted of the extant literature. These articles spread the knowledge of how the "Golden Hour" is used within the different nursing disciplines. Resources used included those available through UCF library services such as electronic and printed materials including EBSCO-host, CINAHL, MEDLINE and PsychINFO databases. Initial search terms included "golden hour", "golden hour protocol", "nurs*", "education", "trauma", "simulation", "time limit*", "rapid response team", and "origins". Various combinations of these terms were also used.

Inclusion criteria included full text peer reviewed journal articles published in English addressing subject matter consistent with the concept of the Golden Hour. Exclusion criteria included non-English language articles, articles unavailable in full text, editorials and non-peer reviewed articles. Articles meeting the inclusion criteria were reviewed for definition of the concept of the Golden Hour, alternative terms used, time limitation parameters and the discipline of focus.

Background

Origin

According to Lerner and Moscati (2001) the golden hour term has been used in the past with a focus on the discipline of trauma care. They describe the golden hour as the critical need for care to be initiated within the first hour of injury to lessen the negative impact on morbidity and mortality. They attributed multiple sources of the origin of the term to R. Adams Cowley, MD. However, they do not fully attribute the creation of this term to him. McQueen and Ferko (1989) published an article that thoroughly explained and portrayed the Golden Hour in relation to prehospital care. Within this article is cited a study performed by the American College of Surgeons, which established that a delay in care led to the mortality of 20,000 Americans in prehospital settings. This study established the relationship of time as a critical factor for prehospital trauma patients in urgent need of care.

Disciplines

Some of the disciplines being researched and discussed contain a wide-range of information regarding a time limitation being implemented on certain cases. The disciplines addressed are Trauma or Emergency Care, Pediatrics, Neonates, and acute pathological instances that include the neurological system, cardiovascular system, and sepsis.

Additionally, an emerging discipline is the Rapid Response Team (RRT). No literature was discovered that specifically relates this discipline to the concept of the Golden Hour. However, the very essence of the RRT focuses on the reduction of time to treatment of patient conditions which is consistent with the concept of the Golden Hour. In addition to the RRT, the

nursing disciplines of Emergency Department, Trauma Department, Intensive Care Unit and other disciplines of nursing that must consider such time restraints for the delivery of care. Although this paper focuses on certain specialties, all nurses should be educated on the time limitations because they may have a case in which they will need to use that knowledge.

Trauma. Traumatic events require immediate intervention in order to decrease secondary injuries and the possibility of patient mortality. A study done on hypotensive gunshot wound (GSW) patients stated that taking longer than 10 minutes to get to the Operating Room can increase the possibility of death significantly (Meizoso, et al, 2016). This study focused on the survival analysis and establishes the idea of a hypotensive GSW protocol that can decrease time in the emergency department and save lives.

In the Emergency Medical Services (EMS) prehospital environment, the focus is on the "platinum 10 minutes". Pollak, et al, (2011) explain this platinum rule as the limitation of on-scene time to 10 minutes. During this time window, assessing, stabilizing, and beginning transport must be complete. This rule is significant considering that no one may know the life sustaining interventions necessary to stabilize a victim. However, in what cases would the platinum 10-minute rule not apply? According to Harmsen (2015), in the stable patient, longer on-scene time and focused care correlated with significantly better patient outcomes. Therefore, accurately assessing the type of trauma present and the patient's hemodynamic stability while in the field is key.

Pediatric Trauma. Unlike adult trauma patients, pediatric patients are known to be unpredictable and can decompensate much more rapidly. Due to this potential care delivery should be addressed aggressively. Rogers, Rittenhouse and Gross (2015) believe that rather than

6

promoting a specific time period such as an hour, these pediatric traumas should be approached as a "golden opportunity" and should be administered care as quickly as possible.

Neonates. In the neonatal care setting, the first hour after birth is considered the most important period of that newborn's life. It is used to stabilize the newborn's condition focusing on the regulation of body temperature and management of the newborn's airway and respiratory system to ensure adequate placental oxygen transfer (Reuter et al, 2014). Healthcare providers also work to ensure the newborn is not hypoglycemic by initiating breastfeeding as soon as possible and by checking the blood sugar level within the first hour of life (Sharma et al, 2016). A Golden Hour protocol for the neonatal population is relatively new with an increasing amount of interventions needed to support the newborn's transition to extra-uterine life.

Neurologic. In consideration of persons suffering from cerebrovascular accidents (CVA), the concept of the Golden Hour is based on a time window in which the administration of Tissue Plasminogen Activator (TPA) such as Alteplase must be initiated. Intravenous Alteplase is a type of thrombolytic therapy that can be used to treat an ischemic stroke (Fassbender, et al, 2013). The time window for administering TPA is three to four and a half hours from the onset of signature CVA symptoms such as facial droop, slurred speech and hemiparalysis (Fassbender, et al, 2013). If given outside this window, effectiveness can be reduced significantly. This medication cannot be given unless computed tomography (CT) studies reveal that an ischemic event is taking place. Therefore, there is an immediate time restraint to not only obtain a CT scan, but to have the study evaluated by a qualified radiologist. In addition, other qualifying and disqualifying factors must be assessed by EMS, Nursing and Medical providers. In support of meeting the strict time limitations associated with the

7

administration of TPA in the care of the CVA patient, Fassbender (2013) notes that the American

Heart Association (AHA) and European Stroke Organisation created and recommended a

guideline that required all EMS individuals to prenotify the hospital receiving that CVA patient

so that all resources can be readied to give immediate care.

      Cardiovascular. Myocardial Infarction (MI), otherwise known as a heart attack, can be

deadly if not identified as soon as possible. The concept of the Golden Hour used in the

treatment of a suspected MI is similar to the use of the Golden Hour in CVA and Trauma cases.

Papazian (1992) states that it is best if the treatment regimens and tests are administered within

the first 60 minutes. Although, Papazian did not distinguish whether it was 60 minutes from the

onset of chest pain or whether it is 60 minutes from the onset of other heart attack symptoms.

What could be considered heart burn, abdominal pain or other localized pains could be a life-

threatening acute condition. According to Papazian, the highest risk for death is within the first

two hours. Because of this, an Electrocardiogram (EKG), blood tests and all applicable

interventions are on a time restraint. She also states that there are only six therapeutic hours to

have the most preventative effect. The goal is to stop the restricted blood circulation to the heart

muscle as soon as possible in order to prevent permanent damage.

      Sepsis. Sepsis is a bacterial infection that has become systemic by gaining access to the

body's general blood circulation. It carries an extremely high mortality rate if left untreated for

even the shortest period of time. As such, sepsis requires immediate treatment in order to be

successfully treated. Sepsis is the 10th leading cause of death in the United States and can occur

in any healthcare discipline (Raghavan & Marik, 2006). According to Raghavan and Marik, the

main treatment for sepsis is the administration of intravenous broad-spectrum antibiotics. The

best results come from administration of these medications within the first hour of diagnosis. In addition to the immediacy of care, the sequencing of assessment and intervention must be correct. For example, blood cultures must be obtained within the first hour but prior to treatment in order to ensure the prescribed antibiotic will be efficacious.

Findings

EMS and Prehospital times

The Golden Hour originated from and is mostly used in prehospital care and trauma systems where their focus is to provide the timeliest access to care (Dinh, et al, 2012). This is dependent on the condition of the patient which will dictate the urgency required. A study performed by Harmsen, et al, (2015) was focused on prehospital times (activation time, response time, on-scene time, transport time, and total prehospital time) and how they correlate to outcomes of trauma patients. Specifically, the study concluded that for unstable patients, a quick and steady transport was associated with decreased mortality. For stable patients, however, there was a positive outlook on increased on-scene time and total prehospital timely access to care (Harmsen, et al). The study also relates the shorter response time to a better patient outcome in all types of trauma patient cases because of the quicker access to care beginning from the time of injury. The study focused on three types of patients that benefit from swift transport; traumatic brain injuries, penetrating trauma wounds and unstable hypotensive patients (Harmsen, et al).

A problem that was noticed from Harmsen, et al (2015) study is the portrayed a lack statistical significance in relation to measured patient outcomes because when looking at this 30-day mortality rate, outcome could not be measured well in surgical related cases. No one could determine whether the cause of death was related to surgery or the patient's condition and lack of rapid enough intervention protecting the patient and their condition. Prehospital times tracking is necessary for research to see how this affects patient outcomes and more research should be obtained to state the outcomes of EMS times

Rapid Response Team and ICU

The RRT is an emerging approach to patient care that has been recently implemented in hospitals. Facilities have developed teams of highly skilled health professionals that are trained and well suited to responding quickly to suspected deteriorating patients (Lazzara et al., 2014). This is an effort to reduce the number of preventable negative patient outcomes. According to Butner (2011), 70% of adverse outcomes are preventable and the implementation of the RRT is to help prevent these poor outcomes from occurring. Due to RRT being so new to the health care, there is very limited published data available regarding their effectiveness. These teams have a goal, but the question at hand is whether they are meeting this goal and are they doing it effectively. A few studies have been done on RRT and whether they are related to better patient outcomes, decrease cardiac arrest, and decrease mortality. Butner (2011) reviewed 12 studies on the effectiveness of RRTs. Ten of the studies supported a positive outlook on RRT effectiveness, despite some of the studies concluding their findings to be not statistically significant. Salvatierra (2016) looked at the different types of questions that would help in measuring the effectiveness of the RRT on patient outcomes. She saw that although there was an overall improvement in nursing workflow and a higher nurse satisfaction, there was not enough evidence in the study to conclude the better outcomes were the result of the implementation of a RRT. In other words, although statistical significance is not present, there was a clinically significant relationship between the use of an RRT and better patient outcomes. The idea that most authors have supported is that RRTs are trying to better patient outcomes in the working environment of nurses with limited experience of caring for critically ill patients.

Nurses role and Simulation/Education

In a fast-paced environment full of critical patients and unknowns, how does a nurse become ready for what comes next? The simulation learning environment allows for a realistic, yet safe environment to practice and improve critical thinking, teamwork, and self confidence in numerous of different trauma cases (Rice, 2016). Rice's quantitative study is a prime example of how many hospitals prepare and educate their nurses. This study focuses primarily on how to optimize patient outcomes through improving teamwork and communication skills. The study is an experiment that allows the participants to adapt to a simulation. Rice used a sample size of seven Bachelor of Science in Nursing degree (BSN) nurses with less than two years of experience to participate in simulation-based training in which different factors were observed and noted. The participants would take part in a trauma practice simulation, get feedback, and then perform the simulation again in order to improve. According to Rice, teamwork results in decreased patient errors, while simulation allowed for enhancement of these teamwork performance skills. The results of this study supported the use of simulation; however, the sample size was very small, and more research is necessary to provide more reliable statistical data.

The implementation of simulation could impact the Golden Hour by offering healthcare workers practice and feedback. Although this study was practiced in efforts of measuring teamwork, simulation could also be performed by a single person. This study is a prime example of education and practice for any healthcare provider exposed to trauma patients or any other patient where fast critical intervention is needed.

Avoiding Potential Errors in Time Restrained Care

When working within a fast-paced environment and with critical patients, it may be easy to make mistakes. The Golden Hour focuses on quick interventions and improved patient outcomes. Further research will examine the triage process and trauma operating room to assess the background of the process, the error currently made within each process, and what can be done to ensure these errors are less likely to occur.

The Triage Process. Another practice that is usually under a critical time limitation is the triage processes used an Emergency Department (ED). The triage process focuses on who needs care first and uses either of two multi-level algorithms to determine level of acuity of each patient (Ashour, 2013). The 3-level algorithm looks at how long a patient may safely wait to be seen while the 5-level algorithm additionally classifies a patient's priority level by considering the possible number and types of interventions and resources necessary to better the patient's outcome and overall care. Ashour also mentions that it is more common to see the 5-level Emergency Service Index (ESI) as illustrated in figure 1.
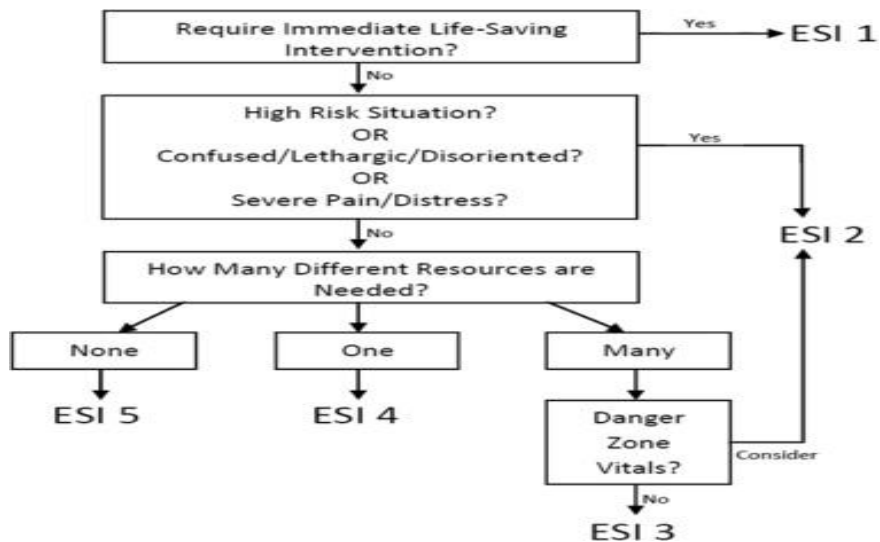
Figure 1: ESI Triage Algorithm

Modified from Gilboy et al., 2005 "*Emergency Service Index, Version 4: Implementation Handbook*"

The modified image defines that the highest acuity patients require priority and would be assigned as an ESI level 1 or 2 while the rest would remotely depend on the amount of resources needed (Ashour, 2013). If numerous interventions and resources are necessary, they would be a level three, while no other resources would be equivalent to ESI level 5. Ashour (2013) also compares the 5-level ESI algorithm to the FAHP-MAUT triage algorithm. This algorithm in figure 2 seen below focuses on the utilization of the utility theory. Utility theory in nursing looks at not only the patient's complaints, but it looks at other factors such as vital signs, age, gender, and their pain level (Ashour, 2013). It these situations, the healthcare team looks at risks versus benefits of treatment items and then they sort the patient based on this "utility value" (Ashour, 2013).
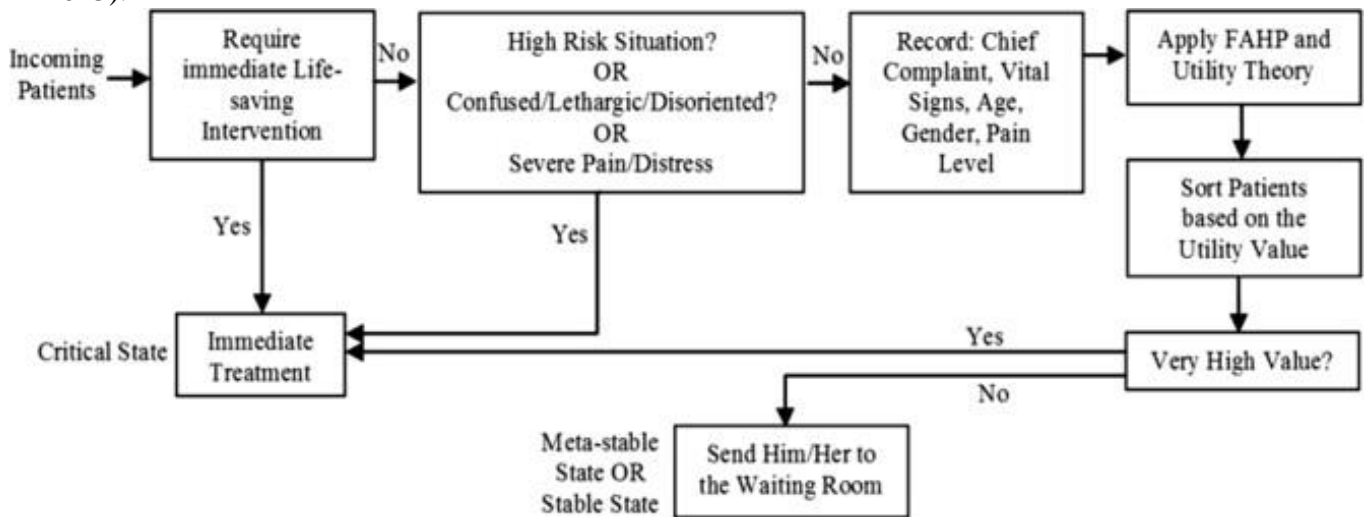
Figure 2: FAHP-MAUT Triage Algorithm

Which triage method is better seems to be open to question. However, Ashour (2013) states that the recommended method that is considered best to use is the FAHP Algorithm

because it relies on quantitative data to determine the triage and placement for the patient. While

the ESI 5-level algorithm seems to depend on the nurse's decision and are considered not as

accurate in placement. Nursing judgement is not always a bad thing to use, but there is a higher

chance of the patient being sorted in the wrong place if the patient is not appropriately triaged.

When triaging, healthcare providers try to get each patient back to a room for care as quickly and

safely as possible to optimize patient's wellbeing and provide rapid interventions.

Trauma Operating Room. Definitive care within the "Golden Hour" can help prevent

disability and even death of critically ill patients who have undergone a trauma (Murdock, 2008).

According to Murdock, from the time of announcement of this incoming trauma until the point

of reaching the Operating Room (OR) may just be a few minutes. Measures should be taken to

ensure that the patient's safety is secured and that the Golden Hour is met to guarantee the better

chance of surviving and recovering.

Surgical counts provided by the surgical nurse are necessary before any surgical

procedure to ensure that the patient is not closed up with any sponges and other unintentional

objects. However, sometimes in trauma situations there is no time to count (Murdock, 2008).

Mitchel (2012) portrays the information regarding surgical count practice in his publication,

Association of periOperative Registered Nurses (AORN) article. This article states that in

emergency situations, the surgical count may be omitted when it is necessary for the preservation

of life or limb (Mitchel, 2012). Sometimes omitting the count is necessary to ensure the patient

gets the quickest interventions and the best care possible. In instances like these where omission

may be necessary, extensive charting is required to provide information on why the omission

was needed. This charting may present as a red flag to any other health care provider caring for

this patient that retention of foreign objects from surgical intervention could have occurred (Murdock, 2008). The patient's safety and life are priority in all situations and the OR is one of the many specialties that requires attention to detail. Traumas may truncate the time being used for preparation; however, significant focus should be on patient interventions, outcomes and developing a routine on how to safely work within the existing time crunch.

Discussion

Recommendations for Practice

The Golden Hour does not seem to be known amongst those in the nursing profession for reason that are not found in reviewed articles. Although the term is not well known in the nursing profession, the time restraints are not used lightly, especially in ICU and ED trauma units. A nurse is expected to know the possible time limitation existing for their patient and what to do about it. In the triage area of the ED the nurse is responsible for assessing the patient and obtaining a medical history so that they may determine their level of acuity (ESI) and the number of resources or interventions that may be necessary (Ashour, 2013). Nurses should be educated through whatever means possible including simulations as a learning environment. Similar to the simulation study that was performed, this literature review was written to use knowledge embedded within to impact its readers and allow them to improve practice and patient outcomes in their desired area. This education and simulation are to help better their confidence and prepare them for anything similar to the simulated environment confronted. Nurses play a major role in today's healthcare and are even found in the OR being ready for whatever comes their way. No matter where the nursing staff is located, they play a large role and should know how the Golden Hour and these time limitations affect their practice.

Recommendations for Research

The Golden Hour is not a common topic for areas not focused on trauma related patient care, but this term should not be linked only to trauma patients. There is a significant amount of sources that explain the Golden Hour amongst the different disciplines as shown in the

background. However, the focus of some of these sources only concentrate on trauma and prehospital patients. More research is necessary to determine if the Golden Hour is a term that is meaningfully used within the hospitals or if it is just originated as a prehospital term.

After reviewing many sources, the Golden Hour in relation to the nursing profession was not found due to the fact that most sources focused on interventions and improved patient outcomes. Efforts could be made to further obtain research focusing on how the Golden Hour affects the nursing staff and their sense of urgency.

Of significance is the existence and conceptual goals of the RRT. This newly rising discipline focuses almost exclusively on the rapid assessment and delivery of care, which is the essence of the Golden Hour. Therefore, there should be research efforts designed and performed to capture the effects of the efforts of these teams on patient outcomes.

Recommendations for Education

Nursing students are not as exposed to the Golden Hour or its conceot as they should be. The author perceives that nursing students should be educated not only on the concept of the Golden Hour, but on the critical time limitations themselves. The students should also participate in simulation to arouse their sense of urgency in addition to testing the retention of knowledge gained from classes. The Golden Hour could be used in any specialty and students should be aware because they may have to use these specific time restraints at any time.

Limitations

There were limitations to the review of literature performed. Several peer reviewed articles found were published prior to 2006, leaving a chance of the information not being fully up to date. When reviewing peer-reviewed articles, there was a profound lack of information in regard to the Golden Hour in the nursing profession. Much of the sources available on the Golden Hour focused on trauma and prehospital care as well.

Rice's (2016) quantitative study shows a positive outlook on simulation training, however, the sample size of seven BSN nurses made the results limited to the small amount of nurses utilized for the study. Other studies reviewed within this paper used a sufficient sample size, but they did not show data that was statistically significant. Sources that were focused on RRT revealed clinical significance rather than statistical significance because patient's lives were being saved. However, the statistical and clinical significances could not be fully attributed to RRT efforts. Another instance was in the Harmsen, et al (2015) study, where there was a lack of statistical data that supported improved patient outcomes from reducing EMS out of hospital times. This was due to the condition of the patient continuously changing depending on the case. They may have survived the ride to the hospital, however, it was found in surgical related cases that there was a decrease survival rate.

Conclusion

To conclude, this thesis was researched and written due to the perception of a lack of knowledge on the concept of the Golden Hour within the nursing field and its respective subdisciplines. This review of literature explored and identified what level of understanding is present within the nursing field. This thesis was also created to clarify how this concept is practiced within different healthcare disciplines. A significant amount of sources communicated about the importance of time limited interventions required in each discipline, but several of these sources lacked information regarding nurses and their role in the Golden Hour.   More research is required to completely acquire the level of knowledge available in the nursing field on the concept of the Golden Hour.

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