

Introduction

Preparedness is the field of emergency management that can best defined as a state of readiness to respond to crisis or any type of emergency situation. It is not only a state of readiness, but also a theme throughout most aspects of emergency management **(Haddow, Bullock & Coppola, 2017)**. Emergency care is an essential public health service that ensures equal and adequate care for all community members, including children. There is lack of pediatric essential emergency equipment and disparities in Emergency Departments (EDs) pediatric preparedness as associated with healthcare structure and community characteristics **(Dudley et al., 2015)**.

Overcrowding in hospital EDs is a growing problem that results in delayed or obstructed care and costs much each year. Access to a primary health care reduces EDs use, but it is needed to determine how to best direct pediatric patients to primary care services and improve the quality of primary emergency care **(Metcalf, Henley & Wilkin., 2012)**.

Annually, about 26 million children visit EDs for urgent or emergent care, and among these children, nearly

10% of these visits result in admission or referral to another facility for care (**Athey et al., 2001**).

Many EDs have deficiencies in equipment and preparation for treating acutely ill and injured children. In addition, lack of pediatric sub-specialists in critical care and emergency medicine. These deficiencies in access to experienced staff, equipment, and pediatric specialty expertise may result in delayed diagnoses and inappropriate medical management of specific injuries or conditions, particularly for critically ill and injured children (**Dharmar et al., 2013**).

The Guidelines for Preparedness were developed to provide the ED with an essential list of emergency equipment necessary to care for critically ill or injured children. These guidelines were the first professional mandate to establish pediatric emergency service and equipment standards, and provided an innovative emergency care standard for children (**Krug et al., 2012**). The guidelines assist in everyday emergency responses by identifying the gaps in equipment and identifying hospitals compliance to preparedness (**Emergency Nurse Association, 2015**).

Updated knowledge, communication and procedural skills, trained medical and paramedical staff, necessary equipment and medications and appropriate practice organization are vital cornerstone of preparedness in order to provide optimal care which may even save lives of pediatric patients (**Eppich, Adler & Mc Gaghie, 2006**).

Significance of the study:

A child progresses from injury or illness to death faster than an adult; the smaller the child, the more quickly progresses from serious illness and injury to death. Thus, children's emergency care requires not only specialized training and equipment but also requires efficiency in the emergency system to ensure that the proper level of emergency care can be provided efficiently in an organized and timely manner (**Greene et al., 2002; Young et al., 2004**).

Fifty thousand children die in the United States yearly with 70% of deaths occurring within a hospital. Sixty percent of the deaths of hospitalized children occur in the emergency and Pediatric Critical Care Unit (**Thienprayoon, Campbell & Winick, 2015**). Despite advances in medical technology and pediatric treatment for critical illness and

injury, children die. However, treatments and procedures do not always result in survival and recovery, and in 53.6% of cases, the child dies (**Chang, MacLeod & Drake, 2013**).

In the researcher point of view the increasing number of pediatric emergencies in the community has prompted new standards in emergency preparedness nursing education. The preparedness of EDs has not been comprehensive and has shown relatively poor pediatric readiness so entry to practice emergency preparedness has been identified as an essential component of nursing education.

Aim of the Study

This study aimed to assess the preparedness of nursing staff during critical situations at pediatric emergency units.

This aim can be attained through:

- 1-Assess knowledge of nursing staff regarding pediatric emergency preparedness during critical situations.
- 2-Assess practice of nursing staff preparedness during critical situations.
- 3-Assess attitude of nursing staff toward preparedness during critical situations.

Research Questions

- 1- What is the knowledge, attitude and practice of nursing staff about preparedness at pediatric emergency?
- 2- Is there a relationship between knowledge and attitude about preparedness and practice at pediatric emergency?

Part I: Overview about Critical Situations at Pediatric Emergency Units:

Emergency Departments (EDs) are the integral part of the community, providing primary health care, urgent care, high technology diagnostics, and treatments that are available 24 hours a day, 7 days a week **(Institute of Medicine & Committee of the Future of Emergency Care in the U.S. Health System, 2006; Huddleston, 2008)**.

Pediatric EDs provided care to a greater proportion of medically complex children than general EDs and had greater rates of hospitalization **(Hudgins et al.; 2017)**. The challenge of providing children emergency care is more complex because of their different care needs requiring specialty trained personnel, as well as different supplies and equipment for diagnosis and treatment **(Gausche-Hill & Wiebe, 2001; McCaig & Burt, 2005, 2006)**.

Pediatric EDs provide around-the-clock care for infants, children and teenagers with injuries or life-threatening illnesses. Critical care of a seriously ill child requiring intensive monitoring and supervision, a high nurse: patient ratio, incorporating high dependency care and intensive care. An international Task Force for Pediatric

Mass Critical Care (TFPMCC) recently published recommendations related to care for children in emergency; and these could be applied to critically ill and injured children which would also provide an infrastructure and preparation for larger scale events **(Barfield et al., 2011)**.

Pediatric emergency is defined as a serious condition that threatens the child's life, it can be caused by a particular illness, an injury, or by ingesting a foreign object or poison, thus requires immediate medical attention **(Mohey and Al azmi, 2017)**.

Most children visit the EDs with complaints that are related to the respiratory system. Children not only have smaller systems, they have very different respiratory systems and are at greater risk of respiratory failure. Respiratory distress is the most common reason for children to be seen in the EDs and admitted to the hospital, and is the most common cause of death in young children. Therefore, a large focus is needed on pre-hospital care and equipment requirements to include vascular access and respiratory adjuncts **(Beitel et al., 2004; Bradley et al., 2011)**.

Causes of serious illness vary by age, respiratory illness, fever, and injury are the most common reason for

pediatric hospitalization, asthma and appendicitis are the most common reasons for hospitalization of school-age children, and affective disorders are the most common cause of adolescent hospitalizations (**Gausche-Hill, 2000., Beitel et al., 2004**).

Emergency situations occur on a daily and are most often related to ineffective airway. Whereas medical complaints are more common in the younger child, the older child is more likely to be in the EDs due to an injury. There are also a growing number of children with chronic illness seek emergency care related to their chronic illnesses such as asthma and diabetes (**Faraci, 2013**).

Pediatric office emergencies occur more commonly and most offices are not well prepared to deal with these situations. Common emergencies include foreign-body aspiration, croup, asthma, bronchiolitis, hypovolemic shock and status epilepticus. Transport of pediatric patients after initial stabilization of an emergency should always be done in a manner that provides adequate safety and monitoring (**Wheeler, Kiefer & Poss, 2000; Shenoi, Pereira, Li & Giardino, 2013**).

Pediatric emergency care requires a different set of skills and equipment from adult care. Numerous tasks such as vascular access and airway management are much more technically challenging skills in children. Numerous sizes of airway adjuncts are essential to care for children from infancy through adolescence. Medication is another challenge in pediatric emergency care as doses must be carefully calculated specific to the child's weight (**Potts& Mandleco, 2012**).

Mortality rate in critical cases depends on the severity and number of system failure. Early recognition of system failure by pediatric nurses can promote system support, reduce mortality rate and improve the outcome in children so nurses who provide care for critically ill children should be assessed for knowledge and attitude (**Hockenberry & Wilson, 2018**).

The ideal first response to a life-threatening pediatric emergency includes early recognition of the emergency, activation of the appropriate emergency response system, initiation and performance of basic life support but the extent of resuscitation training among health care providers likely to

be first at the side of a critically ill or injured child is often deficient (**Ralston & Zaritsky, 2009**).

Pediatric patients presenting to the EDs have medical procedures that are often painful, unexpected and heightened by situational stress and anxiety leading to an overall unpleasant experience, so training of health care providers is very important to reduce tension, enhance the emergency care and improve the proper handling of pediatric emergencies (**Srouji, Ratnapalan & Schneeweiss, 2010**).

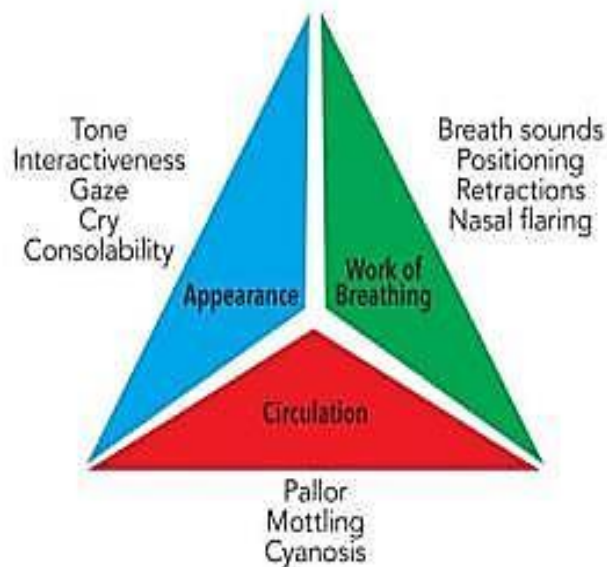
In the past, resuscitation courses beyond basic life support focused on training advanced providers. The Pediatric Emergency Assessment, recognition, and stabilization course was developed by the American Heart Association (AHA) to target a broad range of health care providers who are likely to be first at the side of a child requiring resuscitation. It is hoped that training of health care providers through this courses will translate into early recognition of life-threatening pediatric emergencies and greater resuscitation success (**Ralston & Zaritsky, 2009**).

Rapid recognition of the critically ill child is a crucial skill. The Pediatric Assessment Triangle (PAT) assists providers in assessing children quickly and is an

orderly approach for formulating an initial impression of the child's overall status from the door of the examination room. The three components of the PAT are Appearance, Breathing, and Circulation (ABC). On the basis of the initial PAT, the emergency clinician can distinguish the “sick” from the “well” child rapidly, **(Horeczko et al., 2013)**.

The (PAT) has become the cornerstone for the pediatric education for professional courses, sponsored by the American Academy of Pediatrics. This concept for emergency assessment of children has been taught to health care providers worldwide. It has been incorporated into most standardized American life support courses, including the Pediatric Advanced Life Support course (PALS), Advanced Pediatric Life Support course, and the Emergency Nursing Pediatric Course. The PAT is a rapid and simple observational tool suitable for emergency pediatric assessment regardless of presenting complaint or underlying diagnosis **(Dieckmann, Brownstein & Gausche-Hill, 2010)**.

Figure (1): Pediatric Assessment Triangle



Horeczko, T., Enriquez, B., McGrath, N. E., Gausche-Hill, M., & Lewis, R. J. (2013). The Pediatric Assessment Triangle: accuracy of its application by nurses in the triage of children. *Journal of Emergency Nursing*, 39(2), 182-189.

Part II: Preparedness during critical situations at pediatric emergency units:□

Preparedness refers to a very concrete research-based set of actions that are taken as precautionary measures in the face of potential emergencies. These actions can include both physical preparations (such as emergency supplies depots, equipments and medications) and trainings for emergency action. Preparedness is an important quality in achieving goals and in avoiding and mitigating negative outcomes (**Jahre, Pazirandeh & Van Wassenhove, 2016**).

Emergency preparedness as it specifically relates to nursing is the comprehensive knowledge, skills, abilities, and actions needed to prepare for and respond to threatened, actual, or suspected chemical, biological, radiological, nuclear or explosive incidents, man-made incidents, natural disasters, or other related events (**Slepski, 2007**).

Preparedness consists of a hazard vulnerability analysis and needs assessment, ensuring that the proper supplies and resources are available, planning the appropriate steps involved in a response, and educating the various levels of providers (**Inglesby, 2011**).

The high level of preparation includes having knowledge of the potential threats, possessing proper assessment skills to make a diagnosis, ability to respond to a threat in a quick and efficient manner; and to take proper preemptive actions, such as personal preparedness, to be available during an emergency (**Adams, 2015**).

There are many general questions as "Are we ready?" and "What are the equipments?" This frequently serves as a potent stimulus for government, public health and health care institutions to improve emergency preparedness efforts, despite being hampered by the lack of a specific target or performance measure to assess readiness (**Lazar, Cagliuso & Gebbie, 2009**).

Other than the occasional case report of events experienced and a recording of the victims affected and treated, little has been done to establish a rigorous performance assessment of the response to an actual critical situation. Therefore, a left with insufficient objective data on the present performance level of emergency preparedness making it difficult to direct efforts to be improved. This critical deficiency may be especially problematic for pediatric care (**Markenson & Krug, 2009**).

Particularly, for children receiving emergency medical services, several factors contribute to and exacerbate observed differences in quality of care, including lack of experience and lack of essential pediatric equipment and support personnel. These differences can result in delayed diagnoses, inappropriate therapies, and suboptimal medical management **(Committee on Pediatric Emergency Medicine, 2011)**. Further, among acutely ill and injured pediatric patients, there is often inappropriate use of resources **(Turner et al., 2016)**.

The factors that affect the provision of high quality emergency services at the primary care level are; good governance and collaboration among other health sector partners, sufficient health sector financing, which would in turn result in adequate health infrastructure, availability of equipment, basic medicines and motivated efficient workforce. The present work evaluated the quality of emergency health services at the primary care level and how it can be improved **(Mosadeghrad, 2014)**.

Missed care is defined as required patient care that is omitted or delayed in response to multiple demands or inadequate resources **(Papastavrou et al., 2014)**;