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Physiological and Psychological Effects of Trauma in the Pediatric Patient

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Physiological and Psychological Effects of Trauma in the Pediatric Patient

Abstract

The main purpose of this thesis is to examine, in-depth, the different effects, both physiologically and psychologically, of trauma in pediatric patients. Based on the review of articles that have been written and different studies that have been conducted, an in-depth perspective will be taken to analyze how pediatric trauma affects patients, what gap, if any, exists in the literature, and how Trauma Informed Care can be implemented in the pediatric population to increase patient health outcomes upon admittance into a health care facility as well as maintaining the outcome of the patients' health and recovery upon discharge from the healthcare facility.

The literature review that was conducted aimed to answer four research questions; 1) what are the physiological effects of trauma in the pediatric patient, 2) what are the psychological effects of trauma in the pediatric patient, 3) how often do these physiological and psychological effects of trauma occur in the pediatric patient, 4) is there any correlation between physiological and psychological effects and age, gender or traumatic event experienced?

Another aspect of this literature review was to develop the understanding of the differences in pediatric trauma, specifically physical effects of trauma, as well as to develop a greater understanding of the psychological effects of traumatic experiences in pediatric patients and how those effects, both physical and psychological, play a role in any long-term disability of the pediatric patient.

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PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF TRAUMA IN THE
PEDIATRIC PATIENT

By

Steven Filimon

A Senior Thesis Submitted to the

Eastern Michigan University

Honors College

in Partial Fulfillment of the Requirements for Graduation

with Honors in the School of Nursing

Approved at Ypsilanti, Michigan, on this date 12-5-14

Physiological and Psychological Effects of Trauma in the Pediatric Patient
An In-Depth Literature Review

By

Steven Filimon

Senior Honors Thesis

Submitted to the Honors College

For Fulfillment of Departmental Honors

For the degree of

BACHELORS OF SCIENCE

In

Nursing

Angela Lukomski RN, DNP, CPNP

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First, foremost, and always...God. Words will never be enough. Thank You for being the heartbeat.

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Abstract

The main purpose of this thesis is to examine, in-depth, the different effects, both physiologically and psychologically, of trauma in pediatric patients. Based on the review of articles that have been written and different studies that have been conducted, an in-depth perspective will be taken to analyze how pediatric trauma affects patients, what gap, if any, exists in the literature, and how Trauma Informed Care can be implemented in the pediatric population to increase patient health outcomes upon admittance into a health care facility as well as maintaining the outcome of the patients' health and recovery upon discharge from the healthcare facility.

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Another aspect of this literature review was to develop the understanding of the differences in pediatric trauma, specifically physical effects of trauma, as well as to develop a greater understanding of the psychological effects of traumatic experiences in pediatric patients and how those effects, both physical and psychological, play a role in any long-term disability of the pediatric patient.

Introduction:

Trauma is the primary cause of morbidity and mortality in the pediatric population. However, with the advancements in healthcare, children have a greater success rate of surviving these events. As a result, the care of the pediatric patient becomes increasingly more complex. It is imperative that pediatric nurses consider the unique physiological and psychological parameters of children as these factors predispose children to unique patterns of recovery.

Approximately two-thirds, 67.8%, of youth experience at least one traumatic event by 16 years of age (Wechsler-Zimring, et al. 2012). With this information in mind, one of the main goals in doing this literature review was to see how the different effects of pediatric trauma are handled in a trauma center setting and how that initial treatment can aid in the overall health outcome of the patient. The thought generated was that the better the understanding of the effects of trauma, the better the initial treatment would be that is offered, resulting in improved outcomes for the pediatric patient and their family. Also of interest in completing this literature review was the area of pediatric emergency medicine and how it differs in being specific to individual patients. The overarching idea of the exploration of the literature was to observe how traumatic experiences are manifested in pediatric patients and to explore if there are enough resources put in place to properly help pediatric trauma victims in fully recovering, both physically and/or psychologically, within a healthcare facility and after discharge from the healthcare facility.

The completion of this literature research and thesis is meant to serve as a launching pad in contributing to the existing research and the possibility of implementing

new ideas, treatments, trainings, etc., into the pediatric clinical setting. The integration of these resources will be helpful in advancing the overall efficiency and effectiveness of health care professionals that come in contact with victims of trauma in the pediatric setting.

Method:

An in depth review of the literature that focused on the different effects of pediatric trauma was conducted using several databases to obtain information on pediatric trauma. Topic subjects included, but were not limited to, major causes, immediate affects, healthcare methods, and long-term effects. Search databases for the intended literature in the area of pediatric trauma was conducted in CINAHL, PubMed, and Google Scholar for the gathering of the information that was being sought. Results from the search using keywords such as; *trauma, physiological effects, psychological effects, adolescents, pediatric, outcomes, trauma informed care*, yielded results on different types of articles and statistical data that are publicly available.

The focus of the literature research, pertaining to the articles that were being sought, was concentrated on several inclusion prerequisites, such as articles being peer-reviewed, written in the English language, and pertaining to the geographical location of the United States. There is one exception to the geographical location focus of the research articles, with the inclusion of an article that was written based on research done in Victoria, Australia. The article was included so that there could be some analysis of the differences, if any, in the effects of pediatric trauma in a different geographical location. The article also serves as a comparison of different research, results, and treatment(s) that occur in a different country.

The time range for the articles that were being sought was set between the years of 2008-2013; however, a couple older articles have been included on the basis of the relevance of the research and the information that is presented in them. The articles that are included for this literature review that have been gathered through the online databases CINAHL and PubMed, were accessed through Eastern Michigan University Library System with full permission to access these databases on account of being an educational participant (student) of the university. The articles have all been read and approved for relevance pertaining to the information of trauma, as well as post-trauma effects in the pediatric population.

The Child's Reaction to Traumatic Events Scale-Revised (CRTES-R) has also been reviewed and included in this research as it pertains to an example of implementation of Trauma Informed Care (TIC) in the pediatric setting. This scale is a questioner that assesses the different psychological responses to stressful life events in pediatric patients (Jones, 2002). Permission to use this likert-type questioner has been obtained by the creator of the scale for full implementation into this review. This scale also serves as a baseline measure for future research and implementation into a clinical pediatric setting as a human subject study.

Future Implementation:

The implementation of future research on this topic of pediatric trauma is especially important in the development of different training and programs to help nurses care for pediatric patients in the recovery process of a traumatic experience after they are discharged from the healthcare facility. The Child's Reaction to Traumatic Events Scale-Revised (CRTES-R) is a questionnaire that may perhaps be helpful in getting

implemented in clinical settings to obtain information from pediatric patients that are suffering from a traumatic experience to notice where most areas of disability, whether physiological or psychological, are found and how to treat those specific areas in aiding the patient to making a full recovery, especially post-discharge from the trauma center or hospital.

Based on the research that was done and the information that was obtained, future research will focus on using this information and implementing different interventions and training protocols that will aid in the more specifically targeted rapid implementation of emergency care and increased and effective follow-through of ongoing monitoring of pediatric patients after they are discharged from the hospital.

Defining Trauma

Trauma involves a variety of different definitions that can be associated based on age, gender, type of trauma, outcomes, and the long-lasting effects of the trauma on the individual that has experienced it or is experiencing it. The specific age group that was focused on for the information of this thesis pertains to the pediatric individual, specifically individuals 0-18 years of age.

New or additional morbidities can be a result to the patient that has experienced a traumatic event, or several traumatic events. One such definition states that trauma is 'a severely disturbing experience that leads to lasting psychological or emotional impairment', ("Trauma" *Medical Dictionary*. The American Heritage® Medical Dictionary, 2004). Another such definition of trauma is defined as 'an injury, physical or mental', (Stedman, T. *Stedman's medical dictionary for the health professions and nursing*, 2005). Both of the definitions are appropriate in relating to the research that was conducted because of the general, yet often specific scopes of understanding what trauma really is. This is also noticed in the results of some of the research that has been conducted on the issue of pediatric trauma. For example, Halloran (2002) states that there are two current definitions of trauma, 1) the presence of overwhelming and extreme danger, anxiety, or arousal; or 2) an individual's experience of profound helplessness when threatened with death or injury to self or others, (Halloran, 2002, p. 19).

Within the scope of pediatric trauma, it is important to understand that every pediatric patient is individually unique. No two patients share the same physical, emotional, or even psychological characteristics, even if they are the same gender or age. In addition to every patient being individually unique in genetic makeup, no two patients

have the same reaction to the many different types of trauma that can occur within the pediatric population.

It is also important, for the purpose of this paper, to keep in mind that the differences in characteristics of patients and the uniquely individual reactions to trauma, whether the same trauma or different, makes the treatment of trauma within pediatric patients unique in every traumatic situation that occurs. The differences in the type of trauma and the different treatments that are applied to every different situation makes the area of trauma informed care a very broad one with many different aspects that are applied to the treatments, medications, intra-hospital care, post-hospital care, and long-term health recovery and maintenance of the pediatric patient that has experienced one, or several traumatic events.

Differences in Types of Trauma

Children, 0-18 years of age, are exposed to many types of injuries. Specifically, they are unique in that they don't necessarily have all the tools, characteristics, and "experience of life" to avoid potential traumatic experiences. Because of all the added susceptible characteristics of the pediatric patient, there are many different types of trauma that can occur in this population. The susceptibility of the pediatric patient to different, unavoidable, traumatic experiences puts the pediatric individual at risk for an increased chance that a traumatic event will occur, based on the different types of situations that the pediatric individual is exposed to.

The two main categories of trauma that the pediatric individual can experience are categorized on whether or not the trauma that occurs is *intentional* or *unintentional*.

Unintentional injuries are effects that occur as a result of a traumatic injury that adds to

the comorbidity of an initial traumatic experience. For example, in the pediatric population, acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) are possible effects of initial trauma that can add to the complexity of the traumatic injuries by stimulating painful memories of the trauma. "The unintentional physical and psychological injuries that occur within the pediatric population continue to be the leading cause of morbidity and mortality, especially in children that are 1 year of age or younger" (Gold, 2008, p. 81).

These long-term effects that can result from initial trauma are found to have a serious impact in the lives of some pediatric patients that experience traumatic events. According to Gerson and Rappaport (2012) "the effects of such events [intentional and unintentional traumatic events] can last long into adulthood, as traumatic experiences in childhood lead to a greater risk of psychiatric, cardiac, metabolic, immunological, and gastrointestinal illness later in life." (Gerson and Rappaport, 2012, p.137). With the knowledge of these occurring comorbidities in the pediatric population, nurses are especially important in the frontline defense of helping the pediatric patients who experience these types of events in being able to have the necessary information, education, and tools to fully recover.

Within the categories of intentional or unintentional trauma, there are different, and more specific categories (subsets), of trauma that classify the trauma. Subsets such as family disruptions (death, divorce, etc.), group misfortune (natural disasters), personal misfortune, or man-made disaster (such as war), are all subsets of intentional and unintentional trauma (Halloran, 2002, p. 21). All of these categories, and the subsets that

exist within them, are part of the traumatic experience that the pediatric individual experiences and how it will ultimately affect them, initially as well as long term effect.

It is also important to recognize that traumatic experiences can happen very quickly, or they can happen over an extended period of time. For example, a motor vehicle accident (MVA) can be a traumatic experience that happens very quickly. A parental divorce, on the other hand, can be a traumatic event that occurs over a long period of time in a pediatric individual's life. The difference in the lengths of time that the traumatic experience has occurred can play an important role in the length of time that the patient takes in recovering from the traumatic event or experience. The length of time that a traumatic event occurs can also determine the different psychological and physical disability that the pediatric individual develops as a result.

The differences in the actual occurrence/sequence of a traumatic event are not as much of a concern for this review, as the overall effect, or reaction, of the pediatric individual who has experienced the traumatic experience. However, the amount of time, or the length of exposure that the pediatric individual has had to the traumatic event, can play a role into the different effects/manifestations that the traumatic event has on the individual. Different physical and psychological outcomes can present themselves depending on the differences in the amount of time that the individual has been exposed to the specific traumatic event(s).

Of equal concern, for the purpose of this literature review, is the pediatric individual's age that has experienced the traumatic event. Children that are younger have been found to experience more significant, as well as longer lasting effects of the traumatic experience. The differences of these effects as well as the correlation of the

individual's age are an important factor in the research outcomes that are an area of focus for this study. "Adolescents are better able to understand the significance and severity of the trauma, but younger children have fewer coping skills, less sense of time, more dependence on adults, and less ability to verbalize thoughts and feelings." (Halloran, 2002, p. 21).

Effects of trauma

Both physical and psychological manifestations of trauma occur in the pediatric individual, with many signs and symptoms occurring as a result of the different types of trauma. While in most cases physical and psychological effects occur, emotional and spiritual effects are unquestionably present in the majority, if not all, pediatric individuals that experience trauma. Just as no two individuals are exactly the same in characteristics, the presentations of traumatic experiences are unique to each case and no two individuals experience the same manifestations of a traumatic experience. However, broad categories of the different effects of trauma can be looked at and appropriately treated based on effective interventions that deal with the different types of those manifestations of trauma. For example, posttraumatic stress symptoms (PTSS) that present themselves in the pediatric patient after a traumatic event can be looked at and treated based on the different comorbidities that those symptoms create, for example, sleep disturbances, difficulty concentrating, withdrawal, etc. Based on the study by Schreier et al, (2005) "the posttraumatic stress symptoms that pediatric patients experience are significant and lasting academic and cognitive impairments as well as impairments in social and familial relationships" (p. 353).

Also unique to every individual is the way that they relate to, or are affected by a traumatic experience. While an experience can be very traumatizing to one individual, that same experience can possibly be of no great concern, or have no great effect on another individual of the same age and gender.

While traumatic experiences can affect just one part of the pediatric patient, the majority of individuals that have sustained trauma through some event, experience effects in two or more aspects of daily functioning. For example, a pediatric individual may sustain some sort of psychological burden, as well as some type of physical limitation or deformity. There are several determinants of the outcome of the traumatic event that are based on the age, cognitive development, physical maturity, psychological ability to handle trauma, support of family and/or friendships, as well as other factors, both internal and environmental.

The many different effects of trauma to the pediatric individual seems to be an ever expanding list, with both physical and psychological effects occurring, as well as many other effects within the different subsets of those main categories. General effects of pediatric trauma are mainly divided into the different effects that are experienced at different age levels.

Table 1

How common reactions to trauma differ by age-group

Children birth-5 years	Children 6-11 years	Teenagers 12-18 years
Trauma-related fears/anxiety	Trauma-related fears/anxiety	Trauma-related fears/anxiety
Sleep problems	Sleep problems	Sleep problems
Crying, sadness, whining, irritability	Depression, sadness, irritability	Depression, sadness, irritability
Confusion, misunderstanding	Confusion, misunderstanding	Confusion, misunderstanding
Difficulty concentrating	Difficulty concentrating	Difficulty concentrating
Sensitivity to loud noises	Sensitivity to loud noises	Sensitivity to loud noises
Excessive clinging/fear of being left alone	Excessive clinging	Lack of appropriate autonomy from family
Vomiting, constipation, and diarrhea	Headaches, stomachaches, nausea	Somatic complaints
Decreased appetite	Decreased interests	Decreased interests/anhedonia
Nonverbal traumatic play	Traumatic play/retelling the events	Retelling the events
Immobility/passivity	Disobedience	Rebellion
Increased aggression	Increased hostility with siblings/fighting with peers/peer rejection	Increased hostility/interpersonal difficulties
Difficulty dressing or eating without assistance	Poor school performance	Declining academic performance
Fear of darkness, animals, weather (such as lightning)	Irrational fears	Increased worries
Thumb-sucking		
Bed-wetting, soiling	Bed-wetting	
Speech difficulties (mute, stuttering)	Visual or hearing problems	
	Behavior problems at school	School problems
	Refusal to go to school	Decreased responsible behavior including antisocial behavior
		Withdrawal and isolation
	Social withdrawal	Revenge fantasies/plans
	Hate and anger statements	Negative self-attributions/feelings of guilt and shame
	Negative self-attributions/feelings of guilt and shame	Increased risk-taking behavior
		Changes in expectations about the future
		Increased use of drugs and alcohol

(Halloran, 2002, p. 20).

While both physiological and psychological effects are present in the pediatric individual after a traumatic event, there are both short-term and long-term manifestations of each category that can present within the individual. Some individuals can develop just one effect of the traumatic experience, while others, usually the majority, develop two or more comorbidities that are present as a result of the traumatic event that took place.

Table 1 lists the many signs and symptoms that are present in different pediatric individuals based on the different age groups in pediatrics.

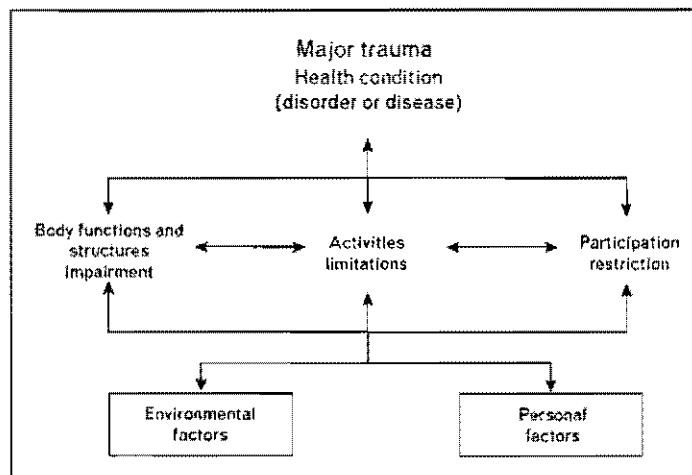
Results/Review of the Literature

Winthrop (2002) thoroughly assesses the different outcomes on quality of life based on the different health care treatments and procedures that are provided to the pediatric patient(s) that have sustained some type of trauma. Appropriate emphasis, within the article, is placed on the acknowledgement that there are several different and universal inconsistencies that lie within the realm of properly being able to follow and assess how health related quality of life (HRQOL) affects different patients based on the type of treatment that they receive. "A number of factors have been identified that influence HRQOL after pediatric trauma, including age, sex, type of injury, injury severity, functional status, symptoms of acute stress disorder or PTSD, pre-injury personality, socioeconomic status, psychosocial function and family functioning. However, there are inconsistencies in the literature with respect to which factors are more significant. For example, conflicting results are reported on the relationship between injury severity and HRQOL" (Winthrop, 2010, p. 348).

Winthrop also focuses on three different areas of injury that are included in her study for the outcome of quality of life after pediatric trauma, 1) orthopedic injuries and HRQOL, 2) impact on family, caregiver stress and burden of injury, and 3) PTSD and pediatric trauma.

While relevant to the study of the quality of life in pediatric patients after trauma, the absence of solutions or suggestions to the improvements of how quality of life can be improved and maintained with health care treatments that are given is noticed as missing

from the article. The information given within the article is good in bringing forth the different aspects that are contributing factors to all the different areas that affect pediatric patients after sustaining some type of trauma. However, the information in the article, although informative, seems to lack completeness by not including the proper initiatives that could possibly be taken in improving the HRQOL in pediatric patients *after* their hospitalization. The only mention of acknowledgment to this problem is the mention that “resources are needed to screen children and families at risk for poor HRQOL” (Winthrop, 2010, p. 350).



(Figure 1)

Many different factors often present themselves within the complexity of the long-term healing process of the patient that has sustained some sort of trauma and that are in the process of a treatment that will ultimately lead to recovery, whether it is psychological, physical, emotional, or spiritual recovery. One of the graph representations that Winthrop uses (Figure 1) depicts this concept.

This aspect is also brought to attention through another article that focuses on unintentional pediatric trauma, where the authors, Gold, Kant, and Kim, (2008) discuss

unintentional pediatric trauma and its effects on pediatric patients. The article, without a major focus on complex injuries, only goes so far as to mention what a complex injury is, stating that “complex injuries occur in the context of preexisting problems, including familial, community, and societal instability” (Gold, Kant, Hyeon Kim, 2008, p. 81).

Based on the fact that environmental factors play a role in the recovery from traumatic experiences in the pediatric individual, the function in post-discharge treatment is essential in getting the pediatric individual fully recovered. The comorbidities of a traumatic experience can be much more damaging if there are other issues outside of the trauma that are also present in the patient.

With this information in mind, one of the questions that seem to arise pertaining to care of the pediatric patient is, how the care and/or treatment of the patient, which sustained some type of trauma, is related to or implemented into the long-term treatment and recovery of pediatric patients after they leave the trauma center or healthcare facility. The education of the pediatric patients and their caretakers for continuing recovery after being discharged from the hospital setting needs to be maintained so that the sustainability and improvement of the patient’s recovery can continue to progress and be taken to completion. It is important to note that not all pediatric patients need continued treatment after they leave the healthcare facility but for those patients and families that do need that extra post-discharge care and/or treatment, the post-discharge trauma informed care that is provided becomes a very important aspect of the overall goal of the optimal health of the patient.

Halforan, (2002) discusses the different evaluation and the treatments of traumatized children and adolescents. In her article, she recognizes that there are different

approaches to treatment that occur in different phases, stating that “the first phase focuses on concrete support: ensuring safety; helping [them] adapt to new or return to previous living arrangements; and establishing a routine schedule that includes time for family, school, and friends” (Halloran, 2002, p. 23). The article also does well in mentioning the importance of the response to the trauma that the pediatric individual has gone through. This is an important factor in the recovery process of the pediatric individual because any negative response to the result of the trauma can deter the patient in being able to fully recover and it can ultimately do more harm to the patient as well as result in different comorbidities, for example psychological stress, to the individual.

Socially, a child may be at a very vulnerable disadvantage if they ultimately end up obtaining a deformity or permanent disability due to the trauma that they have sustained. Age also becomes a very important factor in this domain of trauma, as children who are at crucial ages in their cognitive development can suffer psychological trauma in addition to their existing morbidities if they are not accepted, or they feel that they are different and no longer fit in with other children of their age group. In this regard, the child that has sustained the trauma and now has a disability as a result, needs to be supported and have a well-maintained social balance that allows them to thrive psychologically and physically.

Preparedness and execution of interventions by the healthcare professionals in a trauma facility is another very important factor in the maintaining of the pediatric individuals health. The efficiency of the trauma center that a pediatric patient is getting treated at plays a big role in the different outcomes of the recovery of the pediatric patient. Not all trauma centers are always best prepared to deal with a pediatric patient

that has gone through a traumatic experience, and inability to properly diagnose and treat pediatric patients can be detrimental to their health outcomes.

One of the ways that this can be done is through the creative intervention of art therapy than can be very effective in the post-discharge care of pediatric patients. In their article, about the examination and the correlations of a traumatic event, Schreier et al. (2005) describe the positive effect that this form of therapy can have on a pediatric patient in helping them to fully recover from their traumatic experience. The intervention is aimed at the retelling of the traumatic experience through the drawing of pictures that the patient is asked to draw pertaining to the traumatic experience. "The child is engaged in a retelling of the event, using the drawings to illustrate the narrative. During the retelling, numerous issues are addressed, including misperceptions, rescue and revenge fantasies, blame, shame and guilt, coping strategies, treatment and follow-up plans, traumatic reminders, and reintegration strategies." (Schreier et al., p. 356). This is just one of the examples of the different and effective interventions that can play a significant role in helping pediatric patients in overcoming any barriers that they may have in recovering and providing the tools that they may need to continue their road to recovery, even after discharge from the trauma center and/or healthcare facility.

According to Knudson and McGrath (2007), all trauma centers should be prepared, and need to be fully equipped and ready to be able to deal with a traumatic situation that is not only adult oriented, but also be ready to treat any pediatric individual that comes in as a victim of a traumatic experience (Knudson, 2007). It is crucial to be able to not only medically treat the pediatric patient, it is also just as important to be able to provide the necessary teaching on therapies and interventions to that patient in an

appropriate way, (depending on their age, cognitive level, etc...), as well as to the family of the pediatric patient. When different teachable moments are presented, the healthcare team at the trauma center should be trained and well equipped to be able to relay important information to the caretakers of the pediatric patient. Information and the ability to provide adequate education and resources about the continuing recovery tools, social, psychological, developmental, and emotional aspects of healing is just as important as the information that is given on the procedures, diagnoses, treatments, etc... that the patient is receiving (Knudson, 2007).

This also plays an important role in the care and recovery of the pediatric patient after they are discharged from the trauma center and/or healthcare facility. It is especially important to the pediatric patient and the caretakers of the patient to be able to have access to information that may be required if any questions or concerns arise in the continuing care of the pediatric patient after they leave the healthcare facility. This is an essential role that can be expanded on in the nursing field. As Knudson and McGrath point out, "the trauma center must recognize its essential role in injury prevention...the trauma team can have a significant impact with appropriate interventions." (Knudson and McGrath, 2007).

Gap in the Literature Reviewed

After extensive review of the literature that was gathered, one of the gaps that were noticed in the literature was the aspect of continuing education for the pediatric patient and the family as a whole. Failure to provide follow-through with pediatric patients and their families after discharge from the healthcare facility may prevent complete recovery of the pediatric individual and the complete support of the family of

the affected individual. The importance of the continued educational needs for both patients and family members of the patient is an area that is of deep importance and that needs to be managed and applied to all pediatric patients that suffer a traumatic experience. Evaluation of treatments and continued support should be documented and any areas that are found to be lacking should be a focus for the improvement of the pediatric patient. The carrying out of this education needs to be applied well so that the effectiveness of the education can reap the full amount of benefits that it is meant to produce. The patient and the family will only stand to benefit from the information that is presented to them in the continuing recovery of the pediatric patient.

Also of notice in the reviewing of the literature is the missing link between the extent of which the trauma center is equipped to handle a pediatric patient that presents with a traumatic event injury, and the amount of training that is given to the staff of the trauma center to overcome any deficits in preparedness. The advancement of training for healthcare staff that is employed in the realm of emergency medicine should focus on the recognition and effective specific and targeted treatment of the different types of trauma that may be presented in the hospital or trauma center. The effectiveness in the area of being able to recognize and treat direct cause, physically and psychologically, is a major advantage to the patient that presents with a trauma in being able to stop any further development of comorbidities and preserve the wholeness of the patient so that they can begin to recover.

This gap in health provision is mentioned in an article written by Gabbe et al. (2011), which focused on the different outcomes, both functional and health-related, of pediatric patients that have experienced traumatic experiences. The article, written based

on research that was conducted in Victoria, Australia showed that pediatric trauma patients had not typically been followed after their discharge from a pediatric trauma center. The article concluded that, "seriously injured children showed ongoing disability and reduced HRQOL 12 months after injury" (Gabbe, et al, 2011, p. 1532).

The comparison from a different global geographic location that is dealing with the same issue shows the relevance that the care for pediatric patients, within the context of traumatic experiences and events, is an issue that is of global concern. If addressed properly, this issue can be resolved throughout different world regions for the betterment of the overall treatment and care for the pediatric population that deals with a traumatic event or experience.

Future Research/Implementation of Research

In each traumatic experience that occurs in the pediatric population, it is of great importance to notice if the length of the traumatic experience that the individual has gone through has added any comorbidities to the health of that specific individual. The broad understanding of the traumatic experience will aid the healthcare providers (especially nurses), in being able to provide the best treatment(s) for the pediatric patient. The more complete understanding of the trauma that the patient has experienced will also aid in the effective inter-departmental referrals that can be made for that specific patient post-hospitalization.

The use of the *Child's Reaction to Traumatic Events Scale-Revised* (Jones, 2002) is a tool that can be implemented to guide nurses in noticing the different psychological and physical manifestations that the traumatic experience or event has had on the pediatric individual. This tool can then be reviewed and specific areas of treatment can be

established for the pediatric individual. Use of interdisciplinary teams in the healthcare setting can also be established based on the different findings of this scale. Based on the needs of the patient for full recovery, this scale can allow nurses to also assess and implement different treatments and services for the pediatric individual after discharge from the health care facility.

Based on the importance of full social recovery, (stigma from a sustained deformity, etc.), the education of the family and caretakers of the pediatric individual is also very important. It is after discharge from a healthcare facility, that a child is faced with the reality of the true effect of their trauma, especially if they are at a crucial age that they are aware of the difference between them and other children. This can hurt or traumatize any individual at any age, especially the pediatric individual. Post-discharge services should be acknowledged and brought to the attention of the caretakers of the pediatric individual to aid in the transition of the child into a home, school, and social setting. It is important to recognize the need for successful integration of the pediatric individual into these different settings so that the appropriate support and encouragement can be implemented and maintained for the pediatric individual and ultimately aid in the full recovery of the child/adolescent.

Nurses can be well prepared to offer the specific and needed interventions for a pediatric individual that presents to the trauma center or hospital after a traumatic experience. The trauma center and health facility team can provide adequate and essential information for those involved in the patients care about those different treatments and interventions that are supplied to the patient in order to maintain constant and effective communication. Nurses can also effectively provide teaching to pediatric patients, their

family members, caretakers, friends, etc. in the area of social reintegration if they themselves are properly trained and educated to provide that teaching. The nurse's role in being a patient advocate for the continuing recovery of their patients even when they leave the healthcare facility is instrumental in answering the questions that may arise pertaining to the specific area of recovery for the pediatric patient.

The use of the CRTES-R and all the additional information obtained from the research can be implemented in future clinical settings as additional, personal research. The implementation of the additional research into clinical settings can be added to the existing data on trauma informed care and be significant in the completion of further projects pertaining to the effects of trauma in the pediatric individual.

Implications for Nursing

The addition of these projects and trainings can have a positive implication on the pediatric nursing field in helping nurses to continue to be confident in the care that they are providing as well as have the additional tools they need to aid in specific ways while taking care of pediatric patients that have experienced a traumatic event.

One of the findings that were gathered throughout the review of the literature is that a gap exists in the information of the treatment that is available and administered to pediatric patients after they are discharged from the hospital or trauma center. This lack of documented follow-through for pediatric patients that have suffered a traumatic experience is one that is very hindering in the recovery process, in the regards of making sure that the pediatric individual and all those affected are properly being taken care of. Different measures could be set in place for the advanced training of health care personnel at a nursing level to support the pediatric individual and their families and

caretakers in making the transition from hospital to the home setting a much more efficient and complete process.

The nurses understanding and utilization of interdisciplinary healthcare is also a major role in the post-discharge recovery process of a pediatric patient that has suffered a traumatic experience. Areas of medicine such as physical therapy, occupational therapy, environmental safety, psychological counseling services, etc. are not implemented enough for the continuing treatment of the pediatric child to fully recover from the traumatic experience, whether it is physical or psychological.

Additionally, nursing care that extends beyond the time that the pediatric patient spends in a healthcare facility due to a traumatic experience is many times a very critical component in aiding in the full recovery of the patient. The nurse plays a vital role in helping the patient, and their caretaker(s) to properly balance both the transition into a home environment and full recovery of the traumatic experience.

Conclusion

With the added insight into pediatric trauma and its effects, both physically and psychologically, nurses will not only be able to continue to provide effective and efficient care to their patients, but they will also be able to provide appropriate anticipatory guidance for parents and children. This will aid in providing faster and complete recovery for pediatric patients that experience a traumatic event, and will also have the added benefit of increased health to an up-and-coming generation of individuals in society.

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APPENDIX A

Articles Reviewed for Relevance to Project/Study

ARTICLE #	AUTHOR(S)	YEAR	TITLE	RESEARCH DESIGN	PURPOSE OF STUDY	INCLUDE
1	Gabbe, B. J., Simpson, P. S., Sutherland, A. M., Palmer, C. S., Williamson, O. D., Bevan, C., & Cameron, P. A.	2011	Functional and Health-Related Quality of Life Outcomes After Pediatric Trauma	Prospective cohort study	To measure the potential for lifelong problems in pediatric patients 1 month, 6 months, and 12 months following injury	Yes
2	Gerson, R., & Rappaport, N.	2012	Traumatic Stress and Posttraumatic Stress Disorder in Youth: Recent Research Findings on Clinical Impact, Assessment, and Treatment	Qualitative systematic research	To research literature pertaining to the impact of traumatic stress on adolescent development	Yes
3	Ghanizadeh, A., & Tavassoli, M.	2007	Gender Comparison of Exposed Trauma and Posttraumatic Stress Disorder in a Community Sample of Adolescents	Multistage stratified cluster sampling study	To survey the prevalence of exposed traumatic events and posttraumatic stress disorder among high school students	No
4	Gold, J. I., Kant, A. J., & Kim, S. H.	2008	The Impact of Unintentional Pediatric Trauma: A Review of Pain, Acute Stress, and Posttraumatic Stress	Qualitative research	To research how ASD and PTSD result from simple injury in pediatric patients and how pain plays the role of both a trigger and a symptom	Yes

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Articles Reviewed for Relevance to Project/Study

5	Halloran, E. C.	2002	Evaluation and treatment of traumatized children and adolescents	Qualitative descriptive research	To research how traumatic events can affect different age-groups differently and how to best approach treatment in each age-group	Yes
6	Jones, R.T., Fletcher, K., & Ribbe D. R.	2002	Child's Reaction to Traumatic Events Scale-Revised	Qualitative research questionnaire	To assess psychological responses to stressful life events	Yes
7	Knudson, M., & Mcgrath, J.	2007	Improving Outcomes in Pediatric Trauma Care: Essential Characteristics of the Trauma Center	Qualitative descriptive research	To assess the five major aspects of a trauma center and describe the essential role that they play in the treatment of pediatric injury	Yes
8	McNally, R. J.	1996	Assessment of Posttraumatic Stress Disorder in Children and Adolescents	Qualitative descriptive research	To assess the research of PTSD in children and adolescents using an interview, questionnaire, and psycho-physiological approach	No
9	Regan, K. R.	2010	Trauma Informed Care on an Inpatient Pediatric Psychiatric Unit and The Emergence of Ethical Dilemmas as Nurses Evolved their Practice	Quantitative case study	To explore the ethical dilemmas experienced by nurses who wanted to improve their patient care practice	No

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Articles Reviewed for Relevance to Project/Study

10	Schreier, H., Ladakakos, C., Morabito, D., Chapman, L., & Knudson, M. M.	2005	Posttraumatic Stress Symptoms in Children after Mild to Moderate Pediatric Trauma	Longitudinal quantitative study	To examine the prevalence of PTSD in children and adolescents after an acute traumatic event using an interview approach	Yes
11	Wallace, M., Puryear, A., & Cannada, L.	2012	An Evaluation of Posttraumatic Stress Disorder and Parent Stress in Children With Orthopedic Injuries	Prospective study	To evaluate pediatric orthopedic trauma and the correlation of symptoms of PTSD as well as parent stress	No
12	Wechsler-Zimring, A., Kearney, C., Kaur, H., & Day, T.	2012	Posttraumatic Stress Disorder and Removal from Home as a Primary, Secondary, or Disclaimed Trauma in Maltreated Adolescents	Quantitative Study	To evaluate the effect of PTSD on maltreated youth using several measures in a structured interview	Yes
13	Winthrop, A. L.	2010	Health-related quality of life after pediatric trauma	Literature review	To measure all health dimensions relevant to the pediatric trauma population	Yes