

Effect of Trauma-Informed Care Educational Program on Nurses' Knowledge and Practices at Pediatric Burn Unit

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Abstract

Background: Trauma-informed care includes a range of practices that build a culture of safety, healing, and empowerment. Burns' practices in pediatrics don't fully incorporate trauma-informed care (TIC), as the nature, extent, and impacts of trauma are not understood. Nurses are uniquely positioned to provide trauma-informed care, as they care for children in a serious and complex healthcare setting. **The study aimed** to evaluate the effect of trauma-informed care educational program on nurses' knowledge and practices at the pediatric burn unit. **Study design:** A quasi-experimental research design using one group (before, immediately after, and 2 months follow-up) was used. **Setting:** The study carried out at the Pediatric Burn Unit at the Plastic, Reconstructive, and Burn Surgery Center at Mansoura University Hospitals, Egypt. **Subjects:** A convenience sample of (65) pediatric burn nurses were recruited in the study. **Tools:** Data were collected using nurses' knowledge structured questionnaire and Nurses' Self-rated competence scale. **Results:** The study revealed that there was a significant improvement in nurses' knowledge. All nurses showed incompetent score levels of practice before intervention. While the majority of them had a competent level of practice immediately and after two months of intervention. There were highly statistically significant differences in relation to most items of nurses' opinions regarding trauma-informed care before and after the educational intervention. **Conclusion:** Implementing an educational program about trauma-informed care effectively improved nurses' knowledge and practices about the importance of incorporating both medical and psychological care at the pediatric burn unit. **Recommendation:** Periodic trauma-informed care training for nurses is needed and should aim to build nurses competence in providing trauma-informed care in different health care sitting.

Keywords: Trauma Informed-Care, Nurses, Pediatric Burn, Pediatric Trauma

Introduction:

Burns is a prominent cause of death worldwide, killing approximately 180 000 people each year. Children and adolescents account for 22.5% of burns, with children aged 5 to 16 accounting for 42%. Burns are among the most traumatic injuries a child may experience, and when combined with long-term aggressive and non-aggressive medical and nursing therapies, they can

cause long-term physical and psychological problems. Children, particularly those under the age of five, have been proven to be more vulnerable to burn injuries, ranging from simple wounds that may be managed at home to moderate wounds that require surgical treatment in the pediatric burns unit and major wounds that necessitate retrieval to the pediatric intensive care unit (PICU) and burns unit. However, Major burn

injuries necessitate high-quality care to guarantee a satisfactory cosmetic and functional outcome (**Brinegar, 2022**).

Ongoing epidemiological data on childhood burn injuries are crucial to provide vital information for developing strategies aimed at reducing their frequency and severity. Successful strategies have included establishing primary prevention programs that focus on reducing exposure and secondary strategies that focus on the outcome of burn injuries following early therapeutic action in emergency rooms and burn units. Treating a child with a significant burn injury can comprise multiple invasive frightening procedures, prolonged treatments, and regular encounters with a health facility (**Ibrahim, Abusaad & Ebrahim, 2021**).

Burns affect the child on a physical as well as a psychosocial level. According to the integrated model of pediatric medical traumatic stress, several stages of an accident or illness might be stressful for children. After a burn injury, children may have acute and post-traumatic stress symptoms. Repeating the traumatic event is one of the symptoms of post-traumatic stress disorder in the form of flashbacks, intrusive memories, and nightmares (**American Burn Association, 2019; WHO, 2018**). Adjustment to burns might be difficult, children describe changes on an emotional, behavioral, and social level, this included avoidant and overly sensitive behavior, anxiety about one's look, and unfavorable peer reactions. Children additionally discussed how their experiences may be reframed positively and how they might be able to grow personally at the same time (**The Royal Children's Hospital Melbourne, 2022**).

A trauma-informed care model (TIC) recognizes how trauma shapes a person's

experiences, vulnerabilities, and recovery between service providers and service users. By incorporating TIC into the assessment and treatment of burn patients, trauma reactions and mental disorders will be treated (**Cleary, et al., 2020**). The trauma-informed care (TIC) philosophy and practices aim to improve the way professionals treat traumatized individuals. To support the implementation of trauma-informed care, the workforce needs to be able to deliver care and a strategic commitment to practice change needs to be implemented more systematically (**Simons, Kimble & Tyack, 2021**). A trauma-informed approach or psychosocial care in pediatric healthcare supports the children's and their parent's emotional needs by anticipating their needs throughout recovery. In addition, this approach is used to improve the quality of care for children and their families, as well as the well-being of healthcare workers. (**Oral, et al, 2020; Stenman, 2019**).

Nurses play a critical role in preventing injury-related post-traumatic stress disorder by providing trauma-informed care, which includes recognizing pre-existing trauma, addressing acute traumatic stress reactions associated with the traumatic event, minimizing potentially traumatic aspects of treatment, and identifying children who require additional monitoring or referrals for additional help (**Children's Hospital of Philadelphia, (2015); Wheeler & Phillips, 2019**). Today's nurses care for children in a complex and diversified healthcare environment. Trauma awareness, trauma evaluation in pediatrics, and health and resiliency promotion are all critical. At the same time, healthcare governing systems and professional organizations continue to acquire best practices for implementing what is known about trauma-informed care into the field. The nurse is in a prime

position regardless of the practice environment to implement trauma-informed care as part of a basic skill set to help reduce trauma triggers and build resilience and strength-based empowerment for children (Goddard, Janicek & Etcher, 2022).

Significance of the study:

In the long run, pediatric burn victims are at risk for elevated anxiety, traumatic stress symptoms, and psychopathology (Woolard et al., 2021). To become trauma-informed, a care system must first comprehend the complexities of trauma. The demand for trauma-informed care systems has expanded in recent years, but even when trauma is not the primary focus of services, it is critical to teach all workers, administrative staff, and secretarial staff to transform the organization to become trauma-informed. One method of professional staff training is to improve the knowledge and abilities of pediatric nurses who give treatment to traumatized children through education. In this article, we examine how trauma-informed care can be adapted and applied to foster the professional and personal development of pediatric nurses on burn units (Berger, & Quiros, 2014). Therefore, this study aims to evaluate the effect of implementing an educational program about trauma-informed care on nurses' knowledge and practice at the pediatric burn unit.

Aim of the study:

This study aimed to evaluate the effect of trauma-informed care educational program on nurses' knowledge and practices at the pediatric burn unit.

This aim can be accomplished through:

- Assess pediatric burn nurses' knowledge, opinions and perceived barriers regarding trauma-informed care.
- Assess pediatric burn nurses' practices related to trauma-informed care.

- Designing and implementing a trauma-informed care educational program for pediatric nurses working at burn unit at the Plastic, Reconstructive, and Burn Surgery Center.
- Evaluating the effect of implementing a trauma-informed care educational program on knowledge and practices of pediatric burn nurses'.

Research Hypothesis:

H1. The implementation of trauma-informed Care (TIC) educational program will promote the knowledge of pediatric burn nurses.

H2. The implementation of trauma-informed Care (TIC) educational program will promote the practice of pediatric burn nurses.

Research design:

A quasi-experimental research design using one group (before, immediately after, and one-month follow-up) was used. Quasi-experimental design aims to establish a cause-and-effect relationship between an independent and dependent variable. However, unlike a true experiment, a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria (Andrade, 2021).

Setting:

This study was carried out in the burn unit at the Plastic, Reconstructive, and Burn Surgery Center allied with Mansoura University. This center is located at Mansoura University Hospitals and provides care for burned patients and plastic surgery. The building contains two floors to care for burned patients and ICU. It has a special floor for operation and a separate floor for plastic and reconstructive Surgery, each floor consists of six rooms to care for burned patients, and each room consists of 3 beds, a hydrotherapy room, a bathroom, a nursing room, and a doctor's room. The nurse to burnt patient ratio in the morning shift was

2:1 (2 nurses to 1 pediatric patient) and sometimes 1:1 while; in the afternoon and night shifts was 1: 2. This setting was selected due to the high prevalence of burned children in them and because they serve the biggest region of the children in rural and urban areas.

Subjects:

The Sample Size was calculated based on data from the literature (**Broughton, 2017**), considering the level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula: $n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \times 2(SD)^2}{d^2}$

Where, SD = standard deviation obtained from the previous study; $Z_{\alpha/2}$, for 5% this is 1.96; Z_{β} , for 80% this is 0.84 and d, for the expected difference. Therefore, $n = \frac{(1.96 + 0.84)^2 \times 2(1.1)^2}{(0.544)^2} = 64.1$

A convenience sample of (65) pediatric burn nurses were recruited considering the following inclusion criteria: willing to participate in the study and have no mental or physical disorders regardless of their age, gender, educational level, or years of experience.

Tools: Three tools were used in the current study:

Tool I: Demographic and occupational structured questionnaire:

This tool was used to investigate the nurses' demographic data such as age and educational level, and their occupational data as, years of experience, and participation in any training courses about TIC.

Tool II: Nurses' Knowledge Structured Questionnaire:

This tool includes two parts:

Part (1). Used to assess nurses' knowledge regarding Trauma Informed Care (TIC), including the prevalence and risk factors, signs & symptoms of trauma, and effectiveness of screening and intervention of TIC in children with burns. It was

formulated by the researchers following a review of recent literature and studies (**Simons, Kimble & Tyack, 2022; Cleary, et al., 2020; Moss, et al., (2019); Bruce, Kassam-Adams, Rogers, Anderson, Sluys & Richmond, 2018**). The scoring system was calculated through one mark awarded for each correct answer. The total score of knowledge was 11 points with a cut-off point for the unsatisfactory knowledge level of less than 75% of total scores (less than 8.25 marks), and a satisfactory level for 75% to and more of total scores (from 8.25 marks and more).

Part (2). Nurses' opinions and perceived barriers regarding trauma-informed care:

It includes six statements that examine nurses' opinions regarding TIC and four statements that examine barriers to applying TIC to nurses 'practice from their point of view. Nurses' opinions and perceived barriers regarding trauma-informed care were evaluated twice times before and after the application of the educational program.

Tool III: Nurses' Self-rated competence scale:

It was adapted from **Kassam-Adams et al., 2015**. This scale was used to assess nurses' self-rated competence related to TIC practices for children with burns. It is composed of 3 categories (Detection and Assessment, Intervention and Management, and Education and Counselling). All these categories were composed of 17 items. The scoring system was developed on the bases of (3 for "Very Competent", 2 for "Somewhat Competent", and 1 for "Not Competent" for ten Likert scale questions. Seven Yes and No questions, one mark awarded for a No response, and two marks awarded for a Yes response. To calculate the total self-competency domain score, the responses were summed up, and the total score was 44. A nurse's level of perceived self-competency was considered competent

when the total score exceeded 75% (33 and more) and incompetent when the total score was less than 75% (less than 33 marks).

Method

Ethical considerations: The study was approved by the research ethical committee at Mansoura Faculty of Nursing (R: No. p. 0368), and by the head of the pediatric burn unit affiliated with the Plastic, Reconstructive, and Burn Surgery Center at Mansoura University after the purpose of the study was explained. Also, nurses' informed consent to voluntarily participate in the study was obtained after the purpose of the study was explained to each participant (nurse) before starting the study. Data privacy and confidentiality were assured throughout the study. Participants have the right to withdraw from the study at any time without any responsibility.

Validity and reliability:

An expert panel of 5 experts in the fields of pediatric and psychiatric and mental health nursing reviewed data collection tools for clarity, relevance, applicability, and comprehensiveness. Based on their opinions, any significant modifications were made to the tools. Tools' reliability: To verify the reliability of the developed tools, a statistician used Cronbach's alpha coefficient test to assess the internal consistency over the whole questionnaire. Nurses' Knowledge Structured Questionnaire $\alpha = 0.776$ and Nurses' Self-rated competence scale $\alpha = 0.976$.

Pilot study: was conducted on 10% of the total number of the study subjects (6 nurses) to demonstrate the feasibility and applicability of the study tools, furthermore, it indicated the time required to complete the instruments. Since no significant changes were needed in the study tools, the subjects of the pilot study were included in the total sample.

Fieldwork:

Process of data collection:

In this study, data were collected approximately over four months starting from the beginning of January 2023 to the end of April 2023. Using the previously mentioned study tools, each nurse was interviewed individually to obtain the required data from 9 a.m. to 12 p.m. The nurses answered the questionnaire after it had been explained to them by the researchers; it took fifteen minutes to complete the questionnaire. Nurse participants were divided into small groups (11 each). There were three phases to the data collection process (assessment, implementation, and evaluation phase). The initial assessment was done before beginning the TIC education "pre-test". The second stage is to implement TIC education, followed by two months follow-up to evaluate the impact of the intervention. The intervals were selected to ascertain the maximum benefits of the intervention, based on the assumption that nurses would observe the learning process by stages of attention, retention, and motivation. Furthermore, the second assessment post-intervention (two months later) examined nurses' retention and use of the acquired learning knowledge in their practice, as well as the effect of the TIC educational program.

Assessment phase: To help nurses understand how to complete the questionnaire, the researchers provided a brief introduction. Nurses' knowledge and practices of TIC at the burn unit of the plastic, reconstructive, and burn surgery center before, immediately after, and two months after implementation includes prevalence and risk factors of trauma, signs and symptoms of trauma, and effectiveness of screening, intervention, and nurses' opinions perceived barriers of TIC in burnt children and nurses' TIC related practices

using the above tools (tool I, tool II, and tool III).

Implementation phase: Following the assessment phase, goals, priorities, and expected outcomes were formulated to address nurses' practical needs and knowledge deficits regarding TIC for children with burns. The application of the TIC educational program was aimed to improve the nurses' knowledge and practice regarding TIC at plastic, reconstructive, and burn surgery center through a booklet involved three main chapters based upon the assessment of the actual educational needs of the nurses, the objectives and contents of the program were determined based on a thorough review of the related literatures (Davies, 2022; Garner, Andrew, and Michael Yogman, 2021 & Oral, et al. 2020) and translated into Arabic language; every chapter explanation consumed 2 sessions with nurses, where nurses were divided into six groups (10 to 12 nurses each), each session lasted for 45- 60 minutes along 6 weeks duration. Including fifteen minutes for open discussion and nurses' feedback.

Three chapters are included in the Trauma-Informed Care educational program

In the first chapter (the first two sessions) the meaning and principles of TIC were discussed, as well as the prevalence, risk factors, and the signs & symptoms of trauma that children and their families experience, how to assess these symptoms, how trauma impacts health, and the effectiveness of trauma screening, detection, and assessment. The second chapter (the third and fourth sessions) discussed TIC interventions and management, identifying the necessary areas for TIC implementation, and strategies to incorporate trauma knowledge into policies, procedures, and practices. Taking steps to avoid re-traumatization (i.e., trauma reactions caused by interactions with those directly affected by traumatic events).

Finally, the third chapter of the TIC instructional booklet (the fifth and sixth sessions) discussed techniques to cope with upsetting circumstances (e.g. accept the uncontrollable situation, focus on the controllable, identify and acknowledge the child & family strengths and find/use the positive aspects of the situation. and informs parents about emotional or behavioral reactions that signal that the child may want assistance. The researchers began describing each session with a synopsis of the previous session and the objectives of the new session. Reinforcement of teaching was completed based on the needs of nurses to validate their grasp. Many teaching methods were used such as group discussions, lectures, and power-point demonstrations.

Evaluation phase: After the implementation of the TIC educational program, nurses' knowledge and practices were evaluated immediately and after two months follow-up using the previously mentioned study tools.

Statistical design

Statistical Package of social sciences (SPSS) version 24 was used to code and enter the collected data. Upon completing the entry process, data were analyzed to detect errors, followed by analysis with the same program to present frequency tables with percentages. Percentages were used for qualitative data. Kolmogorov-Smirnov was used to test study data for normality. RM-ANOVA was used to compare the mean scores of more than two closely related groups when the variables were normally distributed. For comparisons between two or more closely related groups, paired t-test was used. Wilcoxon Signed Ranks tests were used for not normally distributed variables to determine the difference between the mean scores of two related groups and Friedman tests for more than two related groups. Key study variables were correlated using Spearman correlation (r). The significance

level (P-value) of all tests was equal to or less than 0.05.

Results:

Table (1) illustrated that more than three-quarters (89.2%) were female, and more than half (50.8%) were in the age group between 30 to less than 40 years, with a mean of 28.94 (6.299) years old. As regards nurses' educational level, it was noticed that one-third of the nurses had bachelor's degrees and had from 1 to less than 5 years of experience (35.4% for each), with mean years' experience of 6.55 (3.38) years. The majority of the studied nurses did not receive workshops about trauma-informed care (92.3%).

Table (2) reveals that 55.4% of the studied nurses had an unsatisfactory level of knowledge regarding the prevalence and risk factors of trauma before the educational intervention. While immediately and 2 months after the educational intervention, this percentage improved to 16.9% and 23.1%, respectively. Regarding the total knowledge level, it was noticed that slightly less than two-thirds of the studied nurses (61.5%) had "unsatisfactory" levels of knowledge about all knowledge items before the intervention. Immediately after the educational program and two months later, this percentage decreased to 4.6% and 12.3%, respectively. The difference was significant ($p=0.000$ between before, immediately after, and two months after the educational program relating the previous items).

Table (3) represents that there were highly statistically significant differences in relation to most items of nurses' opinions regarding trauma-informed care before and after the educational intervention ($P=0.000$).

Fig (1) portrays that slightly less than three-quarters of the studied nurses perceived time constraints and lack of training as significant barriers regarding trauma-informed care

intervention (73.8% for each). A minority of nurses reported that confusing evidence of what to do and worry about further upsetting children and families were considered as somewhat of barriers regarding trauma-informed care intervention (12.3% and 18.5% respectively).

Table (4) illustrates that all nurses showed an incompetent score level of practice with a mean of 23.85(3.5) before intervention. While 67.7% and 84.6% of them had a competent level of practice post and after two months of intervention with a mean of 33.86(2.1) and 33.86(2.1) respectively. There were significant differences in relation to nurses' self-competency rating scale regarding trauma-informed care before, immediately after, and 2 months after the educational intervention ($P=0.000$).

Table (5) showed that there were statistically significant differences between the level of education, marital status, years of experience, and attaining workshops about trauma-informed care as personal characteristics of the studied nurses and their total knowledge score related to trauma-informed care before, immediately after, and two months after the educational intervention ($P=0.000,0.000,0.006$ and 0.001 , respectively).

Table (6) showed that there were statistically significant differences between the level of education, marital status, years of experience, and attaining workshops about trauma-informed care as personal characteristics of the studied nurses and their total practice score related to trauma-informed care before, immediately after, and two months after the educational intervention ($P=0.000,0.001,0.026$ and 0.000 , respectively).

Table (7) represents a weak positive correlation between the total knowledge score and total self-competence rating score

related to trauma-informed care before the educational intervention.

Table (1). Percentage Distribution of studied nurses' characteristics N = (65)

Items	N = (65)	(%)
Age		
From 20 to less than 30	31	47.7
From 30 to less than 40	33	50.8
From 40 to less than 50	1	1.5
(SD)	28.94(6.299)	
Sex		
Male	7	10.8
Female	58	89.2
Marital status		
Single	23	35.4
Married	40	61.5
Widow	2	3.1
Level of education		
Diplome (nursing school)	37	56.9
Technical nursing institute	5	7.7
Bachelor's degree (BSc)	23	35.4
Years of experience		
Less than 1 year	2	3.1
1 to less than 5 years	23	35.4
5 to less than 10 years	22	33.8
10 years and more	18	27.7
(SD)	6.55(3.38)	
Years employed as a nurse at the burn department		
Less than 1 year	15	23.1
1 to less than 5 years	32	49.2
5 and more	18	27.7
(SD)	3.88 (2.36)	
Participation in any training courses about trauma-informed care		
Yes	5	7.7
No	60	92.3

Table (2). Level of Nurses' knowledge regarding trauma-informed care before, immediately after, and 2 months after the educational intervention N = (65)

Knowledge	Test time N = 65						F	P value*
	Before		Immediately after		After 2 months			
	N	%	N	%	N	%		
Prevalence and risk factors of trauma (6 marks)								
Satisfactory	29	44.6	54	83.1	50	76.9	29.64	0.000
Unsatisfactory	36	55.4	11	16.9	15	23.1		
(SD)	4.2 (1.54)		5.65 (0.80)		5.52 (0.89)			
Signs and symptoms of trauma (3 marks)								
Satisfactory	17	26.2	58	89.2	53	81.5	44.39	0.000
Unsatisfactory	48	73.8	7	10.8	12	18.5		
(SD)	2.22 (0.52)		2.89 (0.31)		2.78 (0.48)			
Effectiveness of screening and intervention (2 marks)								
Satisfactory	42	64.6	56	86.2	56	86.2	19.00	0.000
Unsatisfactory	23	35.4	9	13.8	9	13.8		
(SD)	1.29(0.96)		1.86(0.35)		1.86(0.35)			
Total knowledge (11 marks)								
Satisfactory	25	38.5	62	95.4	57	87.7	48.78	0.000
Unsatisfactory	40	61.5	3	4.6	8	12.3		
(SD)	7.71(2.47)		10.4(0.98)		10.17(1.23)			

F: Repeated measured ANOVA

P (significance)

* Significant (p< 0.001)

Table (3). Nurses’ opinions regarding trauma-informed care before and after the educational intervention N = (65)

Items	Test time N = 65		Z-Score	P value
	Before	After		
Providers should focus on medical care for hospitalized children as opposed to children’s mental health.	3(1)	3(1)	-6.363	0.000*
The way that medical care is provided can be changed to make it less stressful for children and families.	3(0)	3(1)	-3.922	0.000*
Providers can teach families how to cope with trauma.	3(0)	3(0)	-1.372	0.170
Healthcare professionals should regularly assess for symptoms of traumatic stress.	3(1)	4(0)	-5.437	0.000*
Providers must have mental health information about their pediatric patients to provide appropriate medical care.	2(1)	3(1)	-6.329	0.000*
I have colleagues I can turn to for help with a child or family experiencing significant traumatic stress.	2(1)	3(1)	-6.979	0.000*

Z: Wilcoxon test Data are presented median (interquartile range)
 P (significance)
 * Significant (p< 0.001)

Figure (1). Nurses’ perceived barriers regarding trauma-informed care intervention

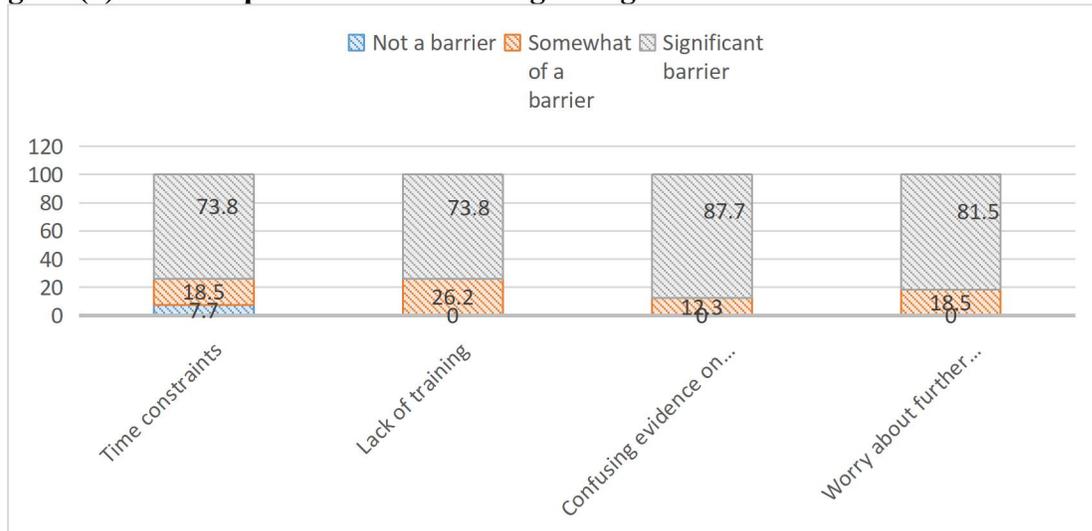


Table (4). Nurses' self-rating competency practice regarding trauma-informed care before, immediately after, and 2 months after the educational intervention: N = (65)

Self-Rating Competency Scale	Test time N = 65						F	P value*
	Before		Immediately after		After 2 months			
	N	%	N	%	N	%		
Detection and assessment (13 marks)								
Incompetent	59	90.8	22	33.8	22	33.8	170.86	0.000
Competent	6	9.2	43	66.2	43	66.2		
(SD)	6.35(1.7)		9.12(1.2)		9.13(1.3)			
Intervention and management (18 marks)								
Incompetent	65	100	27	41.5	28	43.1	407.41	0.000
Competent	0	0	38	58.5	37	56.9		
(SD)	9.91(1.5)		13.63(0.89)		13.89(0.99)			
Education and counseling (13 marks)								
Incompetent	63	96.9	1	1.5	0	0	409.94	0.000
Competent	2	3.1	64	98.5	65	100		
(SD)	7.57(1.2)		11.1(1.03)		11.72(1.1)			
Total practice (44 marks)								
Incompetent	65	100	21	32.3	10	15.4	693.08	0.000
Competent	0	0	44	67.7	55	84.6		
(SD)	23.85(3.5)		33.86(2.1)		34.78(1.96)			

F: Repeated measured ANOVA

P (significance)

* Significant (p< 0.001)

Table (5). Relationships between personal characteristics of nurses and their total knowledge score related to trauma-informed care before, post, and two months after intervention.

Personal Characteristics	Total knowledge		
	Before Mean (SD)	Immediately after Mean (SD)	After 2 months Mean (SD)
Age			
From 20 to less than 30	7(2.1)	9(0.0)	11(0.0)
From 30 to less than 40	8.33(2.7)	8.9(0.3)	11(0.0)
From 40 to less than 50	9(-)	9(-)	11(-)
Significance	F=2.886 (P=0.063)		
Sex			
Male	7.57(1.9)	9(0.0)	11(0.0)
Female	7.72(1.5)	8.95(0.2)	11(0.0)
Significance	F=0.035 (P=0.853)		
Level of education			
Diplome (nursing school)	6.14(1.7)	8.92(0.3)	11(0.0)
Technical nursing institute	6.8(1.3)	9(0.0)	11(0.0)
Bachelor's degree (BSc)	10.43(0.9)	9(0.0)	11(0.0)
Significance	F=70.563 (P=0.000*)		
Marital status			
Single	6.04(1.2)	9(0.0)	11(0.0)
Married	8(1.4)	8.93(0.3)	11(0.0)
Widow	8.65(2.6)	9(0.0)	11(0.0)
Significance	F=11.537(P=0.000*)		
Years of experience			
Less than 1 year	8.5(0.7)	9(0.0)	11(0.0)
1 to less than 5 years	6(1.1)	9(0.0)	11(0.0)
5 to less than 10 years	10.59(0.2)	9(0.0)	11(0.0)
10 years and more	6.28(2)	8.83(0.4)	11(0.0)
Significance	F=62.046 (P=0.006*)		
Workshop about trauma-informed care			
Yes	9(0.0)	11(0.0)	11(0.0)
No	7.43(2.4)	8.95(0.2)	11(0.0)
Significance	F=11.425 (P=0.001*)		

F (Repeated measure ANOVA)

P (significance)

Table (6). Relationships between personal characteristics of nurses and their total self-competence rating score related to trauma-informed care before, immediately after and two months after the educational intervention:

Personal Characteristics	Total Self-Competence Rating Scale		
	Before Mean (SD)	Immediately after Mean (SD)	After 2 months Mean (SD)
Age			
From 20 to less than 30	23.45(5.03)	33.48(2.2)	34.39(2.2)
From 30 to less than 40	24.09(.29)	34.12(1.9)	35.1(1.6)
From 40 to less than 50	28 (-)	37(-)	37(-)
Significance	F=0.138 (P=0.92)		
Sex			
Male	26.71(5.96)	35(2.52)	35.57(2.57)
Female	23.5(2.99)	33.72(1.98)	34.69(1.88)
Significance	F=2.91 (P=0.08)		
Level of education			
Diplome (nursing school)	22(2.68)	33.27(2.04)	34.24(2.1)
Technical nursing institute	29.6(0.55)	35.6(2.5)	35.6(1.95)
Bachelor's degree (BSc)	25.57(2.77)	34.43(1.67)	35.48(1.44)
Significance	F=12.594 (P=0.000*)		
Marital status			
Single	21.52(4.21)	33.21(2.19)	33.87(2.18)
Married	24.93(2.1)	34.13(1.92)	35.3(1.68)
Widow	29(0.00)	36(0.00)	35(0.00)
Significance	F=6.458(P=0.001*)		
Years of experience			
Less than 1 year	18(0.00)	33(0.00)	33(0.00)
1 to less than 5 years	22.48(4.55)	33.48(2.33)	34.04(2.18)
5 to less than 10 years	25.36(2.65)	34.36(1.68)	35.45(1.47)
10 years and more	24.39(0.98)	33.83(2.2)	35.11(1.94)
Significance	F=2.926 (P=0.026*)		
Workshops about trauma-informed care			
Yes	30(1.41)	34(2)	36.2(2.17)
No	23.33(3.12)	33.85(2.08)	34.67(1.91)
Significance	F=62 (P=0.000*)		

F (Repeated measure ANOVA)

P (significance)

* Significant (p< 0.05)

Table (7). Correlation between total knowledge score and total self-competence rating score related trauma-informed care before, and immediately post.

Predictor	Total knowledge score			
	Before		After	
	Rs	P	Rs	P
Total self-competence rating score	0.303	0.014*	-0.045	0.719

rs: for Spearman's correlation

P value significant if ≤ 0.05

If $rs \leq 0.5$ = weak correlation

If $rs > 0.5$ = strong correlation

Discussion

Trauma-Informed Pediatric care integrates an understanding of post-traumatic stress, and specific practices to reduce posttraumatic stress, into the clinical care of ill or injured children. Pediatric burn is a common potentially emotionally traumatic event. Trauma-informed care involves a range of practices that shape a culture of safety, healing, and empowerment. It is reasoned that the potential for nursing care to become a trauma-informed practice that can be concerned with addressing distress and supporting the emotional needs of the children and their families throughout the treatment and recovery process. Such practices are likely to improve the quality of care for children and their families, as well as the well-being of nurses (Forkey, et al., 2022).

Continuing education especially for pediatric burn nurses about TIC is a crucial part of their professional development (Cleary et al., 2020). The current study showed that a high percentage of studied nurses did not attend training courses about TIC. This outcome might be brought on by the overworked nature of nurses, the staffing crisis, the dearth of training opportunities, and the dearth of specialized nursing curricula. This finding is incongruent with Simons, Kimble, & Tyack, (2022) who

reported that 64% of the study participant receive 1-10 hours of training specific to trauma-informed care.

Concerning the Level of Nurses' knowledge regarding trauma-informed care before, immediately after, and two months after the educational intervention the current results revealed that about one-third of the participants in this study demonstrated a satisfactory knowledge score as nearly half of them have an overall understanding of prevalence and risk factors of traumatic stress, and slightly less than two-thirds of them actually know the effectiveness of screening and intervention, as they consider the TIC as a contemporary because it's relevant to the holistic approach, which is part of what they know. These findings are congruent with Conley, A. S., (2015) who conduct a study at the oncology unit entitled "Assessment of Nurses' Views and Current Practice of Trauma-Informed Pediatric" and demonstrated that oncology nurses have an overall understanding of traumatic stress. On the other hand, almost three-quarters of nurses at the pediatric burn unit have unsatisfactory scores regarding how to identify signs and symptoms of post-traumatic stress. This finding may interpret as the identification of trauma manifestation is based on their emotional intelligence to recognize it, even sensory experiences, stress, distressed children and families, and

emotional needs, and so there is no certain manifestation they were able to refer to. This finding is matched to **Simons, M., Kimble, R., Tyack Z., (2022)** in their qualitative study "Understanding the meaning of trauma-informed care for burns health care professionals in a pediatric hospital: A qualitative study using interpretive phenomenological analysis" in their study the nurses were unable to identify specific signs and symptoms of burn psychological trauma.

The current study found highly statistically significant variations in most items of nurses' perceptions about trauma-informed treatment before and after the educational intervention. Following the implementation of the educational intervention, the nurses working in the pediatric burn unit had favorable judgments about trauma-informed practices and felt knowledgeable about the specific areas examined by the survey. These findings reflected the participants' eagerness to participate in a formal educational training session on trauma-informed care to maximize the skills indicated in the survey. This finding is consistent with the findings of **Marsac et al. (2016)** in their study "Implementing a Trauma-Informed Approach in Pediatric Health Care Networks," in which they emphasize the importance of implementing a trauma-informed approach and provide a framework for training pediatric healthcare providers in trauma-informed care practices to improve their attitude and opinion toward the trauma-informed care approach.

According to the current study's findings, over three-quarters of the nurses surveyed considered time restrictions and a lack of training as significant impediments to trauma-informed care intervention. These findings add to the existing research base, highlighting the need for additional training in psychological care for nurses and all

health workers worldwide (**McDowell, Pasek, Perlick, 2022; Kostie K. et al., 2020; Shultz & Forbes, 2020; Moss, et al., 2019**). These findings are consistent with those of **Afzal et al., (2022)**, who conducted research on "Barriers to emergency department clinicians' confidence in providing pediatric trauma-informed care" and discovered that specific barriers and aspects of the clinical environment within hospitals contribute to health workers' confidence in providing trauma-informed psychosocial care to families and trauma-exposed children. Time restrictions, concerns about further upsetting children, a lack of training, and a lack of hospital policy support for delivering psychological therapy all contributed to health personnel's lack of confidence.

By nurses' self-rated competence regarding trauma-informed care, a limited number of nurses rated their practice as competent before the educational intervention. This result may explain that most nurses at the pediatric burn unit apply trauma-informed practices in their daily routine without knowing the concept of TIC, so their practices may be random, unorganized, and many times incorrect practices. This finding is dissimilar to the study of **Kassam-Adams et al., (2015)** who conduct a study about "Nurses' views and current practice of trauma-informed pediatric nursing care" and reported that trauma nurses considered competent related to trauma-informed skills, had a reasonable understanding of traumatic stress and included most of the skills in their everyday practice. These dissimilarities and differences found between the two studies' specialties are logical and expected as most nurses in the current study did not receive any workshop or training related to TIC, unlike the nurses of the previously mentioned study, and can most be expected to be attributed to the immeasurable

differences in injury and illness. This attribution is assured immediately and after two months of the educational intervention as this limited level of self-rated competence of nurses had improved.

As a result of the present study, it was found that there were statistically significant differences between the educational level, the number of years of nursing experience, and previous participation in trauma-informed care workshops among the nurses studied, as well as their total knowledge and self-competence ratings before, immediately after, and two months after the educational intervention. Given this finding, the Burn Hospital at Mansoura University requires intensive and continuous education and training in TIC, as there is currently no protocol or way to deliver care that reduces stress and prevents patients or families from developing post-traumatic stress disorder. Although burns were the focus of this study, all medical crises like illnesses/injuries can trigger a traumatic stress response. As a result, pediatric healthcare providers must aim to minimize the severity of trauma related to all illnesses and injuries. This finding is matched with **Simons et al. (2022)** who conduct a study entitled “A web-based educational intervention to implement trauma-informed care in a pediatric healthcare setting: protocol for a feasibility study using pre-post mixed methods design”, they reported that staff at hospital-based pediatric care should adopt trauma-informed practices to reduce downstream treatment delivery costs due to reduced pain and distress for children and care providers, improved health-related quality of life, and greater patient satisfaction.

Conclusion:

The data presented in the current study supported the proposition that application of trauma-informed care educational program

promoted the knowledge and practices of pediatric burn nurses. So, developing nurses' knowledge of traumatic stress for pediatric patients and their families is important to provide this type of comprehensive care with evidence-based practices to ensure an inclusive patient-centered care approach to address both medical and psychological consequences of this damaging trauma that have chronic or terminal sequela like the pediatric burn.

Recommendation:

Based on the findings and conclusions drawn from the study, the following recommendations are made:

1. Periodic TIC training for nurses is needed and should aim to build nurses' competence in providing TIC in different healthcare settings.
2. Raising the awareness of nurses regarding the concept of TIC and its application in the care of children in different healthcare settings through pamphlets, simple instructions or posters.
3. Repetition of this study on large sample size and wide scales in various governorates of Egypt so that the results could be generalized and compared between Egypt and other countries.

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