Test file: Analysis of the Effects of Surgical Emergency Care and Psychological Nursing Interventions in Traumatic Surgical Patients

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Abstract

Background: Traumatic injuries represent a leading cause of global morbidity and mortality, placing immense demand on emergency healthcare systems. The perioperative period is critical for patient outcomes, requiring not only proficient surgical and emergency nursing care but also attention to the significant psychological distress experienced by patients. Objective: This study aimed to analyze the combined effects of standardized surgical emergency care protocols and structured psychological nursing interventions on clinical outcomes, complication rates, and psychological well-being in patients undergoing emergency surgery for trauma. Methods: A prospective cohort study was conducted involving 120 traumatic surgical patients admitted to the emergency department. Participants were systematically allocated into an intervention group (n=60) receiving integrated standardized surgical emergency care plus targeted psychological nursing interventions, and a control group (n=60) receiving standard surgical emergency care alone. Clinical parameters (vital sign stability, time to surgery, complication rates), physiological indicators (pain scores, cortisol levels), and psychological metrics (Hospital Anxiety and Depression Scale - HADS, Post-Traumatic Stress Disorder Checklist - PCL-5) were assessed at admission, pre-operatively, post-operatively (24h, 72h), and at one-month follow-up. Results: The intervention group demonstrated statistically significant improvements compared to the control group. Key findings included enhanced hemodynamic stability pre-operatively ($p<0.01$), reduced mean time from admission to operation ($p<0.05$), lower incidence of post-operative complications such as infection and delirium (15% vs. 31.7%, $p<0.05$), and significantly lower reported pain scores at 24h post-operation ($p<0.01$). Psychologically, the intervention group showed markedly lower HADS scores for anxiety and depression at 72h post-operation and at one-month follow-up ($p<0.001$), as well as lower PCL-5 scores indicative of reduced PTSD symptom severity ($p<0.01$). Patient satisfaction scores were also significantly higher in the intervention group ($p<0.001$). Conclusion: The integration of structured psychological nursing interventions with standard surgical emergency care protocols significantly improves both physiological and psychological outcomes in traumatic surgical patients. This dual approach facilitates smoother perioperative transitions, reduces complications, alleviates psychological distress, and promotes long-term recovery. These findings underscore the necessity of incorporating psychological support as a core component of holistic trauma care protocols.

Keywords: Traumatic Injury; Emergency Surgery; Surgical Nursing; Psychological Nursing; Perioperative Care; PTSD; Anxiety; Patient Outcomes; Holistic Care.

1. Introduction

Traumatic injuries, resulting from incidents such as vehicular accidents, falls, and violence, constitute a major public health challenge worldwide, often necessitating immediate surgical intervention [1]. The primary goals in the management of surgical trauma patients are the preservation of life, prevention of further harm, and stabilization for definitive treatment—a process heavily reliant on efficient and precise surgical emergency care [2]. This care encompasses rapid assessment (e.g., Advanced Trauma Life Support protocols), resuscitation, preparation for surgery, and vigilant post-operative monitoring [3].

However, the focus on physiological stabilization has historically often overshadowed the acute psychological impact of trauma. Patients experiencing sudden, severe injury and emergency surgery are vulnerable to intense psychological stress, including acute stress reactions, anxiety, depression, and later development of post-traumatic stress disorder (PTSD) [4]. This psychological distress is not merely a secondary concern; it can directly impair physiological recovery by exacerbating pain perception, dysregulating stress hormones like cortisol, compromising immune function, and hindering cooperation with treatment and rehabilitation [5, 6].

Evidence suggests that psychological factors significantly influence surgical outcomes. Pre-operative anxiety has been linked to increased analgesic requirements, higher rates of post-operative nausea and vomiting, and longer hospital stays [7]. Despite this, standardized protocols integrating psychological care within the acute surgical emergency pathway remain underdeveloped. Psychological nursing interventions, including empathetic communication, information provision, sensory comfort, anxiety-reduction techniques, and early emotional support, can mitigate this distress [8, 9].

This study posits that an integrative model of care, combining evidence-based surgical emergency nursing with proactive psychological nursing interventions, will yield superior patient outcomes compared to standard care alone. The analysis aims to evaluate the effect of this combined approach on clinical stability, complication rates, pain management, and psychological morbidity in the perioperative period and early recovery phase.

2. Methods

2.1 Study Design and Participants

A prospective, comparative cohort study was conducted over 18 months at the Emergency and Trauma Center of a major urban teaching hospital. A total of 120 adult patients (aged 18-65) who sustained acute traumatic injuries (blunt or penetrating) requiring emergency surgical intervention within 12 hours of admission were enrolled. Exclusion criteria included severe traumatic brain injury (GCS $\leq$ 8), pre-existing major psychiatric disorders, intoxication impairing consent, and injuries not requiring surgery. Ethical approval was obtained, and informed consent was secured from patients or their legal proxies.

2.2 Group Allocation

Participants were allocated into two groups using a systematic sampling method based on

admission date. The Intervention Group (n=60) received integrated care: Standard Surgical Emergency Care plus Structured Psychological Nursing Interventions. The Control Group (n=60) received Standard Surgical Emergency Care alone.

2.3 Interventions

1. Standard Surgical Emergency Care (Both Groups): Based on established trauma guidelines [3, 10], this included: Primary and secondary survey, immediate resuscitation (airway, breathing, circulation management), rapid diagnostic workup, pre-operative preparation (IV access, lab work, imaging, informed consent for surgery), intraoperative assistance, and post-operative monitoring in recovery/PACU for vital signs, bleeding, and pain.
2. Structured Psychological Nursing Interventions (Intervention Group Only): Delivered by nurses trained in trauma psychological first aid, interventions were initiated at admission and continued perioperatively:

Empathetic Communication & Rapport Building: Using calm, clear, and reassuring language.

Procedural and Sensory Information: Brief, honest explanations of procedures, sensations to expect (e.g., pressure, noise), and environment orientation to reduce fear of the unknown [11].

Anxiety Reduction Techniques: Encouraging simple breathing exercises, offering reassurance, and minimizing environmental stressors (e.g., reducing unnecessary noise) when possible [12].

Emotional Support & Normalization: Acknowledging the patient's fear and distress as normal reactions to an abnormal event, providing emotional containment.

Family Support Facilitation: Brief, structured communication with family members to reduce their anxiety, which indirectly supports the patient.

Post-operative Psychological Follow-up: Brief assessment of emotional state and reinforcement of coping during recovery.

2.4 Data Collection and Measures

Data were collected at five time points: T1 (Admission), T2 (Pre-operative), T3 (24h Post-op), T4 (72h Post-op), T5 (1-month Follow-up).

Clinical/Physiological Outcomes: Time from admission to incision; Hemodynamic stability (frequency of BP/HR outside target range); Incidence of post-operative complications (surgical site infection, sepsis, delirium, etc.); Pain intensity using Numeric Rating Scale (NRS).

Psychological Outcomes: Hospital Anxiety and Depression Scale (HADS) [13]; PTSD Checklist for DSM-5 (PCL-5) at T5 [14].

Biomarker: Serum cortisol level at T1 and T2.

Process Evaluation: Patient satisfaction with care (5-point Likert scale) at T4.

2.5 Statistical Analysis

Data were analyzed using SPSS v.26. Descriptive statistics, Chi-square tests, independent t-tests, and repeated-measures ANOVA were employed. A p-value < 0.05 was considered statistically significant.

3. Results

3.1 Demographic and Clinical Characteristics

Both groups were comparable at baseline regarding age, gender, injury severity score (ISS),

mechanism of injury, and type of surgery (predominantly orthopedic and abdominal).

3.2 Primary Clinical Outcomes

The intervention group showed superior pre-operative stabilization. Patients exhibited fewer episodes of significant tachycardia or hypotension ($p<0.01$). The mean time from admission to operation was shorter in the intervention group (98 ± 22 minutes vs. 118 ± 28 minutes in controls, $p<0.05$). The overall post-operative complication rate was significantly lower in the intervention group (9 patients, 15%) compared to the control group (19 patients, 31.7%) ($p<0.05$), with notable reductions in post-operative delirium and surgical site infection.

3.3 Pain and Physiological Stress

Mean pain scores (NRS) at T3 (24h post-op) were significantly lower in the intervention group (4.1 ± 1.2 vs. 5.3 ± 1.4, $p<0.01$). While cortisol levels were elevated in both groups at T1, the rise from T1 to T2 (pre-operative period) was less pronounced in the intervention group, suggesting a moderated stress response, though this difference approached but did not reach strict significance ($p=0.052$).

3.4 Psychological Outcomes

Psychological measures revealed stark differences. At T4 (72h post-op), HADS-Anxiety and HADS-Depression subscale scores were significantly lower in the intervention group (Anxiety: 7.2 ± 3.1 vs. 10.8 ± 3.9; Depression: 5.9 ± 2.8 vs. 8.7 ± 3.5; both $p<0.001$). At the one-month follow-up (T5), the intervention group maintained lower HADS scores and, crucially, demonstrated significantly lower PCL-5 scores (21.4 ± 8.7 vs. 29.8 ± 11.2, $p<0.01$), indicating a lower severity of PTSD symptoms.

3.5 Patient Satisfaction

Patient satisfaction ratings were significantly higher in the intervention group across all domains, particularly regarding "feeling cared for as a whole person" and "adequacy of emotional support" ($p<0.001$).

4. Discussion

The results of this analysis strongly support the central hypothesis that integrating structured psychological nursing interventions with standard surgical emergency care generates significantly better outcomes for traumatic surgical patients. The findings align with and extend the growing body of literature advocating for holistic, patient-centered approaches in acute care settings [15, 16].

The clinical benefits observed—enhanced pre-operative stability, reduced time to surgery, and lower complication rates—are profoundly important. A possible mechanism is that psychological interventions reduce autonomic nervous system hyperarousal (anxiety), leading to more stable hemodynamics [17]. Calmer patients may also provide more coherent histories and cooperate better with pre-operative procedures, streamlining workflow [7]. The reduction in complications like delirium is particularly noteworthy, as acute psychological stress and poor pain control are known risk factors for its development [18]. Effective early psychological support and pain

management, as demonstrated here, may act as protective factors.

The significant amelioration of psychological morbidity is a key contribution of this study. The lower anxiety and depression scores shortly after surgery and the markedly lower PTSD symptom burden at one month in the intervention group underscore the potential preventive role of acute psychological nursing [19, 20]. Trauma care that addresses psychological vulnerability from the outset may help "inoculate" patients against maladaptive stress processing, reducing the risk of chronic PTSD [8, 21]. The trend towards a blunted cortisol rise pre-operatively in the intervention group offers a potential neuroendocrine correlate for this psychological buffering effect [6].

The high patient satisfaction scores in the intervention group reflect the value patients place on compassionate, communicative care that acknowledges their emotional turmoil. This aligns with the core principles of patient-centered care and can improve therapeutic alliances and long-term health engagement [22].

5. Limitations

This study has limitations. It was conducted at a single center, and while systematic, the allocation was not randomized. The follow-up period was limited to one month; longer-term studies are needed to assess the durability of psychological benefits. The interventions were delivered by a dedicated team, and generalizability depends on adequate nursing training and institutional support for integrating psychological care into fast-paced emergency workflows.

6. Conclusion

This analysis demonstrates that psychological nursing interventions are not an optional adjunct but a vital component of effective surgical emergency care for trauma patients. The integrated model of care led to tangible improvements across the spectrum of recovery: from faster, more stable pre-operative preparation and reduced physical complications to significant alleviation of acute and sub-acute psychological distress. Healthcare systems and trauma care protocols must evolve to formally incorporate evidence-based psychological support strategies. Training emergency and perioperative nurses in these skills is imperative to deliver truly comprehensive care that heals both the body and the mind of traumatic injury patients.

7. References

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