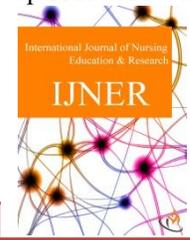




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### A STUDY TO COMPARE THE EFFECTIVENESS OF WOUND HEALING WITH ROUTINE SUTURING AND STAPLING METHOD AMONG PATIENTS UNDERGONE SURGERIES.”AT SELECTED HOSPITALS, TIRUPATI, CHITTOOR (DT), ANDHRA PRADESH

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#### ABSTRACT

Background of the Study: Wound closure plays a critical role in surgical procedures, as it significantly affects postoperative recovery, infection prevention, and overall patient satisfaction. Among the commonly used techniques, routine suturing and stapling are widely practiced. Identifying the more effective method in terms of wound healing, cosmetic outcome, and complication rate is essential for improving surgical care. This study was conducted to compare the effectiveness of wound healing between routine suturing and stapling among patients who had undergone surgeries. Objectives: To assess the effect of wound healing in routine suturing among patients who have undergone surgeries. To assess the effect of wound healing with stapling among patients who have undergone surgeries. To compare the effectiveness of wound healing between routine suturing and stapling among patients. To determine the association between selected demographic variables and wound healing effectiveness. Methodology: A quantitative research approach with a comparative descriptive design was adopted. A total of 100 postoperative patients were selected using a convenience sampling technique from a selected hospital. Wound healing was assessed using the REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation). Data were analyzed using descriptive and inferential statistics to compare wound healing scores, complication rates, and cosmetic outcomes between the two groups. Results: Demographic data revealed that the majority of patients were between 31 and 60 years of age, with an almost equal distribution of gender and surgical types. The comparative analysis showed that the stapling group experienced faster wound closure and earlier signs of healing. However, the suturing group demonstrated better cosmetic outcomes and fewer incidences of local irritation. The mean wound healing score was slightly higher in the suturing group, while stapling offered the advantage of quicker procedure time. A statistically significant difference ( $p < 0.05$ ) was observed between the two groups for specific healing parameters. conclusion: Both suturing and stapling were found to be effective wound closure techniques, each with distinct clinical advantages. Stapling is ideal where speed and early-stage healing are priorities, while suturing is preferred when cosmetic results and long-term tissue integrity are emphasized. These findings underline the importance of individualized clinical decision-making based on patient condition and surgical requirements.



## INTRODUCTION

### Background of the Study

Surgical intervention is a cornerstone of modern healthcare, with wound healing being a critical determinant of postoperative recovery and patient outcomes. The method of wound closure, though often considered a procedural detail, significantly affects structural integrity, infection risk, healing time, and cosmetic results.

Traditionally, suturing has been the preferred method, offering precise tissue approximation and adaptability across various surgical contexts. However, it is time-consuming and carries occupational risks such as needle-stick injuries. In contrast, stapling offers faster wound closure, mechanical consistency, and reduced operating time, making it popular in high-volume and emergency settings. Despite these advantages, stapling may be associated with higher costs, foreign body sensation, and occasional tissue reactions.

Given that wound healing outcomes are influenced by patient-specific factors—such as age, nutritional status, comorbidities, and immune competence—an evidence-based comparison of suturing and stapling is essential. This study was conducted to evaluate the comparative effectiveness of both methods in terms of healing time, complication rates, scar formation, pain levels, and patient satisfaction. By generating clinically relevant data, this study aims to guide surgical teams in making informed, patient-centered decisions regarding wound closure techniques, ultimately improving surgical outcomes and supporting the principles of precision medicine.

### Problem Statement

“A Study to Compare the Effectiveness of Wound Healing with Routine Suturing and Stapling Method Among Patients Undergone Surgeries.”

### OBJECTIVES

- To assess the effect of wound healing in routine suturing among patients who have undergone surgeries.
- To assess the effect of wound healing with stapling among patients who have undergone surgeries.
- To compare the effectiveness of wound healing between routine suturing and stapling among patients.
- To determine the association between selected demographic variables and wound healing effectiveness.

### HYPOTHESES

- $H_{01}$ : There is no significant difference in wound healing effectiveness between patients undergoing

routine suturing and those undergoing stapling

- $H_{02}$ : There is no significant association between wound healing effectiveness and selected demographic variables (age, gender, nutritional status, type of surgery, comorbidities).

### Assumptions

- Comparative analysis of suturing and stapling will enhance the knowledge of medical professionals and improve surgical wound closure practices.
- Effective wound closure methods will help reduce the length of hospitalization among postoperative patients.

### Delimitations

- The study was limited to 100 postoperative patients (50 suturing, 50 stapling) who consented to participate.
- Conducted exclusively among patients undergoing surgeries in selected hospitals in Tirupati.

### Projected Outcome

The study aims to generate evidence on the comparative effectiveness of routine suturing and stapling in wound healing. Findings are expected to support evidence-based practice, guide clinical decision-making, and encourage innovation in wound closure techniques.

## METHODOLOGY

This study aimed to compare the effectiveness of wound healing between routine suturing and stapling methods among postoperative patients at Orange Hospital and Surendra Hospital, Tirupati, Andhra Pradesh.

### Research Approach & Design

A **quantitative comparative research design** was adopted, enabling objective measurement and statistical comparison of wound healing outcomes between two groups:

1. Routine Suturing Method
2. Stapling Method

### Variables

- **Independent Variable:** Type of wound closure (suturing/stapling)
- **Dependent Variable:** Effectiveness of wound healing
- **Extraneous Variables:** Age, gender, nutritional status, comorbidities, type/duration of surgery, BMI, wound site, infection control practices, medications

### Setting & Population

The study was conducted in two selected multispeciality hospitals in Tirupati, equipped with advanced operation theatres and ICUs. The population comprised patients who had undergone surgery using

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either suturing or stapling techniques.

### Sample & Sampling Technique

A convenience sample of 100 postoperative patients (50 suturing, 50 stapling) meeting the inclusion criteria were selected. Inclusion criteria involved patients aged 25–65 years, oriented, able to communicate in Telugu/English, and willing to participate. Patients with chronic wound infections, immunocompromised conditions, or psychological impairments were excluded.

### Data Collection Tool

Data were collected using a structured tool with two sections:

- **Section I:** Demographic variables (age, gender, surgery type, nutritional status, comorbidities, etc.)
- **Section II:** Wound healing assessment using the REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation). Healing was scored as:
  - 0–4: Poor Healing
  - 5–7: Moderate Healing
  - 8–10: Effective Healing

### Content Validity and Reliability of Tool

The tool underwent **content validation** by five experts and was translated into Telugu for clarity. Reliability was established using the split-half method, yielding a reliability coefficient of  $r = 0.84$ , indicating high consistency.

### Pilot Study

A pilot study was conducted with 10 participants to test feasibility and refine the tool. The procedure was found to be reliable and practical for the main study.

### Data Collection Procedure

Data were collected over four weeks, with 4–6 participants assessed daily. After obtaining informed consent, patients were assessed using the REEDA scale. Each assessment took 15–20 minutes. An awareness session on wound care and factors affecting healing was provided to all participants.

### Ethical Considerations

Institutional Ethical Committee approval was obtained, and written informed consent was secured from all participants. Confidentiality, beneficence, and patient rights were strictly maintained throughout the study.

### Data Analysis

Data were analyzed using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics:

- **t-test:** To compare wound healing effectiveness

between suturing and stapling groups

- **Chi-square test:** To assess the association between wound healing and demographic variables

### Data Analysis and Interpretation

This study assessed and compared the effectiveness of wound healing using routine suturing and stapling methods among 100 patients undergoing hip surgeries at Orange Hospital and Surendra Hospital, Tirupati. Data were analyzed using descriptive and inferential statistics, and findings were presented under demographic distribution, wound healing scores, and associations with clinical variables.

### Demographic Profile

- **Age:** Most patients (38%) were between 41–50 years, followed by 30–40 years (27%).
- **Gender:** Males formed a slight majority (54%), with near-equal distribution across both groups.
- **Type of Surgery:** Abdominal surgeries were most common (45%) in overall surgeries.
- **Education:** 38% had primary education, showing lower educational status among patients.
- **Occupation:** Daily wage workers constituted the largest group (35%), suggesting higher surgical incidence among physically active individuals.
- **Income:** Nearly half (47%) earned below ₹10,000, indicating a predominance of lower-income patients.
- **Residence:** Majority (55%) were from rural areas.
- **Comorbidities:** Diabetes was present in 33% and hypertension in 37% of patients.
- **Lifestyle Factors:** 26% were smokers, and 31% consumed alcohol.
- **Surgical History:** 17% had undergone previous surgeries.
- **Post-Surgical Complications:** 55% had no complications; delayed healing was more common in stapling (30%) vs. suturing (24%).

### Key Findings:

- Suturing resulted in **better wound approximation** and fewer inflammatory responses.
- Stapling showed slightly **higher rates of redness, edema, ecchymosis, and discharge**.
- All results were **statistically significant ( $p < 0.05$ )**, confirming a true difference in outcomes.

### DISCUSSION:

This study aimed to evaluate and compare wound healing outcomes between routine suturing and stapling methods among 100 post-surgical patients at a selected hospital in Tirupati, Chittoor District. Wound healing was assessed using the REEDA scale, and demographic factors



were analyzed to determine their association with healing effectiveness.

### Key Findings

#### 1. Socio-Demographic Profile:

- **Age:** Majority (38%) were 41–50 years; only 15% were >60 years, who showed delayed healing.
- **Gender:** Males slightly outnumbered females (54% vs. 46%).
- **Type of Surgery:** Abdominal surgeries were most common (45%).

- **Socioeconomic Factors:** 47% earned <₹10,000 per month, and 55% were from rural areas, reflecting higher surgical incidence among economically weaker and rural populations.
- **Comorbidities:** 33% had diabetes, 37% had hypertension.
- **Lifestyle Factors:** 26% were smokers, 31% consumed alcohol.
- **Complications:** 55% had no complications, 27% experienced delayed healing, and 18% developed infections.

**Table 1: Wound Healing Scores (REEDA Scale).**

Parameter	Suturing (Mean ± SD)	Stapling (Mean ± SD)	Interpretation
Redness	1.5 ± 0.5	1.8 ± 0.6	Higher in stapling
Edema	1.3 ± 0.4	1.6 ± 0.5	Higher in stapling
Ecchymosis	1.1 ± 0.3	1.5 ± 0.5	Higher in stapling
Discharge	1.0 ± 0.3	1.4 ± 0.4	Higher in stapling
Approximation	2.2 ± 0.5	1.9 ± 0.4	Better in suturing

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### Discussion

#### Objective 1: Wound Healing with Suturing

Suturing patients demonstrated lower mean scores for redness, edema, ecchymosis, and discharge, and **better approximation (2.2 ± 0.5)**, indicating optimal wound closure and fewer inflammatory symptoms. *Comparable studies* (Sançar& Ilhan, 2021) reported similar findings, showing improved approximation scores and lower complication rates with sutures.

#### Objective 2: Wound Healing with Stapling

Stapling patients showed slightly higher inflammation-related scores (redness 1.8 ± 0.6, edema 1.6 ± 0.5, etc.). While stapling is faster, it is linked with increased risk of infection and delayed healing in some cases. *Supporting literature* confirms that stapling, though efficient, may cause more tissue irritation initially, but healing outcomes tend to equalize over time.

#### Objective 3: Comparison Between Suturing and Stapling

Statistical analysis revealed significant differences (p < 0.05) across REEDA parameters. Suturing had better closure and less inflammation. Stapling, though convenient, showed higher complication rates. *Khan et al. (2011)* meta-analysis similarly found that suturing resulted in fewer infections but required more time.

#### Objective 4: Association with Demographic Variables

Age, diabetes, nutritional status, and type of



surgery showed significant associations with wound healing. Older age and comorbidities delayed recovery. Kucharzewski et al. (2024) emphasized early risk factor identification for better healing outcomes, aligning with this study's results.

### Implications for Nursing Practice

- **Clinical Practice:** Nurses should regularly monitor wounds, document changes, and educate patients on hygiene, nutrition, and early detection of complications.
- **Nursing Education:** Include simulation-based training on suturing vs. stapling outcomes and post-operative care in the curriculum.
- **Administration:** Ensure availability of both closure methods and conduct workshops for nursing staff to update skills.
- **Research:** Future studies should evaluate cost-effectiveness, long-term scarring, patient satisfaction, and explore hybrid closure techniques.

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### Recommendations

- Conduct quasi-experimental and longitudinal studies on wound healing duration, scar quality, and complication rates.
- Perform cost-benefit analyses to determine the economic impact of each method.
- Develop educational modules for nurses and caregivers on post-operative wound management.

### CONCLUSION

Both suturing and stapling are effective wound closure techniques, but suturing demonstrated superior wound approximation and fewer inflammatory symptoms in this study. Stapling offers faster closure but may increase the risk of delayed healing and infection in certain cases. Clinical decisions should be individualized based on patient comorbidities, type of surgery, and expected healing outcomes. Nurses play a vital role in post-operative care, patient education, and monitoring to improve recovery and minimize complications.