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ASSESSING SURGICAL SITE INFECTION PREVALENCE AND PREVENTIVE STRATEGIES AT KHALIFA GULNAWAZ HOSPITAL IN BANNU PAKISTAN

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Abstract

Introduction: *This study investigates trends in surgical cases, particularly focusing on demographic characteristics, postoperative complications, and wound management practices. Given the significant prevalence of surgical site infections (SSIs) and the complexity of wound care, understanding these trends is important for improving patient outcomes in surgical settings.*

Methodology: *A cross sectional study of simple random convenient sampling was conducted on 126 surgical records from a clinical setting, examining patient demographics, duration of hospitalization, types of surgical procedures performed, and postoperative complications. The study specifically focused on deep and superficial wounds and assessed the practices related to antibiotic administration and pre-surgical preparation.*

Results: *The analysis revealed that the patient population was predominantly young, with the 15-25 years and 25-35 years age groups each accounting for 26.88% of cases. Female patients represented 59.14% of the population. Most patients were hospitalized for 24-48 hours (37.63%), with C-sections being the most common procedure (26.88%). Deep wounds accounted for 57% of cases, with symptoms such as pain (30%), fever (33.3%), and inflammation (23.3%) reported. Antibiotic administration primarily utilized intravenous therapy, with 49 cases receiving a 1- gram dose twice daily for three days. Pre-surgical preparation showed 79% compliance with antiseptic protocols, but bathing (37%) and shaving (12%) compliance were notably low.*

Discussion: *The predominance of younger female patients aligns with trends seen in other studies, indicating a need for targeted interventions in this demographic. The high incidence of deep wounds emphasizes the importance of vigilant postoperative care and thorough patient education on recognizing signs of infection. The structured approach to antibiotic administration reflects current best practices, though the transition from intravenous to oral therapy warrants* *further exploration. Strengthening pre-surgical preparation practices is crucial for minimizing infection risks. Overall, this research underscores the need for ongoing refinement of surgical protocols and education for both patients and healthcare providers to enhance surgical outcomes.*

Conclusion: *This study highlights critical trends in surgical demographics and the incidence of postoperative complications, particularly the prevalence of deep wounds. The findings suggest a need for improved adherence to pre-surgical hygiene practices and enhanced monitoring of postoperative patients to reduce the risk of SSIs.*

INTRODUCTION

Background:

Post-operative surgical wound infection is the term used to describe infection of a wound following surgery. The rates of these infections vary from hospital to hospital, and the site of the infection may be limited to the suture line or may extend into the operative site. One kind of nosocomial infection is surgical wound infection. Infections contracted in hospitals or other healthcare facilities are known as nosocomial infections. A person must have been admitted to a hospital or healthcare facility for a reason other than the infection and not exhibit any symptoms of an active or incubating infection in order to have contracted a nosocomial infection.(1) Nosocomial infections include surgical wound infections, respiratory infections, and urinary tract infections. The most common nosocomial infection after urinary tract infections is surgical wound infection.These infections account for 20% to 39% of all hospital-acquired infections. Postoperative wound infections typically occur between the fifth and tenth day following surgery, though they can occur anywhere from the first day to years later. Wound infection is the most common and troublesome condition preventing wound healing. When the host's defences, both local and systemic, are weakened and organisms begin to infiltrate the tissues, the wound is deemed infected. When a wound leaks pus or needs to be followed up on to guarantee adequate drainage, an infection is present .(2)

On the other hand, serous fluid or pus may be discharged in minor wound infections, but there are no systemic symptoms or severe discomfort. To encompass infections of organs or spaces deep within the skin and soft tissues, the Surgical Wound Infection Task Force changed the term "surgical wound infection" to "surgical-site infection" in 1992. The Centres for Disease Control (CDC), USA, divide surgical-site infections (SSIs) into three categories: (a) superficial incisional SSI, (b) deep incisional SSI, and (c) organ/space SSI. Both gram-positive and gram-negative bacteria contribute to surgical wound infection, according to a number of bacteriological investigations. Pseudomonas aeruginosa (15.79%), Escherichia coli (10.53%), and Proteus mirabilis (5.26%). These bacteria pose a major problem for surgeons because most of them are multi-drug resistant bacteria. Postoperative SSIs can be quite lethal, remaining as a less frequent cause of mortality but a major source of morbidity in surgical patients. They account for approximately one-quarter of the estimated two million nosocomial infections occurring yearly. Furthermore, SSIs cause an increase in treatment cost, bed occupancy in a ward and prolong the hospital stay of the patient. In developing countries, due to limited resources, even basic life- saving procedures like appendectomies and cesarean sections are associated with high infection rates of wounds and mortality. Postoperative sepsis complications can have disastrous outcomes in orthopedic procedures such as joint replacement and internal fixation of the spine. Skin preparation, wound contamination, length of hospital stay prior to surgery, wound drainage, patient age, length of surgery, and surgeon skill and technique are some of the factors that influence the infection rate. Medical officers perform simpler, less complicated surgeries, which explains their low infection rate. In contrast, senior surgeons perform more complex and time-consuming surgeries, which contributes to their higher infection rate. (Sattar et al., 2019)

After surgery, infections of the incision, organ, or space are known as surgical site infections (SSIs). The emergence of antibiotic-resistant pathogens and surgical patients with more complicated comorbidities raise the expense and difficulty of treating SSIs. As the number of surgeries performed in the US keeps increasing, SSI prevention becomes more and more crucial. In addition to the reduction or denial of reimbursements for treating SSIs, public reporting of process, outcome, and other quality improvement measures has been mandated. It has been estimated that the use of evidence-based strategies can prevent about half of SSIs. (August.Docx, n.d.) . Surgical site infections (SSIs) are a major cause of postoperative morbidity following surgery. In addition to being expensive for health services, they are uncomfortable, painful, and even deadly for those who are afflicted. SSI rates have been found to differ significantly between hospitals and could be impacted by surgical care as well as other elements of healthcare quality. The SSI rate, or SSI percentage, has been suggested as a possible measure of care quality in the context of clinical governance and performance evaluation of NHS organisations in relation to goals. Risk Factor Identification through Systematic Review and Development (Docx, n.d.). SSIs are frequent side effects in hospitals with acute care. Between 2 and 5 percent of patients undergoing inpatient surgery are affected by SSIs. In the United States, between 160,000 and 300,000 SSIs take place annually. SSI is currently the most prevalent and expensive HAI. Results related to Social Security Evidence-based recommendations have been shown to be effective in preventing up to 60% of SSIs. SSIs account for 20% of all HAIs in hospitalized patients. Approximately 7–11 extra postoperative hospital days are related to each SSI. The risk of death is 2–11 times higher for patients with an SSI than for those who do not have one. Directly related to SSI, 67 percent of deaths in patients with SSI occur. SSI's attributable costs differ based on the type of infecting pathogen and the type of surgical procedure. Using the Consumer Price Index (CPI) for inpatient services, which adjusts all cost estimates for 2007 dollars, it is estimated that SSIs contribute between $3.5 billion and $10 billion in healthcare spending each year. (Anderson et al., 2014) . SSI is defined as an infection that develops within a year of a prosthesis being implanted or within 30 days following surgery. Up to 30% of surgical procedures and up to 14% of HAIs can result in SSI. (Patel et al 2018) Post-operative surgical wound infection is an infection that develops in a wound following surgery. Hospitals have different rates of these infections, and the infection site may be restricted to the suture line or may spread to the surgical site. Nosocomial infections include surgical wound infections. (Oguntibeju O, Rau N 2004). The term "nosocomial infections" refers to infections contracted in hospitals or other healthcare settings. A nosocomial infection can only be acquired if a patient is admitted to a hospital or healthcare facility for reasons other than the infection and shows no symptoms of an active or incubating infection. (2016, Accessed: October 24, 2018). Nosocomial infections can be urinary tract infections, respiratory infections, or surgical wound infections (Park K 2014).The Centre for Diseases Control (CDC) highlights that despite the advances in environment and surgical technique, surgical wound infections still cause significant mortality and morbidity (Mangram 1999) . An audit of 113 hospitals in England over a period of four years (1997-2000) reported 2074 out of 485,222 patients developing a post-operative wound infection (PHLS 2001). The costs incurred when a patient contracts a surgical wound infection are considerable in financial as well as social terms. It has been estimated that each patient with a surgical wound infection requires an additional 6.5 days in hospital and that hospital costs are doubled. When extrapolated to all acute hospitals in England it is estimated that the annual cost of surgical infections is almost £1 billion (Plowman 2000). Surgical site infections (SSIs) are complications of surgery that cause significant postoperative morbidity. They are costly to health services and inconvenient, painful and potentially fatal to affected patients. Rates of SSI have been observed to vary widely by hospital and may be influenced by surgical management and other aspects of the quality of health care. SSI rate (SSI per cent) has been proposed as a potential indicator of the quality of care in the context of clinical governance and monitoring of the performance of NHS organizations against targets. The risk of developing an SSI is likely to be influenced by the characteristics of patients, of operations and postoperative care. Therefore, the use of SSI as a performance indicator requires hospital-specific rates to be risk adjusted. This research sought to identify important risk factors for SSI in defined contexts, whether surgery specific or generic, and investigate the feasibility of risk-adjusting SSI per cent.(Identification of Risk Factors by Systematic Review and Development of Risk.Docx, n.d.)

Understanding and using surgical wound classification

The CDC identifies four surgical wound classification categories that are:

Clean: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow non-penetrating (blunt) trauma should be included in this category if they meet the criteria.(Han, 2017)

Clean-contaminated: Operative wounds where the genital, alimentary, respiratory, or urinary tracts are entered under carefully monitored circumstances and without any unusual contamination. Particularly, if there is no indication of infection or significant technique breakdown, procedures involving the biliary tract, appendix, vagina, and oropharynx fall under this category.(Han, 2017)

Contaminated: Fresh, open, unintentional wounds. Incisions where acute, non-purulent inflammation is observed, including necrotic tissue without indication of purulent drainage (e.g., dry gangrene), as well as procedures involving significant lapses in sterile technique (e.g., open cardiac massage) or gross gastrointestinal tract spillage, fall under this category.(Bartoli et al., 2025)

Dirty or infected: Includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing post-operative infection were present in the operative field before the operation.(Ssi-Surveillance-Protocol.Pdf, n.d.)

SSIs classification:

Superficial incisional: involving only skin or subcutaneous tissue of the incision

Deep incisional: involving fascia and/or muscular layers

Deep incision primary (DIP)—SSI identified in a primary incision in a patient who has had an operation with 1 or more incisions.

Deep incision secondary (DIS)—SSI identified in a secondary incision in a patient who has had an operation with more than 1 incision.

Organ/space: involving any part of the body opened or manipulated during the procedure, excluding skin incision, fascia, or muscle layers. (Anderson et al., 2014). Understanding and using the ASA score of physical condition.(Chen & Yang, 2021)

The ASA score is a classification system used to measure a patient's pre-operative physical condition and serves as one of several indicators that influence the risk of SSI development. For example, a higher ASA score can be associated with a greater SSI incidence.

ASA score

Class I: A normally healthy patient.

Class II: A patient with mild systemic disease.

Class III: A patient with severe systemic disease that is not incapacitating.

Class IV: A patient with an incapacitating systemic disease that is a constant threat to life.

Class V: A moribund patient who is not expected to survive for 24 hours with or without operation. (Ssi-Surveillance-Protocol.Pdf, n.d.)

Bundles in SSI Prevention: The concept of care bundles was introduced by the Institute for Healthcare Improvement (IHI) in 2001. A care bundle is a set of practices that, when implemented together, lead to better patient outcomes than when implemented individually. Numerous factors before, during, and after surgery influence the patient's risk of SSI. Because the prevention of SSIs is complex, bundles ensure compliance and improve patient safety. Although interventions in a bundle are evidence-informed, some are supported by randomized trials while others are derived from cohort studies or expert consensus.(Ching, 2024)

RATIONALE:
Pakistan is one of many developing nations without a well-functioning surveillance system to describe routine SSI rates. Infection of surgical sites is a problem that practically all Pakistani hospitals face. Preventive care and appropriate wound management are essential for surgical success. Data collection, wound surveillance, and surgical inspection are the most crucial steps in implementing policies that reduce the incidence of SSIs. The incidence of SSIs must be found in the Western literature because, regrettably, this aspect of surgery receives the least attention in the local literature.
It is hoped that this study of the SSI stimulates surgeons, operating room nurses, postoperative inpatient and clinic nurses, infection control professionals, anesthesiologists and healthcare epidemiologists to engage actively in surgical research for the prevention of SSI.

Operational Definitions:
Surgical site infection refers to an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material(Ssi-Surveillance-Protocol.Pdf, n.d.)
Surgical wound refers to a wound created when an incision is made with a scalpel or other sharp cutting device and then closed in the operating room by suture, staple, adhesive tape, or glue and resulting in close approximation to the skin edges(Ssi-Surveillance-Protocol.Pdf, n.d.) Prevalence It is the proportion of a particular population found to be affected by a medical condition at a specific time. Surgical site infection (SSI) prevention, detection, and management guidelines have already been published. According to the 2016 Update to the Surgical Site Infection Guidelines, blood glucose control has undergone the most significant change. In the perioperative period, it has been demonstrated that short-term blood glucose control is more crucial than long-term blood sugar control. The expansion of perioperative blood glucose control to all patients, irrespective of their diabetic status, is now supported by high-quality evidence, which is significant. In contrast to previous guidelines that advised stopping prophylactic antibiotics within 24 hours, we also support stopping them at the time of incision closure. (Dumville et al., 2015) Another significant theme is "bundled" care, which includes preoperative S aureus decolonisation protocols and colorectal surgery, where bundles have been effectively used in the intraoperative setting during closure to reduce surgical site infection. Although research on the use of bundles has produced conflicting findings, the advantages can be significant in studies where patients and providers exhibit high levels of compliance. The success of bundled interventions depends on compliance rates and buy-in, which should be emphasised as we move towards greater standardisation of care..(Ban et al., 2017). From a total of 285 departments at 150 hospitals that participated in the SSI module, 130 departments from 86 hospitals met the requirements for inclusion in the German Krankenhaus Infektions Surveillance System (KISS) study, which includes four years of participation and at least 30 operations per procedure category performed by each department. (Seidelman et al., 2023) The pool of data analyzed consisted of 191,114 operations and 3,241 SSIs. The 75th percentile for the duration of the operations (in minutes) was taken as the cutoff for the NNIS risk index calculation. The cutoff times were the same for the data included in this study as those used for the complete KISS data? In the raw data stratified according to the surveillance year, 14 of 19 operative procedures showed a tendency toward lower SSI rates that was associated with increasing duration of SSI surveillance. (Wang et al., 2023)The effectiveness of SSI surveillance was demonstrated in a group of hospitals that had long-term experience (4 years or more) with SSI surveillance. A considerable reduction of 25% in the SSI rate was observed after 2 years of surveillance. The trend toward reduction was observed for most, but not all, of the operative procedures. Statistical significance at the .05 level

was attained for pooled data and for operative procedures frequently performed, such as cesarean section, hip prosthesis arthroplasty, and coronary artery bypass. The reduction in the SSI rates for nephrectomy and prostatectomy was impressive but not statistically significant because of low sample sizes."(Brandt et al., 2006) . In a non-concurrent cohort study, performed in a large general hospital in Belo Horizonte, from January 2008 to December 2011. The 16,882 surgical procedures, 11,897 (70.5%) were performed in female patients. The mean age was 54.2 years ± 16.4 (18-99), with a median of 55 years. The mean duration of surgeries was 1.6 hours ± 1.0 (0.220.9), with a median of 1.2 hours. During the study period, 568 SSI were diagnosed, with a global incidence of 3.4% [95% CI = 3.1 - 3.6] among all procedures (16,882). The final model was composed of the following variables i.e. length of preoperative hospital stay; duration of surgery; PCSW clean-contaminated, contaminated or dirty/infected and ASA index classified into II, III or IV/V. Although the variables gender, general anesthesia and emergency surgery have been selected in the bivariate analysis (p<0.20), to be part of the multivariate analysis, they did not remain in the final logistic model, since they did not reach the level of significance of 5%, previously set for the multivariate analysis. Of the 568 infections identified, cultures were performed from 177 patients. Staphylococcus aurous (24.3%; 43/177) and Escherichia coli (15.3%; 27/177) were the main microorganisms causing SSI.(World Health Organization, 2018). The overall SSI incidence of 3.4% found in this study was higher than studies carried out in developed countries, such as USA, 1.9%; France, 1.0% and Italy, 2.6%. However, it was lower than in studies carried out in data reported from India and Turkey, which presented an SSI incidence of 5.0% and 4.1%, respectively. Two Brazilian studies involving SSI in general surgeries had higher rates than the identified incidence and compared to international researches, ranging from 6.4% to 11.0%. (Carvalho et al., 2017)Post-operative wound infection was studied respectively over an eight month period in the University Hospital, Kuala Lumpur a total of 5129 operations were included in the survey. These were mainly clean operations (4380 or 85.4%). A total of 174 surgical wound infections were recorded. The overall post-operative wound infection rate was 3.4% and the average clean wound infection rate was 2.9%; rising to 5.4% and 12.2% for clean-contaminated and contaminated surgical wounds respectively. (Santos, 2022). The majority of the infected wounds were in patients from the Orthopedic unit (44.8%), followed by Obstetrics and Gynecology (21.3%) and Surgery unit (20.1%). The surgical wound infection rate was highest for Orthopedic unit (6.5%), followed by Maternity (5.3%) and the Medical Unit (4.6%). Eighty one (47.1%) of infected patients developed wound infection in the first post-operative week. One hundred and thirty nine (80.8%) of infected patients developed clinical wound infection within two weeks post-operatively. (Costa et al., 2020). The incidence of incisional wound infection rose steadily from the second post-operative day to reach a peak on day seven, when 29 (16.8%) wounds were diagnosed. It was observed that 96 (56%) of all infected wounds occurred between day four and day nine. Six (3.5%) of the infected wounds occurred more than three weeks post-operatively after the patients had been discharged (Table 3). Bacteriological studies revealed that both gram positive (47.9%) and gram negative (52.1%) organisms played an important role in wound infection. The commonest bacterial isolates were Staphylococcus aurous (36.1%) of which 17 (9%) were methicillin- resistant strains, and Pseudomonas aeruginosa (15 .4%)~ Coliforms were also commonly isolated and accounted for 30% of all the bacteria isolated from wound infection(Hanifah, n.d.)An 8-month prospective study in 9 secondary and tertiary care hospitals in Thailand with 8764 patients who underwent 8854 major operations from July 2003 to February 2004. Women accounted for 73.4% of the studied patients. The average patient age (SD) was 37.2 (19.2) years, and the overall mortality rate was 1.02%. The median lengths (interquartile range) of preoperative, postoperative, and total hospital stay were 1 (1 to 2), 4 (3 to 5), and 4 (3 to 7) days, respectively. Among 8854 operations, 45.6% were classified as emergency. The median duration of operation (interquartile range) was 50 (35 to 70) minutes. (Gwilym et al., 2023). Prophylactic antibiotics were administered in 8127 operations accounting for 91.8% of all operations. Preoperative, intraoperative, and postoperative antibiotic prophylaxis was administered in 4192 (51.6%), 1972 (24.3%), and 1963 (24.1%) operations respectively. The 4 most common prophylactic antibiotics used were ampicillin/ amoxicillin, cefazolin, gentamicin, and metronidazole, which were used in 39.9%, 22.6%, 20.2%, and 16.2% of all operations performed, respectively. There were 127 SSIs identified in 8854 operations, accounting for an overall crude SSI rate of 1.4 infections/100 operations. 127 SSIs, 35 SSIs (27.6%) were detected after hospital discharge.(Seidelman et al., 2023). The major postdischarge SSIs occurred in cesarean section, appendectomy, and cholecystectomy procedures. The causative pathogens were isolated in 118 (92.9%) of the 127 recorded SSIs. Only 1 fungal infection, Candida albican, was identified in this study. The 5 most common pathogens identified from SSIs were Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Acinetobacter baumanii. (Kasatpibal et al., 2005)

A narrative study demonstrates that a bundle's effectiveness is contingent upon the supporting data and consistent application of recommendations. There is heterogeneity among bundle components, and there probably isn't a single ideal bundle. The components of the most successful bundle will vary from institution to institution and should be customised to the specific context, even though interventions in a bundle for SSI prevention should include all phases of care—preoperative, intraoperative, and postoperative. Bundles ought to change over time. Outdated interventions and potentially harmful practices should be reviewed and replaced as new evidence becomes available. The original intent of IHI's bundles was not to provide all- inclusive care. Furthermore, bundles don't enhance care by themselves. High performance levels not found in individual components are the result of the collaboration and teamwork required for bundles..(Seidelman et al., 2023) To provide high-quality care, multidisciplinary efforts must maintain the synergy that arises from cooperation and communication. From bundle conception to implementation, all stakeholders must be involved because habits and processes are crucial to understand. Everyone is affected by culture change, including patients, frontline employees, and leadership. Preventing SSI is difficult. Integration of interventions before, during, and after surgery is crucial because a patient's surgical experience is influenced by a number of factors. It is challenging to standardise measure implementation, even when best practices are known. In order to prevent SSIs, care bundles help ensure that evidence-based practices are consistently incorporated into routine care for all patients. In order to prevent SSI, we anticipate seeing more care bundles in perioperative pathways. (Ching, 2024)

MATERIALS AND METHODS

Study Population:

All patients who undergo surgical procedure and admitted in different clinical wards for Post op care after surgery in Khalifa Gul Nawaz teaching Hospital MTI Bannu.

Study design:

A descriptive cross-sectional design was used to access the prevalence and risk of surgical site infection in patient s who undergo any surgical procedure and admitted in wards.

Study Setting:

All surgical and allied ward including General Surgery, Neurosurgery, orthopedic and Gynea wards in Khalifa Gul Nawaz teaching Hospital.

Sample Size:

The sample size was calculated through WHO calculator with a 95% confidence interval and 7.8% marginof error, while the population size was 50% the calculated sample size was 126.

Sampling Technique:

Simple random sampling of convenient method was employed to select the patients

Study Duration:

The study was conducted over 04 months.

Selection Criteria

Inclusive criteria:

Patient having surgery at KGN hospital in Bannu both Male and Female.

Patient having pre op admission of 24hrs.

Patients who has at least two days post op admission

Patients who provide written informed consent to participate in the study.

Patents from general surgery, orthopedic, Gynea/Obs, neurology departments of THQ hospital bannu

Exclusive Criteria:

Patients having surgeries outside of KGN hospital Bannu.

Patients having post op admission less than 2 days.

Patient who decline to participate in study.

Data Collection Procedure:

As part of a quantitative cross-sectional study, a structured questionnaire was used to gather data from patient clinical chart and direct observation. The questionnaire aims to assess various aspects of surgical site infection and electronically data. It will cover demographic information, patient pre and post of condition, patient instigations and patient wound condition.

Data Analysis:

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0 Descriptive statistics including, frequency, percentage, mean, and standard deviation were calculated to summarize the demographic characteristics and other relevant data.

RESULTS

Socio demographic

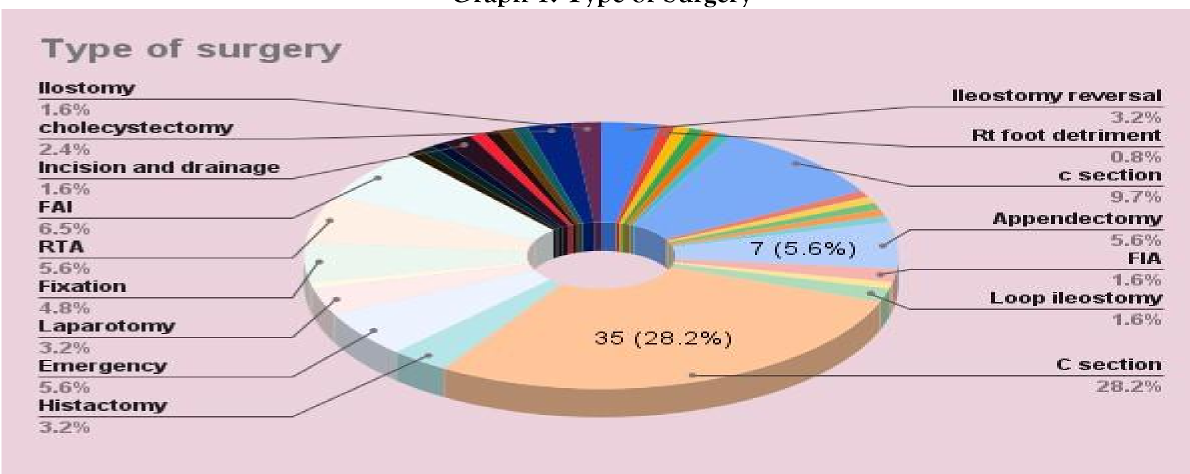
The age distribution of the 126 participants shows the patient population is predominantly young, with equal representation in the 15-25 years and 25-35 years age groups, each accounting for 26.88% of the total cases. This is followed by the 35-45 years age group at 21.51%. The gender representation indicates a higher number of female patients (59.14%) compared to male patients (40.86%). Regarding duration of stay, most patients were hospitalized for 24-48 hours (37.63%), while a notable proportion stayed 48-72 hours (32.26%). The most frequently performed surgical procedure was C-section, comprising 26.88% of cases, followed by Appendectomy and Laparotomy at lower frequencies. The General Surgery department led with 43.01% of the cases, illustrating its critical role in patient care, while Gynecology and Orthopedic Surgery followed. Importantly, a significant majority of surgeries involved deep wounds (64.52%), highlighting the complexity of cases treated. This comprehensive overview underscores the importance of targeted surgical interventions in a predominantly young female patient demographic.

Table 1: Demographic and other essential details of the participants

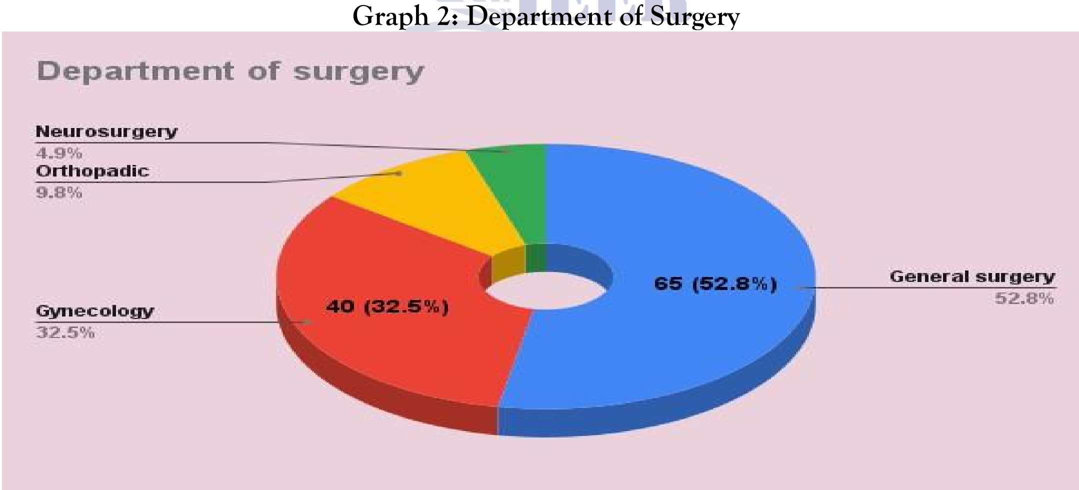
Category	Details	Number of Cases	% of Total	Cumulative Frequency
Age Distribution	**15-25 years**	25	26.88%	25
	25-35 years	25	26.88%	50
	35-45 years	20	21.51%	70
	55-60 years	12	12.90%	82
	5-15 years	8	8.60%	90
Gender	**Female**	55	59.14%	145
	Male	38	40.86%	183
Duration of Stay	**24-48 hours**	35	37.63%	35
	48-72 hours	30	32.26%	65
	72-96 hours	10	10.75%	75
Types of Surgery	**C-section**	25	26.88%	25
	Appendectomy	6	6.45%	31
	Laparotomy	5	5.38%	36
	Ileostomy	3	3.23%	39

	reversal			
	Others	-	-	-
Type of Wound	Deep	60	64.52%	60
	Superficial	33	35.48%	93

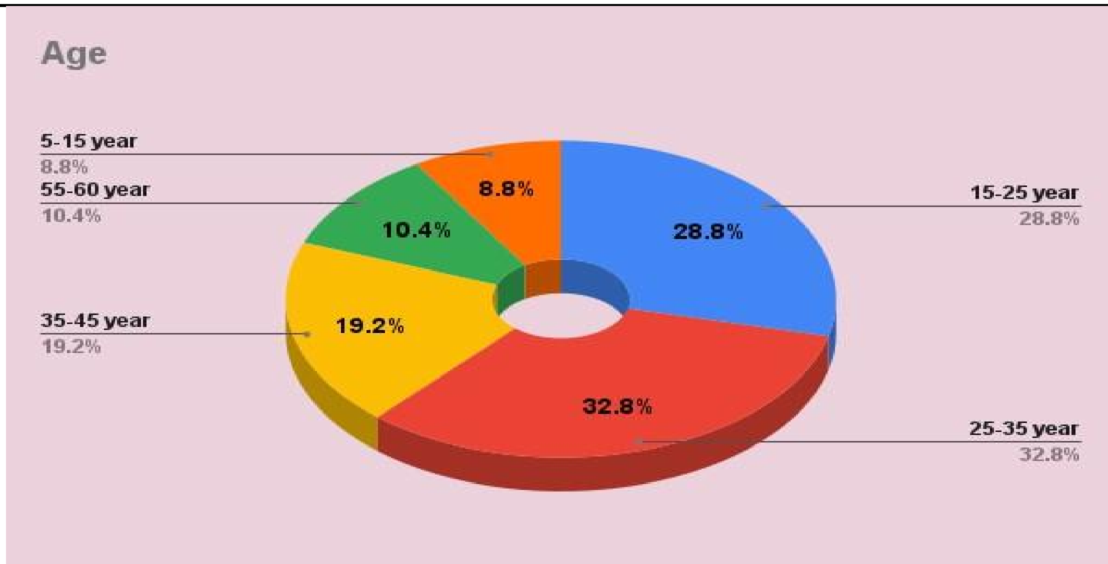
Graph 1: Type of Surgery



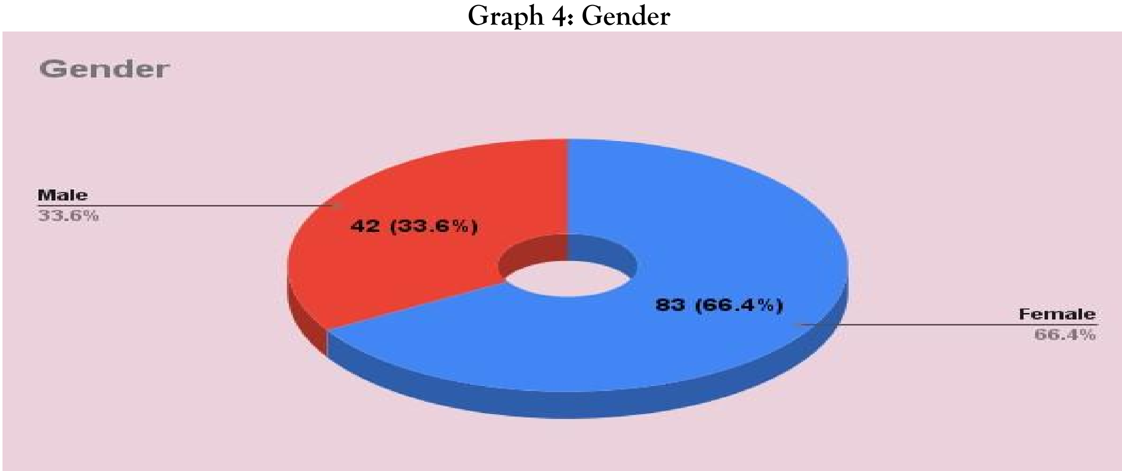
Graph 2: Department of Surgery



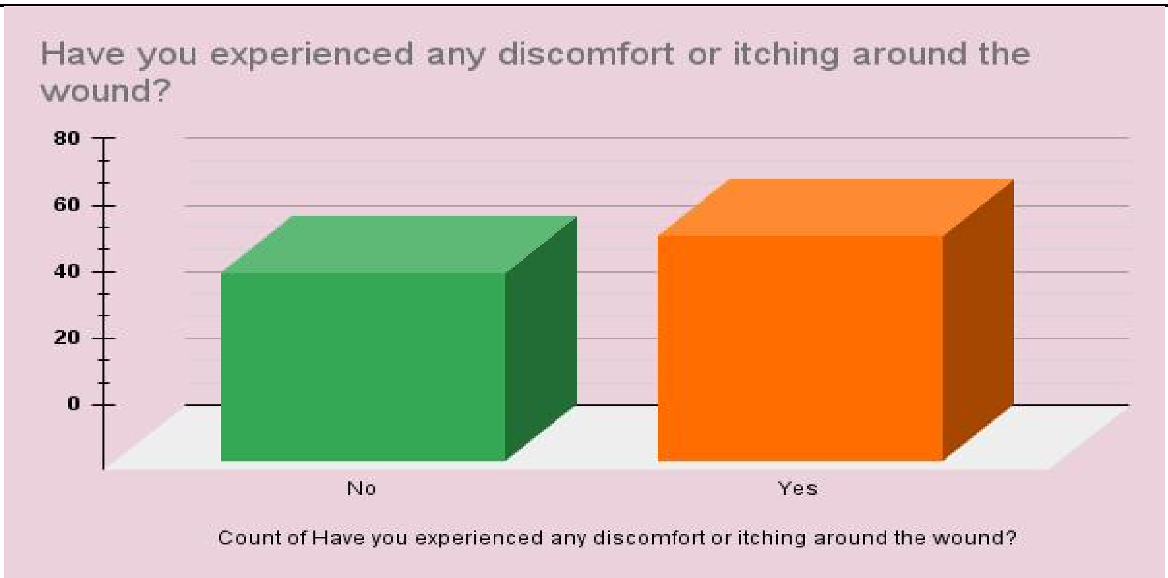
Graph 3: Age



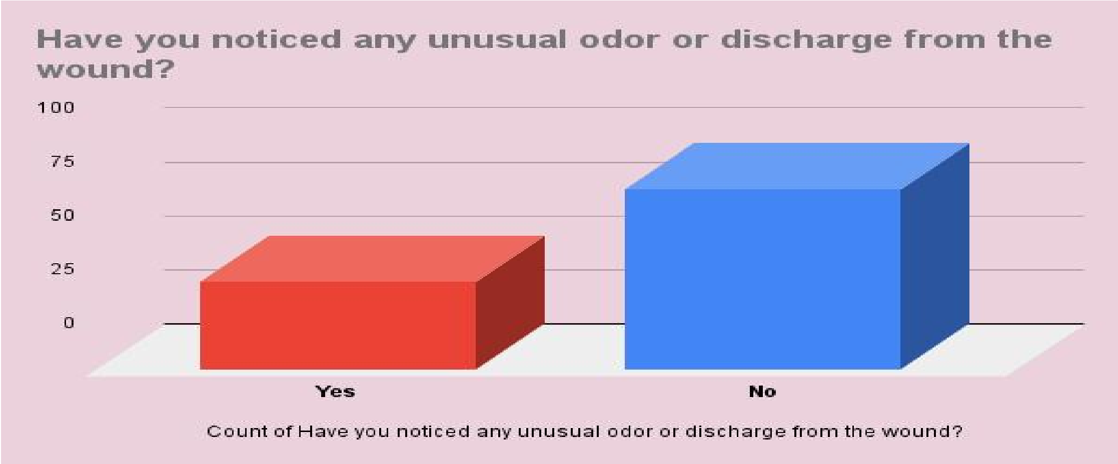
Graph 4: Gender



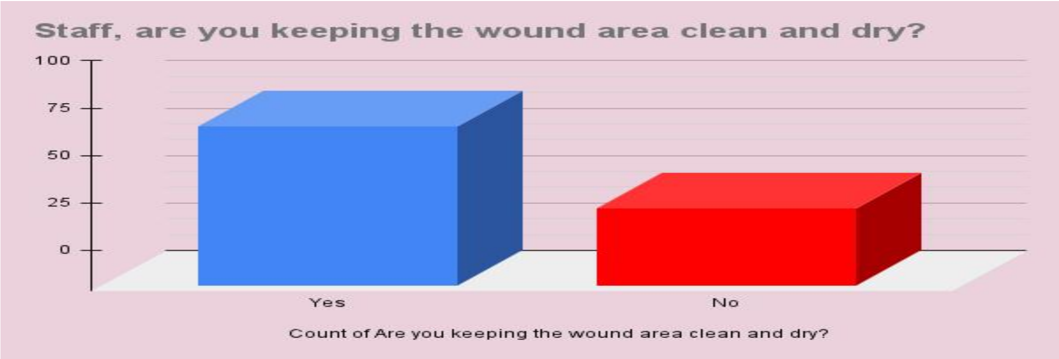
Graph 5: How you experience any discomfort or itching around the wound?



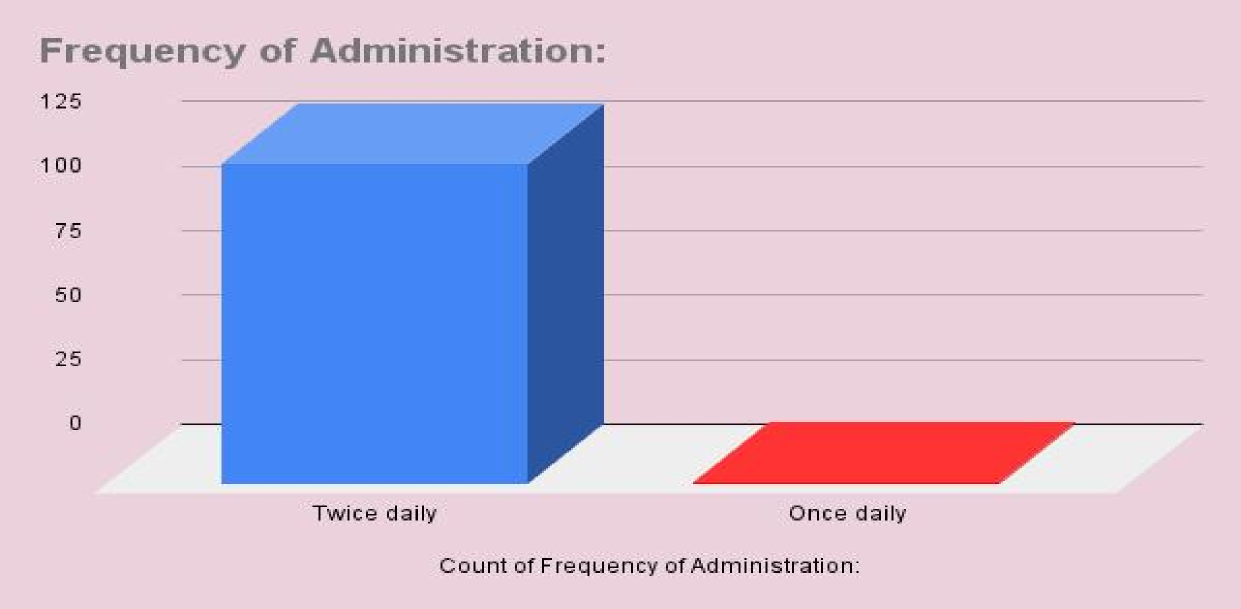
Graph 6: Have you notice any unusual odor or discharge from the wound?



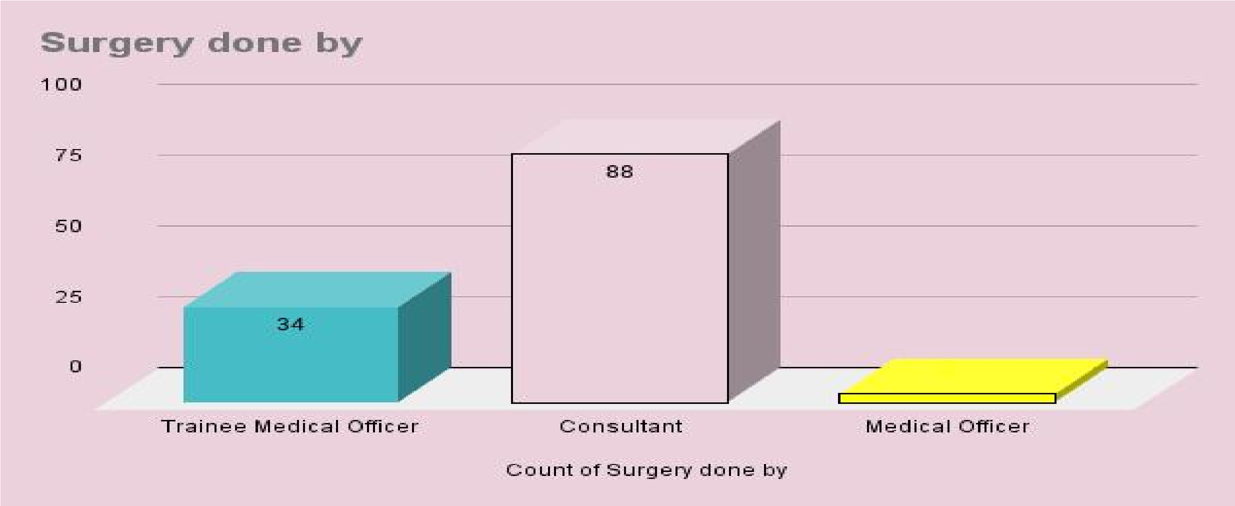
Graph 7: Staff, are you keeping the wound area clean and dry?



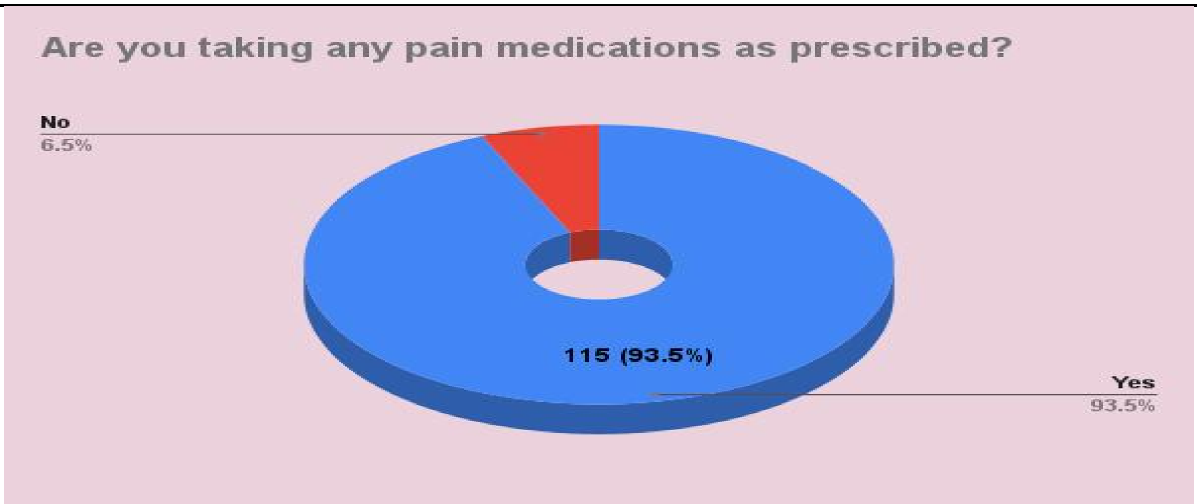
Graph 8: Frequency of Administration



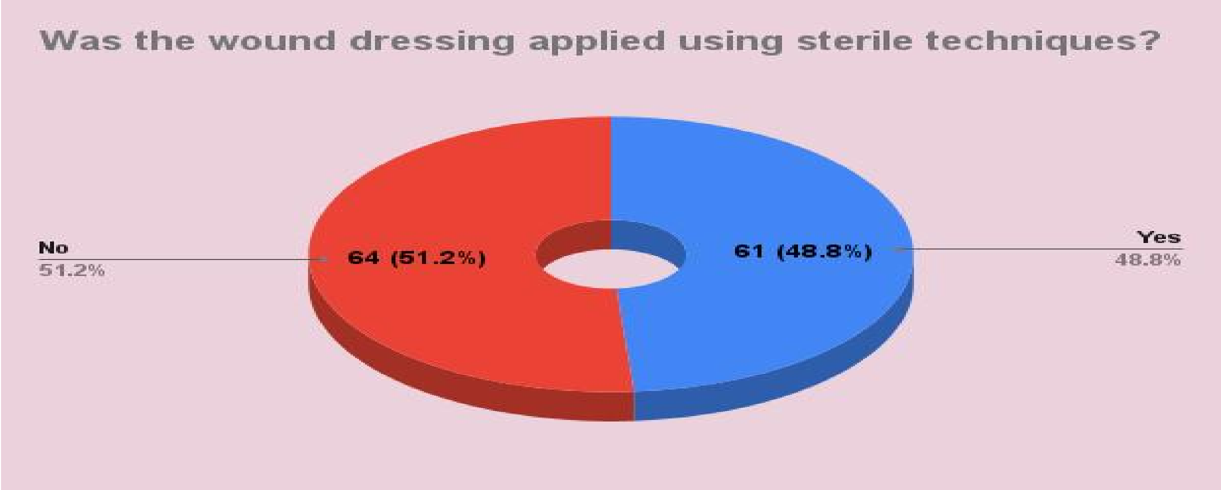
Graph 9: Surgery done



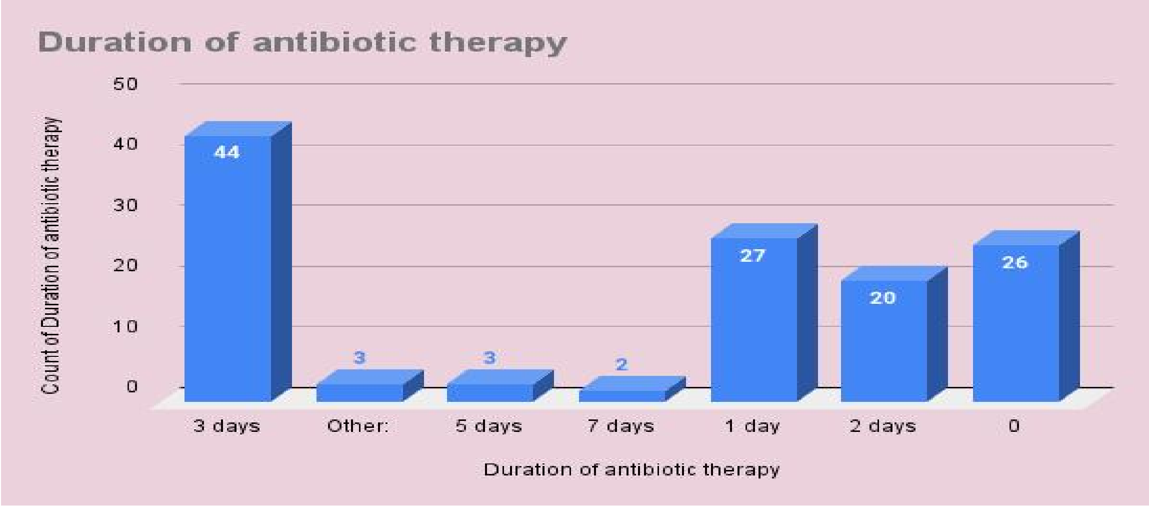
Graph 10: Are you taking any pain medications as prescribed



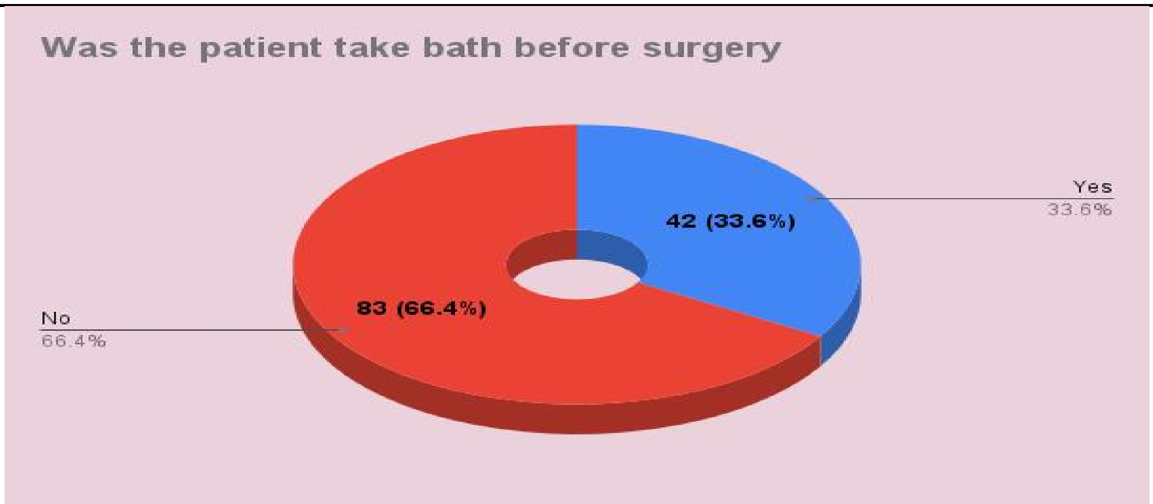
Graph 11: Was the wound dressing applied using sterile techniques?



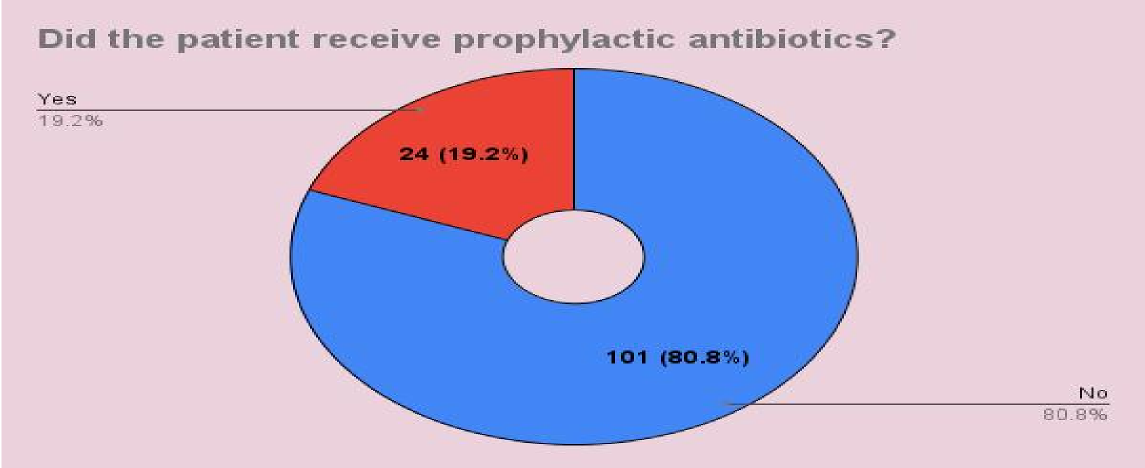
Graph 12: Duration of antibiotic therapy



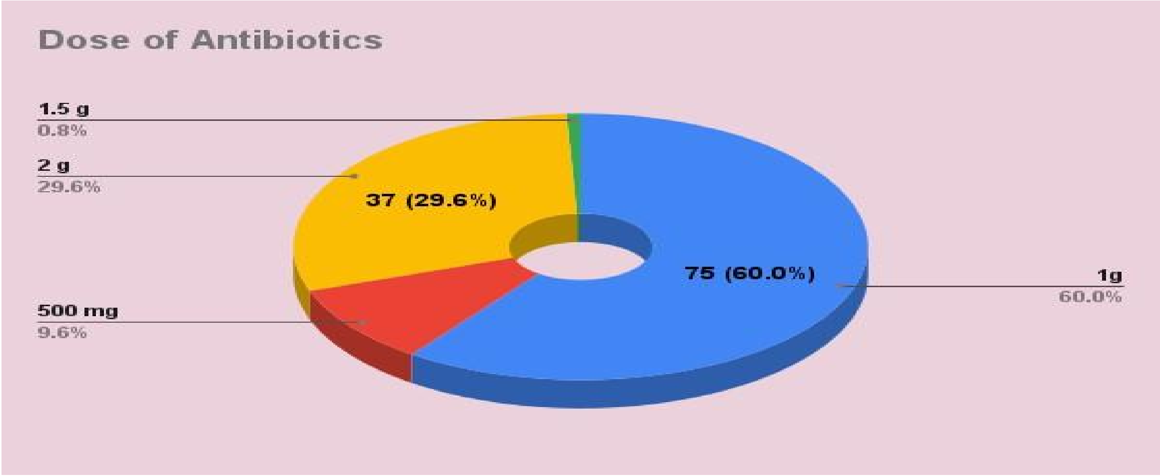
Graph 13: Was the patient take bath before surgery



Graph 14: Did the patient receive prophylactic antibiotic?



Graph 15: Dose of Antibiotic



Graph 16: Have you noticed any unusual odor or discharge from the wound?

Table 2: Demographic and other essential details of the participants

Pre-Surgical Preparation Practices						
Preparation Aspect	Yes (%)	Frequency (Yes	No (%)	Frequency (No	Cumulative Frequency (Yes)	Cumulative Frequency (No)
Antiseptic Preparation	79	79	21	21	79	21
Bath Taken Before Surgery	37	37	63	63	116 (79+37)	84 (21+63)
Surgical Site Shaved	12	12	88	88	128 (116+12)	172 (84+88)
Sterile Dressing Techniques	89	89	11	11	217 (128+89)	183 (172+11

Table 3: Demographic and other essential details of the participants

Summary Table						
Preparation Aspect	Yes (%)	Frequency (Yes)	No (%)	Frequency (No)	Cumulative Frequency (Yes)	Cumulative Frequency (No)
Patients Instructed on Wound Care	56	56	44	44	56	44
Keeping Wound Area Clean and Dry	79	79	21	21	135 (56+79)	65 (44+21)
Noticed Unusual Odor or Discharge	23	23	77	77	158 (135+23)	142 (65+77)
Taking Pain Medications as Prescribed	87	87	13	13	245 (158+87)	155 (142+13)

DISCUSSION

In line with findings from both domestic and foreign studies, the research's findings point to a number of significant trends in surgical cases and postoperative care. Younger patients, especially those between the ages of 15 and 35, make up the majority. This is consistent with a larger trend in surgical literature that shows younger populations frequently undergoing elective and emergency surgeries, especially appendectomies and C-sections.

This is consistent with the results of other studies that report similar age distributions in surgical populations, including those by Huo et al. (2020) and Al-Benna et al. (2017). The greater number of female participants in our study might also be associated with the prevalence of surgical interventions pertaining to reproductive health and the increased frequency of gynecological procedures. The high rate of deep wounds (64.52%) that we found in our analysis emphasises the significance of careful postoperative monitoring and the complexity of surgical procedures. According to research, deep wounds are more likely to experience surgical site infections (SSI), which calls for improved wound care and post-surgery patient education procedures (Kirkland et al., 2018). Our results support Kearns et al.'s (2021) study, which highlighted the significance of determining risk factors linked to deep wound infections. This, in turn, supports the need for focused educational interventions for nurses and patients.

The antibiotic administration patterns found in this study also show a systematic approach to post-surgery infection management, with a notable emphasis on intravenous (IV) therapy. Additional research supports this practice by showing that IV antibiotics are frequently chosen in surgical settings because of their quick onset of action and the urgent need for efficient infection control (Harris et al., 2019). Though knowing when to switch can enhance patient outcomes while lowering the risk of complications, the noticeable switch to oral medications following initial treatment suggests a possible area for additional research.

Although our results show that preoperative hygiene practices, such as preoperative bathing and shaving, need to be improved, preoperative preparation procedures are crucial for reducing infection rates. Concerns are raised by the 12% surgical site shaving compliance rate, which is comparable to findings from studies by Watanabe et al. (2016) that showed SSI rates were significantly elevated by insufficient preoperative preparation. Improving overall surgical outcomes requires strengthening adherence to these procedures through patient education and protocol reinforcement.

Finally, factors influencing postoperative recovery are revealed by analysing the pain levels and underlying medical conditions of the patients. Our results, which show that 34% of patients had circulatory problems or diabetes, are in line with the literature, which shows that these conditions are important risk factors for both increased pain perception and delayed wound healing (Harris et al., 2019). This highlights how important it is to provide patients with known risk factors with specialised postoperative care and education that addresses pain management and keeps an eye out for complications. In order to maximise postoperative outcomes for a variety of patient populations, the study's conclusions highlight the need for ongoing improvement of surgical techniques, improved patient education, and strong infection control protocols.

CONCLUSION

This study provides a thorough analysis of surgical cases, highlighting important patterns and difficulties related to wound care and postoperative care in a patient population that is primarily composed of young women. With 57% of all cases examined having deep wounds, the data shows a notable prevalence of these injuries. The intricacy and prevalence of surgical site infections (SSI) in these patients highlight the need for stricter protocols and increased awareness during postoperative care and monitoring. The discovery that deep wounds frequently cause pain, fever, and inflammation highlights the necessity for medical professionals to be vigilant in identifying these symptoms early on, as this can enable prompt interventions and enhance patient outcomes in general.

The systematic method of administering antibiotics that was seen in this study fits in nicely with current best practices meant to manage infections. An organised system for starting treatment in the immediate postoperative period is indicated by the preponderance of intravenous (IV) therapy, especially with a common dosing regimen of 1 gramme administered twice daily for three days. The switch from intravenous to oral antibiotics, however, merits more research. Examining the appropriateness and timing of this switch could help optimise treatment while weighing the risks of long-term IV administration, like catheter-related infections and higher hospital expenses.

Significant areas for improvement are also highlighted by the findings pertaining to pre-surgical preparation practices. Antiseptic protocol adherence (79%) is praiseworthy, but the low bathing (37%) and surgical site shaving (12%) compliance rates point to the need for more patient education and standardised procedures. A known risk factor for postoperative infections is poor pre-surgical preparation, so improved hygiene practices before surgery can be essential to reducing infection rates and improving patient safety. Ensuring that every patient is aware of the significance of these practices can improve results and adherence.

Additionally, assessing a patient's pain threshold and underlying health issues provides important information for customising postoperative care. With comorbidities like diabetes or circulatory problems reported by 34% of patients, personalised care approaches are crucial for meeting the needs of each patient. Many patients reported moderate to severe pain (23% at 3-5 and 28% at 6- 8), highlighting the importance of effective pain management. This emphasises the significance of routine pain evaluations and customised pain management strategies to improve patients' recuperation.

Finally, the results of this study call for a multifaceted approach to enhance surgical outcomes. Improved training for healthcare providers in sterile techniques is imperative to minimize the risk of infection during dressing changes and other postoperative care activities. Additionally, increasing patient education on wound care and the signs of infection can empower patients to take an active role in their recovery. By addressing these areas, healthcare systems can better mitigate the risks associated with surgical interventions, promote effective recovery, and improve overall patient satisfaction. Future research should continue to explore these dynamics to develop evidence-based strategies that further enhance surgical care and patient outcomes, ultimately leading to lower rates of complications and higher quality of care in surgical settings.

Recommendations

o Implement regular training programs for healthcare staff focused on sterile techniques and infection control practices to reduce the incidence of surgical site infections (SSIs).

o Establish and enforce standardized protocols for pre-surgical hygiene practices, including bathing and shaving, to minimize infection risk and ensure consistency in patient preparation.

o Develop comprehensive educational materials for patients regarding wound care, signs of infection, and the importance of adhering to prescribed care routines to empower them in their recovery.

o Incorporate routine pain assessments and tailor pain management strategies to address the varying levels of pain reported by patients, ensuring timely interventions are provided as needed.

o Review and refine antibiotic administration protocols to ensure the appropriate transition from intravenous (IV) to oral antibiotics, balancing efficacy and risk of complications.

o Establish a robust follow-up system to monitor patients post-discharge, focusing on wound healing and identifying complications early to improve outcomes.

o Encourage additional studies to explore the long-term effects of different surgical protocols and patient outcomes, particularly in diverse patient populations and various surgical procedures.

Study Limitations

o The study's findings may be limited by a relatively small sample size, which may not fully represent the broader patient population or account for demographic variations in surgical cases.

o Conducted at a single institution, the results may not be generalizable to other healthcare settings or regions with differing patient demographics or healthcare practices.

o The reliance on retrospective data may introduce bias or inaccuracies in reporting due to reliance on patient records and self-reported symptoms and care practices.

o Pain levels were self-reported, which may introduce variability and bias in the results due to individual differences in pain perception and reporting.

o While the study focused on specific surgical procedures and outcomes, it may not have captured all relevant factors influencing wound healing and postoperative recovery, such as psychosocial factors and comorbidities.
o The variability in wound care techniques among different healthcare providers may affect the consistency of care and outcomes, making it challenging to assess the impact of specific practices.
o A limited follow-up duration post-surgery may not capture long-term complications or the full recovery trajectory of patients, necessitating further longitudinal studies for a comprehensive understanding.

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