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Association between pre-existing comorbidities and outcomes in 73 ambulatory surgery patients: a cross-sectional study

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ABSTRACT

Introduction: Outpatient care in Primary Health Care is crucial for monitoring access to services, avoiding prolonged hospitalizations, and keeping individuals in their social environment. With technological advances, outpatient surgeries have become more common, providing economic and social benefits. However, despite being cleaner and safer procedures, they are not exempt from postoperative complications. **Objective:** Identify and assess the prevalence of postoperative symptoms in patients undergoing outpatient surgeries and elucidate the primary risk factors associated. **Method:** A cross-sectional study was conducted in an outpatient clinic located in Belo Horizonte, Minas Gerais, analyzing 73 post-operative patients. A structured questionnaire was used to collect data on symptom prevalence, risk factors, and post-operative care practices. **Results**: Out of 73 patients, 57% reported postoperative symptoms, with pain being the most prevalent symptom (45%). Procedures such as cyst and lipoma excisions showed the highest rates of postoperative symptoms. Lifestyle habits, such as smoking and alcohol consumption, proved to be relevant, with a higher incidence among men. Additionally, comorbidities such as diabetes and obesity were also associated with postoperative complications. Patient education was crucial, as those with a completed high school education reported more symptoms. **Conclusion:** Despite advances in outpatient surgery, significant postoperative complications still exist. Patient education, a detailed preoperative assessment, and appropriate postoperative follow-up are essential to minimize complications and ensure the patient's optimal recovery.

Keywords: Surgical wound infection; Risk factor; Signals and Symptoms.

INTRODUCTION

Outpatient care is a valuable tool for monitoring access to services and the quality of Primary Health Care in the country, as it aims to reduce the need for hospitalizations by avoiding the removal of individuals from their social and family environment without significantly interrupting their activities.[1]

With technological and scientific developments in the field of medicine, as well as increased access to public-private partnership sectors and public health resources, it has become possible to perform quicker surgical procedures with less need for hospitalization, popularizing outpatient or minor surgeries.[1] These, in turn, aim

to simplify postoperative care safely, providing physical and psychosocial comfort to the patient.

There are several benefits of this type of care, including economic aspects, as the costs associated with potential hospitalization are considerably higher, both in terms of the treatment itself and the periods of absence for working patients. Examples from the literature include social well-being and cost reduction experienced by patients using Outpatient Surgery, such as those from the medical school of the Federal University of Minas Gerais and the 3rd Surgical Clinic of the Hospital das Clínicas in São Paulo.[2]

Even though these procedures are of lower technical complexity and shorter observation times, they are not free from complications such as unwanted symptoms and surgical site infection (SSI), defined as an infection that occurs after a surgical procedure at the site where the surgery was performed, being the third most common infection associated with healthcare.[3,4]

The impacts of these infections go beyond the patient's health, reflecting also on economic aspects such as increased hospital costs and high mortality rates.[5] However, when well-performed and followed by adequate postoperative care, these procedures can significantly reduce health system costs and provide faster and less painful recovery for the patient.[6,7]

Several factors can influence the symptoms and/or complications, ranging from the type of pathogen in cases of infection to factors related to the healthcare professional and the patients themselves.[8] It is imperative that the patient clearly understands the instructions related to the surgical procedure and the postoperative period. Misunderstood information or neglected care can become fertile ground for unfavorable outcomes.[9,10]

Various studies have already highlighted the need for more directed and informative follow-up for the patient in the postoperative period. This, combined with preventive measures during the surgical procedure, can be an effective strategy in reducing complications.[11,12] Thus, knowledge about the causes, prevention, and control of postoperative infections, especially in outpatient surgeries, is fundamental for medical training and safe clinical practices.[13,14]

In this context, the present study aims not only to identify and assess the prevalence of symptoms in patients undergoing surgical procedures but also to elucidate the main associated risk factors and provide data that can contribute to safer practices, directly benefiting the attendee population.[15,16]

METHOD

Study Design

The study was structured in an analytical and cross-sectional manner with the primary objective of evaluating the prevalence of postoperative symptoms in an outpatient clinic in Belo Horizonte, associated with the patient's medical history as a risk factor for these outcomes. The sample consisted of 73 patients, all selected based on their scheduled return to the outpatient clinic between July and August 2023, after undergoing a surgical procedure and voluntarily agreeing to participate in the research. The key variables measured included both risk factors associated with postoperative complications and the care adopted in the postoperative period.

Data collection began after approval by the Research Ethics Committee. Ethical principles were respected and are following Resolution 466/12 of the National Health Council. The project was approved under opinion number 6.161.636. Following approval by the Research Ethics Committee, the questionnaires were administered by the academics responsible for the research to the patients between July 2023 and August 2023.

Sample

The sample size was determined considering a population of unknown size, an estimated prevalence of 0.25, an absolute error of 0.10, and a confidence level of 95%. Based on these criteria, 73 patients were voluntarily selected for the study after signing the Free and Informed Consent Form, including both sexes who underwent surgical procedures in a particular outpatient service.

Instruments and Procedures

The primary instrument used in this study was a structured questionnaire developed by the research team. This questionnaire was designed with quantitative and objective questions, aiming to collect specific data on the prevalence of postoperative symptoms, risk factors, and postoperative care practices among patients. Confidentiality of information was ensured, with all data anonymized to protect participants' privacy.

Statistical Analysis

After data collection, the data were digitized and logged in for statistical software for analysis. Categorical variables were presented as absolute and relative frequencies. Numerical variables were described as mean and standard deviation and/or median (1st quartile – 3rd quartile). Numerical variables were subjected to the Anderson-Darling Normality test. For the comparison of means/medians, the t-test or the Mann-Whitney test was used. Possible associations between categorical variables were evaluated using the Chi-square test or Fisher's Exact test. A significance level of 5% was adopted in the study, and the data were analyzed using R software version 4.2.3 and Excel.

RESULTS

The study encompassed 73 patients who underwent minor surgical procedures at an outpatient clinic in Belo Horizonte, comprising 26 men (36%) and 47 women (64%), with ages ranging from 19 to 87 years, and an average age of 54.26 years. (Table 1)

Among the patients analyzed, 45% (33 patients) reported alcohol consumption, while 30% (22 patients) identified as smokers. Regarding the clinical profile of the patients, it was observed that 23% were categorized as obese and 22% had a diagnosis of diabetes. (Table 1) Additionally, a minority, 3%, reported having received a blood transfusion in the past.

When evaluating by gender, it was noted that, among the female group, 17 (36%) have the habit of smoking and 20 (43%) admitted to alcohol consumption. Among men, the rates are 5 (19%) smokers and 13 (50%) consume alcohol. Regarding the prevalence of diabetes, 22% of the total analyzed individuals were found to have diabetes. Of these, 28% are female compared to 12% male. As for obesity, the numbers are equally significant, with 28% of women and 15% of men. (Table 1)

At the 5% significance level, there was ample evidence pointing to significant associations between the variables Symptoms and Diabetes, Obesity, and Smoking, indicating that patients with these conditions are statistically associated with the presence of symptoms. (Table 2)

Among the patients who presented symptoms after surgery, 19% were diabetic, 39% consumed alcohol regularly, 23% were smokers, and 24% were classified as obese. (Table 2)

Table 1: Demographic and clinical characteristics of patients undergoing surgical procedures at an outpatient clinic in Belo Horizonte, Minas Gerais.

		GÊNDER	
Characteristic	**Total, N = 73[1]**	**Female, N = 47[1]**	**Male, N = 26[1]**
Symptoms			
NO	31 (42%)	31 (66%)	0 (0%)
YES	42 (58%)	16 (34%)	26 (100%)
Diabetes			
NO	57 (78%)	34 (72%)	23 (88%)
YES	16 (22%)	13 (28%)	3 (12%)
Alcohol Consumption			
NO	40 (55%)	27 (57%)	13 (50%)
YES	33 (45%)	20 (43%)	13 (50%)
Smoking			
NO	51 (70%)	30 (64%)	21 (81%)
YES	22 (30%)	17 (36%)	5 (19%)
Obesity			
NO	56 (77%)	34 (72%)	22 (85%)
YES	17 (23%)	13 (28%)	4 (15%)
Age Class			
Less than or equal to 38 years	13 (18%)	7 (15%)	6 (23%)
Between 39 and 48 years	13 (18%)	9 (20%)	4 (15%)
Between 49 and 58 years	11 (15%)	5 (11%)	6 (23%)
Greater than or equal to 59 years	35 (49%)	25 (54%)	10 (38%)

[1]Median (AIQ); n (%)

Table 2: Association Test between Symptoms and Demographic Profile of patients undergoing surgical procedures at an outpatient clinic in Belo Horizonte, Minas Gerais.

		SYMPTOMS		
Characteristic	**Total, N = 73[1]**	**NO, N = 31[1]**	**YES, N = 42[1]**	**Value p[2]**
Diabetes				**<0.001**
NO	57 (100%)	18 (32%)	39 (68%)	
YES	16 (100%)	13 (81%)	3 (19%)	
Alcohol Consumption				**0.004**
NO	40 (100%)	11 (28%)	29 (73%)	
YES	33 (100%)	20 (61%)	13 (39%)	
Smoking				**<0.001**
NO	51 (100%)	14 (27%)	37 (73%)	
YES	22 (100%)	17 (77%)	5 (23%)	
Obesity				**0.001**
NO	56 (100%)	18 (32%)	38 (68%)	
YES	17 (100%)	13 (76%)	4 (24%)	

[1]n (%)

[2]Chi-square test of independence

To measure the degree of association between the categorical variables, Cramér's V was used, a statistical measure that evaluates the strength of the relationship between two variables considering the sample size. Cramér's V ranges from zero to one, where zero indicates total independence between the variables and one indicates a perfect relationship. In the present study, Cramér's V was 0.40, with a p-value < 0.001, for the association between Diabetes and Symptoms. These results indicate a moderate and statistically significant association between the analyzed variables.

Regarding the procedures performed, the most frequent were cyst and lipoma excisions, each representing 21% of the total procedures, followed by wart excision (26%) and nevus excision (10%). (Figure 1).

Regarding postoperative manifestations, more than half of the patients (57%) experienced some type of symptom after the procedure. Notably, pain stood out as the most frequent complaint, mentioned by 45% of the participants. (Table 3). When correlating complications with specific procedures, cyst and lipoma excisions stood out, with incidences of 26% and 24%, respectively. On the other hand, nevus and wart excisions had complication rates of 7% and 21%, respectively.

The manifestation of postoperative symptoms showed notable variations between men and women. (Table 3). These discrepancies, detailed in the table below, highlight the need to consider gender as a potentially influential factor in the individual response to surgery and the subsequent recovery process.

Figure 1: Distribution of the main types of surgical procedures performed at an outpatient clinic in Belo Horizonte, Minas Gerais.

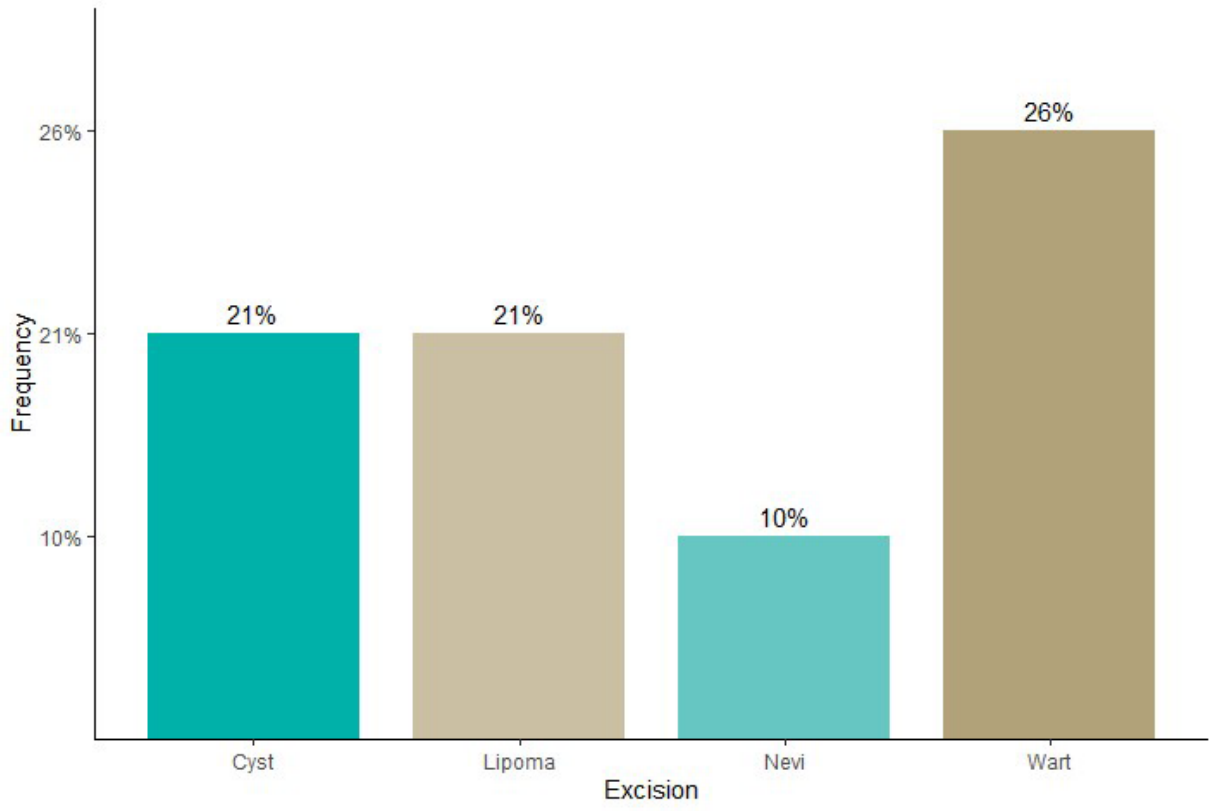


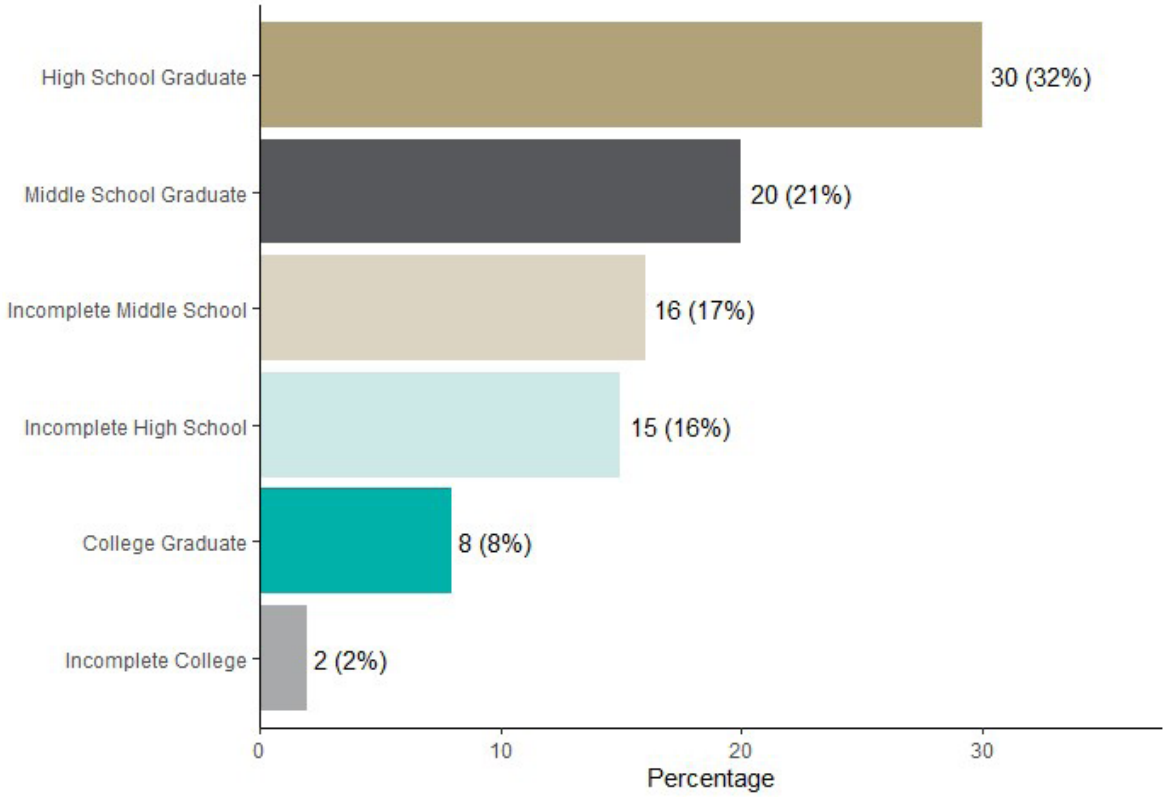
Table 3: Postoperative symptoms presented according to the gender of patients undergoing surgical procedures at an outpatient clinic in Belo Horizonte, Minas Gerais.

		GENDER	
Characteristic	**Total**, N = 73[1]	**Female**, N = 47[1]	**Male**, N = 26[1]
Pain			
NO	42 (55%)	21 (44%)	19 (73%)
YES	33 (45%)	26 (56%)	7 (26%)
Bleeding			
NO	63 (85%)	38 (81%)	24 (92%)
YES	11 (15%)	9 (19%)	2 (8%)
Pus			
NO	68 (93%)	42 (89%)	26 (100%)
YES	5 (7%)	5 (11%)	0 (0%)
Itching			
NO	51 (71%)	32 (68%)	20 (77%)
YES	21 (29%)	15 (32%)	6 (23%)
Swelling			
NO	56 (77%)	32 (68%)	24 (92%)
YES	17 (23%)	15 (32%)	2 (8%)
Warmth			
NO	70 (96%)	45 (96%)	25 (86%)
YES	3 (4%)	2 (4%)	1 (14%)
Redness			
NO	55(75%)	32 (68%)	23 (79%)
YES	18(25%)	15 (32%)	3 (21%)
Foul odor			
NO	71 (97%)	45 (96%)	26 (100%)
YES	2 (3%)	2 (4%)	0 (0%)

[1]n(%)

When evaluating the educational profile of patients, it is essential to understand how the level of education can influence the perception, understanding, and management of medical instructions and postoperative care. Figure 2 presents a distribution of the educational levels among the patients participating in the study, providing a clearer view of the educational composition of the sample and potentially elucidating correlations between education and clinical outcomes.

Figure 2: Educational level of patients undergoing surgical procedures at an outpatient clinic in Belo Horizonte, Minas Gerais.



Among the patients who manifested postoperative symptoms, the distribution by educational level was as follows: 18% had completed part of elementary school; 22% had completed elementary school; 16% had interrupted their studies in high school; the majority, 33%, had completed high school; only 2% had some level of higher education without finishing it, while 9% had a complete higher education diploma. (Figure 2)

Thus, of these patients who experienced symptoms after surgery, only half followed the advice to use analgesics for home relief. In absolute numbers, this translates to 21 patients (29%) of the total sample. The surgeries that most presented the use of analgesia were cyst excision (33%) and lipoma excision (29%).

DISCUSSION

A significant proportion of 57% of patients reported symptoms after the surgical procedure. This number is an important indication of the need for better postoperative guidance and perhaps a review of surgical techniques and patient care protocols and instructions.

Pain was the most prevalent symptom among patients, with 45% reporting this discomfort. This data is consistent with the literature, which frequently identifies pain as one of the main complaints after surgical interventions, regardless of the complexity of the procedure.[17]

Regarding lifestyle habits, a higher proportion of alcohol consumption and smoking was observed among men. Previous studies have already demonstrated an

association between these factors and the incidence of postoperative complications, particularly delayed healing and infection.[18] This finding reinforces the need for comprehensive preoperative evaluation and personalized counseling on cessation of alcohol and tobacco consumption.

The distribution of symptoms between men and women shows notable variations. Women report a higher prevalence of pain and redness. These differences can be partially attributed to hormonal and physiological differences between genders. Hormones play crucial roles in modulating stress response, inflammation, and pain perception. In women, fluctuations in estrogen and progesterone levels, for example, can affect pain sensitivity and inflammatory response. Additionally, physiological differences such as body composition and blood circulation can influence how symptoms are manifested and perceived. Thus, it is essential to consider these aspects when analyzing symptom manifestation in different genders.[19]

Regarding education, it was intriguing to observe a higher prevalence of symptoms among patients with a high school diploma. This demographic tends to report fewer symptoms, possibly due to greater awareness or access to information compared to those with lower educational levels.

The results indicated that cyst and lipoma excision procedures had the highest rates of postoperative symptoms. These procedures, although considered minimally invasive, can be associated with specific complications that deserve attention.

The analysis of the need for analgesics revealed that half of the symptomatic patients used medication for pain relief. This data suggests that, even in the face of symptoms, many patients choose not to use medication, which may be due to concerns about side effects, lack of adequate guidance, or other personal reasons. It is essential to ensure that patients are well informed about the benefits and risks of analgesia, as the underutilization of analgesics, even when indicated, can compromise the patient's quality of life and prolong the recovery period.[20]

Diabetic patients represented 19% of those with postoperative complications. Due to hyperglycemia and compromised circulation, diabetics face an elevated risk of healing problems and infections after surgical procedures. Additionally, they may present symptoms such as prolonged pain, redness at the incision site, purulent discharge, and exacerbated swelling, as reported by the evaluated patients.[21]

The prevalence of obesity among symptomatic patients (24%) is also highly relevant data. Obesity, due to various pathophysiological reasons, has been associated with a range of postoperative complications, from surgical site infection to healing problems and venous thromboembolism.[22]

The incidence of transfusion among patients (3%) may seem low, but it is still crucial. Patients who receive transfusions may have additional risks of transfusion reactions, which can manifest with symptoms similar to those of postoperative complications.[23]

The rates of alcohol consumption and smoking among women were 43% and 36%, respectively. Both are known to negatively affect healing and increase the risk of postoperative infections. The fact that such a significant proportion of women in the study had these habits highlights the need for specific preventive approaches for this demographic group, also considering the potential risks related to the menstrual cycle and hormonal changes that can impact recovery.[24]

Given the results, it is evident that patient education before surgery is crucial. Informing patients about what to expect after surgery and how to manage potential symptoms can have a significant impact on

their recovery. The relationship between high school completion and a higher prevalence of symptoms is a reminder that the relationship between education and health outcomes is complex and multifaceted. It may be that patients with this level of education are more likely to report symptoms, or there may be other confounding factors at play.[25]

The proposed study on the prevalence of obesity, diabetes, and blood transfusion history also highlights the need for comprehensive preoperative evaluation. A clear understanding of patients' comorbidities and medical history can help predict and prevent postoperative complications.[26]

CONCLUSION

The study highlighted several crucial aspects related to the prevalence of postoperative symptoms and surgical site infection, particularly in outpatient procedures. The findings underscore the undeniable importance of proper education and guidance of patients before undergoing surgical procedures, considering the potential complications related to comorbidities, lifestyle habits, and demographic characteristics.

Pain, the most common complaint, and the observed difference in symptom manifestation between genders underline the need for a personalized approach to patient care and follow-up. Factors such as diabetes, obesity, and habits like smoking and alcohol consumption proved to be significant determinants in postoperative prognosis, requiring greater attention from healthcare professionals.

The noted relationship between educational level and symptom prevalence also highlights the complexity of determinants in postoperative health. This data suggests that tailored educational strategies and effective communication are imperative to ensure an optimized recovery for patients.

Finally, although technological and methodological advances in medicine have provided faster and minimally invasive procedures, this study reiterates the imperative of constant vigilance and improved practices. Patient information and education, along with robust preoperative assessment and appropriate postoperative follow-up, are fundamental pillars to ensure safer medical practices and favorable clinical outcomes.

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THE AUTHORS DECLARE THAT THERE IS NO CONFLICT OF INTERESTS IN RELATION TO THIS ARTICLE.