ORIGINAL ARTICLE

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ASSOCIATION BETWEEN DEMARCATION AND OCCURRENCE OF COMPLICATIONS IN THE OSTOMY AND PERIOSTOMY SKIN

ASOCIACIÓN ENTRE DEMARCACIÓN Y APARICIÓN DE COMPLICACIONES EN LA PIEL DE OSTOMÍA Y PERIESTOMÍA

ASSOCIAÇÃO ENTRE DEMARCAÇÃO E OCORRÊNCIA DE COMPLICAÇÕES NA ESTOMIA E PELE PERIESTOMIA

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ABSTRACT
Objective: To analyze the association between preoperative demarcation and the occurrence of complications in the stoma and peristomal skin. **Method**: Cross-sectional, descriptive-analytical study, carried out in a Saspo in Minas Gerais, with 40 patients, of which 20 underwent preoperative demarcation and 20 did not undergo this procedure. Data were collected in 2022 through information from medical records. Descriptive and inferential statistics resources were used. The association between demarcation and the occurrence of complications was assessed by Pearson's Chi-square or Fisher's exact tests. The effect size was measured by Cramer's V and the chance of complications occurring by the Odds Ratio, with 95% confidence intervals and a significance level of 5%. **Results**: Preoperative demarcation was associated with a reduction in the occurrence of dermatitis (X2= 10.1; p-value= 0.001; V= 0.50; OR=-2.94 [-5.1; -0.7]). Cases of necrosis, hernia, edema and prolapse occurred exclusively in patients without demarcation. Due to the low frequency in the sample, it was not possible to establish whether there was an association between demarcation and edema, retraction, prolapse, hernia or necrosis. **Considerations**: Preoperative demarcation is associated with a reduction in the occurrence of dermatitis. However, other complications did not show a significant association.
Keywords: Ostomy; Nursing Care; Marking; Complications; Preoperative.

RESUMEN
Objetivo: Analizar la asociación entre la demarcación preoperatoria y la aparición de complicaciones en el estoma y la piel peristomal. **Método**: Estudio descriptivo-analítico transversal, realizado en un Saspo de Minas Gerais, con 40 pacientes, 20 sometidos a demarcación preoperatoria y 20 no sometidos a este procedimiento. Los datos se recopilarán en 2022 utilizando información de historias clínicas. Se utilizarán recursos estadísticos descriptivos e inferenciales. La asociación entre la demarcación del estoma preoperatoria y las complicaciones del estoma y peristomal se evaluó mediante la prueba de chi-cuadrado de Pearson o la prueba exacta de Fisher. El tamaño del efecto se midió mediante la V de Cramer y la probabilidad de ocurrencia de complicaciones mediante el Odds Ratio, con intervalos de confianza del 95% y un nivel de significancia de $p < 0,05$. **Resultados**: La demarcación preoperatoria se asoció con una reducción significativa en la aparición de complicaciones, presentándose complicaciones en el 50% de los pacientes demarcados, en comparación con el 95% de los pacientes no demarcados ($p = 0,001$). Otras complicaciones, como necrosis y prolapsos, ocurren exclusivamente en pacientes no demarcado, pero no tienen significación estadística. **Consideraciones**: el marcaje preoperatorio se asocia con una reducción en la aparición de dermatitis. Sin embargo, otras complicaciones no mostraron una asociación significativa.
Palabras clave: Ostomía; Cuidados de Enfermería; Marcación; Complicaciones; Preoperatorio.

RESUMO
Objetivo: Analisar a associação entre a demarcação pré-operatória e a ocorrência de complicações na estomia e pele periestomia. **Método:** Estudo transversal, descritivo-analítico, realizado em um Saspo de Minas Gerais, com 40 pacientes, dos quais 20 foram submetidos à demarcação pré-operatória e 20 não passaram por esse procedimento. Os dados foram coletados em 2022 por meio de informações dos prontuários. Foram utilizados recursos de estatística descritiva e inferencial. A associação entre a demarcação e a ocorrência de complicações foi avaliada pelos testes Qui-quadrado de Pearson ou exato de Fisher. O tamanho do efeito foi medido por V de Cramer e a chance de ocorrência das complicações pelo *Odds Ratio*, com intervalos de confiança de 95% e nível de significância de 5%. **Resultados:** A demarcação pré-operatória foi associada a uma redução na ocorrência de dermatite (X^2= 10,1; p-valor= 0,001; V= 0,50; OR=-2,94 [-5,1; -0,7]). Casos de necrose, hérnia, edema e prolapso ocorreram exclusivamente em pacientes não demarcados. Devido à baixa frequência na amostra, não foi possível estabelecer se havia associação entre demarcação e edema, retração, prolapso, hérnia ou necrose. **Considerações:** A demarcação pré-operatória está associada a uma redução na ocorrência de dermatite. Contudo, outras complicações não apresentaram associação significativa.
Palavras-chave: Estomia; Cuidados de Enfermagem; Demarcação; Complicações; Pré-Operatório.

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INTRODUCTION

Healthcare has evolved and seeks to combine quality and safety[1], promoting evidence-based and patient-centered practices[2]. Quality and safety in healthcare are achieved through the implementation of best practices, evidence-based protocols, and the use of appropriate technologies[3]. Furthermore, they require ongoing training of professionals for the effective use of healthcare techniques and resources[4].

Considering the national context, which highlights the transition in the demographic and epidemiological profile, some health conditions are becoming a priority, also considering the need for multidisciplinary care and healthcare technologies[5]. A notable example of this is ostomies, which are procedures resulting from surgical interventions that create an opening in a specific structure of the digestive, respiratory, or urinary systems[6].

For safe care and qualified assistance, one of the recommendations is that the stoma site be properly marked by a trained surgeon or nurse during the preoperative period[6]. This practice is recognized by national[6] and international[7] organizations and aims to identify the most appropriate location for the stoma, taking into account anatomical, functional, and quality of life aspects[8].

Despite being recommended, stoma demarcation is still rarely performed in clinical practice[9-10], mainly due to the shortage of trained professionals and inadequate working conditions[11]. Failure to do so can result in the stoma being placed in inappropriate areas of the abdomen, favoring the occurrence of complications[8]. Therefore, it is believed that demarcation has the potential to prevent complications in people with stoma. However, this relationship has not been demonstrated in Brazilian studies.

The literature on the effectiveness of this practice is still limited and controversial, as evidenced by a recent review study. This study highlights the low quality of the available evidence and the numerous limitations that hinder definitive conclusions, despite studies indicating that ostomy demarcation is a risk factor for dermatitis and that individuals with ostomy demarcation experience fewer ostomy and peristomal skin complications[10-12].

In this context, the question arises: Is there an association between ostomy demarcation and the occurrence of ostomy and peristomal skin complications? Therefore, the objective of this study is to analyze the possible association between ostomy demarcation and the occurrence of ostomy and peristomal skin complications.

METHOD

A cross-sectional, descriptive-analytical study was conducted at a Health Care Service for Ostomized Persons (Saspo), located in the central macro-region of Minas Gerais. Data were

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collected from the medical records of patients treated between 2015 and 2021, totaling a sample of 40 patients. Of these, 20 had their ostomies marked preoperatively and 20 did not undergo this procedure. Patient selection was performed by 1:1 matching, ensuring that each patient with a marked ostomy had a corresponding patient without a mark, with similar clinical characteristics.

The study included individuals with elimination ostomies (colostomies, ileostomies, and urostomies), aged 18 or older, whose medical records contained sufficient information to fully complete the data collection form. The exclusion criteria were:

People with feeding or respiratory ostomies and those with incomplete medical records, characterized by the absence of two or more variables.

Data collection was conducted in June 2022 through documentary research, using information recorded in the medical records. A data collection form was developed exclusively for data collection. The study variables were: sex, age, education, reason for ostomy creation, chemotherapy treatment, type of ostomy, time of occurrence, location, externalization, type of effluent, and ostomy shape.

Descriptive and inferential statistics were used. Frequencies and percentages were presented for categorical variables. Means and standard deviations were calculated for numerical variables. To examine the association between preoperative ostomy site demarcation and stoma and peristomal skin complications, Pearson's chi-square test or Fisher's exact test were used, depending on the adequacy of the data, to assess the association between categorical variables. Additionally, the effect size was determined using Cramer's V test, and the measure of association was the odds ratio with 95% confidence intervals. Statistical significance was set at p-values <0.05. All analyses were conducted using Microsoft Excel© for initial data organization and Jasp version 19.1 for statistical tests.

This study was conducted in accordance with the ethical guidelines established by Resolution No. 466/2012 of the National Health Council. The project was approved by the Research Ethics Committee (CEP) under number 10 ... of Opinion 5,523,922/2022, ensuring compliance with current regulations. The principle of autonomy was ratified through clarifications and the signing of the Informed Consent Form (ICF). In specific cases where it was not possible to obtain direct consent from patients, such as in cases of death, data collection was performed using the Informed Consent Form.

RESULTS

The study sample consisted of 40 patients, with a predominance of males, representing 55% (n=22) of the participants. The mean age of the participants was 65.4 years (SD = 12.3 years), indicating that most patients were elderly. Regarding educational level, it was

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observed that the majority had a low educational level, with 37.5% (n=15) having incomplete elementary education. Furthermore, the main reason for ostomy placement was oncological, totaling 82.5% (n=33) of the cases; however, 62.5% (n=25) were not undergoing chemotherapy, as shown in Table 1:

Table 1 – Characterization of participants. MG, Brazil, 2025.

Variable	n (%)
Gender	
Male	22 (55%)
Female	18 (45%)
Age	
Mean (Standard Deviation)	65,4 (12,3) years
Education	
Incomplet Elementary level	15 (37,5%)
Full Elementary level	10 (25%)
Full High School	9 (22,5%)
Full College Degree	6 (15%)
Cause of stoma	
Inflammatory	2 (5%)
Oncological	33 (82,5%)
Obstructive	4 (10%)
Traumatic	1 (2,5%)
Chemotherapy treatment	
No	25 (62,5%)
Yes	15 (37,5%)

The majority of patients, 50% (n=20), had a colostomy. Regarding the form of exteriorization, 62.5% (n=25) were terminal. Furthermore, 65% (n=26) of patients had temporary stomas and 50% (n=20) were located in the lower left quadrant, 66.5 (n=27) had an irregular shape and pasty effluent in 60% (n=24) of cases, as shown in Table 2:

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Table 2 – Characterization of the stoma. MG, Brazil, 2024.

Variable	n (%)
Type of stoma	
Colostomy	20 (50%)
Ileostomy	12 (30%)
Bricker	1 (2,5%)
Colostomy + Bricker	4 (10%)
Ileostomy + Bricker	2 (5%)
Form of Externalization	
Terminal	25 (62,5%)
Two mouths	2 (5%)
In Handle	13 (32,5%)
Temporality	
Definitive	14 (35%)
Temporary	26 (65%)
Localization	
Lower left quadrant	20 (50%)
Lower right quadrant	15 (37,5%)
Upper quadrant left	4 (10%)
Waistline	1 (2,5%)
Format	
Irregular	27 (66,5%)
Regular	13 (32,5%)
Effluent	
Pasty	24 (60%)
Liquid	16 (40%)

Preoperative demarcation was associated with a reduction in the incidence of complications, with 50% (n=10) of demarcated patients experiencing complications compared to 95% (n=19) of non-demarcated patients (X2=10.1; p=0.001). The most frequent complication was dermatitis, occurring in 47.5% (n=19) of non-demarcated patients and in 50% (n=10) of those with demarcation. Cases of necrosis, hernia-associated dermatitis, edema, or

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prolapse occurred exclusively in non-demarcated patients, but were not statistically significant between the groups, as shown in Table 2.

Table 2 – Association between preoperative demarcation and the occurrence of stoma and peristomal skin complications. MG, Brazil, 2025.

Complication	Undemarcated (n=20)	Demarcated (n=20)	X^2	p-value	V cramer	OR
Dermatitis	19	10	10,1	0.001	0.50	-2,94 (-5,1; -0,7)
Retraction	2	3	0,22	0.63	0.07	0,46 (-1,4; 2,3)
Hernia	1	0	1,02	0.31	0,16	-1,14 (-4,4; 2,1)
Edema	1	0	1,02	0.31	0,16	-1,14 (-4,4; 2,1)
Prolapse	1	0	1,02	0.31	0,16	-1,14 (-4,4; 2,1)
Necrosis	1	0	1,02	0.31	0,16	-1,14 (-4,4; 2,1)

DISCUSSION

The results of this study indicate that preoperative demarcation is associated with a lower incidence of dermatitis, as evidenced by statistical significance, effect size, and odds ratio. However, no significant association was found between demarcation and other ostomy and peristomal skin complications, such as retraction, hernia, edema, prolapse, and necrosis.

These findings suggest that demarcation may act as a protective factor, reducing the incidence of peristomal dermatitis. This conclusion is consistent with previous studies confirming the relationship between demarcation and reduced complications. The study indicated that patients who underwent demarcation had lower rates of early complications (48.4% versus 59.3%; p= 0.019), including a reduced incidence of dermatitis (32% versus 45%; p = 0.004).

The effect of marking on reducing the risk of stoma-related complications was investigated in this systematic review of 27 studies. The risk of stoma-related complications was significantly lower in the marked group compared to the unmarked group, but the evidence is very uncertain[13].

Peristomal dermatitis stands out as the most common complication among people with ostomies. A systematic review study found that its occurrence ranges from 36.3% to 73.4% of cases[14]. Specifically, peristomal irritant contact dermatitis (PICD) was observed in 31.6% of patients in the early period and in 26% in the late period[15].

The data from this study converge with national[16] and international[15,17] studies, which reinforce the high prevalence of peristomal

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dermatitis. A study identified this condition as the most frequent complication, affecting 54.4% of patients with complications, which represented 60.3% of the analyzed sample. Furthermore, the overall incidence of peristomal complications was 65.7%, with 63.6% in the elective group and 69.6% in the emergency group. Among these complications, dermatitis (33.3%) was the most prevalent, appearing mainly in the second or third postoperative week[15].

Comparing complication rates between different types of ostomies, the results show that 35.9% of colostomy patients and 50% of ileostomy patients experienced peristomal complications, with no statistically significant difference between the groups (p = 0.654). Peristomal dermatitis was again the most common, occurring in 61.54% of colostomy patients and 50% of ileostomy patients[18].

In contrast, one study found a low incidence of complications, reporting that 80.75% of patients did not develop any complications related to the ostomy or peristomal skin[19]. This discrepancy may be attributed to methodological differences, characteristics of the study population, or adopted care protocols.

A similar situation is observed internationally. In one study, the majority of patients (62.5%) experienced peristomal dermatitis. Preventive measures, such as the use of low-pH detergent, gauze cleaning, and the use of a protective splint, significantly reduced the risk of dermatitis by 99% (OR = 0.013; 95% CI = 0.002–0.091; p < 0.001), 89% (OR = 0.109; 95% CI = 0.016–0.727; p = 0.021), and 89% (OR = 0.108; 95% CI = 0.041–0.282; p < 0.001), respectively.

Furthermore, a stoma with a regular profile was associated with a lower risk of complications (OR = 0.314; 95% CI = 0.140–0.702; p = 0.005)[17].

Another international study highlighted that up to 80% of individuals with ostomies may experience peristomal complications, with dermatitis being the most prevalent[20]. Dermatitis is known to result from an inflammatory process and denudation of the skin adjacent to the ostomy, resulting from prolonged exposure to caustic effluents, which compromise the skin barrier and make the skin more susceptible to damage[21-22]. Several factors favor the development of peristomal dermatitis, including frequent leaks, improper use of collection equipment, use longer than recommended, incorrectly cut adhesive base in relation to the ostomy diameter, and inadequate hygiene[23].

Clinically, it presents as erythema, moist or white hyperkeratosis (maceration), superficial epidermal loss (erosions and denuded skin), and hypergranulation tissue. Unlike other forms of skin damage, peristomal dermatitis makes care more complex, as the affected skin cannot avoid repeated exposure to collection equipment adhesives and effluents in the setting of rapid erosion of the adhesive base, which can cause persistent skin deterioration. If left untreated,

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peristomal dermatitis can cause scarring, stoma stenosis, and inability to maintain collection equipment adhesion[21].

Another relevant aspect of this study was the lack of a statistically significant association between the demarcation and other complications, such as retraction, hernia, edema, prolapse, and necrosis ($p > 0.05$). This lack of association can be attributed to several factors. The main one is the limited number of cases of these complications in the sample, which limits the statistical power of the analysis and makes it difficult to identify differences between the groups.

Despite this, one study reported lower rates of ischemia/necrosis (2.3% versus 7.2%; $p = 0.014$) and mucocutaneous separation (3.2% versus 8.1%; $p = 0.026$) in patients who underwent preoperative demarcation compared to those who did not. However, there was no statistically significant difference in the occurrence of late complications, such as hernia, retraction, prolapse, and stenosis, between the groups (47.5% versus 54.2%; $p = 0.15$)[24]. Another study confirmed the impact of demarcation on the occurrence of dermatitis, leaks, and quality of life of people with ostomies, but did not address the influence of this factor on other ostomy complications[9].

It is important to emphasize that many of these complications have a multifactorial origin, being related to aspects such as the surgical technique used, the patient's clinical condition, the integrity of the abdominal wall, and intraoperative hemodynamic factors. These factors, in turn, are not directly influenced by the location of the stoma.

The specific surgical technique plays a fundamental role in preventing complications. However, stoma preparation, the final stage of emergency surgeries, is often considered a secondary aspect of the procedure and may be delegated to less experienced surgeons. This approach is concerning, as stoma creation should be recognized as one of the most important phases of surgery, given its influence on the postoperative outcome and the patient's quality of life[15].

Therefore, it is essential that nurses and surgeons adopt preventive strategies to minimize stoma-associated complications. Preoperative demarcation, when performed by a trained nurse, preferably a stoma therapist, is a fundamental measure for reducing complications and contributing to better patient adaptation to the stoma[6]. At the same time, the surgical technique must be rigorously applied, ensuring a Proper ostomy construction and compliance with anatomical and functional criteria that promote healing, maintenance of abdominal wall integrity, and quality of life for people with ostomies[25].

Among the limitations of this study, the sample size stands out. While sufficient to identify an association between the demarcation and the occurrence of dermatitis, it may have limited the statistical power to detect associations with less frequent complications.

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However, in the case of ostomy-associated dermatitis, the observed effect size highlighted the relevance of the findings, indicating that the results have a significant clinical impact.

Furthermore, factors such as the ostomy's outlet angle and the use of medications capable of influencing effluent consistency, aspects that may interfere with the occurrence of dermatitis, were not assessed. Another relevant limitation is the low incidence of retraction, necrosis, prolapse, hernia, and edema in both groups analyzed, which made it difficult to determine a robust association between preoperative demarcation and other less prevalent complications.

Therefore, the results of this study should be interpreted with due caution, understanding that these limitations are largely related to the low frequency of preoperative marking indications, which makes it difficult to obtain sufficiently large samples for more robust comparisons between groups. Therefore, future investigations with a larger number of participants and control for intervening variations are needed to deepen the understanding of the impact of marking on the prevention of ostomy and peristomal skin complications.

FINAL CONSIDERATIONS

This study aimed to analyze the association between preoperative ostomy site marking and the occurrence of stoma and peristomal skin complications. The findings indicated that marking is associated with a reduced occurrence of peristomal dermatitis, reinforcing its relevance as a preventive strategy, especially because it allows for more appropriate stoma positioning in relation to the patient's anatomical characteristics.

In contrast, complications such as parastomal hernia, edema, prolapse, and necrosis occurred only among patients who did not undergo preoperative marking. Although not statistically significant, these findings highlight the need for future investigations with larger sample sizes and designs that allow for greater statistical power to detect differences between groups and evaluate potential relationships relevant to clinical practice.

Given the above, the importance of preoperative marking is reaffirmed as a safe, non-invasive, low-cost, and potentially effective practice in preventing certain ostomy-related complications. Its systematic adoption can contribute to improving the quality of care provided to ostomized patients. Therefore, it is recommended to strengthen institutional initiatives aimed at training professionals, as well as implementing protocols that make demarcation a mandatory step in the surgical preparation of patients eligible for ostomy placement.

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Nothing to declare.

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