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# Prevalence, repercussion and factors associated with intestinal constipation in women in Florianópolis

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ABSTRACT

The objective of this study was to determine the prevalence of intestinal constipation and its association with sociodemographic and health-related factors in 605 adult women of metropolitan Florianópolis/SC who underwent screening tests for cervical cancer. This is a cross-sectional study in which intestinal constipation was evaluated by Rome III criteria. We used Poisson regression considering $p < 0.05$.

*Results:* The prevalence of intestinal constipation according to Rome III was 25.1%. Approximately 80% of women with constipation reported that the problem caused medium/high interference in their lives. In univariate analysis, constipation was associated with: income per capita lower than 1 minimum wage, a poor health state, body dissatisfaction, physical activity during personal commuting and self-report of hemorrhoids. In multivariate analysis and following a hierarchical model, the association persisted only for self-report of hemorrhoids (PR = 4.45, CI = 3.49–5.68). Coping strategies for intestinal constipation in the health care of women are suggested.



## Prevalência, repercussões e fatores associados à constipação intestinal nas mulheres em Florianópolis

*Palavras-chave:*
Constipação intestinal
Qualidade de vida
Imagem corporal
Atividade física

RESUMO

O objetivo foi verificar a prevalência de constipação e sua associação com fatores sociodemográficos e relacionados à saúde em 605 mulheres adultas da grande Florianópolis/SC que realizaram exames de rastreamento de câncer de colo uterino. Este é um estudo transversal em que a constipação foi avaliada por meio dos critérios Roma III. Utilizou-se regressão de Poisson para p<0,05.

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*Resultados:* a prevalência de constipação segundo Roma III foi 25,1%. Aproximadamente 80% das mulheres com constipação referiram que a mesma tinha média/grande interferência em suas vidas. Na análise univariada, estiveram associados à constipação: renda per capita menor que 1 salário mínimo, estado de saúde ruim, insatisfação com o corpo, realizar atividade física no deslocamento pessoal e auto-relato de hemorróidas. Na análise multivariada e seguindo o modelo hierárquico, somente a associação com o auto-relato de hemorróidas foi preservada (RP = 4,45; IC = 3,49-5,68). Sugerem-se estratégias de enfrentamento da constipação no âmbito de atenção à saúde da mulher.



## Introduction

Unlike the old myth that constipation is normal for women, this problem, when chronic, can cause health and quality of life impairment, besides facilitating the appearance of injuries, e.g. prolapse of pelvic organs, hemorrhoids and stress urinary incontinence.[1,2] Functional constipation is defined based on Rome III diagnostic criteria: sensation of abdominal bloating, feeling of incomplete evacuation, need of digital facilitation for defecation, need for straining, passing hard stools and occurrence of less than three bowel movements per week, in addition to the regular use of laxatives.[3]

Studies aimed at understanding this phenomenon usually involve specific groups, with the most varied prevalence. A systematic review showed the presence of distinct diagnostic criteria, resulting in wide variations in the prevalence reported in international studies, from 0.7% to 79% in adults.[4] In Brazil, population-based studies conducted in the south of the country reported a prevalence of 23% in both men and women[5] and of 37% in women.[6]

There is evidence that the prevalence of intestinal constipation is higher in women than in men, due to hormonal factors.[7] The minority of women who suffer from constipation look for health services for a diagnosis or treatment of their condition. This underestimation of data, as well as the lack of a diagnostic and therapeutic standardization,[8] makes it difficult to determine the actual prevalence of constipation.

In general, constipation can be treated at primary care level with cost-effective control of symptoms.[9] In the women's health care service, screening tests for cervical cancer stand out. Epidemiological studies have shown that the coverage of these tests is satisfactory in Brazil.[10,11] It is understood that it would be opportune to investigate the presence of constipation in women looking for these exams and to adopt strategies for this disease.

Of those factors associated with constipation, eating habits, physical inactivity, socioeconomic status, psychological issues, medication use and increasing age stand out.[7] Given the importance of this issue and the social significance of female body appreciation as a constituent of satisfaction and well-being, this research aims to verify the prevalence of intestinal constipation and its association with sociodemographic factors and other health-related issues in adult women who perform routine screening tests for cervical cancer.

## Methods

This is an observational cross-sectional study, with data collection conducted from September 2011 until April 2012. Participants were 605 women who attended the Women's Network Against Cancer in Florianópolis (SC). The institution serves approximately 4200 women per year, being reference to the prevention and care of breast and cervical cancer for women of different socioeconomic classes of the region. The assessments occurred on Tuesday, Thursday and Friday afternoons, given the availability of a room reserved for this study. The patients showed up with no scheduled time for the examination.

The study was approved by the ethics committee of UDESC under protocol n.15/2011 and was conducted within the ethical standards of the Declaration of Helsinki (1964) and according to Resolution 196/96 of the Ministry of Health.

Inclusion criteria consisted of women who attended the institution for cervical cancer screening test and agreed to participate in the study by signing a free informed consent form. Exclusion criteria were: pregnant women, women with cognitive impairment or neurological illness, physical disability limiting ambulation, and women under 18 years of age.

### *Instruments*

Demographic data were obtained through a form containing questions of interest: age, ethnicity, education, marital status, family income (in minimum wages) and health status (levels: very good, good, fair, poor and very poor).

Anthropometric data (weight, height, waist and hip circumference) were obtained with a digital scale and a measuring tape. For classification of abdominal obesity (using the waist circumference, measured just below the last rib), we used cutoff points in relationship to the risk of developing metabolic complications, being categorized into inadequate (≥80 cm) and appropriate (<80 cm).[12]

The physical activity was assessed through questions obtained from a study of IBGE.[13] Women who said that "in the last three months I have practiced some form of physical exercise or sport" were considered as active in leisure. Women who "used to walk or bike from home to work" were considered active in their journey to work. Active women at work corresponded to those who "walked at work most of the time, carried weight or did some other activity requiring intense physical effort." And finally, women considered as active in

the house where those who said that "used to do the (heavy) cleaning at home."

Body image was assessed with the silhouettes' scale of Stunkard.[14] To evaluate satisfaction with body image, the actual body appearance was subtracted from the ideal body appearance. When the variation was = zero, the woman was classified as satisfied; with a non-zero value, she was classified as dissatisfied. If the difference was positive, the dissatisfaction was by an excess of weight; and when negative, the dissatisfaction was with leanness. Body satisfaction, in turn, was identified with a question: "to what degree are you satisfied with your body?" (very satisfied, moderately satisfied, neither satisfied nor dissatisfied, moderately dissatisfied, very dissatisfied).

In order to assess constipation, in addition to self-reports of women we used Rome III criteria, thanks to their wide acceptance and use in studies on this topic.[3,4,15] Rome III consists of objective (number of evacuations, need for manual maneuvers to defecate) and subjective (straining when defecating, incomplete evacuation, sensation of obstruction, hard stools) criteria. To characterize the constipation, two or more of these criteria must be achieved.[15]

Finally, a self-report control question regarding the presence of hemorrhoids was included, as well as an evaluation of how the presence of constipation interfered with everyday life. With this in mind, a visual analog scale with scores ranging from 0 (does not interfere) to 10 (interferes a lot) was used.

**Table 1 – Prevalence of self-reported constipation according to Rome III objective criteria and how constipation interferes with everyday life.**

| Criteria of constipation | *n* | % |
|---|---|---|
| Self-report | 148 | 24.5 |
| Diagnosed according to Rome III | 152 | 25.1 |
| Sensation of anal block | 138 | 22.8 |
| Need for digital facilitation | 9 | 1.5 |
| Sensation of incomplete evacuation | 123 | 20.3 |
| Passage of hard stools | 134 | 22.1 |
| Straining necessity | 134 | 22.1 |
| Occurrence of less than three bowel movements/week | 119 | 19.7 |
| Regular use of laxatives | 31 | 5.1 |
| Hemorrhoids | 51 | 8.4 |
| *Interference in everyday life (0–10)*[a] | | |
| 0 – No interference | 458 | 75.7 |
| 1 | 1 | 0.2 |
| 2 | 5 | 0.8 |
| 3 | 8 | 1.3 |
| 4 | 10 | 1.7 |
| 5 – Medium interference | 25 | 4.1 |
| 6 | 11 | 1.8 |
| 7 | 14 | 2.3 |
| 8 | 20 | 3.3 |
| 9 | 11 | 1.8 |
| 10 – High interference | 37 | 6.1 |

[a] Five women did not respond to this question.

### *Procedures*

The information was collected at the time during which the women were in the waiting room, waiting to their screening exam for cervical cancer. They were invited to participate in the study before the exam, when we explained the purpose of the study and the confidentiality of identification.

Data were collected by a physiotherapist and two undergraduate students (all women, all previously trained) from Physiotherapy Course. Data collection took place on privacy and during the waiting time for the screening test. Very few women refused to participate, because their participation did not entail further loss of time. First, the characterization data of the sample were collected, followed by the application of other research instruments.

### *Data analysis*

Data obtained were tabulated with SPSS statistical program and analyzed using descriptive (frequency, mean, median and standard deviation) and inferential statistics. In order to analyze the associations among the outcome (constipation) and independent (sociodemographic and health-related) variables, we completed a Poisson regression analysis with robust variance to obtain crude and adjusted estimates of prevalence ratios, considering $p < 0.05$. For adjusted analyzes, we adopted the order of a hierarchical model to determine the outcomes in which were included those variables presenting $p < 0.25$ in crude analyses.[16] The level 1 (sociodemographic) variables were adjusted among themselves, being kept in the model those with $p < 0.25$, for adjustment of variables in the subsequent level. Next, level 2 (behavioral) variables with $p < 0.25$ in the crude analysis were included, along with those of level 1, for adjustment of variables.

## Results

As can be seen in Table 1, the prevalence of intestinal constipation according to the self-report was similar to that obtained with Rome III criteria. Most women exhibited none of the established objective criteria and 25.1% had at least two criteria, consistent with the diagnosis of constipation according to Rome III. Regarding the interference of constipation in women's everyday lives, measured with a visual analog scale, approximately 80% of women with constipation reported that this problem had a medium/high interference in their lives.

The mean age of participants was 40.5 (SD = 13.2, median = 40) years. About 70% of women were dissatisfied with their body image, mainly due to an excess body weight.

Prevalence ratios obtained for the variable "constipation" in women in this study, according to a pre-established hierarchical model, are given in Table 2. As for crude analysis, income per capita less than 1 minimum wage, poor health state, body dissatisfaction, physical activity in personal commuting and self-reported presence of hemorrhoids.

After intra- and inter-level adjustments, only the presence of hemorrhoids was associated with constipation, so that the prevalence of constipation in women with hemorrhoids was 4.45 times that of women without hemorrhoids.

**Table 2 – Sociodemographic and health variables associated with female bowel constipation evaluated by Rome III criteria.**

| | n (%)[a] | | Raw analysis PR (CI) | Adjusted analysis PR (CI) |
|---|---|---|---|---|
| | Not constipated (n = 453) | Constipated (n = 152) | | |
| *Level 1 – sociodemographic variables* | | | | |
| Education | | | p = 0.178 | p = 0.269 |
| Fundamental complete/incomplete | 195 (74.7) | 66 (25.3) | 1.69 (0.92–3.11) | 1.66 (0.89–3.10) |
| Medium complete/incomplete | 200 (73.5) | 72 (26.5) | 1.77 (0.97–3.25) | 1.59 (0.87–5.93) |
| Superior complete/incomplete | 57 (85.1) | 10 (14.9) | 1 | 1 |
| Income per capita | | | p = 0.045 | p = 0.120 |
| Up to 1 minimum wage | 261 (72.1) | 101 (27.9) | 1.36 (1.01–1.85)[b] | 1.29 (0.94–1.77) |
| More than 1 minimum wage | 183 (79.6) | 47 (20.4) | 1 | 1 |
| Age group | | | p = 0.065 | p = 0.062 |
| <44 years | 265 (72.2) | 102 (27.8) | 1.33 (0.98–1.80) | 1.36 (0.98–1.88) |
| ≥45 years | 178 (79.1) | 47 (20.9) | 1 | 1 |
| Marital status | | | p = 0.476 | |
| With no partner | 133 (76.9) | 40 (23.1) | 0.89 (0.65–1.22) | [c] |
| With partner | 320 (74.1) | 112 (25.9) | 1 | |
| Ethnicity | | | p = 0.712 | |
| Caucasian | 354 (75.3) | 116 (24.7) | 0.96 (0.66–1.33) | [c] |
| Black/mulatto/yellow | 81 (73.6) | 29 (26.4) | 1 | |
| *Level 2 – health-related variables* | | | | |
| State of health | | | p < 0.001 | p = 0.069 |
| Fair/poor/very poor | 170 (67.7) | 81 (32.3) | 1.66(1.26–2.19)[b] | 1.34 (0.98–1.83) |
| Good/very good | 282 (80.6) | 68 (19.4) | 1 | 1 |
| Hemorrhoids | | | p < 0.001 | p < 0.001 |
| Yes | 6 (11.8) | 45 (88.2) | 4.56 (3.75–5.56)[b] | 4.45 (3.49–5.68)[b] |
| No | 447 (80.7) | 107 (19.3) | 1 | 1 |
| Urinary incontinence | | | p = 0.051 | p = 0.660 |
| Yes | 143 (70.1) | 61 (29.9) | 1.32 (0.99–1.74) | 1.07 (0.79–1.46) |
| No | 310 (77.3) | 91 (22.7) | 1 | 1 |
| BMI classification | | | p = 0.106 | p = 0.423 |
| Excess body weight | 209 (72.6) | 79 (27.4) | 1.27 (0.95–1.71) | 1.13 (0.84–1.52) |
| Normal weight | 215 (78.5) | 59 (21.5) | 1 | 1 |
| Abdominal obesity | | | p = 0.476 | |
| Inappropriate (waist ≥ 80 cm) | 201 (79.4) | 52 (20.6) | 1 | [c] |
| Appropriate (waist < 80 cm) | 175 (76.8) | 53 (23.2) | 1.13 (0.81–1.58) | |
| Body satisfaction | | | p = 0.013 | p = 0.925 |
| Unsatisfied | 114 (67.5) | 55 (32.5) | 1.54 (1.15–2.06)[b] | 1.05 (0.73–1.48) |
| Neither satisfied nor dissatisfied | 44 (71) | 18 (29) | 1.37 (0.88–2.15) | 0.94 (0.57–1.55) |
| Satisfied | 291 (78.9) | 78 (21.1) | 1 | 1 |
| Satisfaction with body image | | | p = 0.066 | p = 0.382 |
| Satisfied | 131 (80.4) | 32 (19.6) | 1 | 1 |
| Unsatisfied | 319 (72.8) | 119 (27.2) | 1.38 (0.98–1.96) | 1.19 (0.81–1.75) |
| Physical activity at work | | | p = 0.345 | |
| Inactive | 251 (76.5) | 77 (23.5) | 0.87 (0.66–1.15) | [c] |
| Active | 202 (73.2) | 74 (26.8) | 1 | |
| Physical activity personal commuting | | | p = 0.005 | p = 0.124 |
| Inactive | 333 (78) | 94 (22) | 1 | 1 |
| Active | 120 (67.4) | 58 (32.6) | 1.48 (1.12–1.95)[b] | 1.26 (0.94–1.71) |
| Domestic physical activity | | | p = 0.655 | [c] |
| Inactive | 39 (72.2) | 15 (27.8) | 1.11 (0.70–1.75) | |
| Active | 410 (75) | 137 (25) | 1 | |

PR, prevalence ratio; CI, confidence interval.

[a] Valid percentages were used due to some missing data for some variables.

[b] Significant at $p < 0.05$.

[c] Variables not included in multiple Poisson model for not presenting $p < 0.25$.

## Discussion

This study identified a high prevalence of constipation (25.1%) in adult women visiting a public health service to perform screening tests for cervical cancer. The prevalence of self-reported constipation was similar to that according to Rome III diagnostic criteria (24.5% and 25.1%, respectively). A similar population-based study conducted in Pelotas, RGS, reached a prevalence of 37% using Rome III criteria.[6] It is difficult to compare the prevalence of constipation with other

previous studies due to different diagnostic criteria, considering that the establishment of Rome III criteria occurred in 2006.[15] The information on the prevalence of constipation in developing countries is scarce.[4]

In the present study, it was identified that constipation affects the everyday lives of adult women, since approximately 80% of patients with this condition reported a medium/high interference in their lives. Although constipation really affect everyday life, many constipated people minimize such discomfort, not considering its bowel habits as abnormal, and believing that they can solve the problem on their own.[4]

The results of this study – high prevalence of constipation and interference of this condition in everyday lives of women – indicate the need to introduce methods to correct the problem in order to prevent its complications in the short and long term. Over the years, the presence of constipation increases the risk of fecal incontinence,[17] cardiovascular events,[18] problems in hemorrhoids and anal fissure,[19] prolapse of pelvic organs, and stress urinary incontinence.[1,2,20]

Therefore, there is a need to develop health education programs which advise on strategies for constipation care, including improved eating behaviors and bodily practice incentives (e.g. games, dance, gymnastics and sports). It is suggested, as a space to develop such actions, the use of women's service of health care in those times when women are seeking the screening test for cervical cancer.

In this study, the prevalence of constipation in women who had incomes per capita lower than 1 minimum wage was 1.36 times the prevalence in women with incomes per capita higher than 1 minimum wage. However, after adjustment with the variables "education" and "age", this association did not keep statistical significance. It was previously described that low socioeconomic status/education level were associated with higher prevalence of constipation.[4,6,7] A possible explanation for this finding is the relationship with different dietary habits and lifestyles of individuals in different socioeconomic conditions.[7]

Furthermore, the prevalence of constipation in women with self-assessment implying a worse health status was 1.66 times higher than that found in women with good health, but this association was not maintained, when adjusted for the other variables of the hierarchical model. In this regard, a review of the recent literature[19] indicates that intestinal constipation may be secondary to many diseases, and also to the use of medications. Possibly, the symptoms of constipation are elements that reduce the perception of health, in its broadest sense.

The prevalence of body image dissatisfaction was high (72.9%) and mainly attributed to excess body weight. The manifestation of dissatisfaction with body image usually begins in girls from 6 years of age (pre-adolescence), when the child begin to assimilate the cultural contexts of body and esthetics.[21] Dissatisfaction with body image is related to depressive symptoms and poorer self-esteem in the female population.[22] Slevec and Tiggemann (2011)[23] explain that the factors responsible for dissatisfaction with body image in middle-aged women are similar to those in young women, whether they are biological (such as BMI), psychological (internalizing the slenderness ideal) and socio-cultural (e.g. bullying related to body weight). Furthermore, according to the authors, the factors "menopause" and "anxiety related to aging" contribute to this feeling of dissatisfaction with body image in middle-aged women.

It is understood that the lack of comfort of Brazilian women in the elimination of flatus, due to a cultural norm establishing that its public elimination is unpleasant, along with the high demand for domestic chores and working activities and also with the poor hygiene in public restrooms in general, will lead to an increased repression of intestinal gases and solid content elimination, with consequent inhibition of defecation reflex – which is a triggering factor for chronic constipation. Such behavior provides evidence of a possible relationship between poor body perception and constipation.

This study found that the prevalence of constipation in women dissatisfied with their body was 1.54 times the prevalence found in women showing satisfaction with their body. However, when the adjustment with the other variables was made, the association between body satisfaction and constipation did not last. It was verified that women with constipation had greater psychological morbidity, manifested by anxiety, depression and social dysfunction, and by an altered perception of feminine identity.[24] The relationship between constipation and satisfaction with the body, including the perception of body image, has not yet been sufficiently explored. The perception, that is, the meaning attributed to the body, undergoes changes throughout life, since the construction of this image can be influenced by cultural, social and psychological contexts.[25]

There was no association between variables related to excess body weight (BMI and waist circumference) with constipation. Furthermore, a systematic review[4] identified several studies describing the relationship between obesity and presence of constipation.

Unlike studies describing that exercise practice stimulates bowel function, since the desire to defecate is often reported during and after exercise,[26] our study did not identify such an association after an adjusted analysis, possibly because the measuring instrument of physical activity through self-report does not offer enough precision to detect this association.

In this study, the presence of hemorrhoids was the factor most associated with constipation (PR = 4.45), even after adjustment. Hemorrhoid thrombosis may be the cause or consequence of constipation,[19] and therefore should be further investigated in the female population in general.

## Conclusion

We observed high prevalence of intestinal constipation and of dissatisfaction with body image for women seeking screening tests for cervical cancer in Florianopolis. The factors associated with constipation in univariate analysis were an income per capita less than 1 minimum wage, a poor health state, body dissatisfaction, physical activity in personal commuting and self-report of hemorrhoids. In multivariate analysis, following a hierarchical model, only the self-report of hemorrhoids remained associated with constipation.

This study is important for identifying that constipation negatively interfere in the everyday lives of adult women. This

justifies the development of health education activities and bodily practices in the context of primary care encouraging better body perception and knowledge, besides the offer of therapeutic and preventive care for constipation and hemorrhoids.

Considering the limitations of this study, it is suggested that future research use population based surveys and preferably continue adopting Rome III criteria for evaluation of constipation. Furthermore, it is suggested that other important factors, as those of obstetric (parity, complications and type of delivery), hormonal (menopause), nutritional, psychological and of medical nature be controlled. In addition, the relationship between constipation and bodily issues need to be further explored.

## Conflicts of interest

The authors declare no conflicts of interest.

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