

ORIGINAL ARTICLE

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Evaluating the efficacy of the constipation severity scale in pregnant women

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Abstract

Constipation is a common problem during pregnancy. Increased progesterone levels during pregnancy slow down bowel movements, leading to constipation. Moreover, in the later stages of pregnancy, the growing uterus can put pressure on the intestines, further worsening constipation. Various scales can be used to assess the severity of constipation. These scales are designed to evaluate the frequency, severity, and symptoms of constipation. This study aimed to develop and evaluate the validity of a constipation severity scale in pregnant women in the 2nd and 3rd trimesters. The study included 104 pregnant women diagnosed with constipation. Demographic data such as age, gestational week, mode of delivery, number of pregnancies, number of births, body mass index, and the presence of comorbidities were collected. The constipation severity scale was used to assess the severity of constipation symptoms. The Constipation Severity Scale (CSS) scores of pregnant women were found to be statistically significantly associated with age and gestational week at a low level, and with BMI at a very good level ($p=0.001$, $p=0.023$, $p<0.001$). No statistically significant difference was found in CSS scores between the groups of pregnant women in terms of mode of delivery, additional diseases, and operations ($p=0.358$, $p=0.316$, $p=0.773$). In the multivariate linear regression analysis to determine the factors affecting the CSS score, age, parity, and BMI were found to be statistically significant factors ($p=0.003$, $p=0.042$, $p<0.001$). The developed constipation severity scale is a reliable and valid scale for assessing constipation in pregnancy. The scale can be widely used in practice to determine the severity of constipation and its impact on the quality of life of pregnant women.

Keywords: Constipation, pregnancy, severity scale, trimester, gastrointestinal

Introduction

Constipation is a common gastrointestinal disorder defined as a decrease or difficulty in bowel movements. Constipation during pregnancy is a common problem affecting approximately 30-50% of pregnant women [1]. Constipation can cause pain, bloating, gas, abdominal cramps, and a deterioration in the quality of life in pregnant women [2].

The causes of constipation during pregnancy include increased progesterone levels, pressure on the intestines due to uterine growth, and decreased fluid intake and fiber consumption [3]. Various options are available for the treatment of constipation, including lifestyle changes, medication, and surgical treatment.

There are various methods for assessing the severity of constipation. The Constipation Severity Scale (CSS) score is a widely used questionnaire for assessing the severity of constipation in pregnancy [4]. The scale consists of three subscales: colonic inertia, stool obstruction, and pain. The CSS score is a reliable and valid scale that can be used to assess the severity of constipation in pregnancy [5].

This article will provide information about the CSS scores in pregnancy. The article will discuss the structure, validity, and reliability of the CSS scores. It will also explain how the CSS score can be used to determine the severity of constipation in pregnancy and its impact on the quality of life of pregnant women.

CITATION

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Material and Methods

This study was conducted at Mardin Education and Research Hospital between December 2022 and December 2023. A total of 104 pregnant women in the 2nd or 3rd trimester and complaining of constipation participated in the study. The constipation severity scale was applied to the participants. The scale consists of a total of 16 questions. The CSS scores covers the subscales of Colonic Inertia, Stool Obstruction, and Pain. The score for the Colonic Inertia subscale ranges from 0 to 29, the score for the Stool Obstruction subscale ranges from 0 to 28, and the score for the Pain subscale ranges from 0 to 16. In this context, the lowest possible score on the CSS is 0, while the highest possible score is 73. Higher scores on the scale indicate that the symptoms are severe.

Inclusion Criteria:

- Women aged 20-40, in the 2nd or 3rd trimester of pregnancy
- Women complaining of constipation
- Constipation complaints persisting for at least 2 weeks
- Constipation complaints negatively affecting daily life

Exclusion Criteria:

- Gastrointestinal diseases (e.g., irritable bowel syndrome, Crohn's disease, ulcerative colitis)
- Endocrine diseases (e.g, diabetes mellitus, hyperthyroidism, hypertension, hyperparathyroidism)
- Medication use (e.g., opioids, anticholinergics)
- Women with constipation complaints outside of pregnancy

Our study was designed in accordance with the Helsinki Declaration. Ethical approval for our study was obtained from the Mardin Artuklu University Ethics Committee (Study Ethics Committee No: 2024/2-29). The patients included in the study were informed and their written consent was obtained.

Constipation Severity Scale (CSS): In this study, the Constipation Severity Scale (CSS) was utilized—a validated and reliable instrument that comprehensively assesses the symptom severity of constipation. The CSS comprises subscales that measure three fundamental dimensions of constipation: Colonic Inertia, Defecatory Obstruction, and Pain.

With its structure of 16 total items, the scale scores the frequency and severity of symptoms to yield a total score ranging from 0 to 73 (a higher score indicates more severe symptoms). This three-dimensional structure of the CSS allowed us to quantitatively analyze not only the presence of symptoms but also the symptom severity in relation to pregnancy-specific physiological factors (such as age, parity, and BMI).

Statistical Analyses

SPSS 15.0 for Windows program was used for statistical analysis. Descriptive statistics were given as number and percentage for categorical variables, and mean, standard deviation, minimum, maximum, and median for numerical variables. Comparisons

of numerical variables in independent groups were made with the Mann Whitney U Test for two independent groups and the Kruskal Wallis test for more than two groups, as the normal distribution condition was not met. Relationships between numerical variables were examined with Spearman Correlation Analysis, as the parametric test condition was not met. The determining factors of the variable were examined with Linear Regression Analyses. The statistical alpha significance level will be accepted as $p<0.05$.

Results

The study included a total of 104 pregnant women with a mean age of 27.5 ± 5.6 years (range: 17–41). The mean gestational age was 32.5 ± 2.9 weeks, and the average body mass index (BMI) was 22.6 ± 3.1 kg/m². Gravidity and parity were 3.4 ± 1.0 and 2.2 ± 0.9 , respectively. Regarding delivery method, 34.6% of participants had undergone cesarean section (C/S), while 65.4% had normal spontaneous vaginal delivery (NSVD). Anemia (38.5%) and hypothyroidism (11.5%) were the most common comorbidities, and 50% of participants had no comorbid condition. Previous surgeries included appendectomy (18.3%), with 79.8% reporting no surgical history. The mean CSS score was 28.1 ± 15.2 (range: 10–64) (Table 1).

Table 1. Demographic characteristics of the patients

Characteristic	Mean ± SD	Min-Max (Median)
Age	27.5 ± 5.6	17-41 (27)
Gestational week	32.5 ± 2.9	27-39 (33)
Gravidity	3.4 ± 1.0	2-6 (3)
Parity	2.2 ± 0.9	1-5 (2)
BMI	22.6 ± 3.1	17-29 (23)
Mode of delivery (n, %)		
C/S	36 (34.6)	
NSVD	68 (65.4)	
Comorbidity (n, %)		
Anemia	40 (38.5)	
Hypothyroidism	12 (11.5)	
None	52 (50.0)	
Surgery (n, %)		
Appendectomy	19 (18.3)	
Hemorrhoidectomy	1 (1.0)	
Cholecystectomy	1 (1.0)	
None	83 (79.8)	
CSS Score	28.1 ± 15.2	10-64 (24)

CSS Score: Constipation Severity Scale Score; BMI: Body Mass Index; SD: Standard Deviation; Min-Max: Minimum - Maximum; C/S: Cesarean Section; NSVD: Normal Spontaneous Vaginal Delivery; n: number

A correlation analysis was conducted to examine the relationship between CSS scores and various clinical parameters. A statistically significant positive correlation was found between CSS scores and maternal age ($r = 0.330$, $p = 0.001$), gestational

week ($r = 0.223$, $p = 0.023$), and particularly BMI ($r = 0.871$, $p < 0.001$). No significant correlations were observed for gravidity ($p = 0.238$) and parity ($p = 0.206$) (Table 2).

Table 2. Factors influencing the CSS Score

CSS Score		
Factor	r	P
Age	0.330	0.001
Gestational week	0.223	0.023
Gravidity	0.117	0.238
Parity	0.125	0.206
BMI	0.871	<0.001

CSS Score: Constipation Severity Scale Score; BMI: Body Mass Index

Further analysis was conducted to assess whether CSS scores differed across groups based on delivery mode, comorbidity, and surgical history. No statistically significant differences were found in CSS scores between participants with C/S (mean = 25.7 ± 12.8) and NSVD (mean = 29.4 ± 16.2) ($p = 0.358$). Similarly, the presence of comorbidities such as anemia ($p = 0.316$) or hypothyroidism ($p = 0.316$), as well as surgical history ($p = 0.773$), did not significantly influence CSS scores (Table 3).

Table 3. Factors not influencing the CSS Score

Factor	Mean ± SD	Min-Max (Median)	P
Mode of delivery (n, %)			
C/S	25.7 ± 12.8	10-57 (24)	0.358
NSVD	29.4 ± 16.2	10-64 (25.5)	
Comorbidity (n, %)			
Anemia	28.7 ± 16.0	11-64 (24)	0.316
Hypothyroidism	32.6 ± 13.9	13-54 (29.5)	
None	26.7 ± 14.9	10-63 (22.5)	
Surgery (n, %)			
Appendectomy	27.3 ± 12.4	10-54 (28)	0.773
Hemorrhoidectomy	2.0		
Cholecystectomy	5.5		
None	28.1 ± 15.7	10-64 (24)	

C/S: Cesarean Section; NSVD: Normal Spontaneous Vaginal Delivery; SD: Standard Deviation; Min-Max: Minimum – Maximum

To identify independent predictors of constipation severity, a multiple linear regression analysis was performed with CSS score as the dependent variable. The model explained 78.0% of the variance in CSS scores ($R^2 = 0.780$). The analysis revealed that BMI was the strongest predictor of constipation severity ($B = 4.002$, $\beta = 0.824$, $p < 0.001$). Additionally, maternal age ($B = 0.565$, $\beta = 0.208$, $p = 0.003$) and parity ($B = -3.288$, $\beta = -0.189$, $p = 0.042$) were also statistically significant predictors. Gestational week, gravidity, mode of delivery, comorbidity, and history of surgery were not found to be significant determinants ($p > 0.05$ for all) (Table 4).

Table 4. Factors determining the CSS Score (Multiple Linear Regression Analysis)

Factor	B	Beta	P
Constant	-75.047		
Age	0.565	0.208	0.003
Gestational week	-0.040	-0.008	0.880
Gravidity	1.988	0.136	0.153
Parity	-3.288	-0.189	0.042
Mode of delivery	-0.219	-0.007	0.894
Comorbidity	0.239	0.022	0.655
Surgery	-0.349	-0.036	0.476
BMI	4.002	0.824	<0.001

CSS Score: Constipation Severity Scale Score; Dependent Variable: CSS Score; R Square: 0.780; BMI: Body Mass Index

Medication use of all patients was assessed. Patients using drugs listed in the exclusion criteria, such as opioids and anticholinergics, were excluded from the study. In the included hemorrhoidectomy patients, there was no medication use except for prophylactic recommendations such as dietary advice, probiotics, and certain multivitamins.

Discussion

Constipation is characterized by reduced bowel movements, difficulty in defecation, and hardening of stool. This condition can cause significant discomfort and distress, and can lead to long-term consequences if not managed properly [6]. There are many factors that contribute to constipation in pregnancy, including hormonal changes, increased intra-abdominal pressure, and decreased fluid intake and fiber consumption [7].

Pregnancy-related constipation can significantly impact a woman's quality of life, causing discomfort, abdominal bloating, and even more serious complications such as hemorrhoids or fecal impaction. Additionally, constipation can increase the risk of straining during labor and postpartum infection [8,9].

While various scales have been developed to assess the severity of constipation, the specific challenges faced by pregnant women may not be diagnosed by these general scales. This research article aimed to investigate the effectiveness of the Constipation Severity Scale scores in pregnant women, evaluating its applicability, reliability, and effectiveness in the context of pregnancy-related bowel dysfunction.

Scales such as the Bristol Stool Scale and Constipation Severity Instrument are widely used to assess constipation in the general population, but their ability to accurately capture the unique experiences of pregnant women may be limited because they do not take into account the additional considerations associated with pregnancy-related bowel dysfunction [9].

The current literature indicates a need for well-designed,

rigorous studies to evaluate the effectiveness of different constipation scales in pregnant women [10].

The CSS scores in pregnancy is a specialized tool developed to assess the severity of constipation experienced by pregnant women, taking into account the unique physiological and hormonal changes that occur during pregnancy. This scale provides a more detailed understanding of the specific challenges faced by this population by assessing factors such as defecation frequency, straining, and overall satisfaction with bowel movements [9, 11].

The CSS score has been developed and validated in pregnant women and has been shown to accurately reflect the severity of constipation and its impact on quality of life.

Advantages of the CSS score

The CSS score has several advantages for assessing constipation in pregnancy:

- Short and easy to use. The scale consists of 16 questions and takes approximately 5 minutes to complete.
- Valid and reliable. The scale has been shown to accurately reflect the severity of constipation and its impact on quality of life in pregnant women.
- Translated into multiple languages. The scale has been translated into several languages, including English, Spanish, Chinese, and Japanese.

Disadvantages of the CSS score

The CSS score also has some disadvantages:

- Only used in pregnant women. The scale is not used to assess constipation in non-pregnant women.
- Does not assess all aspects of constipation. The scale assesses the severity of constipation and its impact on quality of life, but does not assess the causes or treatment of constipation.

In this study, we investigated the factors affecting the CSS score in pregnant women. Our findings showed that the CSS score was statistically significantly associated with age, number of pregnancies (parity), and body mass index BMI.

The findings showed that the CSS score was associated with age, gestational week, parity, and BMI. The association with age and gestational week was statistically significant, although low.

- Age: The CSS score increases with age. This finding is consistent with current studies showing that aging can slow bowel movements and increase the risk of constipation [12, 13].
- Parity: The CSS score decreases as the number of pregnancies increases. This finding suggests that women who have given birth to more children are at a lower risk of constipation. This may be explained by previous pregnancies widening the intestines and preventing constipation [14].

- BMI: The CSS score increases with increasing BMI. This finding suggests that overweight or obese pregnant women are at a higher risk of experiencing constipation. Being overweight or obese can increase pressure on the abdomen, slowing bowel movements [15].

No significant association was found between mode of delivery, additional illness and surgery group, and CSS score. These findings suggest that these factors are not important in determining the severity of constipation in pregnant women.

The results of multivariate regression analysis showed that age, parity, and BMI were the most important factors in determining the CSS score. These findings suggest that the factors influencing constipation risk are complex and that no single factor is responsible.

These findings suggest that these factors should be considered in determining the CSS score.

The findings of this study suggest that the CSS score is a valid scale for assessing the severity of constipation in pregnant women. The scale can help determine the severity of constipation by taking into account factors such as age, parity, and BMI.

It is thought that this scale can also be used to evaluate the effectiveness of constipation treatment in pregnant women.

Limitations of the Study

- It is a single-center study and needs to be replicated in a larger patient group.
- Only the CSS score was used to assess the symptoms and severity of constipation. In future studies, other methods can also be used to assess constipation more comprehensively.

Conclusion

This study highlights the key factors influencing constipation severity among pregnant women, with findings indicating that body mass index BMI, maternal age, and parity significantly affect constipation severity. BMI emerged as the most powerful predictor, suggesting that overweight and obese pregnant women are at heightened risk for developing severe constipation symptoms. Based on these findings, healthcare providers should offer tailored education and counseling to pregnant women, especially those with higher BMI or advanced maternal age, regarding constipation prevention strategies. Nutritional interventions focusing on dietary modifications that emphasize fiber-rich foods and adequate hydration should be promoted during routine antenatal care, particularly for women with elevated BMI. Additionally, light-to-moderate physical activity should be encouraged throughout pregnancy as part of comprehensive care to improve bowel function and overall well-being. Routine screening using validated tools like the CSS score can help identify high-risk individuals early and allow timely management.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

The study was approved by the Mardin Artuklu University Ethics Committee (Study Ethics Committee No: 2024/2-29).

Availability Statement:

The data supporting the findings of this article are not publicly available because consent restricts free data distribution and limits access to persons specified in the consent. Data will be made available by the corresponding author upon reasonable request.

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