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MAJOR RISK FACTORS ASSOCIATED WITH CONSTIPATION IN MEDICAL STUDENTS

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Doi: https://doi.org/10.52340/jecm.2026.01.18

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ყაბზობასთან დაკავშირებული ძირითადი რისკ-ფაქტორები სამედიცინო უნივერსიტეტის სტუდენტებში

თსსუ ეპიდემიოლოგიისა და ბიოსტატისტიკის დეპარტამენტი

რეზიუმე

შესავალი: ქრონიკული ყაბზობა არის გავრცელებული ფუნქციური კუჭ-ნაწლავის დარღვევა, რომლის რისკი ახალგაზრდებში მნიშვნელოვნად არის დაკავშირებული ცხოვრების წესთან, კვებით ჩვევებთან და მედიკამენტების გამოყენებასთან.

მიზანი: თბილისის სახელმწიფო სამედიცინო უნივერსიტეტის სტუდენტებში ქრონიკული ყაბზობის ძირითადი რისკ-ფაქტორების შეფასება.

მეთოდები: ჩატარდა შემთხვევა-კონტროლის ტიპის კვლევა, რომელშიც მონაწილეობა მიიღო 192-მა სტუდენტმა. მონაცემები შეგროვდა სტრუქტურირებული კითხვარის მეშვეობით, რომელიც მოიცავდა დემოგრაფიულ, კვებით, ქცევით, მედიკამენტურ და ფსიქოემოციურ ფაქტორებს. ფსიქოლოგიური მდგომარეობა შეფასდა DASS-21 სკალით. ყაბზობის შემთხვევები განისაზღვრა ROME III კრიტერიუმების, თვითშეფასებითი ჩივილისა და საფაღარათო საშუალებების გამოყენების საფუძველზე. სტატისტიკური ანალიზი ჩატარდა STATA 14.0 პროგრამაში შანსთა თანაფარდობის (OR) და 95%-იანი სარწმუნოების ინტერვალების გამოთვლით.

შედეგები: ყაბზობის პრევალენტობა შეადგენდა 20.83%-ს. სტატისტიკურად მნიშვნელოვანი რისკ-ფაქტორები იყო: ხილის იშვიათი მოხმარება (OR=2.93; p=0.003), ბოსტნეულის არასაკმარისი მიღება (OR=2.28; p=0.0202), უჯრედისის ნაკლებობა (OR=2.61; p=0.0219), არასაკმარისი წყლის მიღება (OR=2.07; p=0.0462), ღამის კვება (OR=2.39; p=0.0146), ანტიბიოტიკების ხშირი გამოყენება (OR=8.33; p=0.005), ანტაციდების გამოყენება (OR=37.75; p<0.001), დიურეტიკების მიღება (OR=12.24; p=0.007), მინერალური დანამატების გამოყენება (OR=3.66; p=0.0199) და შფოთვა, როგორც სამედიცინო ჩივილი (OR=3.32; p=0.0007). სხეულის მასის ინდექსი, ფიზიკური აქტივობა, ძილის რეჟიმი, ალკოჰოლისა და თამბაქოს მოხმარება სტატისტიკურად მნიშვნელოვნად არ ასოცირდებოდა ყაბზობასთან.

დასკვნა: სტუდენტებში ქრონიკული ყაბზობა მჭიდროდ არის დაკავშირებული მოდიფიცირებად ქცევით და მედიკამენტურ ფაქტორებთან, რაც ადრეული პრევენციის შესაძლებლობას ქმნის.

Introduction. Chronic constipation is a prevalent and heterogeneous gastrointestinal disorder characterized by a variety of symptoms and diverse pathophysiological mechanisms (Sharma A., 2021). Effective management and prevention require a comprehensive understanding of its diagnostic criteria, associated risk factors, and population-level impact. Constipation is known as one of the most common digestive system complaints and is generally considered a symptom complex rather than a single entity (Sethi S., 2014). Patients affected by constipation report a wide range of discomforts, including reduced bowel movement frequency, hard stools, straining, and incomplete evacuation (Sandler K., 2022). The global prevalence varies across populations, age groups, and individual characteristics, with an estimated rate of approximately 15% (12–19%) in the general population (Suares N. C., 2011). It is more common among women and is strongly influenced by chronic diseases and lifestyle behaviors. Chronic constipation reduces quality of life and generates significant healthcare costs (Vlismas LJ, 2024).

Modifiable risk factors include insufficient physical activity, depression, decreased caloric intake, and medications that exacerbate symptoms. Constipation negatively affects both physical and mental well-being, reducing productivity and daily functioning. Recent evidence suggests that constipation may have long-term health implications (Sumida K., 2019), while hospitalized patients experience even greater social and functional impairment (Ihara E., 2023).

Despite extensive literature, the precise impact of various risk factors remains insufficiently studied, particularly among young adults. University students often experience irregular eating habits, stress, inadequate sleep, and reduced physical activity — all recognized contributors to constipation (Yildirim MA, 2021). Understanding these risk factors within a medical student population is highly relevant for early prevention and health promotion.

Objective. The objective of this study was to investigate the major risk factors associated with constipation among students of Tbilisi State Medical University.

Materials and Methods. A structured questionnaire was developed in Georgian and English to assess demographic characteristics, lifestyle behaviors, health status, exposure to potential risk factors, and psychological factors using the DASS-21 scale. It consisted of 34 questions and was approved by the Department of Epidemiology and Biostatistics. Participation was voluntary and anonymous.

Study Sample. The study included 192 students from Tbilisi State Medical University (TSMU), selected using cluster random sampling. Of these, 74.87% were female and 25.13% male. The majority (77.08%) studied at the Faculty of Medicine, while 22.92% were students of Public Health Management. The mean age was 22.78 years (SD=1.57, range 18–26).

Case and Control Group Formation. Constipation cases were identified based on:

- ≥3 positive ROME III criteria (worldgastroenterology.org)
- Self-reported constipation complaint
- Frequent or occasional laxative use

After applying all criteria, 40 students were assigned to the case group and 152 students to the control group.

Data Collection and Analysis. Data were collected electronically via Google Forms. Each questionnaire received a unique identifier. Responses were entered into Epidata and analyzed using STATA 14.0. Both descriptive and analytical statistics were performed, including Odds Ratios (OR) with 95% confidence intervals.

Results.

Overview of Study Population (Brief Demographics)

The demographic data, including mean BMI which was 22.88 (SD=4.35) were included as potential covariates but showed no statistically significant associations with constipation in bivariate analysis, except for a higher proportion of female sex in the case group.

Distribution of Risk Factors Among Cases and Controls

Water consumption. Insufficient daily water consumption was more prevalent among cases (42.5%) compared with controls (26.32%). This difference demonstrated statistical significance (p=0.046), suggesting dehydration or low hydration habits may contribute meaningfully to constipation symptoms among students.

Dietary fiber and plant-based foods. Multiple dietary exposures showed clear differences:

- Low dietary fiber intake: 80% of cases vs. 60.53% of controls
- Insufficient fruit intake: 65% of cases vs. 38.82% of controls
- Insufficient vegetable intake: 55% of cases vs. 34.87% of controls

All three factors showed statistically significant associations ($p < 0.05$), indicating that inadequate intake of plant-based foods is one of the dominant behavioral contributors in this population.

Night-time eating. Night eating was reported by 57.5% of cases vs. 34.87% of controls, representing a meaningful behavioral distinction (p=0.0146). This may reflect circadian misalignment, irregular studying schedules, or stress-induced eating patterns.

Physical inactivity. While inactivity was more common among cases (27.5%) than controls (19.74%), the difference did not reach statistical significance.

Sleep disruptions. Frequent night awakenings or all-night wakefulness did not differ significantly between groups, though a slightly higher proportion of cases reported irregular sleep.

Psychological Profile and Emotional Health. Psychological factors were assessed both through self-reported medical complaints and the DASS-21 scale.

Self-reported anxiety complaints. Anxiety reported as a medical issue was significantly more common among cases (57.5%) than controls (28.95%) (p=0.001).

DASS-21 psychological domains. Although DASS scores for depression, anxiety, and stress were higher among cases, none of these differences were statistically significant when comparing severity categories.

Medication Use. Students reporting medication use showed major group differences.

Antibiotics. Frequent antibiotic consumption was sharply higher in cases (10%) versus controls (1.32%) (p=0.005).

Antacids. Antacid use presented the strongest between-group difference: 20% of cases vs. 0.66% of controls (p=0.000), indicating a clear and robust association.

Diuretics. Diuretics were used by 7.5% of cases vs. 0.66% of controls (p=0.007).

Mineral supplements. Mineral supplement use (often calcium/iron) was also significantly higher among cases (15% vs. 4.61%, p=0.02).

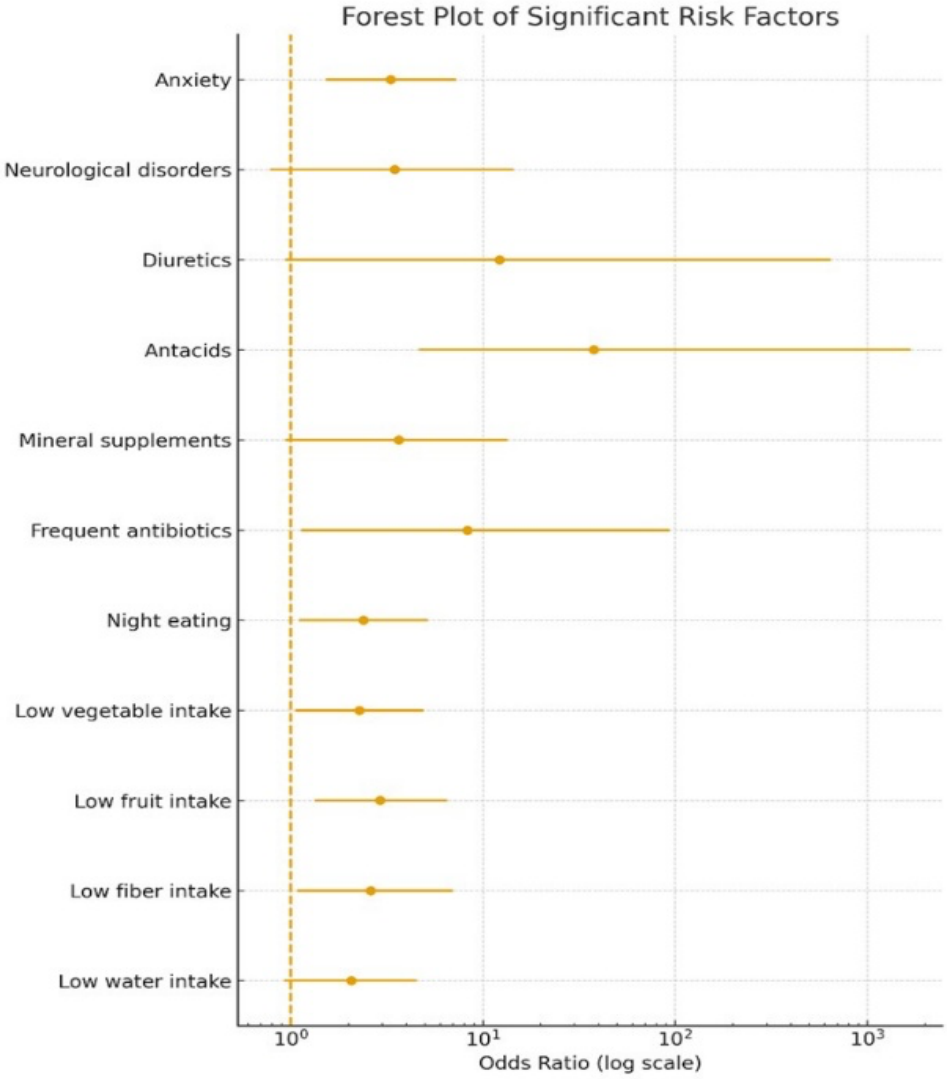
Other medications. Analgesics, antihistamines, antidepressants, and sedatives showed higher proportions in the case group but without statistically significant differences.

Medical Conditions. Neurological disorders were more common among cases (12.5%) compared with controls (3.95%), with a statistically significant difference (p=0.038). Endocrine conditions (thyroid disorders) and diabetes showed no significant group differences.

Odds Ratio Analysis. Odds Ratios (OR) with 95% confidence intervals were calculated for exposures with notable case–control differences (see Fig. 1).

- BMI ≥25: OR=1.16; CI [0.49–2.62]; p=0.7032
- Low water intake: OR=2.07; CI [0.93–4.52]; p=0.0462
- Low dietary fiber: OR=2.61; CI [1.08–6.98]; p=0.0219
- Low fruit intake: OR=2.93; CI [1.34–6.55]; p=0.0030
- Low vegetable intake: OR=2.28; CI [1.06–4.93]; p=0.0202
- Night eating: OR=2.39; CI [1.11–5.18]; p=0.0146
- Frequent antibiotics: OR=8.33; CI [1.13–94.01]; p=0.0050
- Mineral supplements: OR=3.66; CI [0.94–13.51]; p=0.0199
- Antacids: OR=37.75; CI [4.67–1685.25]; p=0.0000
- Diuretics: OR=12.24; CI [0.94–646.72]; p=0.0070
- Anticoagulants: p=0.0056 (OR not calculable)
- Neurological disorders: OR=3.48; CI [0.78–14.44]; p=0.0384
- Anxiety (medical complaint): OR=3.32; CI [1.52–7.28]; p=0.0007

Figure 1. Odds Ratios for Significant Risk Factors Associated with Constipation



Discussion. This study identified several significant dietary, psychological, and medication-related risk factors associated with constipation among university students. Consistent with global evidence, insufficient intake of fruits, vegetables, and dietary fiber emerged as the most robust predictor of constipation (Forootan M., 2018; Bharucha AE., 2013). Students who consumed low amounts of fruits had a nearly three-fold increased risk, likely due to inadequate fiber, fluid content, and natural osmotic agents such as sorbitol.

Low water intake, although marginally significant, aligns with literature linking dehydration to harder stool consistency and delayed colonic transit (Portalatin & Winstead, 2012). Night-time eating presented a notable risk and may reflect circadian misalignment affecting gastrointestinal motility (Bellini M., 2021).

Medication use showed some of the strongest associations. Antibiotics significantly increased risk (OR=8.33), likely due to microbiome disruption (Francino, 2016). Antacids—particularly aluminum-based—demonstrated extremely strong associations (OR=37.75), consistent with known inhibitory effects on intestinal motility (Allen-Brady K., 2020). Diuretics and mineral supplements also showed associations, supporting prior findings that medications affecting fluid balance or containing iron/calcium may promote constipation (Forootan, 2018; Ueki T., 2019).

Psychological factors showed mixed results. Anxiety as a self-reported complaint was a significant risk factor (OR=3.32), in line with evidence on the gut–brain axis (Fond, 2014; Ihara, 2023). However,

DASS-based anxiety and depression scores did not differ significantly between groups, possibly due to the limited sample or underreporting in standardized scales.

Factors such as BMI, physical activity, socioeconomic status, and sleep did not demonstrate statistically significant correlations. However, these findings should be interpreted cautiously due to sample characteristics and reliance on self-reported measures.

Conclusion. This case-control study identified several major risk factors for constipation among medical university students. Insufficient consumption of fruits, vegetables, and water, night-time eating, and the frequent use of antibiotics, antacids, diuretics, and mineral supplements were all associated with increased risk. Anxiety also emerged as a relevant psychological factor.

Although BMI, sleep patterns, physical activity, socioeconomic status, and substance use were not statistically significant, their potential role should not be dismissed. Preventive strategies for students should include dietary guidance, hydration education, stress and anxiety management, and awareness regarding inappropriate medication use.

Further research with larger samples is required to validate these findings.

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SUMMARY

Background: Chronic constipation is a common functional gastrointestinal disorder with multifactorial etiology. University students may be at increased risk due to lifestyle and psychological factors.

Objective: To identify major risk factors associated with constipation among students of Tbilisi State Medical University.

Methods: A case-control study was conducted among 192 students using a structured questionnaire assessing demographics, lifestyle, diet, psychological factors (DASS-21), and medication use. Constipation cases were defined using ROME III criteria, self-reported symptoms, and laxative use. Odds Ratios with 95% CIs were calculated.

Results: Forty students (20.83%) met criteria for constipation. Significant risk factors included insufficient fruit intake (OR=2.93; p=0.003), insufficient vegetable intake (OR=2.28; p=0.0202), low dietary fiber (OR=2.61; p=0.0219), low water intake (OR=2.07; p=0.0462), night-time eating (OR=2.39; p=0.0146), frequent antibiotic use (OR=8.33; p=0.005), antacids (OR=37.75; p=0.0000), diuretics (OR=12.24; p=0.007), minerals (OR=3.66; p=0.0199), and anxiety (OR=3.32; p=0.0007). BMI, physical activity, sleep, alcohol, smoking, and socioeconomic status were not statistically significant.

Conclusion: Dietary factors, medication use, and anxiety were strongly associated with constipation among university students. Interventions promoting healthy eating, hydration, stress management, and cautious medication use are recommended.

Keywords: Constipation; Students; Risk factors; Dietary habits; Medication use; Anxiety; Georgia