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NIGHT EATING SYNDROME AND GASTROESOPHAGEAL REFLUX DISEASE AMONG UNIVERSITY STUDENTS IN LITHUANIA: A CROSS-SECTIONAL STUDY

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SUMMARY

Background and Relevance. Late night food consumption and evening hyperphagia are hallmarks of the underdiagnosed eating disorder known as Night Eating Syndrome (NES). Due to stress, irregular habits and disturbed circadian rhythms, it is more common in young adult groups particularly college students. Since nighttime eating reduces the duration between meals and sleep which exacerbates reflux symptoms, there is growing evidence that NES may have a role in the development of gastroesophageal reflux disease (GERD). However, little research has been done on this relationship among students in Europe especially in Lithuania.

Purpose. This study aimed to determine how common night eating syndrome (NES) and gastroesophageal reflux disease (GERD) symptoms were among Vilnius University students as well as if there were any correlations between the two disorders.

Methods: In 2024, cross-sectional research was carried out via an anonymous online survey that offered a reward for participation. The following validated instruments were used: MEDAS, IPAQ SF, NEQ and GerdQ. To analyze the data, R 4.4.2 was used. Chi square and t-tests were used to assess bivariate correlations. The threshold for statistical significance was $p < 0.05$

Results. Among 697 students there the mean age 20.8 ± 2.1 years; 61.7% female, 28.6% had GERD symptoms and 9.8% had NES. Those with NES had a significantly higher prevalence of GERD (57.9% vs. 25.6%, $p < 0.0001$). Multivariable analysis showed NES was an independent predictor of GERD symptoms (AOR = 2.59).

Conclusions. Night eating syndrome was independently linked to a noticeably higher risk of GERD symptoms among university students. These findings highlight the importance of treating late night eating as a modifiable risk factor and suggest that screening for NES along with promoting healthier eating habits which may help reduce GERD-related distress in student population.

Keywords: gastroesophageal reflux disease, night eating syndrome, students, dietary habit, physical activity, smokin.

INTRODUCTION

According to the Montreal Consensus, gastroesophageal reflux disease (GERD) is a chronic illness characterized by the reflux of stomach contents that results in bothersome symptoms or consequences [1] Heartburn and regurgitation are common symptoms that can seriously lower quality of life and interfere with day to day activities. Around 14% of people worldwide have GERD, while prevalence varies by area, in North America for example, prevalence rates range from 18.1% to 27.8%. Due to failure to report and a lack of local data, the prevalence of GERD in younger individuals particularly university students may be underestimated [2]

The risk of GERD is highly correlated with lifestyle choices. Among the contributing causes include high fat

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diets, smoking, drinking alcohol, irregular eating schedules and a lack of physical activity. The time of eating Food is one understudied but possibly important factor especially at night and in the evening. Anorexia in the morning and insomnia are common symptoms of night eating syndrome (NES) which is an eating disorder marked by delayed circadian eating patterns, including evening hyperphagia (consuming at least 25% of daily calories after dinner) and/or overnight awakenings with food intake [3]. Young adults and college students are more likely to have NES because of their hectic schedules, stress and disrupted lifestyles.

A short period between dinner and bedtime has been linked to an increased risk of GERD according to many studies. According to seminal research by Fujiwara et found that those who went to bed three hours after eating were far more likely to experience GERD symptoms [4]. This is believed to occur because eating late at night hinders stomach emptying and raises intra abdominal pressure which promotes reflux particularly while sleeping supine [5] Few research have explicitly investigated the link between GERD and Night Eating Syndrome (NES) and even less have looked at this relationship in populations of university students in Europe despite the biological plausibility and similar risk profiles of both conditions.

University students who eat at night had almost three times the likelihood of having GERD symptoms compared to those who do not according to a recent cross-sectional study done in Palestine (NES) [6] To guarantee generality, these findings must be investigated in a variety of cultural, behavioral and dietary contexts as they are yet under validated.

Thus, the purpose of this study was to assess the relationship between GERD symptoms and Night Eating Syndrome in undergraduate students at Vilnius University in Lithuania. Along with determining lifestyle variables including physical activity, smoking, and dietary adherence, the study also aimed to determine the prevalence of NES and GERD symptoms. Finally, it aimed to give locally relevant data that might inform preventative health measures for Lithuanian students.

MATERIALS AND METHODS

Study Design and Setting. A cross-sectional methodology was used in this study to assess the relationship between symptoms of gastroesophageal reflux disease and night eating syndrome in students at Vilnius University in Lithuania. The investigation was carried out in 2024 from November to December. This time frame was chosen to ensure more representative lifestyle and eating practices among students by avoiding confounding effects from lengthy holidays or exams pressure.

Eligibility requirements and the target population. Current students from Vilnius University's several faculties made up the target population. Through student social media networks, the authors' extensive student network list and stratification by faculty, invitations were given along with a survey link placed on Google Forms. Respondents might enter a lottery to win wireless headphones in order to encourage participation. Since the survey was anonymous, participants who wanted to participate in the lot were asked to send the author an email

Inclusion criteria:

1) Students that are 18 and older and currently enrolled as a student at Vilnius University;
2) Being prepared to provide informed consent;
3) Finished all the questionnaire's sections.

Exclusion criteria:

1) Diagnosis of inflammatory bowel disease, celiac disease, peptic ulcer disease, or hiatal hernia;
2) Self reported medical diagnosis of GERD or usage of proton pump inhibitors (PPI) or H2 blockers;
3) Postgraduate or PhD students;
4) Incomplete survey answers were defined as those missing responses to more than one item in any of the core scales (NEQ, GerdQ, IPAQ SF, or MEDAS).

Sample Size Calculation. G Power software was used to estimate the minimum needed sample size. A minimum of 410 individuals were needed to identify differences between those with and without NES assuming a medium effect size (Cohen's d = 0.5), a 95% confidence level, a power of 80% and an anticipated GERD prevalence of 25% in university populations. The final target sample was determined at around 480 participants taking into account a 15% projected dropout or incorrect response rate.

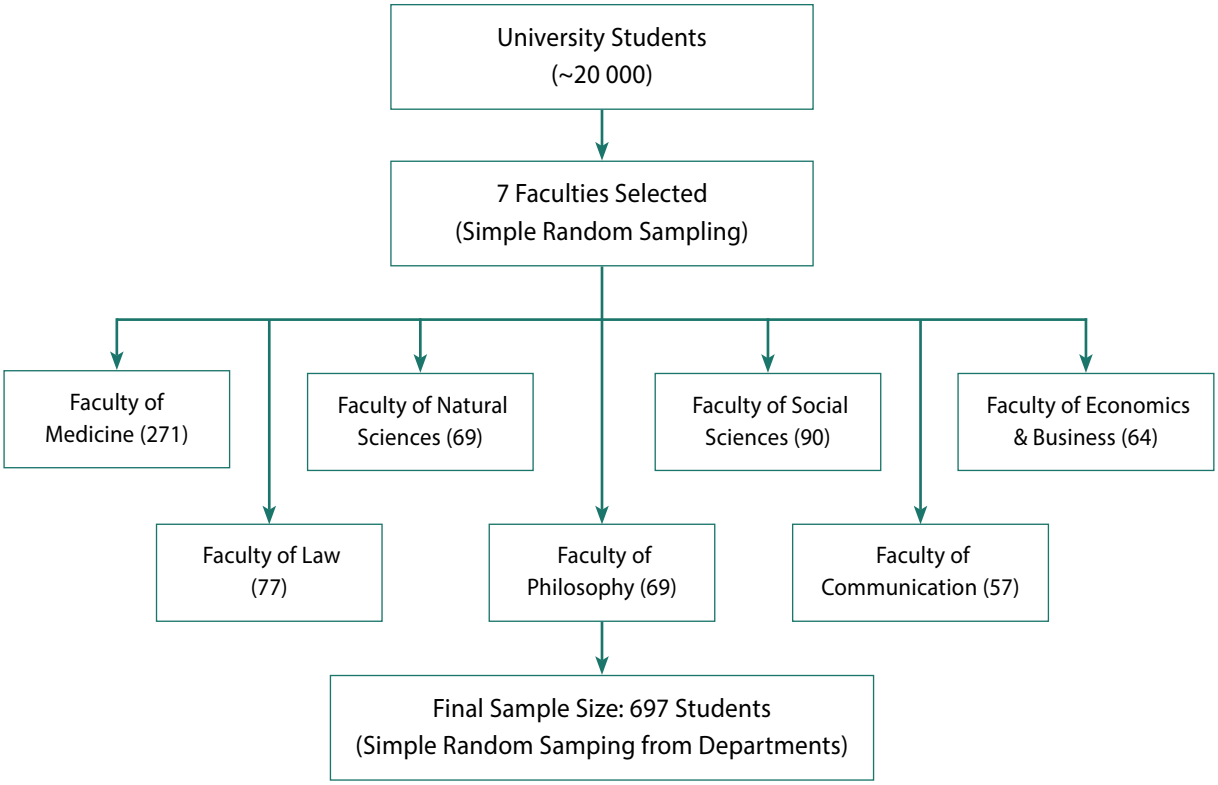

Fig 1. Schematic representation of sampling procedure for the prevalence and associated factors of GERD among university students in Lithuania

Data Collection. An English language structured, self administered online survey was made available to participants. To guarantee technical functioning and clarity and although the questionnaire was administered in English, the language was simplified to ensure clarity and accessibility for non native speakers. To assess comprehension and refine phrasing, the survey was piloted with a group of 18 students from various faculties at Vilnius University there the responses from this group were not included in the main dataset. Based on their feedback, minor adjustments were made to enhance clarity while preserving the content of the validated instruments (NEQ, GerdQ, IPAQ SF, and MEDAS. Similar tools have been successfully used in multilingual student populations.

Before the study began, participants were informed about its goal and provided digital informed consent. No incentives were offered during the pilot phase. Confidentiality and anonymity were guaranteed for the public.

Functional Definitions and Survey Tools

Gastroesophageal Reflux Disease (GERD). The GerdQ questionnaire there a validated 6 item tool that assesses reflux related symptoms over the previous seven days was used to measure GERD symptoms. The following symptoms were included:

- Regurgitation
- Epigastric pain (reverse scored)
- Nausea (reverse scored)
- Heartburn
- Sleep disturbance due to reflux
- Use of medications for reflux symptoms

Each item was rated on a 4 point Likert scale (0 to 3) yielding a total score that ranges from 0 to 18.

A GerdQ score of ≥8 was operationally characterized as GERD based on predefined cutoff values from previous validation studies. It has been shown that this threshold balances sensitivity (67%) and specificity (70%) which is important for the clinical diagnosis of GERD.

Night Eating Syndrome (NES). The Night Eating Questionnaire (NEQ), which consists of 16 questions rated on a 5-point Likert scale (0 = never 4 = often), was used to measure NES. The items evaluated awareness

of nighttime eating, nocturnal eating, morning anorexia, sleep disturbances and evening hyperphagia.
According to psychometric validation, NES was defined as a NEQ score of ≥25, a frequently used limit for clinical significance.

Physical Activity. The International Physical Exercise Questionnaire called Short Form (IPAQ SF), which counts the number of days and minutes spent engaging in vigorous, moderate, walking and sedentary exercise during the previous seven days was used to measure physical activity. Using the conventional IPAQ scoring protocol, activity levels were divided into three categories which are *low, moderate* and *high*.

Dietary Habits. A Lithuanian adapted version of the 14 item Mediterranean Diet Adherence Screener (MEDAS) was used to evaluate adherence to a healthy diet. Binary (Yes or No) questions about the usage of olive oil, consumption of fruits and vegetables, red meat, fish, nuts, legumes and alcohol are all included in the screener.
Adherence is classified as follows with scores ranging from 0 to 14: low (score <6), moderate (6–8), high (≥9).

Other Variables. Age, sex, faculty, academic year, BMI (derived from self reported height and weight), coffee use, smoking status (present, past or never), history of chronic disease and usage of supplements and medications

Statistical Analysis. Data were analyzed using R.4.4.2 using Rcmrd statistical package.
The data is compiled using:
Descriptive statistics:

- frequencies and percentages were used to display categorical variables. Depending on normality, continuous variables were given as medians with interquartile range (IQR) or means ± standard deviation (SD).

Bivariate analysis:

- Chi square tests were used to assess the association between the categorical variables of GERD status (yes/no) and NES status (yes/no) as well as between GERD status and smoking status (yes/no)
- Independent samples t-tests were applied for normally distributed continuous variables like BMI
- Mann Whitney U tests were used for non normally distributed variables like NEQ score

Multivariable logistic regression was performed to identify independent predictors of GERD so binary outcome: GerdQ ≥8 = yes <8 = no

- NES status, degree of physical activity, smoking, BMI and diet adherence were among the predictor factors.
- Covariates included in the model were chosen based on two criteria, the first is statistical significance in bivariate analysis at **$p < 0.20$**, and the second is theoretical relevance supported by prior literature (smoking, physical activity, BMI, Gender).
- 95% confidence intervals (CIs) and adjusted odds ratios (AORs) were presented.
- The Hosmer Lemeshow goodness of fit test was used to evaluate the model's fit. Variance inflation factors were used to assess for multicollinearity there VIF < 5 was deemed acceptable.

Significance threshold: every test had two tails, p values less than 0.05 were considered statistically significant.

Ethical Approval and Informed Consent. All participants provided informed consent electronically prior to commencing the survey. Participation was voluntary and anonymous and respondents could withdraw at any time. No personally identifying information was collected in order to ensure confidentiality.

RESULTS

As shown in table 1, A total of 697 students participated: 61.7% were female. The mean age was 20.8±2.1 years. The prevalence of significant GERD symptoms (GerdQ ≥ 8) was 28.6%. NES (NEQ ≥ 25) was identified in 9.8% of students. Table 1 summarizes participant characteristics. The sample had a mean body mass index (BMI) of 22.9± 3.4 kg/m^2,11.9% were overweight and 3.2% obese. About 19.5% were current smokers and 83.1% reported regular caffeine intake. According to IPAQ SF, 32.5% had low physical activity, 37.2% moderate and 30.3% high. Based on MEDAS, 18.1% had low adherence to the Mediterranean diet, 67.3% moderate and 14.6% high. Detailed information on participants lifestyle and dietary habits including smoking, caffeine uses and physical activity is presented in Figure 2.

Table 1. Socio demographic characteristics of participants (N = 697)

Variables	Category	Frequency (n)	Percent (%)
Age (years)	< 20	116	16.6%
	20–25	514	73.8%
	> 25	67	9.6%
Sex	Female	430	61.7%
	Male	267	38.3%
BMI	Underweight	74	10.6%
	Normal	518	74.3%
	Overweight	83	11,9%
	Obese	22	3.2%
Year of Study	1	130	18.7%
	2	190	27.2%
	3+	180	25.8%
	4+	197	28.3%
Department	Faculty of Medicine	271	38.9%
	Faculty of Natural Sciences	69	9.9%
	Faculty of Law	77	11.1%
	Faculty of Social Sciences	90	12.9%
	Faculty of Economics & Business	64	9.2%
	Faculty of Philosophy	69	9.9%
	Faculty of Communication	57	8.2%

As summarized in table 3 that shows a summary of GERD Associations by Variable, GERD symptom prevalence did not differ significantly by sex (29.8% of females vs 26.6% of males, $p > 0.05$) or BMI category (27.5% of normal weight vs 34.4% of overweight $p < 0.01$). In contrast, GERD was markedly more common in students with NES than without there 57.9% of people with NES, met GerdQ criteria, compared to only 25.6% of non NES students who met the criteria with $p < 0.001$, GERD symptoms were also more frequent in current smokers compared to non smokers (47.1% vs 24.0%, $p < 0.01$)and less frequent in those reporting high physical activity (18.6%) compared to almost 33% in both moderate and low activity with a $p < 0.001$. No significant differences in GERD prevalence were observed across MEDAS categories (low 30.2%, moderate 28.9%, high 24.1%; $p > 0.05$). The detailed frequency distribution of GERD related symptoms is presented in Figure 3.

The results of univariate and multivariate logistic regression are presented in Table 2, NES emerged as a strong independent predictor of GERD symptoms AOR = 2.59, 95% confidence interval [CI] 1.32– 5.09 $p < 0.001$). Students meeting NES criteria had approximately two and a half times higher odds of significant reflux symptoms compared to normal eaters, controlling for other factors. High physical activity was independently protective (AOR = 0.48, 95% CI 0.30–0.78, $p < 0.01$, for high vs low to moderate activity) consistent with an inverse relationship between exercise and GERD. Current smoking was associated with greater odds of GERD (AOR = 1.94, 95% CI 1.08–3.48, $p < 0.001$). Neither sex nor BMI showed significant effects in the adjusted model. Mediterranean diet adherence also was not significantly related to GERD risk (AOR = 0.89, 95% CI 0.55–1.44 for high vs low adherence, $p > 0.05$). We observed no significant associations between GERD symptoms and age, alcohol use frequency or average sleep duration.

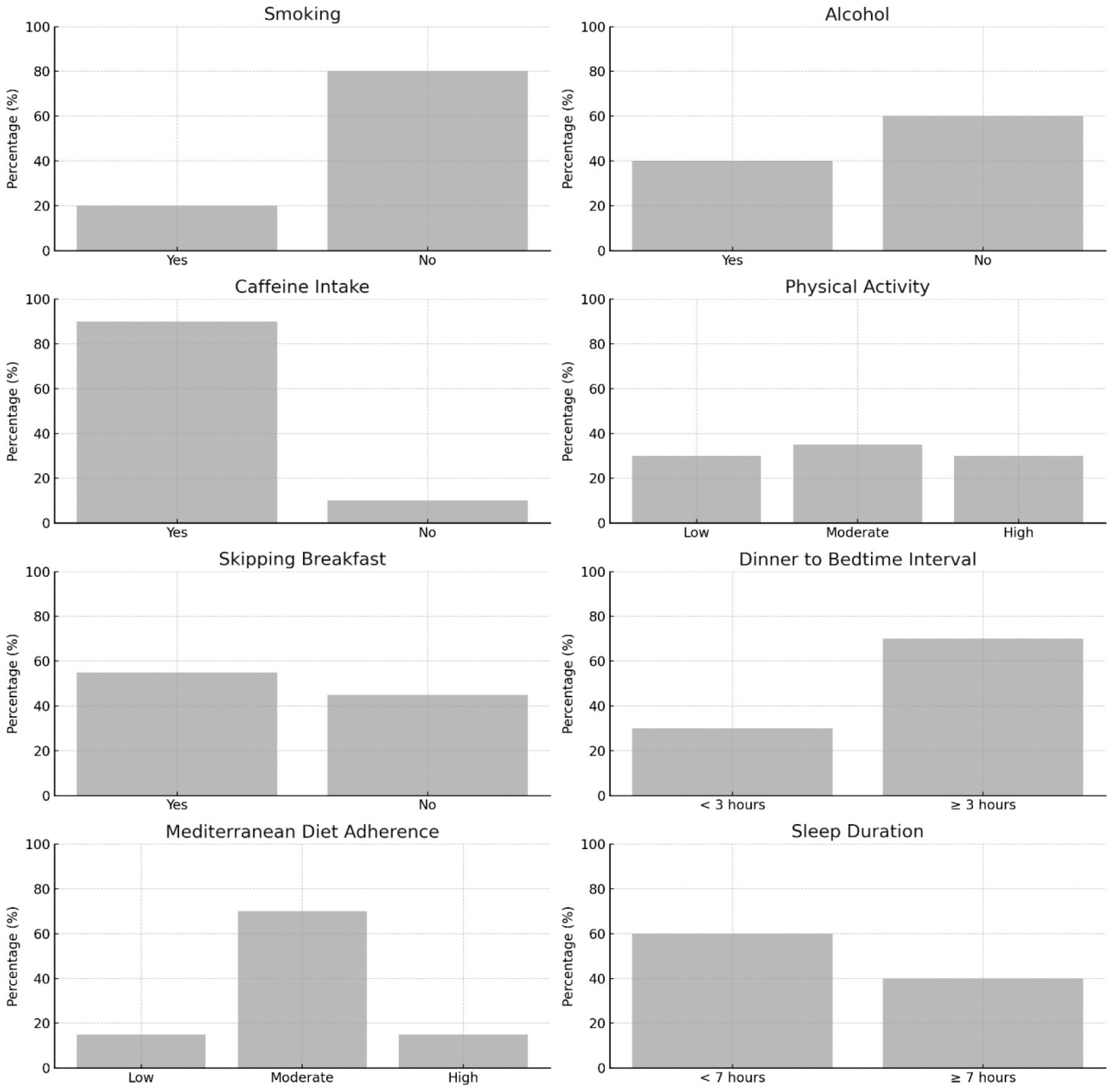

Fig. 2. Lifestyle, dietary, and behavioral factors of participants (N = 697)

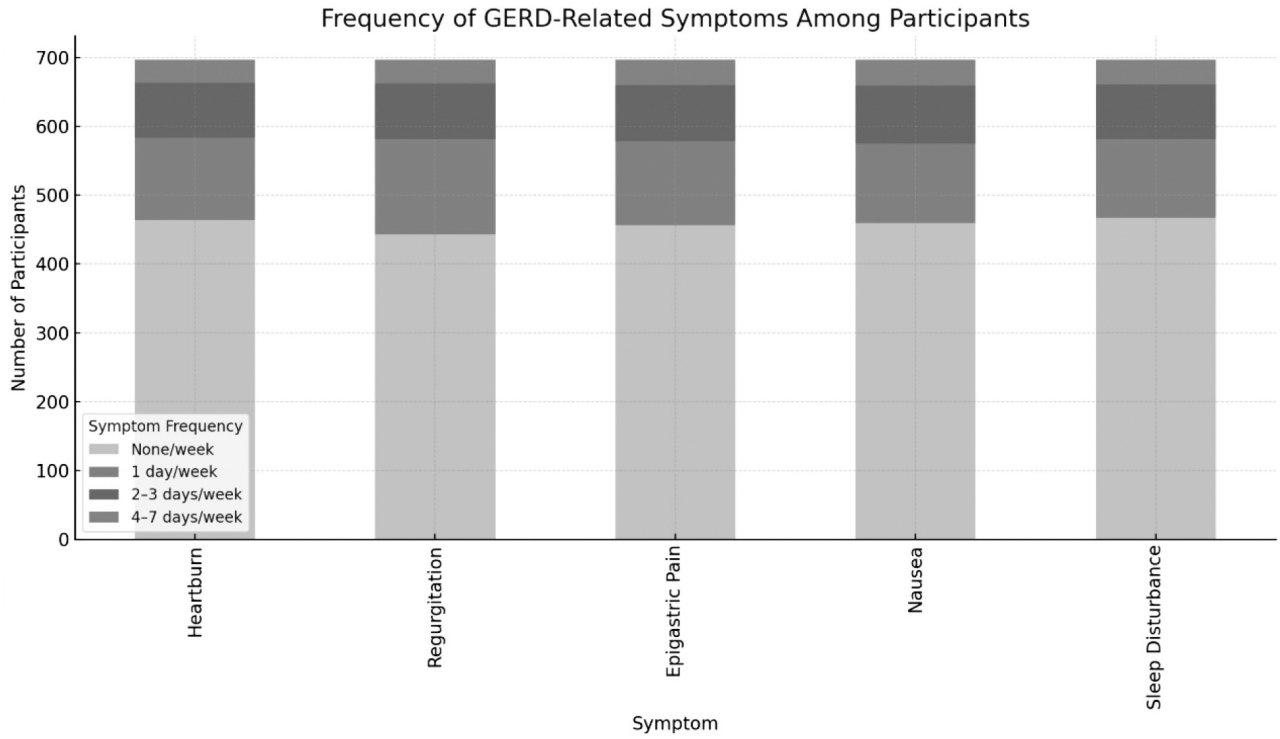

Fig. 3. Frequency of GERD related symptoms among participants (N = 697)

Table 2. Univariate and Multivariate Logistic Regression Results for Factors Associated with GERD Symptoms (n = 199)

Variables	Category	GERD Symptoms (%)	COR (95% CI)	AOR (95% CI)
Age (years)	< 20	33 (28.4%)	1.00	1.00
	20–25	147 (28.6%)	1.01 (0.65–1.58)	1.02 (0.67–1.55)
	> 25	19 (28.4%)	1.07 (0.51–1.94)	1.10 (0.58–2.07)
Sex	Female	128 (29.8%)	1.00	1.00
	Male	71 (26.4%)	0.86 (0.61–1.20)	0.92 (0.64–1.33)
Night Eating Syndrome	No NES	160 (25.4%)	1.00	1.00
	NES	39 (57.9%)	3.94 (2.36–6.58)	2.59 (1.32–5.09)
Smoking	No	135 (24.0%)	1.00	1.00
	Yes	64 (47.1%)	2.8 (1.9–4.14)	1.94 (1.08–3.48)
Physical Activity	Low	75 (33%)	1.00	1.00
	Moderate	85 (32.8%)	0.99 (0.68–1.45)	0.95 (0.61–1.48)
	High	39 (18.6%)	0.46 (0.3–0.72)**	0.48 (0.30–0.78)**
Skipping Breakfast	No	92 (28.4%)	1.00	1.00
	Yes	107 (28.7%)	1.01 (0.73–1.41)	1.09 (0.76–1.55)
Dinner-to-Bedtime Interval	≥ 3 hours	111 (23.1%)	1.00	1.00
	< 3 hours	88 (40.6%)	2.27 (1.61–3.20)	2.11 (1.40–3.19)
BMI	Normal	143 (27.5%)	1.00	1.00
	Underweight	21 (28.4%)	0.99 (0.58–1.69)	0.93 (0.47–1.84)
	Overweight	29 (34.4%)	1.40 (0.86–2.28)	1.42 (0.95–2.14)
	Obese	6 (28.6%)	0.94 (0.36–2.43)	1.10 (0.59–2.03)

Tabel 3. Summary of GERD Associations by Variable

Variable	GERD Prevalence (%)	P-value	Significant?
Sex (Female vs. Male)	29.8% vs. 26.4%	> 0.05	No
BMI (Overweight vs. Normal)	34.4% vs. 27.5%	< 0.05	No (not significant in model)
Night Eating Syndrome (Yes vs. No)	57.9% vs. 25.4%	< 0.001	☑ Yes
Smoking (Yes vs. No)	47.1% vs. 24.0%	< 0.001	☑ Yes
Physical Activity (High vs. Low–Mod)	18.6% vs. ~33%	< 0.001	☑ Yes
Skipping Breakfast (Yes vs. No)	28.7% vs. 28.4%	> 0.05	No
Dinner-to-Bedtime (<3h vs. ≥3h)	40.6% vs. 23.1%	< 0.05	☑ Yes
Mediterranean Diet (High vs. Low)	24.1% vs. 30.2%	> 0.05	No

DISCUSSION

This is the first study to evaluate the relationship between GERD and NES in a population of students from Europe and particularly Lithuania. In a sample of university students from Lithuania, this study discovered that approximately one third of them had GERD symptoms and roughly 10% of them tested positive for night eating syndrome. Crucially, we found a strong correlation between GERD and NES their students with NES were much more likely to have GERD symptoms. In line with this, a recent study conducted in the Middle East to be more specific Palestine found that 10.3% of students had NES and 33.4% of students had GERD with night eaters having a much higher risk of GERD (unadjusted prevalence 60% versus 30% in non-NES) [7]. Our results add to previous data in a European setting and imply that there is no cultural or geographic restriction on the association between late night eating habits and reflux symptoms.

The observed overall prevalence of GERD (28.6%) is on the higher end of rates reported in Europe [11] and is greater than the global prevalence of 13 to 14% in the general population [12] Despite their age, young adults may have increased reflux due to unhealthy eating habits (spicy food, fast foods, carbonated drinks) and elevated stress levels. Nearly one third of college students in Ethiopia also exhibited GERD symptoms according to a cross-sectional study done there [12]. In contrast, other studies have identified lower incidence among student or young adult populations for instance, a survey of medical students revealed that 15% of them exhibited symptoms of GERD [13]. Such disparities are probably caused by variations in lifestyle and methodological factors (sample, diagnostic criteria). Our NES prevalence of around 10% is in line with a previous meta analysis that estimated 8% of college students have NES and it fits within the 4.2 to 15% range observed in student populations [10] The much lower prevalence of NES (1.1 to1.5%) in general population samples [9] highlights the potential predisposition to night eating behavior in college settings and age related variables (irregular schedules, psychosocial stress) [7] It makes biological sense that NES and GERD symptoms would be strongly associated. A delayed circadian pattern of food intake with at least 25% of daily calories ingested after the evening meal and/or frequent nocturnal ingestions is one of the characteristics of NES [7] As a result of this habit, there is a brief gap between eating and sleeping. Going to bed shortly after eating has been linked to a large risk of reflux.In a case control study, people who waited less than three hours between dinner and bedtime had a seven times higher risk of developing GERD compared to those who waited more than four hours [7]. Our results are consistent with this mechanism there NES patients long standing late night ea-

ting behavior probably exacerbates their esophageal reflux while they are supine. Furthermore, NES frequently coexists with other conditions including psychological stress or dysregulated hormone rhythms that may make GERD worse. NES has been associated with depression, decreased psychological functioning and changes in melatonin and cortisol levels [7]. Reflux episodes can be exacerbated by stress and sleep disturbances which often accompany NES. These conditions can also affect esophageal motility and lower esophageal sphincter function. Although we interpret NES as a contributing factor to GERD symptoms, we are unable to demonstrate causality due to the cross-sectional design. Although the possibility of late night eating as a coping mechanism for people with GERD related sleep disturbance is theoretical, the temporal sequence and the body of research (including longitudinal data on meal timing and reflux) more strongly suggest that the eating pattern predisposes to reflux rather than the other way around.

In addition to NES, our study found that smoking increased the likelihood of GERD symptoms and high levels of physical exercise protected against them. By controlling weight and enhancing gastrointestinal motility and tone, regular exercise may help prevent GERD. Physically active people had a 20% reduced risk of GERD than their sedentary colleagues, according to a recent systematic review and meta-analysis (pooled RR 0.80) [14]. This is supported by our findings which indicate that the most active students had noticeably less reflux symptoms. We observe that while regular moderate exercise is obviously good for esophageal health [14]. but really intensive exercise (such heavy lifting or sprinting) might occasionally cause reflux in the short term [15].

The well-established pathophysiology of GERD is supported by the discovery that current smokers are more likely to have it. This is because tobacco smoke, including nicotine from vaping relaxes the lower esophageal sphincter and may enhance the release of stomach acid which facilitates reflux. Smokers in our group were about twice as likely to have GERD and previous student studies have found that smokers and even e cigarette users have higher reflux symptoms [16]. When combined, these lifestyle factors support the general health recommendations to be active and abstain from smoking, which can help young individuals with GERD symptoms as well as prevent chronic diseases [16].

It's interesting to note that in this student population, there was no discernible link between following a Mediterranean diet and GERD. Given data from general adult populations, we postulated that tighter adherence to a Mediterranean dietary pattern which is high in fruits, vegetables, fiber and unsaturated fat might provide protection against reflux. People who ate a non-Mediterranean diet were more than twice as likely to have GERD as people who ate a predominantly Mediterranean diet according to a study conducted in Albania [17]. As might be expected in Lithuania where traditional diets vary, very few students followed a truly high Mediterranean diet instead, their MEDAS scores were primarily in the moderate range with little variability. Thus, our study may have been underpowered to detect a modest effect of diet quality. Additionally, student diets are often diverse (skipping meals, eating fast food and using caffeine) and the MEDAS, although a helpful measure of diet quality generally could miss some reflux causing behaviors like eating hot or fatty foods or eating at odd times. An further null result from our research was that there was no correlation between reflux symptoms and BMI. Given the wealth of studies showing that being overweight or obese raises the risk of GERD, this initially appears paradoxical. Reflux can be caused by even a little higher BMI for example, large prospective research indicated that a BMI of ≥ 25 was linked to noticeably higher probabilities of experiencing reflux symptoms often [18].

However, the BMI fluctuation was modest in our youthful, largely normal weight population and only a small percentage of people fell into the obese range, which is where the mechanical effects on the LES and intra abdominal pressure are most noticeable. This is supported by the parallel research of Palestinian students which also found no correlation between BMI and reflux symptoms [7].. Given that extreme obesity is rare in a university population, lifestyle and behavioral variables seem to have a greater influence on GERD symptoms than BMI. Additionally, whereas previous research has found that male students report higher GERD symptoms, we did not find gender

differences in GERD prevalence [16]. Women frequently report equivalent or higher symptom frequency than men despite males having higher rates of erosive complications according to the research on sex and GERD. Sex was not a significant factor in our multivariate analysis which is consistent with prior findings in college populations [12].

The study contributes novel data on the intersection of eating behavior and reflux in an under researched population (Baltic region students). Strengths include our sample size that was relatively large and diverse across faculties improving the generalizability to the Vilnius University student body. To isolate the independent effect of NES on GERD which to our knowledge has never been documented in a European and particularly Lithuanian student population, we conducted a simultaneous analysis of numerous variables. However, a number of restrictions must be noted. First, causal inference is limited by the cross-sectional design. Longitudinal studies are required to demonstrate that NES predisposes to the eventual development of GERD symptoms as we were only able to identify relationships and not determine the direction of impact. Second, all of the information was self reported. We used the GerdQ symptom score which, while validated has moderate sensitivity/specificity [3]. to confirm GERD instead of a medical diagnosis or endoscopy [8].. It's likely that some individuals who were labeled as " at risk of GERD " actually had functional dyspepsia or other diseases or that some actual instances of GERD were overlooked. Similarly, the NEQ criterion of 25 has been widely used and produces prevalence estimates that are comparable with established ranges, but the fact that NES was evaluated using a questionnaire cutoff rather than a clinical interview may have resulted in misclassification [7]. Potential response bias should also be taken into account. Students who were having eating disorders or GERD symptoms may have been more interested in the issue and more inclined to engage which might have inflated prevalence estimate. By widely promoting a " health and habits " survey without emphasizing on GERD and NES in particular, we tried to reduce potential response bias. Additionally, there is the problem of recollection and reporting bias in activities such as physical activity and food. We were unable to investigate for instance, the precise time between dinner and sleep for each person since we did not gather comprehensive food logs or meal timing (except from what is implicitly represented by NES status and MEDAS score). The evidence for mechanistic linkages would be strengthened by such knowledge. Furthermore, and even though we included important factors, there can be unmeasured confounders. For example, the use of drugs (such as NSAIDs or contraceptives) or the presence of Helicobacter pylori infection were not evaluated which could have an impact on GERD symptoms. Additionally, our survey did not evaluate psychological stress levels directly which may be a significant mediator or moderator given the high levels of stress reported in many student populations and its link to eating behaviors and reflux [19]. Considering these limitations, the study offers valuable data and insights. Our data lack of correlation for variables like diet adherence and BMI does not indicate that there is none, rather, it shows that within a young, reasonably homogeneous sample, those differences may be minor in comparison to behavioral patterns like when and how one eats.

There are real health ramifications for students due to the established connection between GERD symptoms and night eating syndrome. Clinicians and university health services should be aware that screening for disordered eating habits like NES may be beneficial for students who arrive with GERD symptoms. In addition to the standard recommendations to raise the head of the bed and stay away from trigger foods, meal timing counseling such as avoiding large late-night meals and sticking to a regular eating schedule, may be a straightforward but effective way to lessen GERD symptoms. The findings that smoking was harmful to reflux and physical activity was protective in this population provide further leverage for health promotion, students may be more inclined to change their habits (smoking cessation, increased exercise) not only to prevent long term diseases but also to address short term problems like heartburn that interfere with their ability to study and sleep. From the standpoint of public health including lifestyle education and nutrition into university well-being programs might work in concert to address a number of interconnected issues, such as weight gain, mental health and gastrointestinal disorders.

Confirming these results in different contexts and with more reliable designs should be the goal of future studies. To determine temporal correlations, multicenter longitudinal research that tracks freshmen through their college years and measures changes in weight, stress, NES symptoms and GERD incidence would be extremely helpful. To strengthen the causal evidence such research may also look into whether interventions (such a stress reduction program or nutrition session on campus) have a downstream effect on GERD results. Examining physiological mechanisms might be beneficial. For example, comparing students with and without NES in terms of reflux episodes or nocturnal esophageal pH could objectively confirm the increased reflux load that our symptom data findings. In order to further inform intervention techniques, qualitative research may also examine students' perspectives on late night eating and the obstacles they face in breaking the habit. Last but not least, multidisciplinary research connecting medical clinics and student counseling services might aid in the development of complete support networks for those impacted by NES, given its overlapping with other eating disorders and mood disorders.

CONCLUSION

About one third of the Lithuanian students in this cross-sectional research had clinically significant GERD symptoms and 10 percent fulfilled the criteria for night eating syndrome. Even after controlling for other variables NES was substantially linked to a higher prevalence of GERD symptoms indicating that time and eating habits are key determinants in reflux in young people. BMI and Mediterranean diet adherence did not significantly correlate with GERD risk in this population, whereas smoking was associated with increased risk and high levels of physical activity with decreased risk. These results emphasize the importance of understanding that students' symptoms of acid reflux may be exacerbated by irregular eating patterns like NES. Along with general healthy lifestyle promotion (exercise, quitting smoking), educational activities that encourage regular meal times (and discourage heavy nighttime eating) may help lessen the discomfort associated with GERD and enhance the wellbeing of students. Since persistent GERD can result in difficulties, addressing such concerns is crucial for long term health as well as immediate quality of life and academic achievement. In conclusion, this study highlights a potentially changeable relationship between a common gastrointestinal issue (reflux) and an eating behavior (night eating) in a student population providing opportunities for focused treatments and more investigation in this field.

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NAKTINIO VALGYMO SINDROMAS IR GASTROEZOFAGINIO REFLIUKSO LIGA TARP UNIVERSITETŲ STUDENTŲ LIETUVOJE: SKERSPJŪVIO TYRIMAS

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SANTRAUKA

Įvadas ir aktualumas. Vėlyvas maisto vartojimas ir vakarinė hiperfagija yra nepakankamai diagnozuojamo valgymo sutrikimo, vadinamo naktinio valgymo sindromu (NVS), požymiai. Dėl streso, nereguliarios dienotvarkės ir sutrikusio cirkadinio ritmo šis sutrikimas dažnesnis tarp jaunų suaugusiųjų, ypač tarp universitetų studentų. Kadangi valgymas prieš miegą sumažina laiką tarp paskutinio valgymo ir miego, tai gali sustiprinti refliukso simptomus. Vis daugėja įrodymų, kad NVS gali prisidėti prie gastroezofaginio refliukso ligos (GERL) vystymosi. Visgi šis ryšys tarp studentų Europoje, ypač Lietuvoje, dar mažai ištirtas.

Tyrimo tikslas. Šio tyrimo tikslas buvo nustatyti, kaip dažnai Vilniaus universiteto studentams pasireiškia naktinio valgymo sindromas (NVS) ir gastroezofaginio refliukso ligos (GERL) simptomai, taip pat įvertinti, ar tarp šių sutrikimų yra sąsajų.

Metodai. 2024 m. buvo atliktas skerspjūvio tyrimas naudojant anoniminę internetinę apklausą, už kurios užpildymą buvo siūlomas prizas. Tyrime naudoti validuoti instrumentai: MEDAS, IPAQ SF, NEQ ir GerdQ. Duomenų analizei naudota R 4.4.2 programa. Dviejų kintamųjų sąsajoms vertinti naudoti chi kvadrato ir t testai. Statistinio reikšmingumo riba buvo $p < 0,05$.

Rezultatai. Tyrime dalyvavo 697 studentai, kurių vidutinis amžius buvo 20,8 ± 2,1 metų; 61,7 proc. buvo moterys. 28,6 proc. turėjo GERL simptomų, o 9,8 proc. – NVS. Studentams, turintiems NVS, GERL pasireiškė žymiai dažniau (57,9 proc. vs 25,6 proc., $p < 0,0001$). Multivariacinė analizė parodė, kad NVS yra nepriklausomai susijęs su padidėjusia GERL rizika (AOR = 2,59).

Išvados. Naktinio valgymo sindromas tarp universitetų studentų buvo nepriklausomai susijęs su ženkliai didesne GERL simptomų rizika. Šie rezultatai pabrėžia vėlyvo valgymo, kaip modifikuojamo rizikos veiksnio, svarbą ir leidžia manyti, kad NVS patikra bei sveikesnių mitybos įpročių skatinimas gali padėti sumažinti GERL sukeliamą diskomfortą tarp studentų.

Reikšminiai žodžiai: gastroezofaginio refliukso liga, naktinio valgymo sindromas, studentai, mitybos įpročiai, fizinis aktyvumas, rūkymas.

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