

Assessment of the level of addiction, preferred methods of nicotine consumption, and the impact of a change in residence on nicotine use among medical students

Introduction



- **Nicotine** is a psychoactive substance that acts on the autonomic nervous system, which controls the “fight or flight” response. In small doses, it raises **blood pressure** and increases the secretion of **stomach acid**, while in large doses it acts in the opposite manner [1].
- By releasing **dopamine** – the pleasure neurotransmitter – nicotine becomes highly addictive, which explains its popularity [1].
- In Poland, tobacco smoking used to be very widespread [2], but it has **declined** thanks to regulations and public health campaigns since the 1990s; however, according to WHO (2022), 27.6% of men and 19.1% of women still smoke [3].
- Today, nicotine is more frequently consumed **not only in cigarettes**, but also via e-cigarettes, heated tobacco, or nicotine pouches.

Research objectives



- Assessment of the degree of nicotine addiction among medical students.
 - Analysis of the preferred methods of consumption of this substance.
 - Evaluation of the impact of changes in residence on nicotine consumption-related behaviors.
 - Evaluation of the influence of nicotine on overall psychophysical condition.
- The analyses conducted may serve as a basis for developing improved addiction prevention standards.



Materials and methods

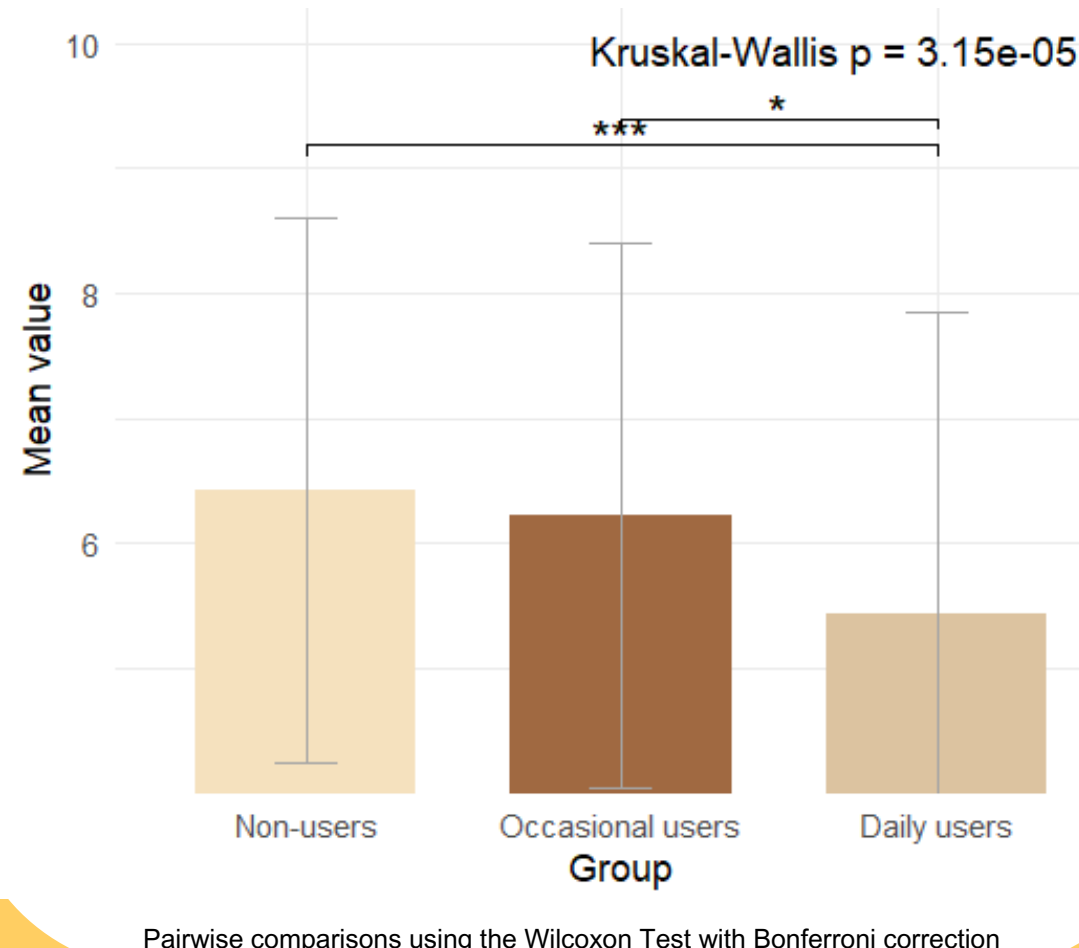


- The study involved **574 medical students** from 17 universities in Poland.
- A modified research questionnaire consisting of **55 questions** was used. **The survey** was conducted between **January 29 and February 15, 2025**.
- Calculations were performed using statistical analysis methods, including the **Shapiro-Wilk** test to assess the normality of the distribution. For further analyses, the **chi-square** test, **Kruskal-Wallis** test, **prop-test**, and **Wilcoxon** test with **Bonferroni** correction were employed, along with **Spearman's** correlation coefficient.
- A significance level of **$\alpha = 0.05$** was assumed.
- p-value annotations: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

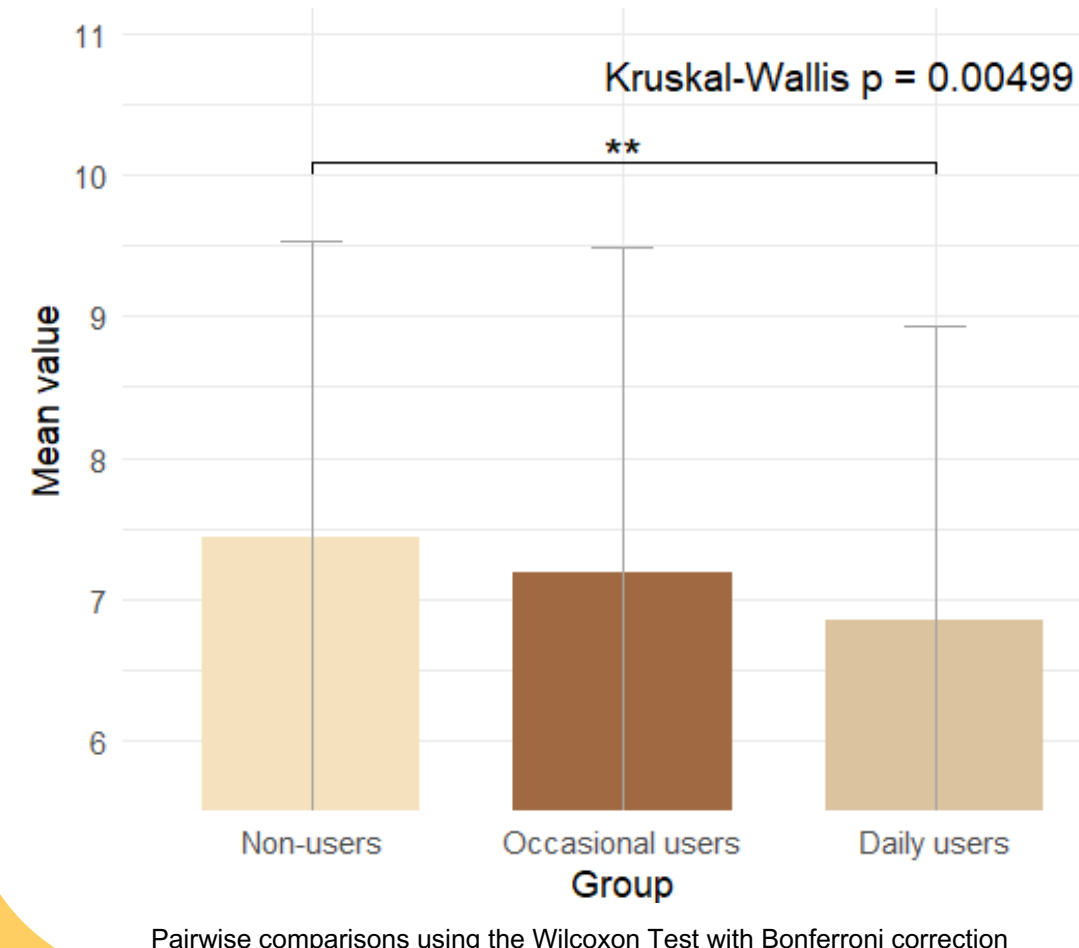
Limitations

- An insufficient number of responses from students in years 4–6 prevented the analysis of the dynamics of nicotine habits over the course of their studies.
- The potential for an increased interest from nicotine users may result in limited randomness of the sample.

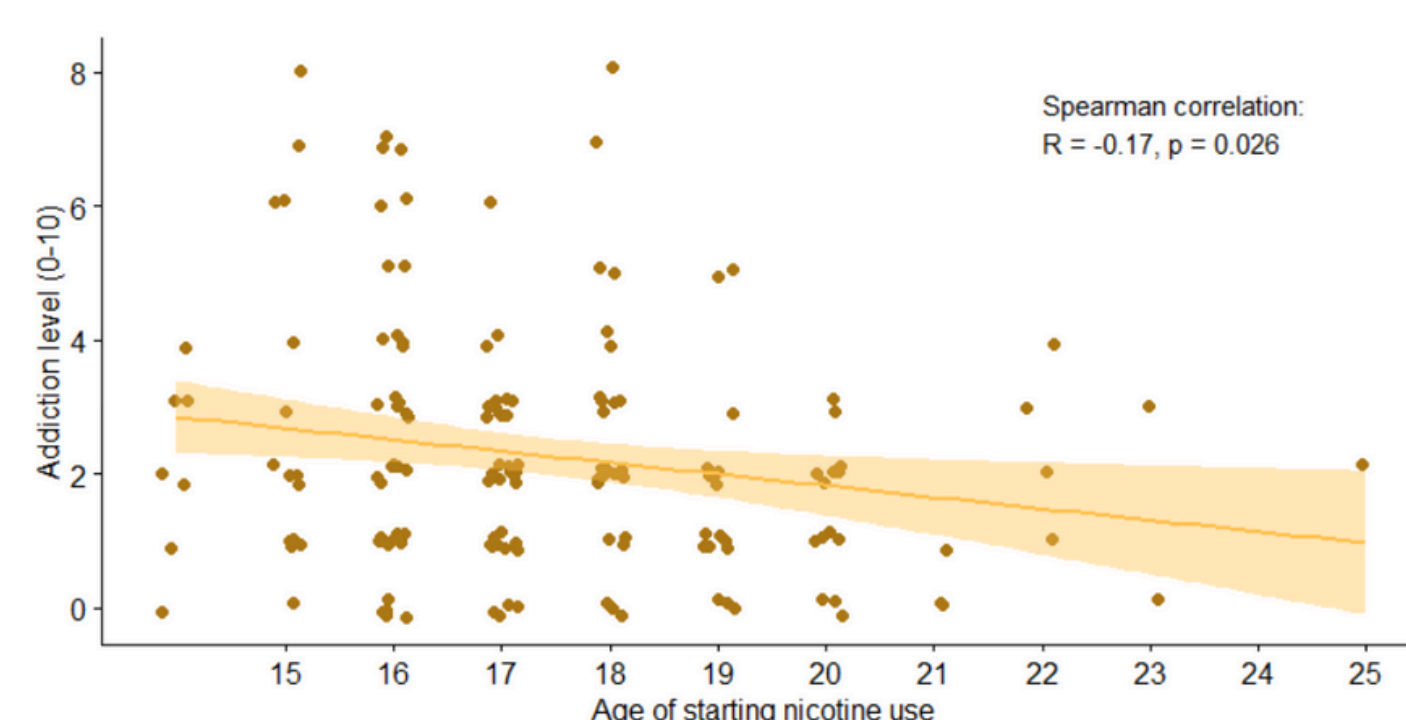
Frequency of nicotine intake and subjective sleep quality assessment



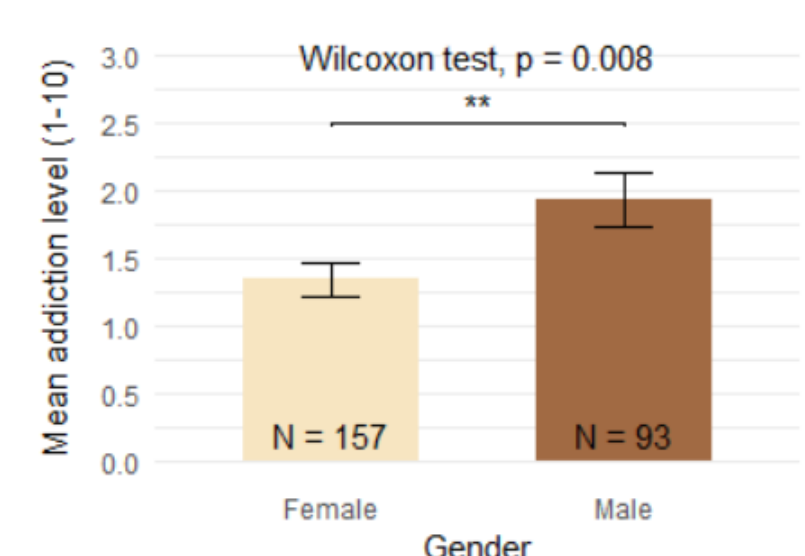
Frequency of nicotine intake and mental health assessment



Impact of smoking onset age on nicotine addiction severity



Degree of nicotine addiction depending on gender



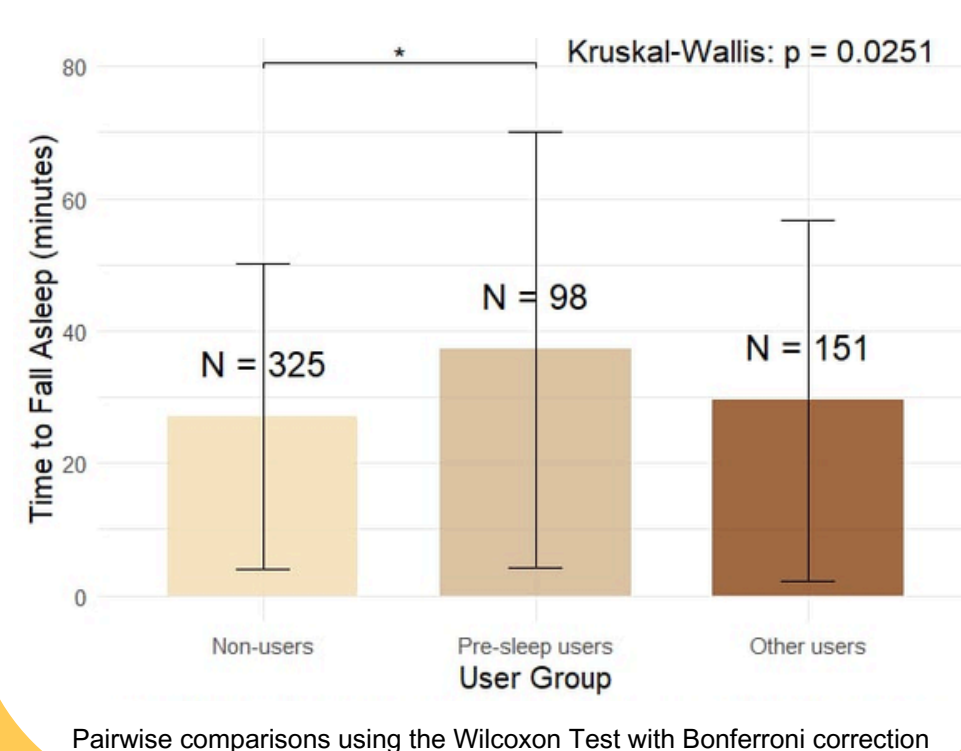
Conclusions and results

- Research shows that the percentage of people using nicotine is similar across both genders, though **men tend to achieve higher levels of addiction** (0.75 points according to the modified Fagerström Scale*).
- The most commonly used form on a daily basis are e-cigarettes with liquid (36% of users), while disposable ones or traditional cigarettes are mostly used occasionally.
- **Stress reduction** (72%) is nicotine consumption's most frequently reported positive effect, which may be a reason for its use.
- **Positive initial experiences increase the likelihood** of continued daily nicotine use, and past **exposure to secondhand smoke predisposes** individuals to become ongoing users (37.3% vs. 25.2%).
- No correlation was found between changing residence and increased nicotine use.
- Daily nicotine use is associated with **poorer sleep quality**, shorter sleep duration, and worse mental health, while using nicotine directly before bed extends the time to falling asleep by approximately 10 minutes.
- **Earlier initiation** of nicotine use correlates with **a higher degree of addiction** according to the modified Fagerström Scale*.

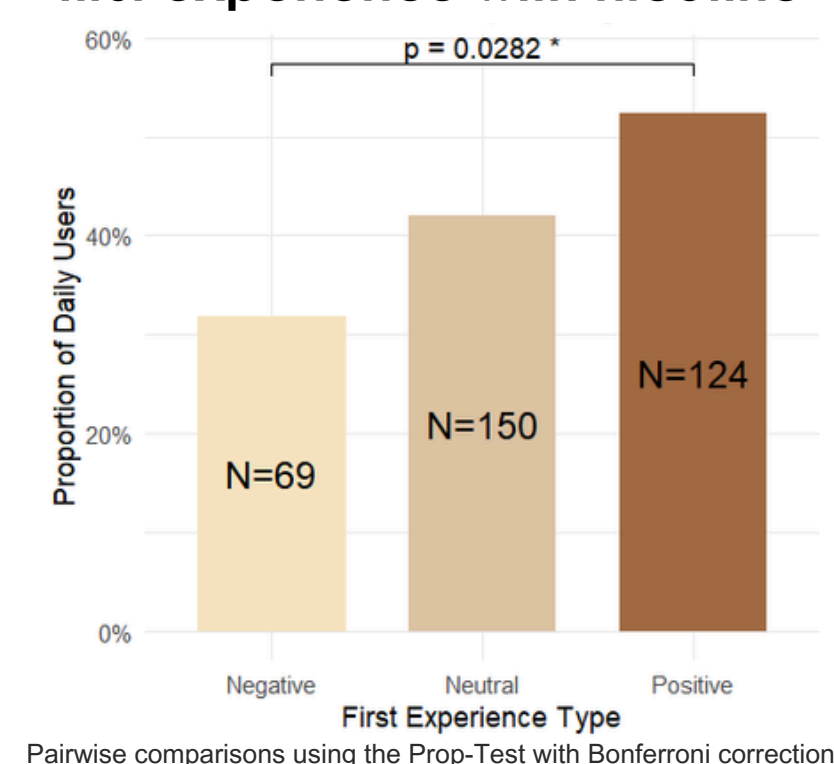
*A modified version of the Fagerstrom Scale was used for the study, which also included alternative forms of nicotine consumption.



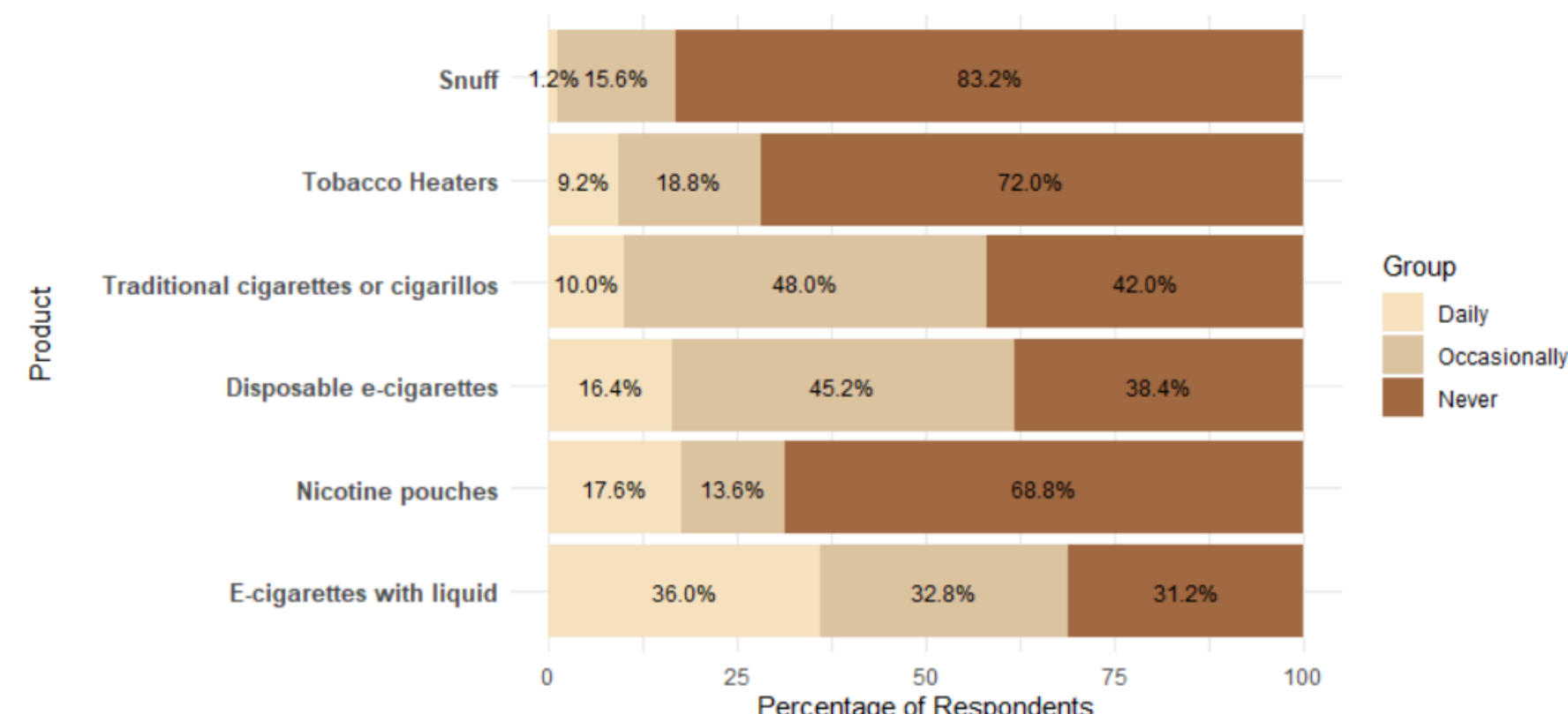
Estimated sleep onset time and nicotine intake before bedtime



Percentage of daily users and their first experience with nicotine



Usage patterns of various nicotine forms among consumers



Sources

1. Mutschler E. Farmakologia i toksykologia, wydanie IV polskie.
2. Zatoński W, Przewoźniak K. Cel operacyjny nr 3: Zmniejszenie rozpowszechnienia palenia tytoniu. W: Goryński P, Wojtyński B, Kuszewski K (red), Kontrola spodziewanych efektów realizacji Narodowego Programu Zdrowia. Warszawa, Państwowy Zakład Higieny 2004; 49–58.
3. World Health Organization. (2023). Tobacco. <https://www.who.int/news-room/fact-sheets/detail/tobacco> (access: 28-02-2025).

