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Article

# Self-Esteem, Self-Efficacy, and Smoking Prevalence among Medical Students: A Cross-Sectional Study

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**Abstract:** METHODS: A cross-sectional study on 456 medical students was conducted via an online survey using structured questionnaires on socio-demographic characteristics, smoking habits, nicotine dependence, self-esteem, and self-efficacy. RESULTS: The prevalence of smoking was 31.1%. The scores of self-esteem and self-efficacy were positively correlated with smoking habits ( $W1=0.957$ ,  $W2=0.975$ ,  $P<0.05$ ). Students presented rather low smoking addiction with male students having slightly higher scores than female students on self-esteem and self-efficacy, military students had higher self-esteem scores than civilians with physical activity having a positive correlation with non-smoking behavior. CONCLUSION: According to our results, self-esteem and self-efficacy were slightly positively correlated with smoking habits. Furthermore, there was no statistically significant association between other social factors and smoking. Our results may develop a theoretical basis for medical students' psychological variables studying for further implementation of university educational programs and preventive interventions empowering students towards an overall better quality of life, addressing, among others, smoking behaviors.

**Keywords:** prevalence; smoking; medical students; self-esteem; self-efficacy

## 1. Introduction

Stress is a common experience for most medical students due to the rigorous demands of their training with medical education being challenging and students often facing heavy workloads and competition pressure situations. Having to absorb and retain a large volume of complex information, time pressure, and expecting to academically perform at a high level can create a significant amount of mental distress. Major years students can have even more challenging and stressful experiences as they are often exposed to the presentation of critically ill patients and life-threatening emergencies with supplementary emotional input. With less time for socializing, hobbies, or self-care and other socio-economic difficulties, medical students can develop various stages of burnout and use unhealthy coping mechanisms, especially after the COVID-19 lockdown when coping mechanisms deteriorated with smoking and drinking being, among others, important factors of the stress perceived [1,2,3].

Smoking is one way, among others, that people usually cope with stress with nicotine providing a temporary sense of relaxation. However, smoking has been linked to a variety of negative health outcomes, including lung cancer, heart disease, and stroke, comprising 16% of non-communicable diseases, in Romania [4,5]. In addition, smoking can increase stress levels over the long term by disrupting sleep, reducing exercise tolerance, and impairing lung function [6,7].

There have been several studies that have looked at the link between smoking and stress in medical school. One study found that medical students who reported high levels of stress were more likely to smoke, with around 30% of students reporting smoking, and that smoking was more common among male students [8]. In Europe, the prevalence of smoking among medical students varies from 28.02% in Germany to 31.3% in Italy, which is higher than in the general population [9] and compared to students from other faculties [10]. Stress and symptoms of anxiety and depression

increase in the first two years of medical studies but decrease towards their end [11]. In doctors, stress and burnout are rather typical. Both issues could start during medical school and continue during residency and then across a lifetime. Medical schools need to be informed about the persistent and important effects of stress and burnout among their students.

The effects of smoking on various psychological variables have been a topic of interest in recent years with studies investigating the relationship between smoking and mental health, including self-esteem and self-efficacy. Smoking was negatively associated with self-esteem and self-efficacy in medical students. This negative relationship is believed to be due to the harmful effects of smoking on both physical and mental health. Smoking may affect one's social and emotional well-being, leading to feelings of isolation and reduced self-worth. Smokers may also experience academic problems, which can further reduce their self-esteem and self-efficacy [12].

Unfortunately, smoking is not the only factor that comes along with stress. A vicious cycle is formed between smoking, low self-esteem, and low self-efficacy. A study published found that these factors were significant predictors of academic performance among medical students. Higher levels of stress were associated with lower academic performance, while higher levels of self-esteem were associated with better academic performance. The study also found that there was a significant negative correlation between stress and self-esteem [13]. Medical students who smoked had lower self-esteem than non-smoking students. Similarly, a study found that smoking was associated with lower self-esteem in medical students. The concerning part is that self-esteem and self-efficacy were negatively associated with smoking and that higher levels of self-efficacy were associated with a lower likelihood of smoking. [14].

The importance of self-esteem and self-efficacy was highlighted by their influence as mediating the relationship between motor proficiency and internalizing problems along with social support. This represents an important aspect of the concept of the environmental stress hypothesis which may also relate to unhealthy coping mechanisms such as smoking [15]. In recent years, there are no studies including all three variables as included in our research. This may represent a more complete understanding of how these psychological variables impact smoking behavior. Even if there are some studies regarding military medical students [16] we found no approaches concerning this type of students in aspects of self-esteem or self-efficacy. The social component is not discussed enough as loneliness and social circle may influence smoking behavior [17].

Thus, this study aimed to examine the relationship between smoking prevalence, self-esteem, and self-efficacy in medical students. Additionally, this study's secondary aims were to compare these factors based on socio-demographic characteristics and investigate their potential correlation. Our hypothesis was based on correlations between variables but no presumptions as to whether they were negative or positive were made in advance. Also, there is likely that coping mechanisms may represent an additional factor for smoking behavior prevalence. Moreover, military students are expected to have lower self-esteem and self-efficacy scores as their military service goes along with their medical training with stress levels being considered higher.

## **2. Materials and Methods**

### *2.1. Study design and participants*

The design of the study was cross-sectional, with a single administration of a survey comprising 22 questions and a series of standardized psychometric instruments. Moreover, the cross-sectional design was successfully used in previous literature on the same theme or other addictive behaviors [18,19], including in Romania [20,21].

456 students (33.1% men, 65.7% women, 1.09% other; mean age = 20.8, SD = 2.24) agreed to participate in the study.

The inclusion criteria were as follows: (1) students currently studying at the university (2) informed consent and willingness to participate voluntarily in this research; and (3) the ability to express their opinions clearly and with a good orientation to time, place, and people.

## 2.2. Context and Procedure

For this study, the data were gathered in April–May 2023 through the administration of an online set of questions containing the study instruments. To launch the research, we sent a preliminary information message to UMFCD students, informing them of the study's aims and soliciting their participation. Participation was anonymous, and students' responses did not affect the teacher's evaluation of students' performance. The students who expressed interest in participating received an explanatory statement about the study and completed informed consent forms. Subsequently, they were sent the web link for answering the psychometric instruments and the survey.

The study procedure was run via a SurveyMonkey® interface (One Curiosity Way, San Mateo, CA, USA). Online testing in educational settings is reported to ensure speed, timeliness, flexibility, and representativeness of the collected data [22,23].

Procedures in the study were designed by the World Medical Association Declaration of Helsinki. The study protocol was approved by the UMFCD Institutional Review Board (no. 14873/2023). A researcher (MS) was available by phone or email in case the participants had questions concerning the filling of the questionnaires. All responses were processed anonymously, and a numerical code was assigned to each participant. The collected data were accessible exclusively to study researchers (LM, CGI, MS), while regular didactic staff had no access to the nominal distribution, collection, or interpretation of questionnaires. The interpretation of the questionnaires was performed independently by two researchers (MS, CGI) and cross-checked for congruence afterward. Results were included in a JASP version 0.10.2 statistical software (Department of Psychological Methods University of Amsterdam, Amsterdam, The Netherlands, <https://jasp-stats.org/>) database.

## 2.3. Questionnaires

All participants answered three standardized psychometric instruments to measure their smoking addiction, self-esteem, and self-efficacy scales.

(1) The Fagerstrom Test for Nicotine Dependence (FTND) is a questionnaire used to measure the degree of nicotine dependence in cigarette smokers. The answers to the 6 questions are used to calculate a total score, with higher scores indicating greater nicotine dependence. Across literature studies, the scale has been shown to have good internal consistency, good validity, and a fairly stable factorial structure [24,25]. Even if sometimes it has a low consistency (0,4-0,6), it is rather acceptable in literature [26].

(2)The Rosenberg Self-Esteem Scale (RSES) is a commonly used scale for measuring self-esteem. It consists of ten statements, to which the respondent rates their level of agreement on a 4-point scale ranging from strongly agree to strongly disagree. The scale measures both positive and negative feelings about oneself, with higher scores indicating higher levels of self-esteem. Responses are scored from 0 to 3, with the total score ranging from 0 to 30. A higher score indicates higher self-esteem [27,28].

(3)The Schwarzer and Mathias self-efficacy scale, also known as the General Self-Efficacy Scale (GSE), is a psychometric tool designed to measure an individual's self-belief in their ability to handle difficult situations and achieve their goals. It consists of ten statements that participants rate on a four-point scale, with higher scores indicating greater self-efficacy. Scores are then calculated and interpreted to provide an overall measure of an individual's self-efficacy. [29,30].

In addition to these three psychometric tests, the participants provided information about their age, place of origin, current academic year, type of training-medical or civilian, current residence, specialty, and coping mechanisms.

## 2.4. Data analysis

In line with the explorative nature of our study, we first described the demographics of our participants. The internal consistency of the smoking addiction, self-esteem, and self-efficacy scales

was assessed using Cronbach's alpha coefficient and all instruments had coefficients above 0.7, which is considered to be the minimum acceptable value for proper reliability [31].

We made descriptive statistics using all the data depending on the smoker/non-smoker status. Afterward, we performed T-tests to compare various groups on the three main variables studied: smoking addiction, self-esteem, and self-efficacy. Furthermore, we used Chi-Squared tests to quantify differences in smoking/non-smoking depending on the place of living and gender. Other T-tests were used to compare the three scales depending on situations when smoking, coping mechanisms, and type of cigarettes smoked.

Data management and descriptive analyses were performed using JASP statistical software, version 0.17.2 statistical software [32].

#### Ethical Considerations

- Participants were appropriately informed about the nature of the research.
- Informed consent was taken from the participants.
- Anonymity of participants and confidentiality of the information was maintained.
- Participants were given the right to withdraw from research at any time.
- The responses were accurately represented.

### 3. Results

#### 3.1. Sociodemographic data and smoking correlates

The response rate was 10.08% (456 out of 4521 medical students invited). Data was collected from 456 students who agreed to participate in the study (151 men, 300 women, 5 not specified gender; mean age = 20.88, SD = 2.24). A total of 86.8% of the participants were Romanian module students with 14.2% reported being Military Medicine students and only 27.4 % reporting living in a student campus (complete detailed results in Table S1. Supplementary Materials). Table 1 summarizes the descriptive indicators of the sociodemographic data.

**Table 1.** Sociodemographic characteristics of the sample.

Variable	Condition	Participants (n)	Percent (%)
Gender	Female	300	65.79
	Male	151	33.11
	Other	5	1.10
Study module	Romanian module	396	86.84
	English module	56	12.28
	Missing	4	0.88
Specialty	Civil Medicine	391	85.75
	Military Medicine	65	14.25
Origin	Urban	371	81.36
	Rural	85	18.64
	Campus	125	27.41
Current residence	Personal propriety	331	72.59
	No	309	67.76
Smoker	Yes	142	31.14
	Missing	5	1.10
	No	30	6.58
Smoking before college	Yes	112	24.56
	Missing	314	68.86
	No	431	94.52

<b>Psychotropic treatment</b>	Yes	25	5.48
<b>Psychological treatment</b>	No	406	89.04
	Yes	50	10.97
<b>Total</b>	-	<b>456</b>	<b>100.00</b>

The Fagerstrom nicotine dependence test showed a low mean level of nicotine addiction among medical students ( $m = 1.45$ ,  $SD = 1.406$ ) [33]. The data reveal interesting patterns in smoking behavior across different sociodemographic categories. As expected, the majority of both smokers and non-smokers are from Civil Medicine (being the majority), but the proportion of smokers in Military Medicine is noticeably higher than that met in Civil Medicine students. This could suggest a potential association between the stressors or lifestyle factors specific to Military Medicine and smoking behavior. In terms of residence, while the majority of both groups reside in personal properties, there is a slightly higher proportion of smokers residing on campus, probably due to frequent casual socialization. Details can be seen in Table 2.

**Table 2.** Smoking and some of its sociodemographic correlates.

<b>Smoker</b>	<b>Categories</b>	<b>Participants (n)</b>	<b>Percent (%)</b>
<b>No</b>	Civil Medicine	271	87.70
	Military Medicine	38	12.30
	Campus	85	27.51
	Personal propriety	224	72.49
	<b>Total</b>	<b>309</b>	<b>100.00</b>
<b>Yes</b>	Civil Medicine	115	80.99
	Military Medicine	27	19.01
	Campus	40	28.17
	Personal propriety	102	71.83
	<b>Total</b>	<b>142</b>	<b>100.00</b>

### 3.2. Patterns in smoking: risk situations and alternative coping

Next, we will deal with two opposing factors relevant to smoking: contexts that increase risk of smoking behaviours and coping strategies that may lower its frequency or diminish its impact. Concerning the types of contexts that triggers smoking the results are presented in Table 3. The data reveal that the majority of smokers reported experiencing academic stress (78.17%) and social smoking (90.14%) as extremely common contexts for smoking. In contrast, emotional conflicts were reported by a smaller, yet still substantial, proportion of participants (66.90%).

**Table 3.** Types of situations for smoking.

<b>Situations</b>	<b>Present</b>	<b>Participants (n)</b>	<b>Percent (%)</b>
Academic stress	Yes	111	78.17
	No	31	21.83
	<b>Total</b>	<b>142</b>	
Social smoking	Yes	128	90.14
	No	14	9.86
	<b>Total</b>	<b>142</b>	
Emotional conflicts	Yes	95	66.90
	No	47	33.10
	<b>Total</b>	<b>142</b>	

The alternative coping to smoking can be seen in Table 4. Not surprisingly, the mean score for smoking within the group engaged in physical activities is lower (1.260) compared to the group not engaged in physical activities, with a mean score of 1.774. Other methods for coping with stress reported verbatim by participants are: music therapy, reading, and some negative methods such as alcohol, marijuana, and binge eating.

**Table 4.** Coping Strategies for Smoking.

Strategy	Present	Participants (n)	Percent (%)
Mindfulness	Yes	43	30.28
	No	99	69.72
	Total	142	
Relaxation	Yes	89	62.68
	No	53	37.32
	Total	142	
Physical activity	Yes	66	46.48
	No	76	53.52
	Total	142	

There is also another series of apparent linked factors that are not actually related to smoking behaviour. We found no significant correlation of Fagerstrom nicotine dependence results with gender, language module, military vs civilian module, area, living place, previous psychotropic treatment, previous psychotherapy, and starting before entering university (All the statistical analyses results are attached in Supplementary Materials).

There is no significant difference in smoking addiction scores between students who practice mindfulness and those who do not ( $p > 0.05$ ). Based on these p-values, there is no convincing evidence to suggest a significant difference in the measured variables between the relaxation and no-relaxation groups.

### 3.3. Self-Esteem, Self-Efficacy, and their sociodemographic correlates

The Self-Esteem assessment shown practically no difference between smokers/non-smokers (30.09 vs 30.98). The prototypical participant with high self-esteem is: male, Romanian module student, Military Medicine student, from urban areas, living on campus, with no previous psychotropic treatment and no psychotherapy.

Overall, the differences in mean scores between individuals engaged in physical activities and those who are not are relatively small across the variables.

### 3.4. Differences in Self-Esteem and Self-Efficacy between Smokers and Non-Smokers

Significant differences were found between non-smokers and smokers in terms of self-efficacy and self-esteem. Smokers reported higher levels of self-efficacy ( $p = .001$ ,  $r_{pb} = -0.198$ ) and self-esteem ( $p = .044$ ,  $r_{pb} = -0.123$ ) compared to non-smokers. The effect sizes for the significant results were small to medium, suggesting a practical significance of the findings (Table 5).

**Table 5.** Comparison of Self-Efficacy, Rosenberg Self-Esteem, and Fagerstrom Test for Nicotine Dependence Scores Between Non-Smokers and Smokers.

Dependent Variable	Non-Smokers			Smokers			U	p	$r_{pb}$
	N	M	SD	N	M	SD			
Self-Efficacy	271	30.70 5	4.15 5	132	32.26 5	4.60 8	14350. 5	.00 1	-0.198
Self-Esteem	265	30.09 8	5.1	134	30.98 5	5.61	15571. 5	.04 4	-0.123
Nicotine Dependence	-	-	-	81	1.457	1.40 6	-	-	-

**Note.** M and SD represent the mean and standard deviation, respectively. U represents the Mann-Whitney U test statistic. p represents the p-value for the Mann-Whitney U test.  $r_{pb}$  represents the rank biserial correlation, which is the effect size for the Mann-Whitney U test. All p-values are two-tailed. Effect sizes were calculated using the formula  $r_{pb} = 1 - (2U / (n_1 * n_2))$ , where  $n_1$  and  $n_2$  are the sample sizes for the two groups.

## 4. Discussion

### 4.1. Smoking prevalence

Only one-third of the students responding to our survey were smokers, but rather low addiction scores were reported as confirmed by the Global Adult Tobacco Survey (GATS) 2018 study in a sample of the Romanian general population, remaining unchanged since 2011 [34]. There were no gender differences regarding smoking addiction with most of the smokers living in their own houses. Also, academic stressful situations and intense emotional conflicts were reported as the most frequent situations when students smoke as another study previously reported [35]. This may represent a norm for young adults as addictive behaviors were previously reported as adopted in various stressful situations, especially work and family-related ones [36].

Otherwise, our results may present an optimistic outcome concerning the relatively low degree of addiction even in those starting smoking before entering university and taking into consideration the growth in consuming heated-tobacco products (HTP) as Romania is the second European country reporting the use of HTPs [37,38]. This perspective is confirmed by studies including Romania as being the 9th EU member state on smoking prevalence and 10th on pack-year prevalence but persisting on a descendent trend in contrast to other Eastern European countries like Bulgaria or Greece [39,40].

Concerning coping mechanisms, only physical activity had a significant correlation to low smoking addiction scores. Physical activity, among others, was highlighted as an important predictor of health outcomes across life stages, including smoking [41,42].

### 4.2. Self-esteem, self-efficacy, and smoking prevalence

The present study aimed to investigate the relationship between smoking addiction with self-reported self-esteem and self-efficacy among medical students. The results showed that correlations between smoking addiction and self-esteem/self-efficacy were positive, indicating that higher levels of smoking addiction were associated with higher levels of self-esteem and self-efficacy. However, it is important to note that the correlations were relatively weak and not statistically significant. It is important to retain that only one-third of the students declared smoking with 78.8% starting before entering university. The mean scores on the smoking scale were showing rather low addiction. This may represent a point of interest in discussing why the majority of the students did not develop a higher addiction since they began smoking a few years now. Based on the results of this study and the literature as well, it seems it is necessary to conduct more studies in this area, especially longitudinal and interventional studies to practically determine the effect of self-esteem and self-efficacy improvement programs on smoking prevention or cessation.

Most of the studies rank medical students among the students with low self-esteem and self-efficacy [43,44] this leads to various mental health issues like depression, anxiety, and burnout [45]. Also, most of the studies rank them lower than non-medical students regarding smoking [46,47,48]. Few studies tried to correlate the variables of self-esteem and self-efficacy with smoking addiction levels.

Our study found results that may explain the protective role high self-esteem and self-efficacy may have in stopping students not to develop higher levels of addiction as the years go by. Also, the finding might be a result of cumulated factors including social interactions, breaks between learning sessions, but also other coping mechanisms that interfere with these results (mindfulness, relaxation, physical therapy, etc.)

With most of the studies focused on smoking cessation and self-esteem and self-efficacy [49-52] having predictor roles for successful abstinence and not advancing in higher stages of addiction, our study stays in line with those findings. Also, happiness was associated with lower scores of smoking in young adults [53] confirming our relatively low addiction scores in our research.

While few studies correlate high self-esteem and self-efficacy with habits like smoking [54] others show negative correlations, especially among young adults progressing in smoking [55-58] with negative social capital being also linked with smoking behavior [59]. In contrast, a study shows

that self-esteem may not represent a predictor for smoking [60]. This may be considered important in the light of social, economic, and cultural characteristics of the Romanian population.

#### 4.3. Gender differences

Gender differences were observed in the study, with males tending to have slightly higher self-efficacy and self-esteem scores compared to females which is supported by previous research [61]. Also, gender can influence social expectations and perceptions, which may further affect self-esteem and self-efficacy [62]. There was no significant difference in smoking addiction scores between genders. This suggests that gender alone may not be a significant factor influencing smoking addiction.

#### 4.4. Other social correlates

The study found that individuals in the military group had higher self-esteem scores compared to the civilian group. This suggests that the context of military service may positively influence self-esteem.

Studies have shown that military medical students may vary in matters of well-being, depression, burnout, or the tendency to leave medical school while trying to adopt more coping strategies [63,64]. Military medical students are a unique population to study in relation to smoking, self-esteem, and self-efficacy, knowing that military service members and veterans have been found to have higher rates of smoking than the general population. Military medical students may face additional stressors related to their military obligations, such as deployments, training exercises, and other demands of military service. These stressors may impact their self-esteem and self-efficacy and may also influence their smoking behavior.

Students living on campus had higher self-esteem scores compared to those who lived alone. The social environment and support provided in the campus setting may contribute to higher self-esteem as highlighted before [65].

Individuals engaged in physical activities had slightly higher self-efficacy scores and lower smoking addiction scores. Physical activity and exercise can positively impact self-esteem and self-efficacy through improved physical well-being and feelings of accomplishment. Students engaged in physical activities had lower smoking addiction scores compared to those who were not engaged in physical activities. This suggests that being physically active may have a positive influence on reducing smoking addiction and improving overall quality of life as previous research showed [66,45,67].

## 5. Conclusions

In our study, self-esteem and self-efficacy were rather high among smokers and non-smokers as well. Our study suggests that there may be other psychological variables worth taking into consideration concerning smoking habits, like personality, cultural background, social attitudes, and mental individual variables. There is a need to investigate the cultural and social aspects of smoking in Eastern European countries like Romania where smoking policy and education still have a lot of space for improvement.

Self-esteem and self-efficacy were reported as high in most of our participants. Medical students are required higher intellectual effort and engagement than most of the superior education systems thus there is a need for confidence and self-enhancement to perform academically at the expected standards.

Smoking may not represent at the moment, in their first three years of study, a matter of concern regarding physical or mental aspects but the lifetime perspective needs to be addressed.

So, medical students need to be aware of the negative effects of smoking on their mental and physical health, as well as their academic performance. Quitting smoking and adopting healthy lifestyle habits can lead to improvements in self-esteem and self-efficacy, which can ultimately lead to better academic performance and overall well-being. Further research is needed to explore the

specific mechanisms underlying the relationship between smoking and self-esteem/self-efficacy in medical students. It becomes crucial to address this issue through preventive interventions. By promoting smoking cessation and the adoption of healthy lifestyle habits, it is possible to break the cycle and potentially improve self-esteem and self-efficacy among students. These improvements, in turn, can lead to positive outcomes in academic performance and overall well-being.

Smoking is a major public health concern and understanding the factors that contribute to smoking behavior can help inform interventions and policies aimed at reducing smoking prevalence considering Romania already signed the WHO Framework Convention on Tobacco Control (FCTC), when a national campaign was launched as “the First Generation without Tobacco” endorses the WHO ‘tobacco end game’ by 2035 [68,69,70].

Understanding the relationship between smoking, self-esteem, and self-efficacy can help identify potential targets for intervention and provide insights into the psychological processes underlying smoking behavior. Medical students are at a critical point in their education and career development; addressing smoking behavior among medical students can have important implications for their future patients, as well as for the broader medical profession.

## 6. Limitations

This study has several limitations. The sample size was rather small, and the participation in the survey was based on self-selection. The sample was asymmetric in terms of gender and origin, although this reflects the real proportion of students in medical universities (skewed towards women from urban areas and one-third being English-module students). The design of the study was cross-sectional, not allowing the assessment of the study variables in their short- and long-term dynamics. The level of digital competence and the easiness of online communication have not been considered preconditions for the inclusion of participants in the study. Also, the sample size only included the first three years of medical students mainly from Bucharest and Muntenia southern region of Romania. This may reduce the generalizability of the findings, taking into consideration cultural, social, and attitude aspects toward smoking.

## Future Research

Next, studies on this subject could be run longitudinally and include other potentially relevant variables (e.g., pertaining to personality or other psychopathological variables). Moreover, a distinct line of development could be represented by the creative use of the qualitative methodology among medical students. The in-depth evaluation of personality traits, mental and physical well-being, and social circle employing, for example, self-enhancement or counseling groups, could not only supplement the data, but also offer a valuable opportunity for students to reflect on the complex etiology of smoking and other addictive behaviors, and assess them in relation to their life and academic goals.

**Supplementary Materials:** The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

**Author Contributions:** M.L. and M.S. contributed to the design of the work. M.S. conducted the data collection. M.S. and C.G.I. conducted the data analyses. M.S. contributed to the interpretation of the results. C.G.I., M.S., and M.L. contributed to drafting the manuscript. M.L. supervised the development of work and helped with manuscript evaluation. M.S. and C.G.I. helped to evaluate and edit the manuscript.

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**Informed Consent Statement:** Written informed consent has been obtained from the participants to publish this paper” if applicable.

**Data Availability Statement:** The data presented in this study are available on reasonable request from the corresponding author.

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