

# Validation of the Romanian Version of the Social Media Addiction Scale-Student Form (SMAS-SF) Among Undergraduate Medical Students

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**Purpose:** Internet addiction is a recently recognized condition that has been linked to decreased academic performance, clinical symptoms of depression or anxiety, alongside decreased empathy levels. This study examined the validity and reliability of "the Social Media Addiction Scale - Student Form (SMAS-SF)".

**Patients and Methods:** The final Romanian version of the questionnaire was tested in a focus group for the understandability of each question. For confirmatory factor analysis and structural equation modeling, a sample of 649 students was recruited. A subsample of 67 undergraduate students was used to measure reliability by Cronbach's alpha and intraclass correlation coefficient (ICC).

**Results:** A 2-step confirmatory factor analysis was used and 4 factors emerged, similar to the original questionnaire: virtual tolerance, virtual problems, virtual information, and virtual communication, showing acceptable levels of fit. The structural equation modeling measured the structural relationship between measured variables and latent constructs and acknowledged that the 4-factor model had satisfactory levels for comparative fit index (0.916) and Tucker–Lewis index (0.897), root mean square error of approximation (0.062, with 95% CI between 0.055–0.069), and standardized root mean square residual (0.053). Values of Cronbach's alpha = 0.817 and ICC = 0.829 for the overall 16 item questionnaire were acceptable.

**Conclusion:** The Romanian version of the SMAS-SF is a reliable and valid tool to measure social media addiction among undergraduate medical students that may be further used in subsequent research.

**Keywords:** Social Media Addiction Scale-Student Form, SMAS-SF, medical students, validation, social network, addiction

## Introduction

Over the past years, online social networking has become an essential part of young people's everyday life, being used as a socializing tool, for connecting with family, friends, or for exchanging information and other activities. Social media activity is possible with the help of mobile and web technologies that create connectivity, active collaboration, and exchange of ideas between users.<sup>1</sup> However, in current psychiatry, there has been a growing concern that the excessive use of these social networks may have negative effects on students' mental health and well-being. Also, there is a higher chance of developing an addiction, therefore decreasing academic performances and creating a favorable ground for the development of depressive or anxious symptoms.<sup>2</sup> On this subject, recent studies have been conducted, to identify the relationship between social networking and mental health difficulties that emerge in undergraduate students.<sup>3</sup>

International classification manuals, such as the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM 5),<sup>4</sup> are beginning to discuss Internet addiction and have recommended that they should be included in the appendix of the manual, to encourage further study. Internet addiction is a recently identified condition,

associated with loss of control over internet usage. This addiction has several negative consequences, such as lowering previous individual academic levels, deficient social functioning, or even criminal activities.

According to a survey by iSense Solutions conducted in early 2019<sup>5</sup> and presented at the Digital Marketing Forum, online social media channels are accessed by 53% of Romanians in the urban environment as soon as they wake up. The preference for Facebook amongst young people, aged between 18 and 25, has dropped from 82% in 2018 to 48% in 2019, while Instagram gained popularity, rising from 7% in 2016 to 42% at the beginning of 2019. Facebook addiction has been associated with behavior and emotional issues and difficulties in academic and work performances.<sup>6</sup>

Socializing via the Internet has become an increasingly important part of young adult life.<sup>1</sup> Social networking sites (SNS) are online communication tools that allow users to create a public or private profile to interact with other people.<sup>7</sup> While not to dismiss its many benefits in helping people connect in unprecedented ways, several researchers have noted that the current ingrained social media use is associated with elevated anxiety, depression, loneliness, and poor sleep.<sup>8</sup>

Specific social media platforms were reported to be highly detrimental to the mental health of young people, as they tend to generate feelings of inadequacy and worsen body image issues for approximately a third of teenage girls, 14% of boys. They were related to suicidal thinking amongst 13% of British and 6% of American users.<sup>9</sup>

Researchers at the Royal Society for Public Health UK have posited that social media is “more addictive than cigarettes and alcohol and is now so entrenched in the lives of young people that it is no longer possible to ignore it when talking about young people’s mental health issues”.<sup>10</sup> Griffiths’ model of addiction labels six components that are present in any type of addiction, a few of which are highly important for mental health: mood modification and conflict.<sup>11</sup> Internet addiction affects numerous aspects of everyday life, as it interferes with: emotional and psychological balance, mood, time management, work and school performance, the ability to concentrate, going as far as influencing sleep patterns and the usual alimentation schedule.<sup>12,13</sup>

In terms of neurobiological evidence, some of the more significant adverse health consequences of excessive use of social networking are represented by structural and functional changes in brain regions involved in emotional processing, attention, decision-making, and cognitive control.<sup>14–16</sup>

Mirror neurons, the purported neural basis of human empathic understanding of others’ emotions, which are activated when we witness other people’s emotions or actions, become desensitized in those who watch violent films or undergo constant exposure to violent imagery.<sup>17,18</sup> These mirror neurons cannot distinguish between reality and what the person observes. Therefore, constantly observing other people’s actions on social media leads to desensitization.<sup>19,20</sup> Consequently, constant social media users may show lower levels of empathy as opposed to those who have not constantly been exposed to different imagery and other people’s actions.<sup>21</sup> Seeing as empathy represents an important factor in the general medical practitioner’s life and influences patient satisfaction and the patient-doctor relationship, any alteration in the ability to empathize with others, should be worrisome.<sup>22</sup>

This study is part of a larger project, aiming to identify the connection between the use of social networking and individual Theory of Mind (ToM), alexithymia, and empathy levels of students of the Faculty of General Medicine of the “Victor Babes” University of Medicine and Pharmacy Timisoara, Romania, in order to raise awareness about this new type of addiction.

The aim of this validation study was to explore the psychometric properties of a newly developed Romanian language version of the Social Media Addiction Scale-Student Form (SMAS-SF). We hypothesized that the data from this study will confirm the proposed four-factor model of the original SMAS-SF and that individual items of the SMAS-SF show high correlations within their respective factor. SMAS-SF was created by Sahin<sup>23</sup> in 2018 to measure the social media addiction of university students. This particular social media addiction scale evaluates the number of hours spent in the virtual socializing platforms, how it affects mood, whether it determines conflicts within the family or with friends and relapse. All of the above could represent predictors of the medical career that stands before our students, seeing as all of these factors influence the way they relate and how they address others.

## Materials and Methods

### Organization of the Study

To proceed with the validation of the Romanian version of the SMAS-SF, written permission for use and validation was requested and received from the authors (Prof. Cengiz Sahin, Ankara Haci Bayram Veli University, Turkey, documents available upon reasonable request).

The questionnaire uses a 5-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree and strongly agree) and consists of 29 items and 4 sub-dimensions. Items 1 to 5 investigate the virtual tolerance sub-dimension; items 6 to 14 belong to the virtual communication sub-dimension, items 15 to 23 are related to the virtual problem sub-dimension, and items 24 to 29 refer to the virtual information sub-dimension. All items on the scale are positive. The highest score that can be obtained is 145, and the lowest is 29. Higher scores indicate that the subjects perceive themselves as “socially dependent”.

This study was approved by the Research Ethics Committee of the “Victor Babes” University of Medicine and Pharmacy Timisoara, Romania (No. 15/20.03.2020). All subjects included in this study provided informed consent before participation.

### Methods, Techniques, and Instruments

The Social Media Addiction Scale-Student Form (SMAS-SF) validation was performed in several steps.

As part of the first step of the validation process, we proceeded to a one-way translation of the questionnaire validated in English by Sahin,<sup>23</sup> into Romanian. This forward translation was performed by a bilingual psychiatrist, fluent in English. The back-translation into English was performed by two independent translators with knowledge of both health terminology and linguistic nuances. The original English version was then compared with the backward-translated versions and, taking into consideration certain ambiguities and word discrepancies between words, minor corrections have been made to the Romanian version. Pretesting the questionnaire was performed on ten volunteers working in a panel, and represented the second validation step. This step aimed to provide a clear and easy understanding of each question. The pretesting panel determined some minor improvements in the terminology and phrasing of some questions. The Romanian version of the Social Media Addiction Scale - Student Form (SMAS-SF) is presented in the [Supplementary Material](#).

As part of the third step, we performed an internal and external reliability analysis, which was conducted on 67 undergraduate medical students from the “Victor Babes” University of Medicine and Pharmacy Timisoara, Romania, who underwent testing and retesting 21 days after the first round.

### Research Population and Sample

As part of the third step, we performed an internal and external reliability analysis, which was conducted on 67 undergraduate medical students from the “Victor Babes” University of Medicine and Pharmacy Timisoara, Romania, who underwent testing and retesting 21 days after the first round. For the reliability analysis, a sample size of 67 was sufficient, taking into account that for a power of 80%, minimum acceptable reliability of 0.7, and expected reliability of 0.85, 53 patients would be necessary.<sup>24</sup>

Cronbach's alpha reliability coefficient was determined for the main parts of the questionnaire. The external consistency (or test-retest) was assessed with the intraclass correlation coefficient.

Next, in step 4, the students of the 4th, 5th, and 6th year General Medicine Faculty of the “Victor Babes” University of Medicine and Pharmacy, Timisoara, Romania, were invited to participate in a survey. Potential participants were recruited through advertisements in the target population, and those who did not agree to participate were excluded.

The data were collected from March to May 2021. The first section of the questionnaire included the introduction of the survey and a consent form. Besides the 29 items of the SMAS-SF questionnaire, the survey also contained demographic questions, such as gender, year of study, and students' average grades. A Google Play application (android and iOS) or a desktop version on a web platform was developed to help students complete the survey. To ensure total anonymity, a series of alphanumeric codes have been generated so that each student receives a random cipher, which

allows him/her to access the test. In addition to this application, a desktop version on a web platform (<https://timsonet.ro>) was also made available.

## Data Processing

A computerized database was created using the Stata program version 16.1 (StataCorp, Texas, USA). The results are presented as absolute and relative frequencies. Continuous variables are presented as mean and standard deviation (SD) or medians and interquartile ranges (IQR). A P-value < 0.05 was considered statistically significant. The psychometric properties of the Romanian SMAS-SF were examined in terms of its validity, reliability, and goodness of fit. For Cronbach's alpha, a level > 0.7 was considered acceptable. The test-retest reliability was assessed using the intraclass correlation coefficient (ICC), with a value  $\geq 0.3$  considered acceptable. Factor analysis is a statistical method for reducing large numbers of items to fewer underlying dimensions. The confirmatory factor analysis (CFA) is used to confirm the underlying factor structure and was used as a model-driven approach to test how well our data fit the model that emerged in the Sahin's questionnaire.<sup>25</sup> First-order confirmatory factor analysis was conducted using all 29 questions of the SMAS-SF, with the orthogonal rotation (varimax). Items with suboptimal loading were excluded and a second-order confirmatory factor analysis was executed and then a structural equation model was built. Kaiser-Meyer-Olkin (KMO) coefficient (>0.7) and the Bartlett Sphericity test ( $p > 0.05$ ) were used to test the suitability of the data for conducting CFA. Structural equation modeling (SEM) was employed to analyze the structural relationship between measured variables and latent constructs. For SEM, the Tucker Lewis index (>0.9), Comparative Fit Index (>0.9), Root Mean Square Error of Approximation (<0.08), and Standardized Root Mean Square Residual (<0.08) were used to assess the model fit.

## Results

The demographic characteristics of the test sample are presented in Table 1. The mean age is 23.5 years with a standard deviation of 1.5 years. Women represent 79.7% of the group.

In the first-order analysis, all 29 items were included in the CFA. The determinant for the correlation matrix is 0.00008043, above the threshold of 0.00001, suggesting that multicollinearity is not an issue.<sup>26</sup> An orthogonal rotation (varimax) was applied. The sampling adequacy for the analysis was verified with the Kaiser-Meyer-Olkin measure KMO=0.91 and all KMO values for individual items were > 0.82, which were above the acceptable limit of 0.5. Bartlett's test of sphericity  $\chi^2 (406) = 6010.2$ ,  $p < 0.001$ , indicated that the correlations between items were sufficiently large for CFA.

**Table 1** Demographic Characteristics of the Sample (n=649 Students)

Demographic Variables		Number	%
Gender	M	132	20.3%
	F	517	79.7%
Age category	21–22 years	173	26.7%
	23–24 years	356	54.9%
	25+ years	120	18.5%
Year of medical school	4th	252	38.8%
	5th	171	26.3%
	6th	226	34.8%
Last year's grade	Bellow 9	341	52.5%
	9 or above	308	47.5%

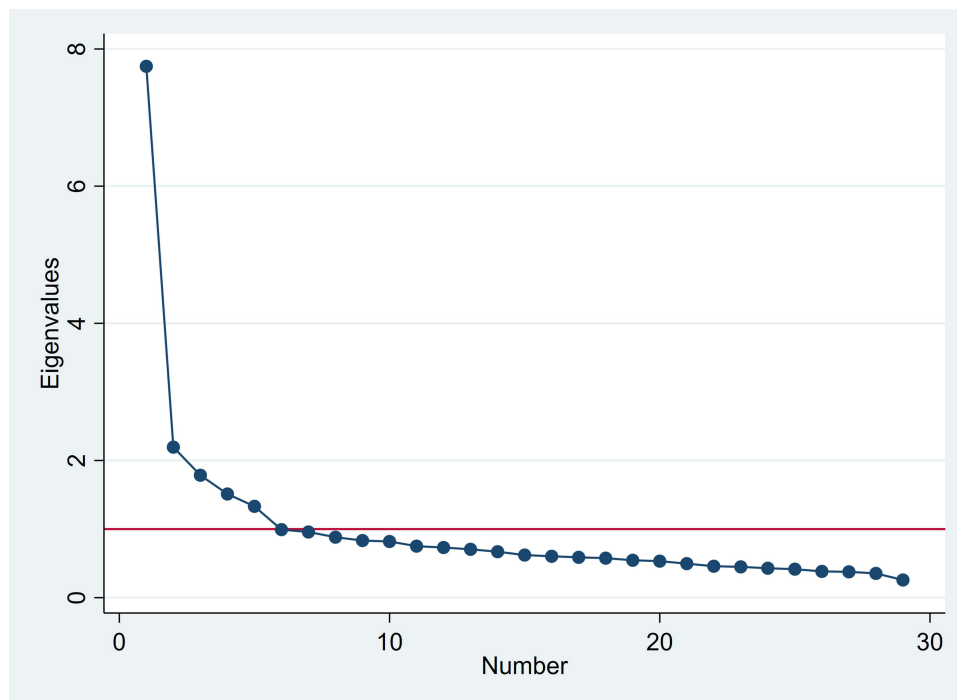
An initial analysis was run to obtain eigenvalues for each factor in the data. Five factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 50.2% of the variance. After the examination of the scree plot, because the inflection of the scree-plot at the fourth point allowed us to retain only four factors, explaining 45.7% of the variance (Figure 1). Table 2 shows factor loadings after varimax rotation.

The items that cluster on the same factors suggest that factor 1, which includes questions 1, 2, 3, and 5 represents virtual tolerance, factor 2, which includes questions 14, 15, 22, and 23 represents virtual problems. Factor 3 includes questions 25–28 and represents virtual information, while factor 4 includes questions 7, 8, 10, and 13 represents virtual communication.

The second order of four factors CFA was executed, after the exclusion of the variables that were not included in the four factors during the first analysis. The determinant for the correlation matrix was 0.01, suggesting that multicollinearity is not an issue. Bartlett's test of sphericity  $\chi^2$  (129) = 2975.7,  $p < 0.001$ , indicated that the correlations between items were sufficiently large for CFA. The latent variables are grouped into the same components as previously described, with 57.9% of the variance being explained by the model. Table 3 shows second-order factor loadings after varimax rotation.

Figure 2 presents the SEM for the four factors that include 16 items. R square for the equation level for the goodness of fit is 0.99. This model also showed acceptable levels of fit [chi-squared test 342.0 with degrees of freedom of 98 ( $p < 0.001$ )], and had satisfactory levels for Comparative fit index (0.916) and Tucker–Lewis index (0.897), Root Mean Square Error of Approximation (0.062, with 95% CI between 0.055–0.069), and Standardized Root Mean Square Residual (0.053). Covariances between latent factors are positive and significant.

Internal and external reliability was calculated using Cronbach's Alpha and intraclass correlation coefficient, respectively, for the original 29 items questionnaire and for the 16 items questionnaire retained for the Romanian version of SMAS-SF. Overall, all measures had indices over the 0.8 thresholds, denoting good reliability. Except for section 4, the indices for sections scores were all above the 0.7 thresholds. Table 4 contains the internal and external reliability coefficients for 29 items questionnaire, respective for the 16 items questionnaire, validated in Romanian.



**Figure 1** Scree plot of eigenvalues (95% confidence interval) after CFA.

**Table 2** Factor Loading for the Four Factors After Varimax Rotation

Variable	Factor 1	Factor 2	Factor 3	Factor 4
1. I am eager to go on social media.	<b>0.3563</b>	-0.0115	0.0667	-0.0936
2. I look for internet connectivity everywhere so as to go on social media.	<b>0.3899</b>	-0.0117	-0.0038	-0.1258
3. Going on social media is the first thing I do when I wake up in the morning.	<b>0.3138</b>	-0.0347	0.074	-0.1574
4. I see social media networks as an escape from the real world.	0.178	0.0963	-0.0332	0.0453
5. A life without social media becomes meaningless for me.	<b>0.3507</b>	-0.0498	-0.1057	0.0959
6. I prefer to use social media even there are somebody around me.	0.2991	-0.0914	0.0031	0.0837
7. I prefer the friendships on social media to the friendships in the real life.	0.0267	0.0082	-0.0679	<b>0.4671</b>
8. I express myself better to the people with whom I get in contact on social media.	-0.0237	0.0316	0.0843	<b>0.4282</b>
9. I am as I want to seem on social media.	0.0193	-0.0232	0.1508	0.0951
10. I usually prefer to communicate with people via social media.	0.063	-0.0725	0.0672	<b>0.4368</b>
11. Even my family frown upon, I cannot give up using social media.	0.2755	0.0962	-0.0357	0.0106
12. I want to spend time on social media when I am alone.	0.1997	0.0052	0.181	0.0423
13. I prefer virtual communication on social media to going out.	-0.0392	0.0451	-0.0073	<b>0.489</b>
14. Social media activities lay hold on my everyday life.	0.0852	<b>0.3336</b>	-0.0301	0.0318
15. I pass over my homework because I spend much time on social media.	0.0294	<b>0.4182</b>	0.0539	-0.1146
16. I feel bad if I am obliged to decrease the time I spend on social media.	0.1912	0.2086	-0.0893	0.0524
17. I feel unhappy when I am not on social media.	0.2247	0.1463	-0.0986	0.0816
18. Being on social media excites me.	0.2458	-0.0061	0.1406	-0.0204
19. I use social media so frequently that I fall afoul of my family.	0.0991	0.2717	-0.073	0.0672
20. The mysterious world of social media networks always captivates me.	0.1416	0.118	0.0815	0.0869
21. I do not even notice that I am hungry and thirsty when I am on social media.	-0.0624	0.2585	0.0207	0.1783
22. I notice that my productivity has diminished due to social media.	-0.1187	<b>0.4898</b>	0.093	-0.107
23. I have physical problems because of social media use.	-0.0846	<b>0.4442</b>	0.0012	-0.0368
24. I use social media even when walking on the road in order to be instantly informed about developments.	0.015	0.0383	0.2942	0.0014
25. I like using social media to keep informed about what happens.	-0.0136	-0.0441	<b>0.4766</b>	-0.0004
26. I surf on social media to keep informed about what social media groups share.	-0.0741	-0.0169	<b>0.4799</b>	0.0573
27. I spend more time on social media to see some special announcements (eg birthdays).	0.0365	-0.0391	<b>0.3593</b>	-0.0769
28. Keeping informed about the things related to my courses (eg homework, activities) makes me always stay on social media.	-0.1046	0.1005	<b>0.3323</b>	0.0019
29. I am always active on social media to be instantly informed about what my kith and kin share.	0.1635	-0.0443	0.2427	0.0127

**Notes:** Numbers in bold represent the items which aggregate in each factor. Adapted with permission from Sahin C. Social media addiction scale - student form: the Reliability and Validity Study. Turkish Online J Educ Technol. 2018;17(1):169-182. Copyright © The Turkish Online Journal of Educational Technology.<sup>23</sup>



**Table 3** Second Order Factor Loading for the Four Factors After Varimax Rotation

Variable	Factor 1	Factor 2	Factor 3	Factor 4
1. I am eager to go on social media.	<b>0.4832</b>	0.0354	0.002	0.0453
2. I look for internet connectivity everywhere so as to go on social media.	<b>0.5361</b>	0.0175	0.0307	0.0311
3. Going on social media is the first thing I do when I wake up in the morning.	<b>0.4921</b>	0.0183	0.0916	0.0563
5. A life without social media becomes meaningless for me.	<b>0.4106</b>	0.081	0.1734	0.0729
7. I prefer the friendships on social media to the friendships in the real life.	0.0177	0.043	<b>0.4916</b>	0.0672
8. I express myself better to the people with whom I get in contact on social media.	0.0333	0.0449	<b>0.46</b>	0.0744
10. I usually prefer to communicate with people via social media.	0.0575	0.0555	<b>0.4661</b>	0.0647
13. I prefer virtual communication on social media to going out.	0.0762	0.0296	<b>0.5144</b>	0.0102
14. Social media activities lay hold on my everyday life.	0.1462	<b>0.3792</b>	0.1243	0.0639
15. I pass over my homework because I spend much time on social media.	0.1106	<b>0.498</b>	0.0212	0.0066
22. I notice that my productivity has diminished due to social media.	0.0631	<b>0.5756</b>	0.0409	0.0331
23. I have physical problems because of social media use.	0.0748	<b>0.4929</b>	0.0145	0.0417
25. I like using social media to keep informed about what happens.	0.0483	0.0192	0.0017	<b>0.5325</b>
26. I surf on social media to keep informed about what social media groups share.	0.0376	0.0021	0.0524	<b>0.5712</b>
27. I spend more time on social media to see some special announcements (eg birthdays).	0.0676	0.0484	0.0703	<b>0.4535</b>
28. Keeping informed about the things related to my courses (eg homework, activities) makes me always stay on social media.	0.0798	0.1221	0.0049	<b>0.3895</b>

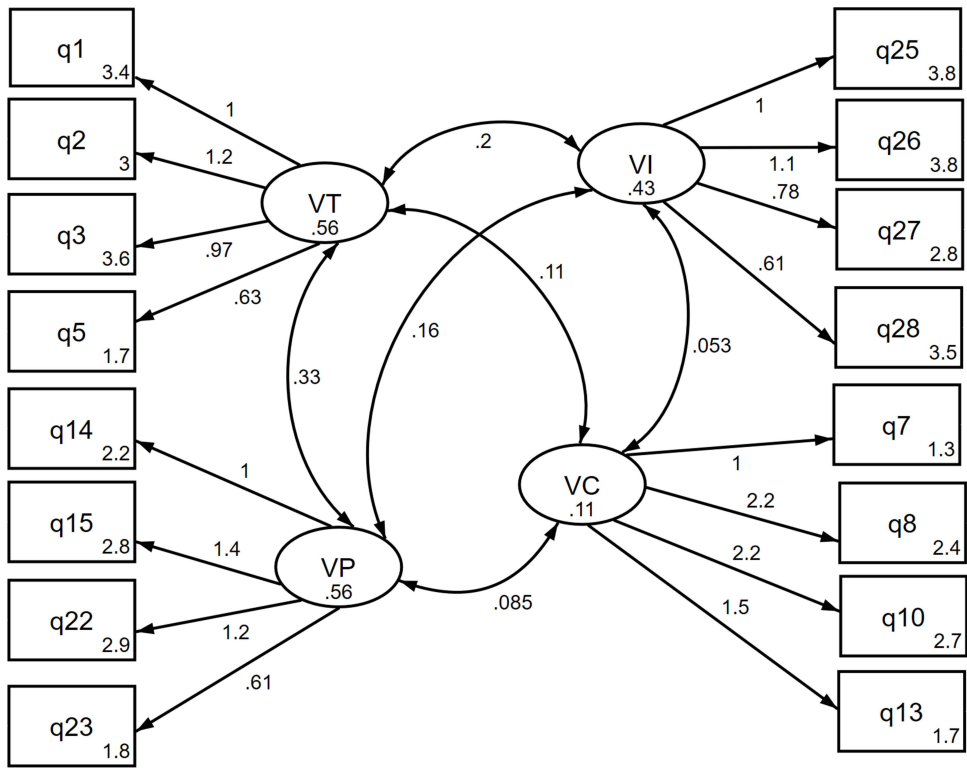
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## Discussion

What does Social Media addiction mean in the current context? How can it influence us? Are we only talking about its negative aspects, or does it also have some benefits? These were some of the questions that we aimed to answer by the validation of the scale on a population represented by Medicine students. Currently, to the best of our knowledge, there is no validated tool to collect media addiction data for medical students, in Romania. The present study aimed to validate and adapt the Social Media Addiction Scale - Student Form, initially developed by Sahin,<sup>23</sup> into the Romanian language. This study confirmed the hypothesis that the proposed four-factor model of the original SMAS-SF and that individual items of the SMAS-SF show high correlations within their respective factor. Nevertheless, the results of CFA emphasized some potentially problematic items in terms of factor allocation.

Social media platforms have become extremely popular, especially in this pandemic era, where people interact, make friends, communicate, express themselves, find emotional support for their problems or search for news.<sup>27</sup> Beyond its positive aspects, social media also comes with several risks, which affect the state of health.

Our study introduces SMAS-SF to measure the media addiction levels in the Romanian population by examining its psychometric properties. The data were used to assess the internal and external validity of the questionnaire, as well as its construct and convergent validity. The results of the internal validity (Cronbach's alpha = 0.817) and of external validity (ICC = 0.829) were adequate, and above the threshold of 0.7 for both, Cronbach's alpha<sup>28</sup> and ICC,<sup>29</sup> indicating good reliability. Sections scores performed similarly well, except for section 4 - virtual information, with indices exhibiting moderate reliability in both internal and external validity.



**Figure 2** The confirmatory factor analysis of the Romanian version of SMAS-SF with a 4-factor structure.  
**Notes:** Numbers on the double-headed arrows represent the covariance between components, numbers on the single-headed arrows represent the standardized factor loadings. The factors are: VT = virtual tolerance, VP = virtual problems, VI = virtual information, and VC = virtual communication.

The factors of the confirmatory factor analysis overlap the sections of the questionnaire, as they were developed by Sahin,<sup>23</sup> but some of the questions were not included in the 4 factors retained after the analysis. These questions were part of the fifth factor, which was not retained by the factor analysis. The structural equation model, which was constructed with the four factors retained assessed the model fit using the published threshold for the Tucker Lewis index, Comparative Fit Index, Root Mean Square Error of Approximation, and Standardized Root Mean Square Residual, which were all in the adequate ranges.<sup>30</sup> Also, question 14 was included in the virtual problem section in the Romanian version, while in the original questionnaire it was included in the virtual communication section. Cultural differences in self-reported social media usage patterns and contextual factors may be responsible for differences among different

**Table 4** Coefficients for Internal and External Reliability Analysis (n=67)

SMAS-SF Questionnaire	Internal Reliability				External Reliability (Test-Retest)	
	Original SMAS-SF		Romanian Version SMAS-SF		Original SMAS-SF	Romanian Version SMAS-SF
	No. of Items	Cronbach's Alpha	No. of Items	Cronbach's Alpha	Intraclass Correlation Coefficient	Intraclass Correlation Coefficient
Overall	29	0.890	16	0.817	0.831	0.829
Section 1	5	0.839	4	0.760	0.774	0.759
Section 2	9	0.730	4	0.705	0.755	0.729
Section 3	9	0.803	4	0.789	0.736	0.745
Section 4	6	0.568	4	0.668	0.569	0.561



languages.<sup>31</sup> In this case, medical students may perceive that “social media activities that lay hold on everyday life” is a factor included in the virtual problem area, rather than having to do with virtual communication.

Factor 1 represents virtual tolerance. Tolerance is one of the factors of addiction, showing an ever-increasing use over time, in order to get the same degree of satisfaction.<sup>32</sup> Using a population sample, Kocak et al<sup>33</sup> observed a direct relationship between educational level and tolerance for media addiction.

Virtual problems are representative of factor 2. The spectrum of problems is large, from everyday life problems to reduced engagement in school activity and productivity to physical problems. In a large cross-sectional study, media addiction was associated with medium effect size with conduct problems, hyperactivity, and sedentary behavior.<sup>34</sup> In a six European countries study<sup>35</sup> which included Romania, it was found that especially for younger age the problems generated by heavy use of social media ranged from low academic performance and low activities scores.

Items in factor 3 aggregate for virtual information. Information overload was identified by Young<sup>36</sup> as one of the 5 types of internet addiction. Information-seeking behavior, especially related to peer activity on social media, was linked to the activation of the appetitive system, which further may stimulate the neurological pathways leading to addiction experience.<sup>34</sup>

Factor 4 represents virtual communication. According to social skills theory, low self-presentation skills and a preference for remote communication systems led to excessive use of social media.<sup>37,38</sup>

Latent variables exhibit statistically significant positive correlations with each other with the highest covariance being found between virtual tolerance and virtual problems. Tolerance is represented by the need for more time to be spent on social media, similar to increasing the concentration or the dosage of the substance of abuse.

Social interaction is deeply imprinted in our behavior. People have always depended on each other for emotional support, professional fulfillment, education, fulfillment of goals. In the age of technology, this is possible with only one click. Social networks allow us to interact with each other to find out information, make friends, feel what it means to belong to a group or a cause, or help us take a break during a busy schedule or while waiting for the train.

The concept of internet addiction is defined from several perspectives and includes several aspects: withdrawal symptoms, tolerance, loss of control, excessive use of the internet despite negative psychosocial problems, loss of interest in other recreational activities, endangerment or loss of a significant relationship or opportunity. Unfortunately, when online activities interfere with our optimal daily functioning at work or at home, when we find ourselves wasting hours every day trying to post an image, edit it, set a status, comment on various posts, trying to gather “likes” and “followers”, it can become a problem. It basically leads to a disconnection from the real world, an isolation in solitude.

We use social media to meet our cognitive needs (gathering information, supervision, and understanding), emotional needs (aesthetics and emotional experiences), personal integration needs (increasing self-confidence and credibility), social integration needs (relationships with friends and family). The positive part of these technologies is that they allow us to be in constant contact with our loved ones, to broaden our horizons of knowledge, to be closer to friends, and to form relationships anywhere on the planet. We can also express our ideas and opinions about a topic anytime, anywhere.

One of the potential limitations of the current study is the representativeness of the sample since a convenience sample from a single university center was used. Though SMAS-SF was explicitly designed to assess the media addiction levels of medical university students, the results’ generalizability to other universities in Romania could be biased. Response bias might be an issue since a self-completed questionnaire was employed. Another limitation was that we did not evaluate the convergent validity of the instrument and further studies are needed to assess this.

## Conclusion

Our study reported that the SMAS-SF is a valuable and reliable instrument for an accurate evaluation of social media addiction levels of Romanian medical students. The results from this validation study are not dissimilar to the original SMAS-SF instrument, by supporting a four-factor component questionnaire, with the following items: virtual tolerance, virtual problems, virtual information, and virtual communication. Given the fact that social media addiction represents a rising problem, it is important to have in Romania a scale that evaluates this particular addiction. The validation of this scale opens the horizon for other research directions to bring more data about online addiction. We aim to understand

how addiction correlates with empathy, alexithymia, and the Theory of Mind from a longitudinal perspective, in an academic environment. To serve this purpose, we sought to develop a survey, to evaluate students, longitudinally, namely, in their first year of medical school and four years later, in their fifth year of Medicine, so that we could subsequently propose a plan of psychotherapy interventions.

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## Disclosure

The authors report no conflicts of interest in this work.

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