

RESEARCH ARTICLE

The Relationship Between Smartphone Addiction and Phubbing Behavior and Communication Skills of Medical Students

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Abstract:

Introduction: Individuals addicted to smartphones have been shown to phub people due to fear of missing out, social comparison orientation, and loneliness. The impact of phubbing can lead to a stuttering in direct communication due to the habit of indirect communication, namely, using smartphones and the internet. **Research objectives:** To assess the relationship between smartphone addiction and phubbing behavior and its relationship with the communication skills of students at the Faculty of Medicine, University of Muhammadiyah North Sumatra. **Method:** Correlational analysis with a cross-sectional approach; a sample of 76 students; a systematic sampling technique was applied, namely by including all subjects who were present and met the criteria, namely respondents must have an odd NPM, until the required number of samples was met. A Spearman correlation analysis was performed to evaluate the strength and direction of the association among smartphone addiction, phubbing behavior, and communication skills. The independent variable studied was smartphone addiction, while the dependent variables were phubbing behavior and communication skills. This study used the Smart Phone Addiction Scale–Short Version (SAS-SV), the General Scale of Phubbing (GSP), and the Communication Skills Attitude Scale (CSAS) as measurement instruments. **Result:** The bivariate analysis revealed a significant positive correlation between smartphone addiction and phubbing behavior ($p=0.001$; $r=0.529$). Crucially, a significant negative correlation was found between phubbing behavior and the CSAS outcome ($p=0.001$; $r=-0.587$), indicating that greater phubbing is strongly associated with poorer attitudes toward communication skills. **Conclusion:** There is an association between smartphone addiction and phubbing behavior with the communication skills of medical students.

Keywords: Communication skills, Medical students, Phubbing , Smartphone addiction, Digital Behavior

INTRODUCTION

Smartphone addiction is a condition where an individual finds it difficult to stop using a smartphone.(1) With the increasing popularity of smartphones, a new maladaptive behavior known as phubbing has emerged. This phenomenon is a form of modern social neglect, occurring when someone prefers to focus on their smartphone rather than engage in conversation with the person they are talking to.(2) Communication skills encompass the effective delivery of information, both verbally (e.g., speech regulation and listening techniques) and nonverbally (e.g., gestures, facial expressions, eye contact, and body language). In the medical world, these skills are crucial for healthcare professionals in helping patients understand and process medical information through an empathetic approach, shared decision-making, and active patient engagement throughout treatment.(3) Smartphones are one of the most popular technologies in Indonesia, widely used for internet access. Approximately 70% of Indonesian internet users are youth aged 13-18.(4) Indonesians are in first place in the world for those addicted to scrolling through their mobile phones. The data shows that Indonesia is the largest user, spending more than 5 hours per day on gadgets (cell phones and tablets). In 2022, the average duration of cellular network use by Indonesians reached 5.7 hours per day, a significant increase compared to 5.4 hours per day in 2021(5)

Phubbing can diminish the quality of social relationships by fostering a sense of disrespect toward others. This behavior is often interpreted as a rejection of interpersonal communication or a disregard for the surrounding environment.(6) Smartphone addiction significantly impacts phubbing behavior. Phubbing behavior prioritizes smartphone use over face-to-face communication, ultimately leading to neglect of the people around the perpetrator. High levels of smartphone addiction can reduce an individual's awareness of their surroundings. As a result, this group is more likely to engage in phubbing than those without smartphone addiction.(7)

Phubbing can improve the quality of social relationships and weaken communication skills. Professionals, who rely on interpersonal communication, are particularly affected by the negative effects of phubbing, especially when it erodes the quality of interactions. However, in healthcare, for example, verbal and nonverbal communication are crucial foundations of human interaction.(8) Previous research has shown that students with high phubbing behavior scores have low communication skills scores. Phubbing behavior status ranks among the most significant factors influencing nursing students' communication skills.(9) Previous research has shown that the increase in phubbing has a significant impact on

understanding the quality of communication as well as satisfaction with relationships.(10)

Professionalism and communication skills are key pillars in providing effective medical care, as they significantly impact patient recovery and physician well-being. Given their positive impact on patient satisfaction, adherence to therapy, reduced risk of medical errors, and job satisfaction, these competencies must be integrated across all aspects of medical education and practice.(11) Effective communication skills are a powerful therapeutic tool for healthcare professionals to put their knowledge into practice. Through various communication skills, such as self-introduction, building rapport with patients, and actively listening and asking questions, physicians can convey the message that they accept individuals, whether healthy or ill, value their individuality, and are interested in them. This relationship, built with patients, increases their self-confidence. Therefore, physicians must use their communication skills to collect data from their patients and provide appropriate, high-quality care. If medical students lack communication skills, this can hinder their future communication with patients, posing a significant barrier to developing a treatment plan.(9)

The purpose of this study was to assess the association between smartphone addiction and phubbing behavior, as well as the relationship between phubbing behavior and

the communication skills of medical school students. To identify the proportion of smartphone addiction, phubbing behavior, and communication skills of medical school students.

METHOD

This research was conducted in strict accordance with ethical research principles. Ethical clearance was officially approved and issued by the Health Research Ethics Committee of the Faculty of Medicine, Muhammadiyah University of North Sumatra in 2024. With letter number: 1180/KEPK/FKUMSU/2024. Following ethical approval, data collection was conducted over one month from May to June 2024. Prior to completing the survey, all participants were provided with an informed consent form detailing the study's purpose, the voluntary nature of their participation, and guarantees of data anonymity and confidentiality.

The method applied in this study is a correlative analysis with a cross-sectional approach, involving 76 students from the Faculty of Medicine, Muhammadiyah University of North Sumatra, from the 2020 to 2023 intakes. The research location was at the Faculty of Medicine, Muhammadiyah University of North Sumatra, located at Jalan Gedung Arca No. 53, Teladan Barat, Medan Kota District, North Sumatra. The study population comprised 76 students from the Faculty of Medicine at

Muhammadiyah University of North Sumatra.

This research used a systematic sampling technique. The target population for this study comprised medical students across four academic cohorts (2020, 2021, 2022, and 2023) at the Faculty of Medicine, Muhammadiyah University of North Sumatra. A systematic selection sampling technique was employed to select the participants, specifically recruiting students with odd-numbered identification numbers (NPM). This process yielded a final sample of 76 students who met the inclusion criteria and completed the questionnaires. The scientific rationale for using odd-numbered NPMs rests on their function as natural randomizers. Because NPMs are assigned sequentially by the university administration based on mechanical criteria (such as registration order or alphabetical list), the odd/even split is entirely independent of the behavioral and communication traits being investigated. This eliminates selection bias. Despite the relatively small sample size ($N=76$), this systematic approach rigorously safeguards the representativeness of the sample across all four cohorts. By applying a consistent selection filter (odd NPMs only) across all academic years, the study ensures the sample is not clustered within a single cohort. Consequently, the 76 participants serve as a balanced, structurally proportional miniature of the medical student population at the institution.

Data collection was conducted using a predetermined questionnaire as a measurement tool, administered to 76 respondents. This study used three instruments: The Smartphone Addiction Scale–Short Version (SAS-SV) to measure smartphone addiction, the General Scale of Phubbing (GSP) to measure the extent of phubbing behavior, and the Communication Skills Attitude Scale (CSAS).

Concurrent Validity Test of the Indonesian Adaptation of the SAS-SV. The concurrent validity of the Indonesian version of the SAS-SV instrument was evaluated using Pearson's correlation with the NMP-Q questionnaire, a comparison instrument for measuring smartphone addiction levels. The NMP-Q instrument has been validated in the Indonesian version, with a very high level of reliability (Cronbach's $\alpha = 0.931$). Reliability Test of the Indonesian Version of the SAS-SV. The Indonesian version of the SAS-SV instrument demonstrated adequate internal consistency with a Cronbach's α coefficient of 0.740. Based on statistical criteria, this value is within the acceptable category.(12)

The results of the Rasch Model analysis indicate that the Indonesian version of the Generic Scale of Phubbing (GSP) instrument has good empirical quality. The item reliability was very strong at 1.00, while the respondent reliability (person

reliability) was in the sufficient range at 0.77. The overall interaction between respondents and statement items, as indicated by the Cronbach's Alpha (KR-20) value, was 0.76; this instrument can be considered reliable for measuring phubbing behavior. In terms of validity, this instrument meets the unidimensionality criteria, with a raw variance of 59.2%, indicating that it consistently measures only one variable: phubbing behavior. Rating scale analysis also yielded valid results, with the Andrich Threshold value moving monotonically from negative to positive logit (-1.87 to 2.34), indicating that respondents clearly understood and distinguished among the answer options.(13)

On the Communication Skills Attitude Scale (CSAS) questionnaire, the internal consistency reliability and reproducibility of the total CSAS score were 0.84 (Cronbach's alpha) and 0.81, respectively, indicating acceptable questionnaire reliability. The item-level content validity index (I-CVI) and the scale-level content validity index (S-CVI/Ave) yielded similar results: 0.97 and 0.94, respectively.(14)

Smartphone Addiction (X1): In this study, smartphone addiction is operationally defined as the compulsive and sustained use of smartphones among medical students at Universitas Muhammadiyah Sumatera Utara, persisting despite its potential

negative consequences. This variable was measured using the Smartphone Addiction Scale–Short Version (SAS-SV), a validated self-report questionnaire comprising 10 items. Each item is scored using a Likert scale, yielding a cumulative continuous score. For descriptive profiling, the total scores were further converted to an ordinal scale with three distinct severity categories: low smartphone addiction (scores 19-22), moderate smartphone addiction (scores 23-28), and high smartphone addiction (scores 29-32).(15)

Phubbing Behavior (Y1): Phubbing is operationally defined as the behavior of individuals who ignore others in their immediate physical environment because they are highly focused on their smartphones rather than initiating or engaging in conversation. This variable was assessed using the General Scale of Phubbing (GSP). Individual item responses follow a Likert-type format, yielding a cumulative score. For descriptive analysis, the cumulative scores were classified into four ordinal categories: no phubbing behavior (scores 0–15), low phubbing (scores 16–45), moderate phubbing (scores 46–75), and high phubbing behavior (scores 76–105).(16)

Attitude toward Communication Skills (Y2): This variable refers to the individual's perceptions and orientation toward learning and delivering clear, understandable messages during interpersonal interactions.

In accordance with the instrument design, this study specifically measured the affective and attitudinal dimensions toward communication skills using the Communication Skills Attitude Scale (CSAS). The cumulative scores were categorized into a binary ordinal rank based on established literature thresholds: a less favorable attitude toward communication skills (scores 16-68) and a favorable attitude toward communication skills (scores 69-120).(14)

The obtained data were analyzed using SPSS (Statistical Package for the Social Sciences). First, univariate analysis was performed to determine the frequency distribution and characteristics of the sample and research variables. Bivariate analysis was then performed. This study used ordinal data, so the nonparametric Spearman test was used.

RESULTS

Univariate Analysis

Table 1. General Characteristics of Subjects Based on College Year

Year	Frequency (n)	Percentage (%)
2020	23	30.3
2021	17	22.4
2022	22	28.9
2023	14	18.4
Total	76	100%

Based on college year, there were 23 (30.3%) respondents from the class of 2020, 17 (22.4%) from the class of 2021, 22

(28.9%) from the class of 2022, and 14 (18.4%) from the class of 2023.

Table 2. Smartphone Addiction Levels of Students at the Faculty of Medicine, Muhammadiyah University of North Sumatra

Addiction Level	Frequency (n)	Percentage (%)
Normal	2	2.6
Low	9	11.8
Moderate	33	43.4
High	32	42.1
Total	76	100%

Based on the research of the SAS-SV questionnaire, it was found that the majority of respondents, namely 33 students of the Faculty of Medicine, Muhammadiyah University of North Sumatra (43.4%), tended to have a moderate SAS-SV score. This indicates that the majority of respondents experienced a moderate level of smartphone addiction. Meanwhile, 32 students (42.1%) had a high level of smartphone addiction, 9 students (11.8%) had a low level of smartphone addiction, and only 2 respondents (2.6%) did not experience smartphone addiction.

Table 3. The Level of Phubbing Behavior of Students at the Faculty of Medicine, Muhammadiyah University of North Sumatra

Phubbing Level	Frequency (n)	Percentage (%)
Not Phubbing	1	1.3
Low	34	44.7
Moderate	30	39.5
High	11	14.5
Total	76	100%

It can be seen that the majority of respondents, namely 34 students from the Faculty of Medicine, Muhammadiyah University of North Sumatra (44.7%), had low GSP scores. This indicates that most students had low levels of phubbing behavior. Meanwhile, 30 students (39.5%) had moderate levels of phubbing, 11 (14.5%) had high levels, and only 1 (1.3%) did not phub.

Table 4. Communication Skills of Students at the Faculty of Medicine, Muhammadiyah University of North Sumatra

Communication Skill	Frequency (n)	Percentage (%)
A less favorable attitude toward communication skills	12	15.8
a favorable attitude toward communication skills	64	84.2
Total	76	100%

It is known that the majority of respondents, namely 64 students from the Faculty of Medicine, Muhammadiyah University of North Sumatra (84.2%), tend to have good communication skills. Meanwhile, 12 students (15.8%) have less favorable attitudes toward communication skills.

Bivariate Analysis

The results of the study on the influence of smartphone addiction on phubbing behavior and phubbing behavior on communication skills can be found in the following Spearman statistical test table:

Table 5. Spearman Test Result

Phubbing Behavior		
Smartphone Addiction	r	0.529

	p	0.000
	n	76
Total	76	100%
Communication Skill		
Phubbing Behavior	r	-0.587
	p	0.000
	n	76
Total	76	100%

Based on the results of the Spearman correlation test above, a p-value of 0.000 ($p < 0.05$) was obtained, indicating a significant association among smartphone addiction, phubbing behavior, and attitudes toward communication skills. The statistical test yielded a correlation coefficient of 0.529, indicating a moderate positive association between smartphone addiction and phubbing. This positive coefficient suggests a unidirectional relationship; as smartphone addiction increases, phubbing behavior also significantly increases. Meanwhile, the correlation test between phubbing behavior and communication skills yielded a correlation coefficient of -0.587, indicating a moderate negative correlation. It is critical to note that this correlation specifically reflects the Communication Skills Attitude Scale (CSAS) outcome, which evaluates students' attitudes toward communication learning rather than their objective, real-world communication performance. The negative coefficient of -0.587 indicates that greater phubbing is strongly associated with a lower CSAS outcome, suggesting poorer attitudes

toward the development of clinical communication skills.

DISCUSSION

Univariate Analysis

From the data presented in Table 1, the class of 2020 contributed the largest number of respondents. Meanwhile, Table 2 shows that the majority of UMSU Faculty of Medicine students experience moderate levels of smartphone addiction, namely 33 students (43.4%). This finding of high levels of moderate addiction aligns with previous research showing that medical students often face stress due to high academic loads and social pressures, which can lead to excessive smartphone use.(17) The study explains that medical students, especially those entering the 2020–2021 class, rely heavily on the internet to complete their coursework. However, the constant urge to check communication apps like WhatsApp for lab group coordination and social media ultimately traps them in a repetitive, difficult-to-break cycle of smartphone use.(18)

Based on the data in Table 3, the majority of respondents, namely 34 students (44.7%), showed a low level of phubbing behavior. This finding is very interesting because although the majority of UMSU Medical Faculty students have a moderate level of smartphone addiction, this does not necessarily manifest as high levels of ignoring the surrounding environment

(phubbing) in real life. This condition aligns with previous research on phubbing among medical students, which found that academic needs and educational communication often drive their smartphone use.(19) The low rate of phubbing among UMSU Medical Faculty students is closely related to the high demands for collaborative learning and the internalization of ethical communication values taught in medical education. As a result, when students engage in real-life social interactions, they have better self-control to refrain from inappropriate device use, thus maintaining good interpersonal relationships with lecturers, colleagues, and the surrounding environment.

Based on Table 4, the majority of students at the Faculty of Medicine, Muhammadiyah University of North Sumatra, had good communication skills, namely 64 students (84.2%). Meanwhile, a small number of students, namely 12 people (15.8%), showed a less positive attitude towards communication skills. The high percentage of students with good communication skills indicates the success of the internationalization process of the medical education curriculum at the Faculty of Medicine, UMSU. In the medical education system, communication skills are not only taught theoretically, but are also trained intensively through skills lab activities and tested in a standardized manner through OSCE (Objective Structured Clinical Examination). This simulation-based

learning method with standard patients requires students to master effective communication, empathy, and professionalism directly. This aligns with previous research, which emphasizes that communication skills are a crucial basic medical competency and must be facilitated and trained early in medical education because they have a significant impact on future patient care outcomes.(20) Mature and well-trained communication skills, as demonstrated through OSCE, also explain why students' phubbing behavior tends to be low (Table 3). The professional awareness they develop enables them to refrain from ignoring the person they are talking to for the sake of their smartphone.

Bivariate Analysis

Based on the Spearman correlation test, a p-value of 0.000 ($p < 0.05$) was obtained, indicating a significant relationship between smartphone addiction and phubbing behavior among students of the Faculty of Medicine at the University of Muhammadiyah North Sumatra. The results of the statistical test showed a positive correlation coefficient (r) of 0.529. This figure indicates a moderate (sufficient) unidirectional relationship. This means that the higher the level of smartphone addiction experienced by students, the higher their tendency to engage in phubbing behavior (ignoring people around them for their smartphones). This study shows a moderate correlation and unidirectional relationship

between smartphone addiction and phubbing behavior ($r = 0.529$). This aligns with previous research that found smartphone addiction to be a 47% predictor of phubbing behavior.(21) Psychologically and behaviorally, this positive correlation demonstrates that phubbing is a tangible impact or direct manifestation of smartphone addiction. Students with moderate to severe levels of smartphone addiction struggle to control their attention in the real world. This is due to the constant urge to check notifications, social media, and other digital messages, which can lead them to sacrifice face-to-face social interactions unconsciously.(22)

This study shows a fairly moderate correlation between phubbing behavior and communication skills ($r = -0.587$). This finding supports previous research that found phubbing behavior serves as an indicator of communication disorders and obsessions.(23) In other studies, it is suspected that phubbing behavior has a strong and negative influence on communication skills and is one of the determining factors of communication skills.(24) Several factors that can affect their relationship include the perceived presence of smartphones as a disruptive factor in direct communication in the surrounding environment. The tendency to become obsessed with smartphones stems from a strong urge to use the device, even while engaging in direct communication in

the environment.(25) Phubbing weakens empathic interest, closeness, and interpersonal trust, and leads to a vicious cycle as the amount of time spent phubbing increases, the person's empathy decreases, and the quality of the relationship deteriorates.(26)

LIMITATION

This study did not explore potential variations in smartphone addiction, phubbing, and communication attitudes across demographic characteristics, such as gender, year of study, and academic burden. Given that the existing literature suggests these demographic factors can significantly influence students' behavioral patterns and social adaptation, the lack of comparative analysis represents a methodological limitation for generalizability. Furthermore, a significant methodological limitation of this study is the potential for self-report bias, as all the instruments used—namely, the Smartphone Addiction Scale-Short Version (SAS-SV), the General Phubbing Scale (GSP), and the Communication Skills Attitude Scale (CSAS)—relied entirely on self-report questionnaires. This data collection approach is highly susceptible to social desirability bias, response bias, and cases of over- or under-reporting by participants.

CONCLUSION

From the research analysis conducted, the majority of smartphone addiction levels

among students of the Faculty of Medicine, Muhammadiyah University of North Sumatra tend to have moderate levels of smartphone addiction. This study shows that the majority of students in the Faculty of Medicine at Muhammadiyah University of North Sumatra exhibit low levels of phubbing behavior. This study shows that the majority of students in the Faculty of Medicine at Muhammadiyah University of North Sumatra have good communication skills. There is a significant association between the variable of smartphone addiction and phubbing behavior, as well as phubbing and communication skills. The results of the study show that the higher the addiction to smartphones, the greater the tendency to engage in phubbing behavior. This study demonstrated a significant association: the higher the phubbing behavior, the lower the communication skills score, indicating less favorable attitudes toward communication skills.

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