



Research Article

Development and Validation of Nomophobic Behavioral Identification Scale (NBIS)

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Abstract

The introduction of smartphones has enhanced communication, creating a phenomenon known as nomophobia, which is characterised by the fear of being without mobile phone access. "Nomophobic Behavioural Identification Scale" was developed to investigate nomophobia and measure the anxieties among mobile phone users. This tool comprises 24 items and was tested on 110 randomly selected students. Validity was assessed using correlation methods, while reliability was established with a Cronbach's alpha of 0.834, indicating strong internal consistency. The scale measures nomophobia on a range from 20 to 115, where higher scores reflect greater levels of nomophobia.

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INTRODUCTION

The introduction of smartphones has transformed communication, providing unprecedented convenience and connectivity. However, this digital dependency has resulted in a syndrome known as nomophobia, or "no mobile phone phobia." Nomophobia is defined as the unreasonable fear or worry that people experience when they are unable to use their cell phones or smartphones or communicate through these technologies. This psychological state is becoming more common, indicating the profound reliance on mobile technology in modern culture. The investigator created and tailored the content based on the dimensions of the relevant variable, the study's objectives, and its delimitations, ensuring the tool's purpose was upheld. Given that nomophobia is a relatively underexplored concept, this tool specifically assesses college students' irrational fears or anxieties experienced when they cannot use their smartphones. The language used was kept simple to enhance comprehension of the items. Since an accurate tool reflecting the selected dimensions and delimitations was unavailable, the researcher developed the "Nomophobic Behavioural Identification Scale."

2. Planning and Purpose of the Tool

In designing this tool, careful consideration was given to its purpose, objectives, target population, the formulation of items based on the dimensions of nomophobia, the type of items, and the scoring procedure. To deepen the understanding of the nomophobia construct, a thorough literature review was conducted, consulting various sources, including articles, research papers, books, theses, journals, and manuals related to existing tools.

Some definitions of nomophobia are presented below:

King, Valenca, and Nardi (2010) defined nomophobia as "the fear of being out of mobile phone contact. It is a growing problem in our 24/7 culture and can lead to anxiety, respiratory alterations, trembling, perspiration, agitation, disorientation, and tachycardia."

Dixit et al. (2010) described nomophobia as "an abbreviation for 'no-mobile-phone phobia', referring to the anxiety and discomfort experienced when an individual is unable to use their mobile phone or is out of mobile phone contact."

Yildirim and Correia (2015) described nomophobia as "a modern phobia affecting millions in which one feels anxious or nervous at the thought of losing, forgetting, or being without their mobile phone."

Bragazzi and Del Puente (2014) defined nomophobia as "the fear or anxiety experienced by individuals when they are unable to use their mobile phones for communication or access information."

Based on the above definitions, it can be concluded that Nomophobia is the fear or anxiety of being without a mobile phone or being unable to use it, characterized by four key dimensions: (1) the inability to communicate, (2) the loss of connectedness with others, (3) the lack of access to information, and (4) the disruption of convenience in daily life (Zethy & Octaviani, 2017; Adawi et al., 2019). The Nomophobic Behavioural Identification Scale, a five-point rating scale, was created to systematically quantify the severity of this anxiety.

3. Item Generation

The first step was to create a comprehensive list of items representing different facets of nomophobia. The investigator planned to develop a Nomophobic Behavioural Identification Scale based on the operational definitions of the variable and the literature on nomophobia. Four conditions were considered as dimensions of the present scale:

- The fear of not being able to communicate, as individuals worry about losing the ability to stay in touch with others.
- The fear of losing connectedness, where people feel isolated or left out without their phone.
- The fear of not being able to access information, causing distress over the inability to retrieve necessary data.
- The fear of giving up convenience, where everyday tasks become challenging without mobile access.

Expert advice was sought from 5 experts from the faculty of education at the college and university level for their comments. The dimensions were found relevant in the opinion of experts. It was advised to structure the scale in two parts: the first part relating to general information about daily usage of smartphones, and the second part dealing with statements related to nomophobic behaviour.

The question pool in the first part was made up of 18 statements, and the second part consisted of 30 statements. Items that were overlapping, biased, or vague were removed with the guidance of the supervisor. After the elimination process, 12 statements in the first part were retained. A 5-point Likert-type scale was used. After conferring with specialists, a prototype 5-point Likert scale was developed with response options: "Strongly Agree", "Agree", "Undecided", "Disagree", and "Strongly Disagree". Ten experts from colleges and universities assessed the preliminary items to confirm their validity. Items that were redundant or confusing were removed, and a final draft of 7 statements in the first part and 24 statements in the second part was prepared.

Several precautions were taken before formulating the items, including:

- Using clear, precise, and grammatically correct language;
- Ensuring items were interrelated;
- Avoiding misleading statements;
- Avoiding double-barreled statements;
- Eliminating ambiguous wording;
- Arranging items in order from simple to complex;
- Providing clear yet concise instructions for marking responses appropriately.

4. Try-out of the Tool

Pilot Testing: After the rough draft was created, pilot research was conducted to assess the sample population's understanding of the statements. The 24 statements on the draft form were delivered to 50 individuals whose characteristics matched those of the study population. The language was modified in response to student feedback. Two statements in the first part and some statements in the second part were reframed or substituted as per requirements before the final try-out.

Final Try-out: The tool, consisting of 24 items, was administered to 110 college students from the Ludhiana district.

Section B: Nomophobic Behavioural Identification Statements

Sr. No.	Statement	SA	A	U	D	SD
1	When I'm not using my smartphone, I think a lot about it.					
2	If I'm away from my smartphone, then it hurts me.					
3	I find it challenging to limit my smartphone usage.					
4	I feel uneasy because I cannot find important information on my smartphone.					
5	I would feel anxious if my smartphone battery discharged.					
6	If I cannot check notifications on my Smartphone for a long time, then I feel the desire to check it out.					
7	Without a Smartphone, I find myself feeling anxious as I am unable to communicate with my loved ones.					
8	I feel anxious and unsettled when I am without my smartphone.					
9	If I do not have my smartphone, then I feel nervous because I cannot get text messages and calls.					
10	If I do not have my smartphone, then I am frightened because I do not know who would have tried to contact me.					
11	Leaving my smartphone at home makes me anxious, as it disrupts my daily routine.					
12	As soon as I get up in the morning, the first thing I do is check my smartphone.					
13	To find solace and ease my loneliness, I turn to my smartphone.					
14	Due to excessive use of smartphones, I am late to bed or get less sleep.					
15	If I awoke in between sleep, mostly I checked notifications on my smartphone.					
16	I would feel uneasy if I didn't have my smartphone providing me with a continuous flow of information.					
17	Without a network signal or Wi-Fi connection, I would repeatedly check for any available signal or attempt to locate a Wi-Fi network.					
18	If I were unable to access my smartphone for a period of time, I would undoubtedly experience an urge to do so.					
19	I might feel anxious and uneasy if I were to lose connection with my digital persona.					
20	I keep feeling anxious and restless due to the fear of losing my smartphone.					
21	Using a smartphone during lectures, travelling, or eating makes me feel comfortable.					
22	Use of smartphones is more preferred than participation in co-curricular activities in college.					
23	I am always anxious that my data will be exhausted.					
24	I always avoid travelling or going to areas where broadband coverage might be poor, because that would make me fear being 'disconnected'.					

6. Item Analysis of the Tool

Validity of any item defines the extent of that item's ability to measure what it purports to measure. The coefficient of correlation was calculated for each item to find out item validity by correlating each item's score with the total score of the scale.

(Singh, 2006). As shown in Table 1, items with correlation values of 0.19 and above were selected, and the rest were discarded. The value of Cronbach's alpha, if an item is deleted, does not change substantially. Therefore, all 24 items were retained after item validity analysis.

Table 1: Item Validity of the Nomophobic Behavioural Identification Scale

Item No.	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item No. 1	0.206	0.834
Item No. 2	0.418	0.826
Item No. 3	0.471	0.824
Item No. 4	0.343	0.829
Item No. 5	0.418	0.826
Item No. 6	0.386	0.827
Item No. 7	0.395	0.827
Item No. 8	0.354	0.829
Item No. 9	0.386	0.827
Item No. 10	0.370	0.828
Item No. 11	0.348	0.829
Item No. 12	0.472	0.824
Item No. 13	0.409	0.826
Item No. 14	0.341	0.829
Item No. 15	0.310	0.830
Item No. 16	0.370	0.828
Item No. 17	0.377	0.828
Item No. 18	0.452	0.825
Item No. 19	0.320	0.830
Item No. 20	0.362	0.828
Item No. 21	0.445	0.825
Item No. 22	0.474	0.824
Item No. 23	0.360	0.828
Item No. 24	0.300	0.831

In the next step, the Discrimination Index (DI) for the Nomophobic Behavioural Identification Scale was analysed.

The scores for each item were arranged in descending order, creating high- and low-scoring groups consisting of the top.

27% and the bottom 27%, following Kelley's method (1939). The item analysis involved calculating the t-ratio to assess

significant differences between the high- and low-scoring groups for each statement.

Table 2: Discrimination Index of Nomophobic Behavioural Identification Scale

Item No.	t-value	Significant Value
Item No. 1	2.058	0.045
Item No. 2	3.655	0.001
Item No. 3	5.122	0.000
Item No. 4	3.585	0.001
Item No. 5	5.211	0.000
Item No. 6	4.374	0.000
Item No. 7	4.013	0.000
Item No. 8	2.811	0.007
Item No. 9	3.691	0.001
Item No. 10	4.778	0.000
Item No. 11	4.351	0.000
Item No. 12	5.186	0.000
Item No. 13	3.237	0.002
Item No. 14	2.862	0.006
Item No. 15	3.575	0.001
Item No. 16	9.129	0.000
Item No. 17	2.540	0.014
Item No. 18	2.486	0.016
Item No. 19	4.493	0.000
Item No. 20	2.991	0.004
Item No. 21	4.198	0.000
Item No. 22	15.392	0.000
Item No. 23	3.157	0.003
Item No. 24	15.392	0.000

7. Reliability Testing

To examine dependability, the scale was administered to a wider, more diverse population. Statistical methods, specifically

Cronbach's alpha was used to assess the scale's internal consistency. The value of Cronbach's alpha was found to be 0.834, confirming that the scale accurately assesses the concept of nomophobia.

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	No. of Items
0.834	0.834	24

8. Validity Testing

Validity refers to the degree to which a test accurately assesses what it is designed to measure. Content validity was established for this scale by the investigator. To assess content validity, professors and experts were given the scale to compare items with the construct. They assigned +1 for items deemed appropriate according to the variable's dimensions, -1 for those considered inappropriate, and 0 for items they were uncertain about. The Index of Suitability (IOS) was calculated using the following formula:

IOS = Sum of experts' responses / Total number of experts (N). The value of IOS for the Nomophobic Behavioural Identification Scale was 0.86, which lies within the expected range of 0.8–1.0 for establishing content validity. Because the definitions of the construct and items agreed, the scale was found to have content validity.

9. Scoring of the Tool

The first part of the scale provides general information regarding smartphone usage, whereas the second part is quantitative, with each item scored as follows:

Table 4: Scoring of the Tool

Strongly Agreed	Agreed	Undecided	Disagreed	Strongly Disagreed
5	4	3	2	1

The minimum possible score of the scale is 24, and the maximum is 120. As per Kelley's method (1939), the scale indicates three levels of nomophobia.

Table 5: Interpretation of Score

Score	Interpretation
< 24	Absence of nomophobia
24–50	Low level of nomophobia

51-93	Average level of nomophobia
94-120	High level of nomophobia

10. CONCLUSION

The Nomophobic Behavioural Identification Scale (NBIS) is an effective instrument that offers valuable insights into the psychological impact of modern technology dependence. By thoroughly examining individuals' responses, it enhances understanding of nomophobia and aids in addressing this growing concern in the digital age. After reliability and validity testing, the NBIS was finalised. This version includes a balanced selection of 24 items that properly assess the fear and anxiety associated with mobile phone unavailability.

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