

Usage patterns of electronic devices for communication and prevalence of nomophobia among General Certificate of Education Advanced Level students in Colombo, Sri Lanka

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Abstract

Introduction: Nomophobia is becoming an increasing concern as a result of inappropriate use of electronic communication devices.

Objectives: To describe the pattern of use of electronic communication devices and the prevalence of nomophobia among General Certificate of Education (GCE) Advanced Level (A/L) students in Colombo Educational Zone.

Method: This descriptive cross-sectional study was carried out from January to March 2020 in six of the randomly selected government and government approved private schools within the Colombo Education Zone. A self-administered questionnaire including a culturally adapted nomophobia-questionnaire was used. Data were analysed using SPSS-20.

Results: Of 337 students, 336 (99.7%) were regularly using a device for communication, the most preferred (n=319) being mobile phone; 213 owned a mobile phone; 60.4% were spending ≥ 2 hours/day with these devices, 10.1% spending > 5 hours/day. Common uses of devices were listening to music (96.7%), taking photos (85.4%), sending text messages (84.8%) and academic activities (84.5%). Prevalence of moderate and severe nomophobia was 49.8% and 34.2% respectively. Prevalence of severe nomophobia was significantly higher in females ($p < 0.001$) and those studying in grade 13 ($p = 0.036$), government schools ($p = 0.002$),

Sinhala-medium ($p = 0.017$) and Science stream ($p = 0.024$).

Conclusions: Among GCE A/L students in Colombo, Sri Lanka, 99.7% were regularly using a device for communication. Prevalence of moderate and severe nomophobia was 49.8% and 34.2% respectively.

(Key words: Communication devices, Nomophobia, Students, Sri Lanka)

Introduction

While multiple types of electronic devices are available for communication, mobile phone remains the most popular device followed by laptop computers and tablet devices. Mobile phones were introduced in 1980s and worldwide subscribers increased from 12.4 million in 1990 to 5.3 billion by end of 2010¹. In Sri Lanka, by the end of September 2018, cellular mobile subscription rose to 147.9 phones per 100 inhabitants², clearly showing the extent of its distribution.

Mobile phones are attractive because they allow users to browse the Internet, work with people from a distance, connect with friends and colleagues, resolve problems and render services without having to physically move³. While making our life comfortable, these new devices can lead us to many social problems such as social isolation and financial losses. It can also cause both physical and psychological pathologies as well⁴.

The word “nomophobia” is derived from the expression “No Mobile Phobia”, a state of phobia of being without a mobile phone. Nomophobia, considered a disorder of contemporary digital and virtual society, refers to discomfort, anxiety, nervousness or anguish caused by being out of contact with a mobile phone or computer⁵. Globally, nomophobia is becoming an increasing problem. Although nomophobia has yet to find a formal place within the DSM-V, it is commonly perceived as a phobia based on DSM-V diagnostic criteria⁶. Clinical features of nomophobia are described as anxiety, respiratory alterations, trembling, perspiration, agitation, disorientation and tachycardia⁷. Though there are certain

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validated psychometric scales which are available to diagnose nomophobia, there is no universally accepted criteria to diagnose this condition. Various psychological factors are involved when a person overuses the communication device, e.g., low self-esteem, extrovert personality⁷. Nomophobia can act as a proxy to other disorders as well. Hence, we have to be very judicious regarding its diagnosis. Certain psychological conditions like social phobia or social anxiety and panic disorder can precipitate nomophobia and vice versa⁷. Thus, it is very difficult to differentiate whether the patient becomes nomophobic due to communication device addiction or existing anxiety disorders manifest as nomophobic symptoms⁷. The complexity of this condition is very challenging to the patients, family members as well as for the physicians, as nomophobia shares common clinical symptoms with other disorders. That is why nomophobia should be diagnosed by exclusion⁷. As the concept of nomophobia is relatively new, the treatment modalities are very limited. However, treatment modalities like cognitive-behaviour therapy, combined with pharmacological interventions like benzodiazepines and antidepressants (in normal dosage), show promising results^{3,7}. Another important step of the management is to educate these patients on how to make use of their communication devices effectively without being dependant on these devices.

A study by Sharma N, *et al*⁸ amongst medical undergraduates in India revealed that all of them were possessing at least one mobile phone with activated internet services in 87%, while 34% had two mobile phones. Interestingly, 73% of them were nomophobics⁸. Another study in France among undergraduates revealed that almost one in three students have nomophobia⁹. The only local study done on nomophobia revealed that its prevalence among medical undergraduates was 100% with 28.1% having mild, 62% moderate and 9.9% severe nomophobia¹⁰.

As usage of electronic devices for communication among school children in Sri Lanka is increasing during the last few years, it is important to thoroughly assess their uses and short-and-long-term effects among youth and have a wider discussion among stakeholders on how to use them effectively.

Objectives

To describe the pattern of use of electronic communication devices and its association with nomophobia among General Certificate of Education (GCE) Advanced Level (A/L) students of Colombo Educational Zone in pre-Covid pandemic time.

Method

A descriptive cross-sectional study was carried out from January 2020 to March 2020 among students of GCE A/L classes in government and government approved private schools in the Colombo Educational Zone. Sample size, initially calculated for an expected prevalence of moderate nomophobia of 62%¹⁰, a level of precision of 6% and a confidence level of 95% and adjusted for an expected prevalence of mobile phone use of 80%, was 313. This was further adjusted to overcome the effect of clustering using a design effect of 1.1 which gave a final sample size of 345.

Statistics of number of students in public schools and government approved private schools were retrieved from the Ministry of Education Zonal Education Office and Private School Branch of Ministry of Education. Based on those statistics, stratified cluster sampling method was applied considering public and government approved private schools as two strata. Six schools were selected proportionate to total number of students studying in AL classes in each stratum of school. One class of 30 students was considered a cluster. Four government schools, (two girls' schools, one boys' school and one mixed school) were selected randomly, while two government-approved private schools (one boys' school and one girls' school) were selected randomly. Within the six selected schools, two A/L classes were selected randomly representing both science and arts / commerce streams. In the selected classes, all students were invited to participate.

A self-administered questionnaire was used to collect data. First part inquired about socio-demographic details and second part asked questions related to use of electronic communication devices. Prevalence of nomophobia was assessed using a freely downloaded validated questionnaire prepared by Caglar Yildirim of Iowa State University in USA¹¹. The inventory has 20 items and a 7-point response scale (1= strongly disagree; 7= strongly agree). It was translated into native languages (Sinhala/Tamil) and back translated and the content validity of the questionnaire was assessed through the consensus of a group of experts. The questionnaire was pretested in a group of 10 school children of the same age and was modified according to the responses.

Each selected school was visited by the principal investigator, after getting permission from the school authorities. A GCE A/L class was randomly selected, and the principal investigator briefed students about the study and distributed information sheets, consent forms and assent forms at a time which was least disruptive to the students'

work and was prescribed to us by sectional head / grade head teachers. Students were asked to get consent of their parents. Our team revisited same classes during the pre-identified date and time and distributed self-administered questionnaires among all students who consented to participate to collect data.

Ethical issues: Ethical clearance was obtained from the Ethics Review Committee of University of Colombo, Faculty of Medicine (EC-19-146) on 19th December 2019. Written informed consent was obtained from the parents and assent from the children.

Statistical analysis: Data were analysed using Statistical Package for Social Science version 20. Patterns of use and prevalence of nomophobia were calculated as percentages with 95% confidence intervals. Severity of nomophobia was measured according to the nomophobia score¹¹. Chi-square test and logistics regression were applied to determine the statistical significance of factors associated with nomophobia.

Results

Of the sample of 372 students 337 responded and were recruited. Of the 337 recruited students 219

(65%) represented government schools and 118 (35%) were from government approved private schools. This closely follows the proportion of GCE A/L students studying in government and government approved private schools.

One hundred and eighty-seven (55.5%) students were females and 150 (44.5%) were males. Two hundred and seventy-nine (82.8%) students were from Grade 12 and the rest were from grade 13. Study medium was divided among students as Sinhala (79.5%), English (12.2%) and Tamil (8.3%); (59.9%) were from commerce stream followed by arts (26.2%) and science (13.9%).

All but one student reported using an electronic device for communication regularly. Out of the 319 students who claimed using a mobile phone, 96.9% used a smart phone. Further, 213 (63.2%) students claimed that they have got their own mobile phone. Among the students, 29.7% owned a laptop, 8.3% owned a tablet and 2.7% owned a smart watch.

Table 1 shows the types of devices and the duration of use by students. Whilst 33.9% students used a mobile phone for 2-4 years, 29.9% had used a laptop for more than 4 years.

Table 1: Types of devices and duration of use of devices by students

Name of device	Number of students (%)	Duration of use - number (%)			
		<1 year	1 to <2 years	2 to 4 years	>4 years
Mobile phone	319 (94.6)	78 (24.4)	99 (31.0)	108 (33.9)	34 (10.7)
Laptop	167 (49.6)	31 (18.6)	45 (26.9)	41 (24.6)	50 (29.9)
Tablet	48 (14.2)	10 (20.8)	14 (29.2)	11 (22.9)	13 (27.1)
Smart watch	12 (03.6)	06 (50.0)	01 (08.3)	05 (41.7)	0 (0)

Table 2 shows the behaviour related to mobile phone use in a typical day; 203 (60.4%) were spending ≥ 2 hours/day with these devices and 34

(10.1%) were spending >5 hours/day. Preferred time for use of these devices was 6pm–12 midnight (79.8%).

Table 2: Time spent and preferred time of day of use of mobile devices

Students	Total time spent with the device on a typical day (hours)				Preferred time period of device use			
	<1	1 to <2	2-5	>5	6am-12pm	12pm-6pm	6pm-12am	12am-6am
Number (%)	56 (16.7)	77 (22.9)	169 (50.3)	34 (10.1)	09 (02.6)	45 (13.4)	268 (79.8)	14 (04.2)

Table 3 shows the purposes to which the devices have been used and it is evident that students in our study sample mostly used these devices for entertainment and not for either communication or academic purposes.

Median monthly expenditure on connection was LKR 520 (IQR:300-1350) with LKR 100 (IQR:50-300) spent on calls and LKR 450 (IQR:200-1000) on data.

Table 3: The purpose of device use (n=336)

Purpose of use	n (%)
To listen to music	325 (96.7)
To take photos	287 (85.4)
To text family/friends	285 (84.8)
Academic purposes	284 (84.5)
To talk to family/friends	274 (81.5)
To roam in the social networks	263 (78.3)
To play games	161 (47.9)
For other purposes	144 (42.9)

Two hundred and sixty-six (79.2%) students had tried to restrict its use and 150 (44.6%) students were comfortable without these devices.

Nomophobia

Only 269 students completed the questionnaire on nomophobia. It was found that 134 (49.8%) had moderate degree of nomophobia. Ninety-two (34.2%) students had severe nomophobia while

only forty-three (16%) had either no or mild nomophobia. (Table 4)

Prevalence of severe nomophobia was not significantly associated with the time spent on extracurricular activities ($p=0.258$), tuition classes ($p=0.643$), academic position in class ($p=0.060$), ownership of communication device ($p=0.510$) or duration of use of those devices ($p=0.680$).

Table 4: Prevalence of nomophobia according to gender, type of school, grade, medium and stream of study

Total students (n=269)		No or mild nomophobia (Score: 0-60)	Moderate nomophobia (Score: 61-100)	Severe nomophobia (Score: 101-140)	Chi-Squared (p-value)
Gender	Male (118) – n (%)	20 (16.9)	73 (61.9)	25 (21.2)	16.660 ($p=0.000$)
	Female (151) – n (%)	23 (15.2)	61 (40.4)	67 (44.4)	
Type of school	Government (172) – n (%)	23 (13.4)	77 (44.8)	72 (41.8)	12.659 ($p=0.002$)
	GAP (97) – n (%)	20 (20.6)	57 (58.8)	20 (20.6)	
Grade	12 (225) – n (%)	36 (16.0)	119 (52.9)	70 (31.1)	6.657 ($p=0.036$)
	13 (44) – n (%)	07 (15.9)	15 (34.1)	22 (50.0)	
Medium of study	Sinhala (209) – n (%)	28 (13.4)	99 (47.4)	82 (39.2)	11.993 ($p=0.017$)
	Tamil (24) – n (%)	06 (25.0)	14 (58.3)	04 (16.7)	
	English (36) – n (%)	09 (25.0)	21 (58.3)	06 (16.7)	
Stream of study	Science (40) – n (%)	04 (10.0)	16 (40.0)	20 (50.0)	11.257 ($p=0.024$)
	Commerce (163) – n (%)	22 (13.5)	85 (52.1)	56 (34.4)	
	Arts (66) – n (%)	17 (25.8)	33 (50.0)	16 (24.2)	

Discussion

As there are no published studies in Sri Lanka on nomophobia among GCE A/L students and only a single local study available to refer on this topic, this study exposes the potential impact of the use of communication devices on the psychosocial wellbeing of our future generation. In our study, use of these communication devices was extremely high. Another local study and an Indian study reported similar findings^{12,13}. This shows that communication devices have become an essential part of life among the younger generation including school children.

According to Dasgupta P, *et al*¹⁴, the majority used smartphones for talking and texting followed by gaming, music or for ‘killing time’ and checking mail or social media. Even though a majority of students in our study used the device for academic activities, the common uses were to listen to music, to take pictures and text family/friends. This questions the validity of purchasing these devices as an academic tool, but which is ultimately used for other functions by the younger generation. A study by Gunathilaka N, *et al*¹⁰ among medical students, revealed that 80.3% have identified smartphones as a hindrance to studies and have attempted to reduce usage (65.5%) but have failed in doing so¹⁰. Our data also shows that although almost 80% tried to restrict its use, only about 44% were comfortable without a device. This shows how the younger generation is struggling to optimise usage of these devices despite knowing its adversity.

Pavithra MB, *et al*¹³ revealed that 74% undergraduates spent 300-500 Indian rupees per month on mobile recharge. Our students have also spent a similar amount of money, the major portion being on data. We found that 84% had a moderate to severe degree of nomophobia. Despite the tools to assess the nomophobia being slightly different from each other, similar studies targeting different age categories show a high prevalence of nomophobia among communication device users. Nomophobia was prevalent among all undergraduates participating in a study, 71.9% of them having moderate to severe nomophobia¹⁰. According to Buctot DB, *et al*¹⁵, only 0.5% of the participants did not have nomophobia. A French study revealed that almost one third participants were nomophobics⁹. Studies in different parts of the world with different cultural background such as India¹⁴, Poland¹⁶, Pakistan¹⁷ and Spain¹⁸ confirmed the widespread prevalence of this entity.

Compared to regional and global data, prevalence of nomophobia in our study sample is very high, and to make matters worse, participants were 17-18-year-old school children. The steep rise in these communication devices, due to wide availability and low prices in the local market, would have played a major role in the results shown above. Further, this might reflect the threat it poses at our doorstep as reversal of this situation is daunting unless a well-structured programme is put in place to advocate rational use of these devices among our younger generation.

Prevalence of severe nomophobia among girls in this study was higher than in boys [(n=25 (21.2%)

vs n=67 (44.4%) $p<0.001$]. Similar results were shown by Tavalacci MP, *et al*⁹ in France (AOR=2.71[1.55-4.74]) and Buctot DB, *et al*¹⁵ in Philippines (t(1445)= -4.91, $p<0.001$). The findings of Gezgin DM, *et al*¹⁹ in Turkey (372 vs 557 $p<0.001$) and Daei A, *et al*²⁰ in Iran ($p<0.001$) were different. However, Çolak M, *et al*²¹ found no gender difference in nomophobia in a study in Turkey. Hence, nomophobia is more or less equally distributed among male and female students of schools and universities. Although our study showed that severe nomophobia was significantly high among the older age group, no such association was found by Gezgin DM, *et al*¹⁹. However, Daei A, *et al*²⁰ revealed a significant association of nomophobia with the age ($p<0.001$). While our study did not show any significant association between severe nomophobia and duration of use of these devices, the study by Gezgin DM, *et al*¹⁹ showed a significant association.

An Indian study found an inverse relationship between nomophobia scores (NMPS) and student's academic performance and no significant difference between NMPS²². Çolak M, *et al*²¹ did not reveal any statistically significant association of nomophobia against Grade Point Average of secondary school children ($p=0.24$)²¹. We also found no significant association ($p=0.06$). We found no association of severe nomophobia with time spent on extracurricular activities ($p=0.258$). Essel HB, *et al*. in Ghana confirmed the same ($p=0.235$)²³. Further, nomophobia scores were high among undergraduates who participated in extracurricular activities ($m=86.9$; $SD=24.7$).

This study was conducted during the pre-Covid era where communication devices were not frequently used. However, with the Covid pandemic, closure of schools directed students to switch to distant learning with the use of a smart data communication device. This provided easy access to devices as well as high chance to own their own device. This would have further changed the landscape of electronic communication device use and leave more room for abuse as well, especially with providing access to younger age groups including in primary education. Therefore, it is important to study the impact of these devices in the post-Covid era involving a wider age group and geographical distribution.

Communication devices have become an essential part of the life of GCE A/L students of selected schools in the Colombo educational zone. Despite caution in generalizing these findings to the entire country, we can anticipate similar findings in most parts of the island. A very high prevalence rate of nomophobia reflects the addiction of children to

devices used for communication which could affect academic performance adversely. Hence, concrete steps should be taken to increase public awareness of this new 'disease' entity nomophobia and its impact on children. Restriction of the use of communication devices by children for longer periods and facilitating face to face interactions of children by motivating them to engage in outdoor games, religious and cultural activities would give promising results in the prevention of nomophobia. Further, school authorities should set up a programme to educate students on nomophobia with its implications and indeed, a mechanism for early identification of affected children and referring them to the relevant healthcare services.

As data collection of this study was completed just prior to onset of Covid pandemic, the current situation in the country might be much worse with complete transition of mode of teaching and learning from physical to virtual. Hence, it is high time for educators, health authorities and policymakers to come forward with an effective implementation of communication device use policy for students.

Conclusions

Among GCE A/L students in Colombo, Sri Lanka, 99.7% were regularly using a device for communication. The prevalence of moderate and severe nomophobia was 49.8% and 34.2% respectively.

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