



Upfront resilience and recovery determinants of mobile phone dependence among children-An exploratory study in southern parts of Indian Subcontinent

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ABSTRACT: Background: The advent of the mobile phone has formed the largest gateway to digital world which attributes, attracts and encourages its use among children. Inappropriate use of mobile phone reinforces personal autonomy among paediatric fraternity which may lead to behaviour disorders and symptoms and negative affectivity. The objective of this study is to summarize and collate suggested methods for investigating this lethargy and outline a few symptoms that characterize the Mobile dependency syndrome in children.

Methods: Questionnaires which measure the behaviour, attitudes, preferences, and opinion of children in primary and secondary level school in the capital city of Kerala, south India, were framed to capture the difficulties associated with excessive use of mobile phones. It consists of 10 items which are scored using a six -point Likert scale and is designed to measure the degree of agreement with that problematic situations arise because of excessive use of mobile. Test dimensions were analysed by exploratory and confirmatory factor analysis for the multidimensional construct, mobile dependency.

Results: The psychometric assessment identified three-factor solution emerged with the assumption that the factors were correlated with one another and the dimensions that constitute the construct (mobile phone dependence) are not independent of one another, namely: withdrawal, tolerance, psychological Impairment, which this study purports as bespoke symptoms of mobile dependency in children. The first factor explained 44.52% of the variance and was composed of six of the final questionnaires. The

second factor explained 14.46% of the variance. It was composed of Questions (1, 2, 3 and 5). Finally, the third factor explained 10.71% of the variance and was composed of Questions ,6 and 10. The estimation of internal consistency was analysed using Cronbach's alpha, obtaining a value (0.852) , which was similar to that found in other published validations.

Discussion: The results strongly demonstrated good reliability and psychometric properties of the construct predisposes aetiology of dependency syndrome and suggest heritability of DSM-5 traits. Our results are also consistent with increasing evidence of previous validation stated elsewhere in this article with robust estimation of research constructs with passable sample size. However we wish to show up the possibility that the frame of survey format shall be designed and communicated more intuitively to teenagers and children who are Digital natives and artificially intelligent susceptible generation, to contain their true aspirations in future studies.

Conclusion:

The major proportion of clinical heterogeneity seen in children with mobile dependency syndrome can be accounted for by three distinct factors each impacting differently on child psychological distress, well-being, academic performance ,social life and anticipated health hazard on account of exposure to radio-frequency environment which is a vulnerable carcinogen. Greater recognition of the reliability and psychometric properties obtained in this study manifests as a useful tool for the analysis of problems arising from inappropriate use of the



mobile phone among children ,may assist clinicians and researchers in identifying appropriately tailored diagnosis and treatment techniques .

KEYWORDS Mobile phone Dependency Syndrome (MDS); Clinicalheterogeneity; Psychometric properties; Varimaxrotation; Rotated Component Matrix; Withdrawal; Tolerance; Psychological impairment, DSM-5: Diagnostic and Statistical Manual of Mental Disorders 5th edition; Exploratory Factor Analysis(EFA).

I. INTRODUCTION

Mobile phones are dominant communication devices, first demonstrated by Motorola in 1973, and made commercially available from 1984¹. In the last few years mobile phones have become a primary part of our lives, which resulted in an exponential explosion of the use of mobile phones among most of the world's countries. According to International Telecommunication Union (ITU) in 2008 mobile phone users were 61.1% of world population². Global surveys reveals that Mobile internet has become increasingly widespread and popular over the past few years, as mobile smart phones are more readily available and affordable than ever. As internet users are gradually switching to mobile devices to browse the web on the go, mobile internet now accounts for over 50 percent of total web traffic worldwide. Mobile phone has become an essential tool for information, communication, and entertainment. In 2019 survey, users spent an estimated 170 minutes per day online, primarily via smart mobile phone and the average daily time spent with the internet per capita is increasing every year. Some of the most popular mobile internet activities include the use of instant messaging services, video streaming platforms, and social media.³

The Mobile phone is considered by many to be one of the best inventions available to this generation, and the accelerated adoption of smartphones by consumers is evidence that the trend will continue, as users realize the power of accessing a wealth of information at the touch of their fingertips.⁴ . Thus, the advent of the mobile phone has formed the largest gateway to digital world but a human life into a different plane of space-time that transcends to a Cosmo vision, the ritual configured for specific learning goal.

Consequently the mobile phone has many attributes and characteristics that make it especially attractive to adolescents and that encourage its use among members of this group and possession⁵ .The use of a mobile phone by children has several functions such as reinforces personal autonomy, especially with regard to parents ⁶ , Provides identity and

prestige in the context of relationships with peers⁷ , a purpose that is quite evident in the newest or most fashionable models⁸, Offers major technological innovations, tools for which adolescents demonstrate a special inclination and skill ,Serves as a source of fun and entertainment and supports the establishment and maintenance of interpersonal relationships⁹ via technological resources, such as those that track “missed calls”, which have a clear social and affective function.

II. BACKGROUND

Notwithstanding being a useful tool in our daily lives, it can also have negative consequences, especially when users exhibit a lack of self-control regarding the length of time they spend online, which can be related to states of Internet use, abuse or dependence, being the most vulnerable groups the adolescents and young adult¹⁰ .Several studies have focused on the threatening effects with mobile phone technology, a medium that allows children to communicate with others without parental or teachers' direct control¹¹, which tends towards extreme mobile phone dependence as a type of technostress¹², a complex mechanism generated by technological innovation. The theoretical framework developed by Brod, identifies the signs of the technostress risk as ; constant use of the mobile phone even in social gatherings, continuous use without turns off the phone, very frequent nocturnal awakenings to connect to social platforms, it also warns the instinct to call in private places ,cinemas, libraries, writing messages while on the move.¹³ . Undesirable and adverse outcomes associated with problematic mobile phone use have caught the attention of researchers around the world. Kimberly, in 1998, investigated the existence of Internet addiction and the extent of problems caused by such potential misuse using Pathological Gambling, an impulse-control disorder that does not involve an intoxicant, as a model based on the diagnoses referenced in the Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV; American Psychiatric Association, 1995)¹⁴.

The 4-factor model, as a theory-based measurement for development and Validation of the Internet Motive Questionnaire for Adolescents (IMQ-A)¹⁵ to identify Problematic Internet Users ,Wolstein, identified the motivational differences between high-risk and low-risk Internet adolescents based on the constructs of social, enhancement, coping, and conformity motives. The result of the study conducted in Germany support the concurrent validity of the IMQ-A statistically but recommend further validation of the questionnaire in clinical sample.



The exploratory and confirmatory factor analysis study carried out in Spain deals with impact of wide use of the Internet in the workplace, academic or social field of young college students¹⁶, can have an impact on daily life. One of the most used questionnaires worldwide to analyse these problems is the Internet Addiction Test (IAT), they validated the Spanish version and analyse its psychometric properties.

Although the psychometric assessment identified two factors Emotional Investment; Performance and Time Management exhibits good research pedagogy with statistical relevancy of remarkable confirmatory analysis with acceptable goodness of fit, the results deals with the Spanish version of IAT with a two-dimensional solution only and partially in concordance with previous validations of the IAT in other languages that have found uni- and multi-dimensional solutions using different methodologies. Besides, some item of this questionnaire is outdated due to the technological and lifestyles changes and should be not taken for future study.

A recent on-line survey further documented that obsessive mobile use in Australia and its potential implications for road safety and identify trends of change related to mobile phone misuse in the Australian population¹⁷.

In vulnerabilities of these "risk behaviours" in mobile addiction among youth published in research domain, there are, however, a few gaps in current research. First, not much is known about affectivity, which plays an important role in understanding problematic mobile use among paediatric fraternity, behaviour disorder symptoms in children which include preoccupation with the device, excessive use with loss of control, use in socially inappropriate/dangerous situations, symptoms of withdrawal, tolerance Physical/psychological problems related to its use¹⁸ are termed to be symptoms of mobile dependency. This study revisits and embark into cognitive dissonance, vide supra outline a few symptoms that characterize the mobile dependency syndrome in children in Kerala, South of Indian sub-continent.

III. STUDY SIGNIFICANCE

The importance of the study appears through: 1) the analysis of the concept of mobile-phone dependency as well as its prevalence, study methodologies, psychological features, and associated psychological comorbidities which contribute in identifying the nature of relation between personality variables, such as extraversion, neuroticism, self-identity, and self-image. Similarly, sleep disturbance, anxiety, stress, and, to

a lesser extent, depression, and emotional balance in contrary to the DSM-5 criteria for substance abuse and dependence; withdrawal, tolerance, used larger amounts/longer, repeated attempts to quit/control use, much time spent using, physical/psychological problems related to use, activities given up to use¹⁸.

2) The study is considered important for shedding light to the spread of intractable Addiction Potential Scale and overall mobile phone usage levels among children below 16 years old and connected adverse development of personality attribution, interpersonal trust and social support. 3) The current study entailed the development and evaluation of the psychometric properties to evaluate dependence on the mobile phone amongst child community. 4) Study results may benefit in planning and setting effective groundwork that will lead to future studies and gain maximum insight into the data set and its underlying structure, to uncover a parsimonious model, one which explains the data with a minimum number of predictor variables and constructs in the premises of current research domain.

IV. STUDY SCOPES

Objective Scope

The aim of this study was to examine the frequency of mobile phone dependence in Paediatric profile community and explore its association with demographic variables, impulsivity, and social support, validate and analyse its psychometric properties and its dimensional structure using exploratory, and confirmatory factor analysis to uncover the usage features related to mobile phone overuse, and validate the differences between usage patterns based on dependence measures as envisaged in DSM-5 diagnostic criteria.

The succinct questionnaire encompassed in this study evaluates the main dimensions of mobile phone dependence in children, in order that it can be easily used by part of many clinicians and researchers from different countries to embark cross-sectional studies on mobile phone addiction and establish mobile dependency syndrome (MDS) in children.

Spatial Scope

The spatial scope of this study encompasses the geographic area in the capital city of Kerala state, Thiruvananthapuram, south of Indian subcontinent, which includes an area of spread over 214.86 km²

V. METHODOLOGY AND MATERIALS

Participants

The sample consisted of 650 school children between 6 and 16 years paediatrics age



group, arbitrarily fixed for limited purpose of this study. A total of 650 participants completed the questionnaires from municipal corporation of Thiruvananthapuram city. This study included children who had used the mobile phone at least once a day in the last year. The survey tool excluded three key risk factors—chronic physical problems, apparent disability and who were under treatment for any psychiatric illness. All participants were primary or secondary school students from public or private schools.

Measurement

Measurement consists of 10 items which are scored using a six-point Likert scale and is designed to measure the degree of dependence mobile use within 12-months period in line with DSM criteria cited vide supra. For every question, the participants had to estimate how much the given statement was agreeable for them on a scale between 1 (strongly disagree) and 6 (strongly agree). and it is designed to measure the degree of agreement with that problematic situations arise because of excessive use of mobile.

While no actual substance abuse is involved in typical mobile use as envisaged in the DSM-5 diagnostic criteria, this study evaluates individual behaviour of disproportionate mobile use in contrary to that concept of substance dependence. The DSM-5 (PI 81) currently lists seven criteria that are used to determine substance dependence as referred elsewhere in this research article .A diagnosis of dependence is established based on the presence of three or more of these symptoms occurring at any time in the same 12-month period.

We propose and analyse the multi-dimensional construct , mobile dependency in children in terms of withdrawal, Physical/psychological Impairment ,Tolerance as independent variablesas the basis of psychometric analysis, in line with the seven DSM–5 criteria for substance use dependence.

Measures

The questionnaires were anonymous and self-administered to avoid any bias, influence, or hesitancy. The questionnaire contained two parts:

Sociodemographic information:

The sociodemographic characteristics including the indicators of age, gender, educational level, parent employment status, childcare, and proxy measures of economic status of the participants’ parents are summarized in the (Table 1.a and b).

The psychometric properties of Mobile phone Dependency Syndrome (MDS)

- i) Questionnaires which measure the behaviour, attitudes, preferences, opinion of children in the community, which constitute the symptoms that characterise the criteria of mobile dependence; ii.) The questionnaire is framed to capture difficulties, associated with excessive use of mobile phones, iii. Intrusion with other school or personal activities iv)observe that the use of mobile phone relieves unpleasant emotions such as anxiety and sadness and connected Physical/psychological impairment, v)To measure level of satisfaction on continuous /gradual increase in use of mobile phone as well as the need to replace functioning devices with new models

Table 1.a- Sociodemographic characteristics of Participants (Age Group)

Table with 5 columns: Gender, Age group, Count, % within Gender, % within Age group, % of Total. Rows include Male and Female subgroups and a Total row.



Table 1.b Sociodemographic characteristics of Participants (Education level)

			Education level		Total
			Primary	Secondary	
Gender	Male	Count	46	244	290
		% within Gender	15.9%	84.1%	100.0%
		% within Education level	28.6%	49.9%	44.6%
		% of Total	7.1%	37.5%	44.6%
	Female	Count	115	245	360
		% within Gender	31.9%	68.1%	100.0%
		% within Education level	71.4%	50.1%	55.4%
Total	Count		161	489	650
	% within Gender		24.8%	75.2%	100.0%
	% within Education level		100.0%	100.0%	100.0%
	% of Total		24.8%	75.2%	100.0%

VI. PROCEDURE

Data were collected via online surveys based on non-random sampling method, due to the limitations involved in terms of representativeness when using the Internet. The Outline Focus Group for the study included primary and secondary level school children irrespective of their gender. The participants were informed that the purpose of this study through discussion and interactions wherever possible and established a rapport with them. They also emphasised the need for honesty when filling out the survey and guaranteed the confidentiality of the responses.

we were able to free up resources for the maintenance of the online collected data, which is a vital prerequisite for reliable samples. We are optimistic that the online data collection may not adversely affect the study result or inferences, despite the fact that the quality of response rates in online data collection and that of the paper-and-pencil method under debate in line with finding of Cronk and West (2002).

VI. INSTRUMENTS

The research instrument was systematically designed having structured questions. The questionnaire was framed to measure three important constructs which were derived through literature review.

VII. ANALYSIS

All the data were analysed using the SPSS for Windows software package (version 22.0). Reliability analysis and exploratory factor analysis (EFA) were performed. Principal-components analysis was used to extract the relevant factors, with varimax rotation, Kaiser normalization.

Internal consistency was assessed using Cronbach's alpha coefficients.

The Kaiser-Meyer-Olkin (KMO) test was performed to analyse the feasibility of factor analysis. This measure may vary between 0 and 1; high values of sphericity mean that the variables are correlated, and the analysis is feasible. Bartlett's test of sphericity was also carried out to confirm the correlation matrix suitable for factorisation. EFA was used to assess the structure of the scale, using Varimax rotation which maximize the variance shared among items, to increase the squared correlation of items related to one factor, while decreasing the correlation on any other factor and discretely represent how data correlate with each principal component.

In this study, the sample size (n = 650) yielded an item-to-participant ratio of 1:11, which is considered adequate to avoid crossloading of items and a sampling error or the indication of a poor items¹⁹

A scree plot and eigenvalues were used to establish the number of factors. The conservative criterion suggested by Hair et al. was applied during factor interpretation. Considering the sample size, a statistical power of 80%, and a significance level of 5%, only factor loadings ≥ 0.33 were used when interpreting the findings.

VIII. RESULTS

Reliability and Factor Analysis

Factor Analysis, the multivariate statistical technique have employed in the analysis to reduce the number of variable to optimum level, establish underlying dimensions between measured variables and constructs and provide construct validity evidence, as the objective involves mainly Exploratory Factor Analysis (EFA) where the study



is being conducted with no pre-conceived theories or expectations and the Confirmatory Factor Analysis(CFA) where the study is being conducted to test a proposed theory. In this context an essential aspect to be considered is theKMO, a measure of sampling adequacy that is recommended to check the case to variable ratio for the analysis being conducted. and found to be 0.721(Table -2) as against the world-over accepted index of 0.6, which

is in the acceptable limit and indicated that the correlation matrix was adequate for the analysis. Likewise, the Bartlett sphericity contrast ($\chi^2 = 3229,244$; $P < .001$) (Table -2) authorized rejection of the null hypothesis that the variables used in the analysis were not correlated in the population of the sample and declare the correlation matrix suitable for factorisation as referred in table-2.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.721
Bartlett's Test of Sphericity	Approx. Chi-Square	3229.244
	df	45
	Sig.	.001

For the initial solution, there are as many components as variables, a loading matrix is generated displaying the extent of correlation between each of the included items and the identified factors(subtypes).The table -3 depicts loading range from -1 to +1 and estimates the degree to which each item is weighted within an identified factor .Measure with loading of ≤ 0.3 or ≥ 0.3 are taken as meaningful to the interpretation of statistically significant correlation criteria ²⁰ and

this pattern of selective criteria was used to name each extracted factor, the sum of the eigenvalues equals the number of components. Eigenvalues greater than 1 be extracted, so the first three principal components form the extracted solution. Three factors were extracted from the factor analysis. Table -3 shows the rotated factor matrix. Items with saturation levels lower than .30 were excluded from the factors.

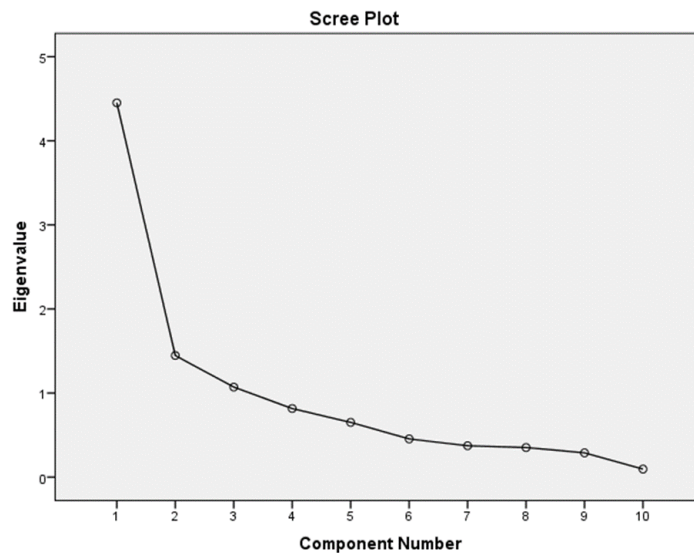


figure 1. -The factors were extracted with the conventional cut-off of eigenvalues greater than one or Kaiser criterion.



Table-3 Rotated Factory Loadings from a Principal -Components Factor Analysis of the 10 MDS - Component structural Matrix			
The psychometric properties	Component		
	Factor 1	Factor 2	Factor 3
Q1. Missing homework due to mobile phone use in the past 12 months	.753*	.179	-.411*
Q 2. Have you stopped other activities (social gatherings, recreational facilities) that you liked due to mobile use?	.508*	.613*	.217
Q 3. Have you encounter restlessness, anger, or irritability when you could not use your mobile phone?	.478*	.541*	.075
Q 4. Have difficulty in concentrating in class or while doing assignments/exams, due to smartphone use.	.761*	-.336*	-.192
Q-5. I need to use newest mobile phone with more application.	.435*	.521*	-.474*
Q-6. Do you observe that the use of mobile phone relieves unpleasant emotions such as anxiety and sadness?	.589*	.097	.675*
Q-7. Using my mobile phone longer than I had intended	.809*	-.039	.026
Q-8The people around me tell me that I use my smartphone too much	.715*	-.351	-.195
Q-9 I need to use my mobile phone more and more often	.814*	-.465*	.041
Q-10. Feeling pain in the wrists or at the back of the neck, experiencing light hard headedness or blurred vision due to excessive mobile phone.	.673*	-.106	.302

* signifies loading of ≤ 0.3 or ≥ 0.3 are taken as meaningful to the interpretation used to name each factor.

The factors were extracted through visual examination of a scree plot in combination with the conventional cut-off of eigenvalues greater than one or Kaiser criterion are also depicted in the figure 1. Orthogonal rotation is then carried out first, followed by a procedure that permits correlations among factors. The first stage consists of rotating loadings to an orthogonal criterion called “Varimax” (Kaiser, 1958). The orthogonal Varimax rotation maximizes the sum of the variances of the squared factor loadings on each factor, greater variability in the magnitude of the squared loadings indicates better simple structure.

Rotation is done so that the first axis contains as much variation as possible, the second axis contains as much of the remaining variation and so on and change of coordinates used as Varimax rotation. It maximizes the sum of the variances of the squared loadings as all the coefficients will be either large or near zero, with few intermediate values. The objective is to associate each variable to at most one factor and interpretation of the component analysis results in simplified format as shown in table 4.



Table 4: Results of factor analysis with varimax rotation on mobile phone dependence tendency questionnaire Items (Rotated Component Matrix-Varimax with Kaiser Normalization.)

Serial No	Item No.in Questionnaire	Psychometric properties	Withdrawal	Tolerance	Psychological /Physical Impairment
1	3	Have you encounter restlessness, anger, or irritability when you could not use your mobile phone?		0.590	
2	1	Missing homework due to mobile phone use in the past 12 months		0,656	
3	2	Have you stopped other activities (social gatherings, recreational facilities) that you liked due to mobile use?		0.591	
4	5	I need to use newest mobile phone with more application		0.811	
5	4	Have difficulty in concentrating in class or while doing assignments/exams, due to smartphone use	0.835		
6	7	Using my mobile phone longer than I had intended	0.650		
7	8	The people around me tell me that I use my smartphone too much	0.808		
8	9	I need to use my mobile phone more and more often	0.897		
9	10	Feeling pain in the wrists or at the back of the neck, experiencing light headedness or blurred vision due to excessive mobile phone use.			0.530
10	6	The use of mobile phone relieves my unpleasant emotions such as anxiety and sadness in last 12 months.			0.866

Based on this rotation technique a robust three-factor solution emerged with the assumption that the factors were correlated with one another and the dimensions that constitute the construct (mobile phone dependence) are not independent of one another, namely :Withdrawal, Tolerance, psychological Impairment which this study purports as bespoke symptoms of mobile dependency in children(Tab-4)

The first factor explained 44.52%(Table-5) of the variance and was composed of Q-5, Q-4 Q-7,

Q-8, Q-9 of the final questionnaires. Based on the content of these items, the first factor was called withdrawal, as it refers both to the discomfort felt when unable to use mobile phones and to the use of these phones to alleviate psychological problems. The second factor explained 14.46% of the variance. It was composed of Questions (1, 2, 3and 5) that refer to the difficulty of stopping mobile-phone use despite efforts to do so and to related problems. The second factor was labelled tolerance and problems derived from use. Finally, the third factor explained



10.71% of the variance and was composed of Questions ,6 and 10, which refer to increasing use and interference with other important activities. This

factor was labelled psychological impairment and interference with other activities.

Table-5 total variance explained

Component	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings		
	Cumulative %	Total	% of Variance	Cumulative %
1	44.518	3.271	32.710	32.710
2	58.983	1.930	19.301	52.011
3	69.696	1.768	17.685	69.696

IX. DISCUSSION

This study identifies three distinct and clinically recognisable sub types (factors)of MDS derived from statistical analysis of objective physical measurement and proposed symptoms of mobile dependency in children. The three factors that were extracted from this study are like the recommendations and rationale put forth by Deborah et al (Deborah,2013) for substance use disorder dependency. That study explicitly establish the dependency syndrome if three of more sub types prevail in a twelve month period ,which are being captured and demonstrated in our study for mobile dependency .The factors score correlations with withdrawal, tolerance, Psychological impairment ,delineate the essential symptomatic clinical presentation together with the features associated with the factors which contextualize possible treatment strategies for the paediatric patients based on their most likely symptoms for dependency under study.

Withdrawal accounted for the greatest variance in the employed measures and was the most symptomatic subtype. The severity and duration of withdrawal dependence are contingent upon many factors, including period and frequency of mobile use ,often exhibits anger, tension, depression, irritability and restlessness ,low energy, trouble sleeping and delayed reflexes .This symptom may lead to profound uncomfortable experience that can stall or otherwise complicate recovery efforts and unmanaged withdrawal can be

dangerous and may require medical care to keep a person safe during their detox period.

Tolerance subtype accounted for the second largest amount of variance in psychometric measures collected within the nascent cohort. Tolerance and withdrawal (physical dependence) symptoms occur because of body's attempt to maintain homeostasis. However, level of tolerance develops and experience before any withdrawal symptoms. Tolerance exhibits as excessive desire for the need for newest mobile phone, more applications, or increased use and is like alcohol abuse. It is important to make an appropriate diagnosis to get the best treatment. Identification of this subtype shall help a long way in understandings the possible diagnostic and treatment strategies

In our study we observed only a moderate variance for the third factor(psychological impairment (Table-5) but it may become significant among the employed measures as it is a useful tool in the clinical and research setting , which constitute an indispensable characteristic criteria of mobile dependency among paediatric fraternity .This impairment can therefore interfere, with other school or personal activities ,drastically alter individual's quality of life and thereby cause frustration in parents. This scenario put forward further paramount questions for future studies pertaining to the anticipated duration of the symptoms, its severity, and the appropriate modality of treatment for the condition.



Table-6 Mobile Dependency Syndrome Questionnaire Items Statistics

Items in the Questionnaire	Mean	Std. deviation	Corrected Item-Total Correlation	Cronbach's Alpha if Deleted
Q-1. Missed homework due to mobile phone use in last 12 months	3.97	1.370	.668	.827
Q-2. stopped other activities (social gatherings, recreational facilities) that you liked due to mobile use in last 12 months.	3.42	1.525	.450	.845
Q-3. I encountered restlessness, anger, or irritability when I could not use my mobile phone in last 12 months.	3.35	1.423	.402	.849
Q-4. Had trouble in concentrating in class or while doing assignments/exams, due to mobile phone use in last 12 months.	3.65	1.493	.628	.829
Q-5 I need to use newest mobile phone with more application	3.02	1.368	.356	.852
Q-6. The use of mobile phone relieves my unpleasant emotions such as anxiety and sadness in last 12 months.	4.03	1.675	.503	.841
Q-7. I use mobile phone longer than I had intended in last 12 months.	4.26	1.307	.717	.824
Q-8. The people around me tell me that I use my mobile phone too much in last 12 months.	4.27	1.478	.574	.834
Q-9. I feel to use my mobile phone more and more often in last 12 months.	4.05	1.403	.702	.823
Q-10. Feeling pain in the wrists or at the back of the neck, experiencing light headedness or vision due to excessive mobile phone use in last 12 months	3.95	1.844	.573	.836

The estimation of internal consistency was analysed using Cronbach's alpha, obtaining a value (0.852) table -6 which was similar to that found in other published validations, in which the value has ranged from 0.85 to 0.93²¹The results indicated desirable reliability of the test and are consistent with the previous studies, which confirmed the reliability of this questionnaire by Cronbach's alpha ($\alpha = 0.86$)²².Also the Cronbach's alpha for the three extracted factors demonstrated association with objective assessments in coherent with²³.Therefore, the Cronbach's alpha obtained determine the internal reliability was appropriate for the questionnaire for research setting.

Therefore, the major proportion of MDS depicted in this study can be accounted for by the three distinct factors, each impacting differently on

clinical diagnosis and heterogeneity. The findings in this study thus provides important reference as diagnostic profile datafor researchers to evaluate mobile phone dependency with regard to its psychometric features and its contents and to allow this method to be translated into wider clinical practice. The results of this study must be interpreted in the context of its limitations, despite it contributing to the paucity of verified clinical evidence.

This questionnaire was also shown to be sensitive to sex and age differences among adolescents, which makes the demographic section consisted of gender, age, level of study at the school. According to the 650 analysed questionnaires,55.4% of the participants were females. The respondents were secondary level



students (37.5% male and 37.7% Female) and primary level school students (7.1% male and 17.7% Female) in the age group range of between 12 to 16, (77.5%). An additional set of questions related to the demography of parents' employment were collected as proxy measures of economic status of the participants, which are not attached to this article. Survey contributors' demographic characteristics are summarised in table 1.

Methodological considerations

The study design encompasses the resident children from randomly drawn stratified sample investigated using a common study protocol, which includes a mixed method design with both open and close questions to evaluate different domains envisaged for this study. An explicit assessment methodology was developed, and the data collection was organized and analysed towards solving the complex issues by breaking down into meaningful inferences, that is easily readable and understood by all.

It may be recalled the multiaxial system of diagnosis. the DSM-IV- utilized diagnoses across five DSM axes to look at the different impacts and elements of disorders. The five axes included: 1. The primary diagnosis, 2. Personality disorders and/or mental retardation, 3. Medical and/or neurological problems impacting the individual's psychological concerns, 4. The nine categories of environmental and psychosocial stressors impacting the client's psychological functioning, (such as job loss, romantic separations, or deaths), and 5. A 0-100 rating called the Global Assessment of Functioning (or "GAF"), quantifying the person's overall level of functioning²⁴. However this study modernized to DSM-5 guidelines which propose simplified diagnostic process by developing a single axis system for assessment and diagnosis, with its structural, or conceptual, level uniqueness reinforces a holistic and reliable perspective for psychometric test of this kind. Rather than provide an exhaustive review of changes in the DSM-5, we provide a brief review of the shift from a multiaxial system to a nonaxial system trailed in the study which significantly impacts use of the manual in daily practice for future development and diagnose mobile dependency syndrome in children. We further note that the diagnoses set forth in the DSM-5 promote guidelines of the World Health Organization Disability Assessment Schedule 2.0²⁵ is designed to be applicable to all health conditions, including diseases, illnesses, injuries, mental or emotional problems, and problems with alcohol or drugs and redefine that illness, neither impairment nor disability/disorder is not considered an inherent feature of any medical or psychiatric diagnosis

similar to medical conditions to how metabolic diseases or heart disease are independently verifiable through objective tests. Instead, they amount to symptoms and behaviours' reported by clients and/or study tools reflected and demonstrated on our study, in turn, are observed by the clinician like any psychometric test, in accordance with their code of ethics and legal statutes²⁶

A major strength of this study is that its data are from a randomly selected population covering urban community typical for a district in south India, in 2020. Reliability analysis ensured that potentially confounding factors were considered. However, there are some methodological limitations: self-reported measures may risk recall bias and social factors, children may inflate indications in order to make their situation seem worse, or they may under-report the severity or frequency of symptoms in order to minimize their difficulties. Student might also simply be mistaken or misremember the material covered by the survey.

In the ubiquitous environment and their persistent interaction with it, today's students think and process information fundamentally differently from their predecessors. as the generation of people who grew up in the era of technology, which disseminate in internet and mobile world as digital native²⁷. As the digital natives are comfortable with technology and computers at an early age and consider technology to be an integral and necessary part of their lives, the frame of survey format shall be designed and communicated more intuitively to teenagers and children to contain their true aspirations in future studies.

Because today's young people are digital natives, this level of use indicates that mobile technology will remain a staple in our society and dependence on mobile phone is an obvious reality rather than a global phenomenon problem, but this reality on the rise. It is necessary to continue to study the conditions that foster this dependence, to develop prevention and treatment programs, and to make available assessment and diagnostic instruments, that enable to identify this addictive behaviour. Finally, we need to use evidence to assess severity to anticipate risk and suggest that the feasibility and subsequent evaluation of global roll-out programme of study warrants further urgent exploration.

X CONCLUSION

The major proportion of clinical heterogeneity seen in children with mobile dependency syndrome can be accounted for by three distinct factors each impacting differently on child psychological distress, well-being, academic



performance, social life and health hazard on account of exposure to growing up radio-frequency environment which are more vulnerable carcinogen. There are obvious disparities in knowledge between various types impairments such as mental trauma, physical distress sustained by the children associated with this translational research which directly affect Quality of Life (QoL). Therefore, the characteristics of mobile dependency syndrome are better studied while effective cognition, communication and behaviour interventions are in peril for the target population. Greater recognition of the reliability and psychometric properties obtained in this study manifests as a useful tool for the analysis of problems arising from inappropriate use of the mobile phone among children, may assist clinicians and researchers in identifying appropriately tailored diagnosis and treatment techniques

XI AUTHORS' CONTRIBUTIONS:

This work was carried out in collaboration among all authors. First author conceived, designed, directed the study and contributed to the supervision of the study and wrote the article and its critical analysis, second and third authors designed the study methodology, carried out literature survey, data collection, analysis, statistical study and reports wrote the article and revised the manuscript and results and fourth Author involved in data collection, analysis, statistical study and reports, manuscript review and all authors approved the final manuscript as submitted and agreed to be accountable for all the work.

REFERENCE

- [1]. Lekutis, C. (2013). Cell phone inventor to address the tower workers who installed the backbone for the "Brick". Wirelss Estimator.com
- [2]. Bellina, L. M. (2009). Mobile cell-phones (M-phones) in telemicroscopy: increasing connectivity of isolated laboratories. BMC/Diagn Pathol <https://doi.org/10.1186/1746-1596-4-19>, 4
- [3]. J.Clement. (2020). Internet usage worldwide - Statistics & Facts. Statista, Inc. New York, NY 10004.
- [4]. Mutchler, L. A. (2011). Exploratory Study on Users' Behavior: Smartphone. Association for Information Systems - AIS Electronic Library (AISeL) (pp. Proceedings of the Seventeenth Americas Conference on Information Systems, Detroit, Michigan August 4th-7th 2011 Paper 418 8-6).
- [5]. Choliz, M. (2012). Mobile-phone addiction in adolescence: The Test of Mobile Phone Dependence (TMD). Reseach gate
- [6]. Oksman V, T. J. (2004). Mobile Communication as a Social Stage. The Meanings of Mobile Communication among Teenagers in Finland. *new media & society*, 6(3):319-39.
- [7]. Fortunati L, K. J. (2003). Mediating the human body: Technology, communication and fashion. Manwah (New Jersey):. Mobile phone tribes: Youth and social identity, p. 87-92.
- [8]. Ling RS, P. (2006). Mobile communications: Re-negotiation of the social sphere. Springer-Mobile phones as fashion statements: The co-creation of mobile communication's public meaning, (5)63-81.
- [9]. Nyiri. (2003). Mobile Democracy: Essays on Society, Self, and Politics. Vienna (Austria). Passagen Verlag, 16.
- [10]. Fernández-Villa, T. (2015). Validation and psychometric analysis of the Internet Addiction Test in Spanish among college students. *BioMed Central - Public Health* , 15:953.
- [11]. Ishfaq.A. (2011). Mobile phone to Youngstres- Necessity or Addiction . *Information management and busienss review* , 2(5) pp 229-238.
- [12]. Brod, C. (1984). Technostress: The human cost of the computer revolution. Addison Wesley Publishing Company.
- [13]. Marta.C. (2017). The Technostress: definition, symptoms and risk prevention . <https://www.researchgate.net/publication/325031719>, DOI: 10.14616/sands-2017-1-358361.
- [14]. Kimerly. (1998). CyberPsychology & Behavior Volume 1, Number 3, 1998 Mary Ann Liebert, Inc. Internet Addiction: The Emergence of a New Clinical Disorder Kimberly s. young, psy.d. most. cyberpsychology & Behavior Volume 1, Number 3, 1998 Mary Ann Liebert, Inc. Internet Addiction: The Emergence of a New Clinical Disorder Kimberly s. young, Psy.D. Most, Volume 1, Number 3.
- [15]. Wolstein. (2014). Identifying Problematic Internet Identifying Problematic Internet Users: Development and Validation of the Internet Motive Questionnaire for Adolescents (IMQ-A). *Journal of Medical*



- Internet Research, 16(10): e230.PMID: 25299174.
- [16]. Tania. (2015). Validation and psychometric analysis of the Internet Addiction Test in Spanish among college students. <https://bmcpublichealth.biomedcentral.com/>, 15:953
- [17]. Oviedo, O. (2019). Problematic Use of Mobile Phones in Australia...Is It Getting Worse? <https://www.frontiersin.org/journals/psychiatry>, 10.3389/fpsy.2019.00105.
- [18]. Deborah. (2013). DSM-5 Criteria for Substance Use Disorders. American Journal of Psychiatry, 170(834-851).
- [19]. Jason 2004, Sample size and subject to item ratio in principal components analysis Research gate.
- [20]. Fereshteh, 2019. Exploratory Factor Analysis for TPACK among Mathematics Teachers: Why, What and How, Anatolian Journal of Education, Vol.4, No.1 e-ISSN: 2547-9652 www.e-aje.net pp. 59-76)
- [21]. Palmira Faraci, 2013, Internet Addiction Test (IAT): Which is the Best Factorial Solution? journal of medical internet research.
- [22]. Toda M, Monden K, Kubo K, Morimoto K. Cellular phone dependence tendency of female university students. Jpn J Hyg 2004; 59:383-6.
- [23]. Bianchi A, Phillips JG. Psychological predictors of problem mobile phone use. Cyberpsychology Behav 2005; 8:39-51
- [24]. Heidi Tobe. 2019, Therapist development Centre
- [25]. World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0; WHO, 2010)
- [26]. Liza, 2014, DSM-5 and the Assessment of Functioning: The World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0.
- [27]. Marc Prensky, 2001, Digital Natives Digital Immigrants.