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Measurement and Pedagogical Diagnosis of Phonoholism Among Adolescents

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Abstract

Research objectives: Adolescence is one of the most difficult developmental periods. Studies have documented ill-being among adolescents (Chen & Lucock, 2022; Alimoradi et al., 2022; Lakkunarajah et al., 2022; Li et al., 2022). Furthermore, compared to adults, adolescents are vulnerable to smartphone addiction (Kwon et al., 2013). The aim of the present study was to investigate the extent to which mobile phone use bears the hallmarks of excessive smartphone addiction or so-called phonoholism (Barabsa, 2018). **Research methods:** The Polish version of the Mobile Phone Problem Use Scale for Adolescents (MPPUSA) was used (Krzyżak-Szymańska; 2018).

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A total of 684 adolescents aged between 12 and 18 years took part in the study. They were students from three schools – one primary and two secondary schools (a high school + technical school and a technical school + vocational school). The surveys are representative of these institutions.
A short description of the context: As the scale has more than nine different cultural adaptations, the Polish data can be related to current global trends.
Research findings: The results show that 14% of Polish adolescents are at risk and 3% use mobile phones problematically. Statistically significant relationships were found between the variable describing phone use among adolescents and both gender and type of school.
Conclusions and/or recommendations: The MPPUSA only partially meets the needs of pedagogical diagnosis. There is little evidence from adolescents or data relating to students' perspectives on phonoholism. The school pedagogue or class teacher should ask specific, multidimensional questions when diagnosing the problem. They should also use the clues from this preliminary diagnosis of the phenomenon in everyday school life concerning internet use.

***Keywords*:** smartphone, addiction, problematic mobile phone use, adolescents, pedagogical diagnosis

Introduction

Adolescence is not homogeneous (Nazari et al., 2022), and a common developmental feature of young people is the need for self-identification and comparison with their peers. Young people go through a process of maturing, expanding social strategies and circles of social functioning, escaping the control of parents and educators, constructing identities, recognising and identifying with psychosocial commitments and engaging in risky behaviour, thus testing themselves and their social environment. This developmental period, described by Erikson (2002) as identity crisis, is the most difficult stage of life, and the choices made during it can

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impact an individual's entire life. It is also worth recalling that the proximal and distal context in which an individual is embedded is important for the quality of choices and decisions they make (Erikson, 2002; Cierzniewska, 2017; Cierzniewska & Błachnio, 2021).

The post-pandemic period has revealed many consequences of the long-term closure of educational institutions (Lisiecka et al., 2023), including personal costs (Gogoi et al., 2022). Lifestyle changes (tendency towards isolation, sedentary lifestyle, eating and body image disorders (e.g., Zachary et al., 2020; Jia, 2021), preferences and greater "immersion" in digital technology are now observed. In parallel, studies have reported an increase in rates of depression, anxiety and stress among adolescents (Chen & Lucock, 2022; Alimoradi et al., 2022; Lakkunarajah et al., 2022; Li et al., 2022). As adolescents tend to use new media proactively and are more vulnerable to smartphone addiction than adults (Kwon et al., 2013), it is necessary to diagnose the extent of mobile phone use among adolescents.

The mobile phone is an indispensable attribute of young people, which, through its excessive use, has ushered in new challenges and initiated new challenges in terms of redundancy (see Zeichner et al., 2014). The mobile phone (often a smartphone) has the undeniable advantage of being convenient to use in many everyday situations. We are doing more and more while staying online almost everywhere. The attractiveness of the apps, the ease of use and the multitude of functions optimise our lives, though leading to negative consequences (Kaviani et al., 2020). Researchers have identified many risks, including phonoholism and nomophobia. Phonoholism, or mobile phone addiction syndrome, describes an addiction that leads to a disruption of habits and instincts, including a constant compulsion to call and/or send and receive text messages. It can also mean an addiction to new phone models (Hoffmann, 2017). The second term is an abbreviation of the phrase "no mobile phone phobia". It describes the anxiety, tension and irritability that a person feels when deprived of physical contact with a phone (Bragazzi & Puente, 2014). Further developments in technology and the availability of the internet on smartphones have increased the risk and led to a loss of criteria clearly distinguishing internet addiction from phone addiction.

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As early as 2012, researchers observed that the rate of smartphone addiction was 8.4%, which turned out to be higher than the internet addiction rate of 7.7% (Kwon et al., 2013). When discussing mobile phone users' addictions, researchers document the negative effects these devices have on the wellbeing of the individual and those around them. These include a loss of control over the course of one's life, cognitive relevance, mood regulation and physical and mental health (Billieux, Maurage, et al., 2015; Billieux, Philippot, et al., 2015; Domoff et al., 2020; Pattnaik, 2018; Sunday et al., 2021).

There is still no consensus on a definition for problematic phone use. The current question is therefore whether this is addiction, which is a clinical qualification (behavioural disorder), or whether it takes the form of inappropriate use/abuse of these devices (Billieux, Maurage et al. 2015; Sunday, 2021). This phenomenon calls for research in the face expanding functionality of more mobile phone products. Addiction has very serious consequences, and overuse of these devices is always problematic and can lead to them. A second recommendation from researchers is to set the research in a broader context (Domoff et al., 2020; Fischer-Grote, 2021; Pajor, 2021; Rathod, 2022). Screen addiction can be socially modelled (by adults or even parents who are addicted to smartphones). It can reveal deficits in adolescents' social environment, where there are no close interpersonal relationships or opportunities to be together and spend time together. More broadly, it exposes a defeatism toward the "digital problem" and the lack of "digital education" of parents and schools (Dębski, 2017) and the unlimited internet access on mobile devices (without rules on the use of digital media), which was partially legitimized by the experience of the COVID-19 pandemic (Hasan & Bao, 2020).

Systematic reviews have shown the effects of overload in terms of digital stress/stimulation, distraction, depression, suicidal thoughts, anxiety, loss of sleep, cyberbullying, false prestige, fear of being left out, obesity, vision problems, migraines and cognitive behaviour (cognitive laziness, impaired memory, shortened attention span and multitasking and expectation of immediate gratification for intellectual effort) (Rathod et al., 2022). In a subsequent systematic review, studies from 16 countries

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were analysed, yielding a sample of 47,943 students. The aim was to investigate the impact of smartphone addiction on learning and educational outcomes. The impact on the quality of learning and level of academic performance was clearly confirmed. An important finding for our study was the identification of moderators that differentiated the effect size: region, study group, purpose of use and test tool (Sunday et al., 2021). Differences were identified according to the age of the adolescents and the educational context (primary and secondary school or university), as well as peer contexts, making young people vulnerable to the impact of mobile/smartphone use to varying extents. There is evidence to suggest that young people under the age of 15 are more vulnerable to the consequences of smartphone misuse (Pattnaik, 2018) and that secondary school girls are more susceptible to addiction (Lange, 2021), using smartphones in a way that is more orientated towards peer networks.

Objectives

The aim of this study was to investigate the extent to which mobile phone use bears the hallmarks of excessive smartphone addiction or so-called phonoholism (Barabsa, 2018). This is particularly timely considering the number of published studies on long-term post-pandemic costs. We formulated three research questions:

- How do adolescents use mobile phones and smartphones?
- What differences exist among adolescents in the use of these devices?
- What is the diagnostic potential of the Mobile Phone Problem Use Scale for Adolescents (MPPUSA) for the educator?

Method

The study was run in one primary school and two secondary schools (a high school, and a technical school + vocational school) at the end of the 2023 school year (April–June). Adolescents aged 12–18 years were

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recruited to complete the questionnaires. The procedure received the approval of the management, teachers and parents and the informed consent of the young people who voluntarily took part in the survey. The sociodemographic characteristics of the participants are summarised in Tables 1 and 2.

The Polish version of the MPPUSA was used (Krzyżak-Szymańska, 2018). It consists of 26 items rated on a 10-point scale (1 meaning "completely false" and 10 meaning "completely true"). It is possible to obtain from 26 to 260 points. The score is used to classify the respondent into one of four possible categories:

- people who occasionally use a mobile phone (26–29 points),
- people who use a mobile phone appropriately (30–130 points),
- those at risk of problematic mobile phone use and at risk of addiction (131–166 points) and
- problematic mobile phone users (167–260 points).

The MPPUSA is a reliable tool, whose Polish version has a Cronbach's α of 0.96; in the current study, the Cronbach's α was 0.874. Although the authors of the scale (Lopez-Fernandez et al., 2013) assumed a single-factor structure, this result was not replicated in the Polish version. The study resulted in a three-factor model (see Table 5). According to Krzyżak-Szymanska (2018) the first factor, "Dominance", includes behaviours such as hiding the amount of time spent on a mobile phone, being late because of a mobile phone, being ineffective in studies and experiencing a fear of turning off one's phone. The reliability of the subscale was good (Cronbach's α = 0.921). The second factor, "Involvement", means, among other things, spending too much time using a phone and losing control over its use. For the Polish adaptation, its Cronbach's α was 0.918. The third factor, "Entrapment," describes dependency or a feeling of being lost without a phone (Cronbach's α = 0.864). A more detailed description is available in the methodology manual (Krzyżak-Szymanska, 2018). In our study, the scatterplot test also indicated a 3-factor solution. There was little variation (see Table 5), and the subscales' reliability was calculated as α = 0.860, 0.808 and 0.777, respectively.

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There were also questions about the amount of time spent with a mobile phone during the week and on weekends. Recognising the limitations of the MPPUSA, additional questions on Internet and gaming use were introduced.

The results are part of a larger survey covering self-compassion (an adaptation of the youth version of the tool) in addition to inappropriate phone use. The analysis was performed in the software program Statistica 13.3.

Results

The survey included 684 students, whose sociodemographic data are shown in Table 1. The respondents lived in both rural and urban areas (including small towns as well as large cities with up to 500,000 inhabitants). Only metropolitan areas with more than 500,000 residents were poorly represented. High school students predominated in the survey, but a sample of teenagers studying in primary school was also surveyed (Table 2).

Table 1. Distribution of age, by gender (N=684)

	N	M	Mo	N Mo	Min	Max	Sd	N/A
Total	661	16.00	16.00	161	12	20	1.76	23
Male	384	16.29	16.00	86	12	20	1.86	4
Female	247	15.53	17.00	70	12	20	1.53	–
Other	21	16.14	16.00	8	14	18	1.11	18
N/A	9	16.33	17.00	4	13	19	1.66	1

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Table 2. Sociodemographic characteristics of the sample (N=684)

		Total N(%)	Male N(%)	Female N(%)	Other N(%)	N/A N(%)
Place of residence	238(35%)	126(32%)	102(41%)	8(36%)	2(7.5%)	Town with
	up to 20,000 people	113(17%)	49(13%)	56(23%)	5(23%)	3(11%)
	Town with between 20,000 and 100,000	147(22%)	64(16%)	75(30%)	5(23%)	3(11%)
	City with between 100,000 and 500,000	153(22%)	139(36%)	11(4.5%)	1(4%)	2(7.5%)
	City with more than 500,000	17(2%)	10(3%)	2(1%)	3(14%)	2(7.5%)
Village	N/A	16(2%)	–	1(0.5%)	–	15(55.5%)
Education	Primary school	106(15%)	53(14%)	50(20%)	1(5%)	2(7%)
	High school	197(29%)	56(14.5%)	128(52%)	8(36%)	5(19%)
	Technical school	326(47%)	242(62%)	68(27.5%)	9(41%)	7(26%)
	Vocational school	41(6%)	36(9.25%)	1(0.5%)	4(18%)	–
	N/A	14(2%)	1(0.25%)	–	–	13(48%)

The values of descriptive statistics are summarized in Table 3. Of particular note is the significantly higher MPPUSA score for girls compared to boys. Student's t-test resulted in a value of t(627)=-497 (p<0.000).

Table 3. MPPUSA – descriptive statistics

	MPPUSA								
	M	Mdn	Mo	N Mo	Min	Max	SD	Skewness	Kurtosis
Adolescents (N=671)	96.383	94	Multiple	12	25	250	37.337	0.469	0.078
Male (N=384)	90.224	86	Multiple	9	25	220	34.711	0.578	0.185
Female (N=245)	104.959	105	Multiple	5	25	250	38.538	0.336	0.233

Based on the data, 14% of adolescents are at risk, and 3% use smartphones in a problematic way. These values are lower than those of the Polish version. At that time, 38.5% of respondents were in the at-risk category and 5.9% used the phone in a problematic way (Krzyzak-Szymanska, 2018).

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Table 4. Categorization of respondents, by phone use and gender

MPPUSA		Total N=678(100%)	Sex	
	Values		Male N=389(100%)	Female N=245(100%)
People who occasionally use a mobile phone	26–29	7(1%)	5(1%)	2(1%)
People who use a mobile phone appropriately	30–130	545(82%)	333(87%)	184(75%)
People at risk of problematic mobile phone use and at risk of addiction	**131–166**	**101(14%)**	**41(10%)**	**47(19%)**
Problematic mobile phone users	**167–260**	**25(3%)**	**10(2%)**	**14(5%)**

The analysis of the 3-factor model solution showed that school type is a criterion that significantly differentiates young people (see Table 6 and Figure 1).

Table 5. Replication of MPPUSA factors

MPPUSA	Factor loadings			Factor loadings		
	1	2	3	1	2	3
	(Krzyżak-Szymańska, 2018)			(current study)		
Item 14	0.819	0.098	0.163	0.720	-0.102	0.125
Item 22	0.781	0.195	0.320	0.772	-0.003	0.229
Item 21	0.773	0.259	0.237	0.622	0.155	0.137
Item 18	0.751	0.316	0.160	0.556	0.361	-0.024
Item 24	0.697	0.128	0.275	0.619	-0.057	0.161
Item 12	0.644	0.255	0.403	0.547	0.166	0.350
Item 17	0.639	0.461	0.186	0.496	0.388	-0.005
Item 4	0.583	0.443	0.115	0.465	0.391	-0.034
Item 6	0.260	0.761	0.251	0.124	0.710	0.046
Item 3	0.266	0.700	0.266	-0.011	0.737	0.145
Item 19	0.450	0.647	0.158	0.193	0.681	0.066
Item 20	0.305	0.600	0.292	0.053	0.475	0.400
Item 2	0.071	0.589	0.399	-0.147	0.542	0.270

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MPPUSA	Factor loadings			Factor loadings		
	1	2	3	1	2	3
	(Krzyżak-Szymańska, 2018)			(current study)		
Item 5	0.408	0.583	0.227	0.262	0.567	-0.119
Item 23	0.481	0.582	0.218	0.459	0.319	0.064
Item 1	-0.014	0.577	0.403	0.058	0.478	0.169
Item 15	0.538	0.558	0.207	0.519	0.386	0.097
Item 9	0.215	0.545	0.436	0.391	0.321	0.162
Item 11	0.515	0.541	0.214	0.405	0.440	0.093
Item 7	0.303	0.247	0.676	0.219	0.062	0.661
Item 16	0.024	0.322	0.655	-0.076	0.245	0.628
Item 13	0.403	0.293	0.633	0.344	0.155	0.574
Item 25	0.299	0.115	0.619	0.323	-0.068	0.283
Item 26	0.422	0.270	0.611	0.460	0.094	0.540
Item 10	0.213	0.299	0.597	0.069	-0.015	0.632
Item 8	0.466	0.359	0.498	0.186	0.253	0.342
Variance explained	6.313	5.357	4.087	4.428	3.794	2.637
Eigenvalues	0.243	0.207	0.157	0.170	0.146	0.101

Rotation method - Varimax with Kaiser rotation

Table 6. Analysis of variance for the three MPPUSA factors, by school type (primary, high, technical and trade school)

	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
Factor 2	79,498	3	26,499	1889,856	660	2,863	9,254	0,000
Factor 1	35,362	3	11,787	1811,116	660	2,744	4,296	0,005
Factor 3	174,694	3	58,231	2242,133	660	3,397	17,141	0,000

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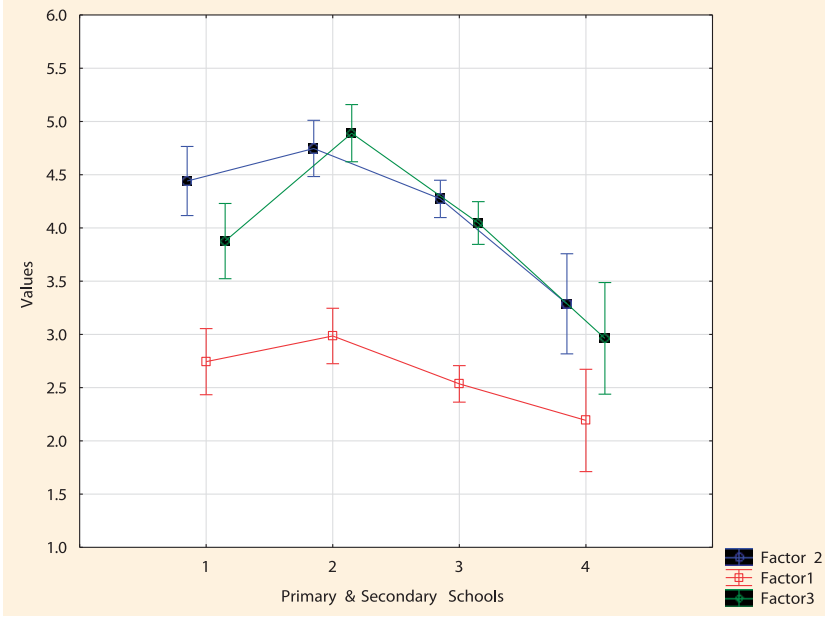
Figure 1. Differences in mean values of MPPUSA factors 1, 2 and 3 in primary schools (1), high schools (2), technical schools (3) and trade schools (4)



To determine the nature of the differences, post hoc analysis was conducted using the HSD test for unequal samples. For factor 1, technical school students scored significantly higher than high school students. For factor 2, students from trade schools scored significantly lower than students from the other schools. High and primary school students scored significantly higher than their technical school counterparts. For factor 3, high school students had the highest score, which differed significantly from the other groups. On the other hand, technical school students had higher scores than primary and vocational school students.

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Table 7. Average values of MPPUSA factors 1, 2 and 3 in primary schools (1), high schools (2), technical schools (3) and vocational schools (4)

FACTOR	School	n	M	SD	HSD (unequal N)		
					(1)	(2)	(3)
1	primary (1)	101	2.744	1.571			
	secondary (2)	197	2.985	1.852	0.729		
	technical (3)	325	2.535	1.571	0.807	0.035	
	vocational (4)	41	2.192	1.521	0.432	0.132	0.784
2	primary (1)	101	4.441	1.643			
	secondary (2)	197	4.747	1.880	0.572		
	technical (3)	325	4.273	1.609	0.896	0.028	
	vocational (4)	41	3.288	1.489	0.011	0.001	0.042
3	primary (1)	101	3.877	1.789			
	secondary (2)	197	4.890	1.913	0.001		
	technical (3)	325	4.047	1.838	0.914	0.000	
	vocational (4)	41	2.963	1.660	0.111	0.000	0.039

The information presented in Tables 8 and 9 shows that a large percentage of young people spend many hours with a mobile phone. More than half of the respondents (53%) indicated the two longest time frames – "4 to 6 hours" and "more than 6 hours" – as estimates of their time on a mobile phone. Nearly one in three people use the internet via mobile phone for up to 4 hours a day. As many as 25% of the teenagers surveyed spend more than 6 hours daily in this way. It should be noted that this activity excludes games.

Table 8. Time spent using a mobile phone during the week

	None at all	Up to 1 hour	1 to 2 hours	2 to 4 hours	4 to 6 hours	Over 6 hours	No data
	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)
Using the internet with a mobile phone	10(2%)	35(5%)	107(16%)	199(30%)	145(21%)	169(25%)	6(1%)
Total mobile phone use	12(2%)	27(4%)	79(12%)	186(28%)	170(25%)	189(28%)	8(1%)
Playing games on a phone	234(35%)	217(32%)	108(16%)	59(9%)	20(3%)	26(4%)	7(1%)

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The results proved consistency, albeit incomplete, in terms of dysfunctional phone use and reported long durations of time spent on the phone.

Table 9. Time spent using a mobile phone during the week by those at risk of problematic phone use and problematic phone users (N=119)

	None at all	Up to 1 hour	1 to 2 hours	2 to 4 hours	4 to 6 hours	Over 6 hours	No data
	N	N	N	N	N	N	N
Using the internet with a mobile phone	4	6	13	22	22	52	–
Total mobile phone use	5	4	8	23	18	60	1
Playing games on a phone	44	31	13	13	3	14	–

Discussion

Our study is part of the growing literature on the utility of the MPPUSA (Mach et al. 2020). The purpose of the article goes beyond a narrow analysis of the utility of the tool, and uses the results to discuss how post-pandemic immersion in digitality can modify attitudes towards the problem of phonoholism.

Research conducted in Poland in 2016 and 2019 (a total of more than 50,000 respondents) by the Dbam o Mój Z@sięg Foundation and the University of Gdansk, as part of the project "Young Digital" on the problematic use of smartphones by schoolchildren aged 12–18, indicated that smartphones and phones are a regular part of children's lives from the age of 10, and in large metropolitan areas from the age of 7 or 8. Mobile phones or smartphones are used regularly by 86.6% of respondents, and 92% of these mobile devices have internet access. More than half use their devices the same amount of time on weekdays and at weekends, so school obligations do not limit the period of use. Among respondents, 35% reach for the phone dozens of times a day. The vast majority of survey participants (77%) are aware of possible mobile/smartphone addiction. When asked whether they self-identify as a mobile phone addict, 20.8% of respondents answered

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in the affirmative, and almost one in ten chose the answer "it's hard to say". The researchers' diagnosis was much more optimistic, as in their interpretation only 1%–2% can be classified as mobile phone addicts (Debski & Bigaj, 2019, 2022).

The researchers also reported intriguing information about the ways of using mobile phones: Respondents ranked social networking and communication with other people first on the list, followed by searching for information, developing their own passions and interests and downloading files with important information (74%–80% of respondents). Other activities of young people include watching films (78%) and listening to musicians of their choice (75%). Two thirds of the respondents keep in touch with their peers this way, and thanks to the internet their circle of friends has expanded by more than 50%.

NASK's report, "Teens 3.0", which determines the extent to which teens are addicted to the internet, computers and smartphones, is based on research using the E-SAPS Test18. This instrument consists of subscales measuring stimulus tolerance, withdrawal syndrome, somatic symptoms and expected gratification. The survey shows that 33.6% of respondents have a high level of problematic internet use, and 3.2% have a very high level, clearly indicating a problem. It also found that girls of high school age are at the highest risk. The researchers recognise the possibility that parents are unable to properly assess the degree of their children's addiction or that teens may hide their addiction. It turns out that one in six teens surf the internet after 10 pm, when parental control is greatly reduced (Lange, 2021, pp. 67–71). Activities identified by teens in the survey included accessing gambling sites (47.2%), publishing private photos (45%), publishing private videos (43.9%) and using social networks (40.3%). Less frequent activities included using Google search (4.3%), browsing news sites (4.8%), using email (5.5%), video chatting (5.9%), using cloud technology (5.9%), reading weblogs (6.7%) and using psychology tests and/or social network games (6.7%) (Lange, 2021, p. 75). The discrepancy in the cited studies is likely due to the methodology used, though the key results regarding the degree of addiction are significantly different, which is hard to explain. Perhaps

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the pandemic led to a significant increase in excessive mobile internet and smartphone use.

Nevertheless, of the 671 participants in our survey, 14% of teens are in the at-risk group and 3% are problematic phone users. This result may seem optimistic compared to previously published estimates of the number of problematic phone users. For example, in the Polish version of the MPPUSA, the group of problematic phone users was almost twice as large (5.9%) (Krzyzak-Szymanska, 2018). In another study that used an abbreviated version of the MPPUSA on a Polish sample, researchers identified problematic users at 9%, but their sample did not consist of teenagers.

The results of our study provoke the hypothesis of changing social attitudes towards frequent smartphone use as a post-pandemic effect. The need for remote learning legitimised long hours spent online. Although students returned to school, parents' and students' vigilance and sensitivity to the time spent on a mobile phone did not return to their pre-pandemic state. Testing this hypothesis requires further research on a larger scale. However, there are indications that support this line of research.

The current study of 450 high school students from across Poland (Łuczynski & Pietruszka, 2022) found that adolescents (aged 15–20) declared that they could live without a phone (64%), but did not actually try. They were more likely to see the consequences of phone abuse in their peers than in themselves. The vast majority (61%) do not take any preventive measures to protect themselves from addiction. Clearly, vigilance against phonoholism is organic. What's more, most of them spend a lot of time (more than 4 hours) on the phone every day.

The aspect of time seems to be crucial in the new, post-pandemic context of managing phone addiction. In the results of our study, we looked for a pattern that would differentiate the use of smart phones according to school or gender. We discuss the results of this below. It should be noted, though, that the analysis showed a change in one of the factors in the tool, namely "Involvement". The three items that no longer loaded on this factor were interpreted quite differently by the respondents in the time domain. It seems that allocating time for being online requires significant adjustment, in the field of research as well as in upbringing and education.

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Referring to these differences, the data prove that the type of school (primary school, high school, technical school or vocational school) significantly differentiated the factors of problematic phone use among young people. For "Dominance" (factor 1), technical school students scored significantly higher than high school students. On the other hand, for "Involvement" (factor 2), vocational school students scored significantly lower than students from other schools. High school and primary school students scored significantly higher than their technical school counterparts. In "Entanglement" (factor 3), high school students received the highest score, which differed significantly from the other groups. Although the factors offer a wide range of interpretive possibilities, they should be used with caution, as the make-up of the MPPUSA's factors varies depending on the language version (Mach et al., 2020).

An analysis of the significance of differences in phone use among adolescents confirmed the differences between girls and boys described in the literature (Billieux et al., 2007; Takao et al., 2009; Kwon et al., 2013). In our study, girls had a significantly higher MPPUSA score (M=104.959) compared to boys (M=90.224). Problematic phone users (n=119) accounted for only one in ten boys surveyed, but as many as one in five girls. The predominance of the problem among girls still requires in-depth research. In the literature, the reasons are attributed to different motives for mobile phone use in women/girls than in men/boys. In particular, phone addiction in women is explained by a higher propensity for social interaction than in men (Billieux et al., 2007). Moreover, some have argued that the higher self-reported scores must be linked to the fact that women tend to be aware of and express their problems more openly than men (Kwon et al., 2013).

A review of both Polish and foreign studies reveals a certain research gap regarding motives for being in contact with others and widespread internet surfing. Researchers indirectly touch on this aspect by considering factors related to the psychological condition of young people. Compensating for certain negative states, such as feelings of loneliness or fear of social exposure, has been identified in research and has positive, negative and indifferent consequences for the individual (Long et al., 2016).

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"Cognitive relevance" has also been identified, defined as a focus on interests and passions that can be moderated by social interactions and online resources, uses hours of a young person's activity (Petry, 2014) and can be identified as smartphone addiction during screening. We would not interpret such engagement with printed text as negative, although the physical health consequences may be similar. From the detailed Polish studies cited above, we can indirectly identify the presence of this type of youth engagement, which can be an important positive dimension of pedagogical work in the school classroom or school as a whole.

Limitations

The research, based entirely on self-reporting tools, followed a mixed model: a paper-and-pencil group survey at school and an online group survey at school. The complexity of the survey procedure in schools prolonged the data collection process (getting the consent of the management, parents, educators and the students themselves). Both the voluntary nature of the survey and the participants' willingness to cooperate significantly affected the researchers' access to young people; the sample is certainly not representative. It would be worthwhile, in the context of the unresolved relationship between gender and phone addiction in the literature, to repeat the data collection on a sample with more girls. The cross-sectional measurement would have to be replaced by a longitudinal measurement.

Conclusions and recommendations

The chosen research tool, the MPPUSA, is commonly used worldwide in many language and cultural versions, as emphasised by the authors of its Polish version, and can be used for screening (i.e. for preliminary identification of adolescents' problematic mobile phone use) (Krzyzaniak-Szumanska, 2018). The following conclusions were drawn:

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1. The school pedagogue or class teacher should ask specific, multidimensional questions when diagnosing phonoholism in accordance with the preliminary diagnosis of the phenomenon in everyday school life. In our opinion, the motives and types of activity related to using the internet are important.
2. Thus, we do not have a standardised tool for the Polish context that would take into account changes in the functionality of smartphones and mobile phones. At the same time, it should be relatively simple to use with children and adolescents, given the differences in the level of thinking and language of such important self-reporting scales. Another tip should be the fact that not every school has a psychologist at its disposal, so the tool should be available to school educators and classroom teachers.
3. An issue generally not raised by researchers outside the NASK "Teens 3.0" report is the assumption that young people will answer the questionnaire honestly, which can be quite doubtful. Even the follow-up questions in the tool are not a problem for savvy teens who adopt a conscious attitude of falsifying their behaviour. Adolescents are well aware of the symptoms of addiction (see Dębski, 2017) and the consequences of reporting them to the adult world. Camouflaging excessive mobile phone and smartphone addiction may be a learnt attitude practiced in everyday life. In addition, studies have been published showing discrepancies between self-reported and actual mobile phone use recorded by tracking applications (so-called psychoinformatics methods; see Montag et al., 2015). The context of the study may also have been modified by the ongoing discussion in the public space about the use of instant messaging in schools and the resulting ban on mobile phones and smartphones in many schools. Resistance among adolescents may stem from a sense of being cut off from the opportunity to satisfy a natural need for contact with others, where the phone is a substitute for real interactions.

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