Problematic Mobile Phone Use among Adolescents with Mild Intellectual Disability[*]

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This study was conducted with the aim to determine the frequency and predictors of problematic mobile phone use in adolescents with mild intellectual disability (MID) and typically developing adolescents (TDA). The sample included 623 TDA and 67 adolescents with MID. The Mobile Phone Problem Use Scale, Loneliness and Social Dissatisfaction Scale, and Rosenberg Self-Esteem Scale were used as primary outcome measures. The percentage of MID and TDA participants with problematic mobile phone use was 11.9% and 9.8% respectively, but there were twice as many participants who belong to the risk group among the participants with MID (20.9%) than among TDA ones (10.2%). Problematic use of mobile phones was related to the number of years of mobile phone usage, more frequent use, female gender, younger age, as well as with a lower level of self-esteem, and a higher level of loneliness. This study showed that almost every third adolescent with MID is having problematic or risky mobile phone use.

Key words: mobile phone, loneliness, self-esteem, intellectual disability

Highlights:

- Adolescents with MID are two times more likely to have risky mobile phone use compared to their typically developing peers.
- Gender and age are the main predictors of problematic mobile phone use in adolescents with MID.
- The length of phone usage and frequency of its use are also significant predictors.

The first commercial versions of mobile phones were introduced in the 1980s. By gradually reducing their size, as well as the expenses of its purchase and later usage, mobile phones became available to an increasing number of potential users (Harris & Cooper, 2019). Apart from its numerous positive sides, it has been determined that the use of mobile phones can, in certain situations, cause symptoms similar to substance use disorders (De-Sola Gutiérrez, Rodríguez de Fonseca, & Rubio, 2016). The first instrument for assessing problematic mobile phone use originated in Japan (Toda, Monden, Kubo, & Morimoto, 2004), while the seminal study on psychological predictors of problematic mobile phone use was published in the following year (Bianchi & Phillips, 2005). Available studies and clinical practice up to 2010 (Chóliz, 2010) suggested that the phrase "mobile phone addiction" should be included in the Diagnostic and Statistical Manual of Mental Disorders (DSM–5; American Psychiatric Association [APA], 2013), as a form of technological addiction. Nevertheless, mobile phone addiction has not been recognized as a mental disorder.

Some authors believe that the problematic use of mobile phones is a form of behavioural addiction, accompanied by specific behaviours, such as craving to use, withdrawal, and tolerance (e.g., Chóliz, 2012; Sahin, Ozdemir, Unsal, & Temiz, 2013; Yang, Zhou, Liu, & Fan, 2019). The other use nomophobia (i.e., "No mobile phone phobia") to refer to problematic use of mobile phones (e.g., King et al., 2013; Yildirim & Correia, 2015). This term indicates an irrational fear of being without a mobile phone, or being without a signal, and if that really happens to them, they feel anxiety, which goes away shortly after they come into contact with a mobile phone again (Martínez & Echauri, 2014). Nevertheless, exploratory studies failed to prove the existence of neurobiological or psychological mechanisms which underlie the aetiology of addictive behaviours related to the use of mobile phones (Billieux, Maurage, López-Fernández, Kuss, & Griffiths, 2015).

The term problematic use of mobile phones is used in many studies as a synonym for addictive behaviours in relation to the use of mobile/smartphones (e.g., Martinotti et al., 2011; Vally & El Hichami, 2019; Zhu, Xie, Chen, & Zhang, 2019). However, some authors believe that, in the absence of consensus on the nature and character of technological addictions, it is more appropriate to use the term problematic use, not as a synonym, but as a substitute for addictive use (López-Fernández, Honrubia-Serrano, & Freixa-Blanxart, 2012). The terms dependence, overuse, pathological use, excessive use, and others are used with the same or similar meaning. Similar terminology is used to denote a pathological pattern of behaviours in the area of Internet use, often without the authors' intention to point to a specific clinical category (Popadić, Palović, & Kuzmanović, 2020). Due to the lack of consensus on technological addictions, we used the term problematic mobile phone use to indicate the lack of control, cravings, tolerance and withdrawals possibly originating from the use of mobile phones.

Adolescents and younger adults, as well as females, are especially prone to problematic mobile phone use (Billieux, 2012; Carbonell et al., 2012; Oviedo-Trespalacios, Nandavar, Newton, Demant, & Phillips, 2019). Problematic mobile phone use is, among other things, also related to loneliness (Bian & Leung, 2015; Tan, Pamuk, & Dönder, 2013) and low level of self-esteem (Bianchi & Phillips, 2005; Ehrenberg, Juckes, White, & Walsh, 2008; Leung, 2007). It is especially important for adolescents to belong to a particular peer group, to identify with the appearance, preferences, and lifestyle of that group. Individuals who experience loneliness and low self-esteem sometimes try to compensate their social difficulties and overcome negative emotional states by using the options offered by modern mobile technology (Barker, 2018). Some authors find that low self-esteem is a significant predictor of problematic mobile phone use (Bianchi & Phillips, 2005).

Studies on the use of mobile phones in participants with different forms of disabilities are mainly focused on the availability of such devices and on the possibility of their use for educational purposes. The samples in available studies most frequently included children with autism spectrum disorder and, to a lesser degree, children with intellectual disability (ID; Chelkowski, Yan, & Asaro-Saddler, 2019). Studies assessing the frequency and consequences of problematic mobile phone use in people with ID are scarce and mainly conducted in Spanish speaking countries. Although no significant differences between typically developing peers and young adults with ID was found in mixed samples of participants from Spain, Mexico, and Chile (Jenaro et al., 2018b), results of available studies indicate an inclination of young adults with ID towards problematic mobile phone and problematic Internet use (Flores et al., 2018; Jenaro et al., 2018a).

The analysis of potential problematic use of mobile phones in people with ID has never been conducted in Serbia. Thus, this study was conducted with the aim to determine the frequency of problematic mobile phone use in adolescents with mild ID (MID) and typically developing peers. In addition, the aim was to determine the impact of self-esteem and loneliness on problematic mobile phone use when considering gender, age, number of years of mobile phone usage, the frequency of its use, and levels of intellectual functioning.

Methods

Participants

The study included two groups; 67 adolescents with MID (MID group) and 623 typically developing adolescents (TDA group). The average age of the MID group was 16.64 years (SD = 1.23) ranging from 15 to 19 years, with 42 (62.7%) males. The average age of the TDA group was 16.70 (SD = 1.27) ranging from 15 to 19 years, with 171 (27.5%) males. No statistically significant difference was found between the two groups in relation to chronological age (t(689) = -.36; p = .72). There were more males than females in the MID group (χ^2(1) = 35.20; p < .001), which is in accordance with the gender distribution of MID in the general population (e.g., Wilson, Parmenter, Stancliffe, Shuttleworth, & Parker, 2010).

The participants of the TDA group attended secondary vocational schools (i.e., medical, designer, technical, economic, beauty school, and aviation), while the participants with MID attended secondary schools for students with disabilities in Belgrade and Pančevo, Serbia. The inclusion criteria were attending school regularly, possession of a mobile phone, and informed consent obtained from participants and/or their parents depending on their age and legal status. There were three additional sample inclusion requirements for participants with MID: the MID diagnosis made based on the formal assessment of intellectual and adaptive functioning, absence of any comorbid condition, which would significantly affect the results, and inability to understand and answer questions on Likert-like scales. The diagnosis of MID was determined by intellectual functioning deficits (i.e., IQ 50–69) and adaptive functioning deficits in conceptual, social, and practical domains (WHO, 1992). All participants were diagnosed prior to enrolment in primary school for children with disabilities. The assessment of intellectual and adaptive functioning was done at least once more, before enrolment in a secondary school.

Instruments

The following socio-demographic variables were collected: gender, age, and IQ score. With regard to general information on using mobile phones, the participants were asked to state when they had started to use a mobile phone and how often they used it.

Problematic mobile phone use. Problematic mobile phone use was measured using an adapted version of the Mobile Phone Problem Use Scale (MPPUSA; López-Fernández, Honrubia-Serrano, Freixa-Blanxart, & Gibson, 2014). The original version of the MPPUSA has 27 items and it was developed for adults (Bianchi & Phillips, 2005). In the MPPUSA, the participants were asked to give answers on a 10-point Likert scale. Since it was very difficult for the participants with MID in our sample to give answers on a ten-point scale, we reduced the given answers to a five-point response scale (1 = *completely untrue* / 5 = *completely true*). A higher score implies a more problematic use of mobile phones. A factor analysis showed that the MPPUSA can be considered to be a unidimensional measure, with only one item having a low factor loading ("All my friends own a mobile phone"), which was omitted for our version. Apart from that, the content of individual items was adapted for adolescents. Thus, the MPPUSA version used in this study had 26 items. The scores ranged from 26 to 130, with a higher score indicating a higher degree of problematic mobile phone use. The MPPUSA had an excellent internal consistency (α = .97) in the original study (López-Fernández et al., 2014). In our study, Cronbach's α was .89 for participants with MID and .90 for TDA participants.

Loneliness and Social Dissatisfaction. The assessment of loneliness and social dissatisfaction in the peer group was based on 16 items of the Loneliness and Social Dissatisfaction Scale (LSDS; Asher & Wheeler, 1985). The participants were expected to state to what extent they agreed with given statements on a five-point Likert scale, as in the MPPUSA. The scores ranged from 16 to 80. The items were recoded so that a higher score indicated a lower level of loneliness and social dissatisfaction. Good internal consistency of LSDS was determined in our study, both among participants with MID (α = .87), and TDA (α = .83). In the original study (Asher & Wheeler, 1985), the internal consistency of this scale was higher (α = .90).

Self-esteem. The level of self-esteem was determined by the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), which consists of 10 items (e.g., "On the whole, I am satisfied with myself"). Each of the claims ranged from 1 = *strongly agree* to 4 = *strongly disagree*. The scores ranged from 10 to 40. The items were recoded so that a larger number of scores indicated a higher level of self-esteem. Internal consistency reliability of this scale was acceptable in participants with MID (α = .68), while it was good in TDA (α = .85). Internal

consistency of RSE in TDA participants is close to the mean reliability across nations (α = .81; Schmitt & Allik, 2005). Internal consistency of the RSE in adolescents with MID ranged from questionable (α = .63; Pérez Tabuenca, 2016) to good (α = .83; Verberg, Helmond, Otten, & Overbeek, 2019). The suitability of the RSE in participants with MID can vary significantly, which was previously reported (Park & Park, 2019).

The translation and cultural adaptation of all instruments for Serbian was done following the standard procedure of forward translation. After the instruments had been translated into Serbian, a team for language adaptation of the scales was formed, primarily for the purpose of adapting the scales for participants with MID. Apart from the authors of the paper, who work with people with MID, one of the team members was a native speaker of English and Serbian. A previously conducted pilot study showed that participants with MID took the sentence "I find it difficult to switch off my mobile phone" literally, and almost without exception stated that it was easy to switch off a mobile phone. Thus, we rephrased this item ("I hate it when I have to switch off my mobile phone"). Double negatives were excluded from certain LSDS items which were confusing for participants with MID, and some abstract terms were replaced with more concrete ones. The translation of the Serbian versions of the used scales was done by a university English teacher, who was not familiar with the adaptation procedure. Finally, one of the authors of the paper, an English teacher, and a linguist, assessed to what extent the original text matched the translations.

Procedure

The sample was formed by the authors contacting the principles of two secondary schools for students with disabilities and six vocational secondary schools and informing them about research goals. Psychological-pedagogical service of secondary schools for children with disabilities made a list of all students with MID, whose parents or guardians were contacted afterwards explaining the study, inviting to participate, and asking to give informed consent for participating if interested. All 72 contacted agreed to participate. The TDA sample was formed by choosing one or two classes of each grade in six schools, depending on the number of students. The classes were selected randomly. With the exception of one school in which we only had permission to test adult students (18 years of age and over), in all other schools, parents were asked to give informed consent for their children to participate in the research. None of the parents refused to give informed consent, but several TDAs gave up on completing the questionnaires, saying that there were too many questions and that the research was boring.

All participants were informed that the participation in the study was voluntary and that they could withdraw at any time if they wanted to. At least one of the authors collected data in each school. Of the initially contacted 72 participants with MID, 69 (95.8%) used a mobile phone. Subsequently, two participants were excluded from the sample because they could not answer Likert-type questions.

All participants in the TDA group completed the instruments in their classrooms. Obtaining data from participants with MID differed from the testing method of their TDA peers. Before the testing, we assessed the ability of every participant to adequately answer questions with Likert scales. In a separate room in the school, we presented video clips of children playing basketball and scoring with a different degree of success. Afterwards, each potential participant was offered to answer the question whether the child from the video clip they had just seen scored never, always, sometimes, etc. Two participants were unable to give adequate answers to the questions asked, the final sample included 76 adolescents with MID. The participants were tested one on one, since most had difficulties with reading comprehension. Additional visual support in the form of cards with answers was provided to each participant. The participants were allowed to ask additional questions and describe

their experiences. They were allowed to take breaks. If needed, the examiner explained the meaning of some words.

The research was approved by the Ethics Committee of the Faculty of Special Education and Rehabilitation, University of Belgrade.

Results

Construct Validity

Exploratory factor analysis (EFA), principal axis factoring method (PAF), was used to test the construct validity of all three scales.

The PAF results showed that for the whole sample one factor can be extracted on the MPPUSA, with factor loading of all items over .3, which explained 26.3% of the variance. In order to check factor similarity (i.e., factor invariance), we assessed the factor structure in two groups (MID and TDA) and calculated Tucker's Coefficients of Congruence. According to Lorenzo-Seva and ten Berge (2006), values higher than .95 imply that two factors can be considered equal and, in our study, the MPPUSA gained a value of .97.

For the other two scales, the LSDS and the RSE, PAF) was also used to test the construct validity. Based on Kaiser-Guttman and Cattel scree plot criteria, both scales show one-factorial solution, with all loadings above .3. These one-factorial solutions explain 31.5% of variance for LSDS scale, and 37.6% of variance for RSE. We also checked measurement invariance, and Tucker's Coefficient of Congruence was .99 for LSDS scale and .92 for RSE. We noticed that item 8 from RSE scale behaves somewhat differently in two groups, and when we removed it, Tucker's Coefficient of Congruence was .96. However, since the removal of this item did not change any of the further results, we decided to keep it. We can conclude that LSDS factors in two groups can be considered equal, while RSE factors show fair similarity, or can even be considered equal without item 8 (Lorenzo-Seva & ten Berge, 2006).

Problematic Mobile Phone Use

At the time when the study was conducted, 591 (94.8%) TDA participants and 35 (52.2%) participants with MID used a mobile phone every day without limitations imposed by their parents. Thirty (4.8%) TDA participants and 24 (35.8%) participants with MID used a mobile phone up to five times a day. One TDA participant (.1%) used a mobile phone up to three times a week, i.e. several times in two weeks, and one participant did not answer this question. In the subsample of participants with MID, five (7.4%) used a mobile phone up to three times a week, and three (4.5%) participants used a mobile phone only a couple of times in two weeks. Participants with MID used a mobile phone significantly less frequently ($M = 4.36$, $SD = .81$) than TDA ($M = 4.94$, $SD = .26$) participants ($t(67.43) = -5.87$; $p < .001$; $d = .96$).

In the MID group, the scores on the MPPUSA ($M = 67.54$; $SD = 19.50$) ranged from 26 to 107, while in the TDA between 26 and 122 ($M = 64.53$; SD

= 18.31). There was no statistically significant difference between the groups (t(69) = 1.27; p = .20).

In order to classify the participants in relation to the degree of problematic use of mobile phones, we used the same method as López-Fernández et al. (2014), who classified their participants into four categories based on MPPUSA scores and percentiles. In our sample, the score of 46 corresponded to 15th percentile, 81 scores to 80th percentile, while 90 scores corresponded to 90th percentile. Thus, the participants were divided into four categories according to the way of using mobile phones: occasional use (a score of 26–45); habitual use (a score of 46–80); risky use (a score of 81–89); problematic use (a score of 90 and above; Table 1).

Table 1
Distribution of various types of Mobile phone use, based on MPPUSA scores and percentiles

Subsample	Occasional, n (%)	Habitual, n (%)	Risky, n (%)	Problematic, n (%)
TDA	92 (14.8)	407 (65.2)	64 (10.3)	61 (9.8)
MID	9 (13.4)	36 (53.7)	14 (20.9)	8 (11.9)
Total	101 (14.6)	443 (64.1)	78 (11.3)	69 (9.9)

Note. TDA = typically developing participants; MID = participants with mild intellectual disability.

Although it may seem that there were more participants with risky use in the MID group, the difference between the groups was not statistically significant (χ^2(3) = 7.66; p = .05; Table 2). The results indicate that females in the TDA group used mobile phones significantly more often than females. There were no gender differences in the MID group.

Table 2
Participants' scores on the MPPUSA according to gender

subsample	Gender	n (%)	M (SD)	t(df)	p
TDA	Males	171 (27.4)	59.63 (17.02)	-4.20 (621)	< .001
	Females	452 (72.6)	66.44 (18.43)		
MID	Males	42 (62.7)	66.02 (19.01)	-.82 (65)	.41
	Females	25 (37.31)	70.08 (20.44)		

Note. TDA = typically developing participants; MID = participants with mild intellectual disability.

The participants in the TDA group use a mobile phone between 1 and 13 years (M = 6.88; SD = 2.27), while the participants in the MID groups between 1 and 14 years (M = 5.17; SD = 3.09). A statistically significant difference was found between the groups with regard to the length of mobile phone use (t(73.88) = 4.39; p < .001; d = .63).

Regarding age, no statistically significant correlation was found between age and problematic mobile phone use either in TDA participants (r = -.07; p = .07), or in participants with MID (r = -.11; p = .38). There was a very low, positive, but still statistically significant correlation between the duration of using a mobile phone and its problematic use in TDA participants (r = .10; p = .007), but such correlation was not present in the MID group (r = -.02; p

= .87). No significant correlation was found between the frequency of using mobile phones and their problematic use, in participants with MID ($r = .09$; $p = .45$), while in TDA participants we found significant negative correlation ($r = -.15$; $p < .001$).

In TDA participants, a low, negative, statistically significant correlation was determined between the scores on self-esteem scale and the MPPUSA ($r = -.18$; $p < .001$), as well as between the LSDS and MPPUSA ($r = -.15$; $p < .001$). There was a moderate, positive correlation between the self-esteem and loneliness scale ($r = .38$; $p < .001$). Among participants with MID, a moderate, negative, statistically significant correlation was found between the scores on self-esteem scale and the MPPUSA ($r = -.34$; $p < .01$), as well as between the LSDS and the MPPUSA ($r = -.39$; $p = .001$). There was a moderate, positive correlation between the self-esteem and loneliness scale ($r = .39$; $p = .001$).

Predictors of Problematic Use of Mobile Phones

In order to determine possible predictors of problematic use of mobile phones, multiple regression analysis was applied. The main predictors included were gender, age, length, and frequency of mobile phone use, participants' group (MID or TDA), self-esteem and, loneliness. The model including all above mentioned predictors accounted for 23.6% of the variance in the MPPUSA score ($F(10, 608) = 18.73$; $p < .001$; $r^2 = .24$). Female gender, younger age, those who used mobile phones longer and more often, as well as participants with MID, had a higher MPPUSA score. Those with lower self-esteem and higher level of loneliness had a higher MPPUSA score, too (Table 3).

Table 3
Significance of predictors of problematic phone use, their regression coefficients, zero order, and partial correlations with criterion

	Beta	*t*	*p*	Correlation	Partial. correl.
gender (male)	-.11	-2.99	.003	-.16	-.12
age	-.14	-3.55	.000	-.07	-.14
length of mobile phone usage	.12	3.18	.002	.08	.12
frequency of usage	.36	9.54	.000	.37	.36
TDA group (MID)	-.15	-3.98	.000	-.03	-.16
RS (self-esteem)	-.14	-3.73	.000	-.20	-.15
LSDS (loneliness)	-.10	-2.63	.009	-.17	-.10

Note. t = t-test; p = significance.

Discussion

With regard to the fact that there were 72 participants with MID in the initial sample, and that three who did not have a mobile phone were excluded, the obtained results show that 95.8% of participants with MID and 100% of TDA participants had a mobile phone. Iglesias, Sánchez, and Rodríguez (2019)

obtained a similar finding in their research, where almost all young people with ID in their sample possessed a mobile phone. This high percentage of the presence of mobile phones may be attributed to participants' age. However, despite this high percentage of presence of mobile phones in adolescents with MID, there were some differences in the number of years during which they used them, and in the frequency of using them, compared to their peers. The obtained results indicate that TDA use mobile phones longer and this finding agrees with the previous data (Jenaro et al., 2018a). Apart from the fact that they become mobile phone users earlier in life, according to the results of our research, TDA use mobile phones more frequently than their peers with MID. Large effect size indicates that participants with MID probably have much less experience with mobile phones then participants from TDA group. Half of our participants with MID used mobile phones every day, without limitations, while one third stated that they used a mobile phone up to five times a day. Bryen, Carey, & Friedman (2007) reported similar results with an interesting fact that almost 40% of their participants who used a mobile phone stated that they used a mobile phone with someone's help. These authors explain the reasons of less frequent use of mobile phones in people with ID by expense, lack of perceived need, and difficulty in use. Furthermore, de Urturi Breton, Hernández, Zorrilla, & Zapirain (2012) concluded that the less frequent use of mobile phones in people with ID can be explained by inappropriate size of buttons, non-user-friendly menu arrangement, and insufficiently clear instructions as significant reasons.

The percentage of MID and TDA participants with problematic mobile phone use is similar (11.9% versus 9.8%), however, there were almost twice as many participants who belong to the risk group among the participants with MID (20.9%) than among TDA ones (10.2%). Among British TDA participants, López-Fernández et al. (2014) obtained similar results, while Olatz, Luisa, & Montserrat (2012) found that about 15% of TDA used mobile phones in a problematic way, and Leung (2007) found this percentage to be almost 30%.

The results of regression analysis show that those who had a mobile phone longer and used it more often, girls, younger participants, participants from the MID group, and those with lower self-esteem, and higher level of loneliness had a higher MPPUSA score. These variables explain 23.6% of problematic mobile phone use in the examined adolescents. In our study, adolescents who possessed a mobile phone for a longer time had a greater tendency toward problematic mobile phone use. The results of the other authors are diverse. There are those who found the same relation (Sahin et al., 2013), those who did not find it (Gezgin, Hamutoglu, Sezen-Gultekin, & Ayas, 2018), and also those who did not determine a significant relation between the length of possessing a mobile phone and its problematic use, but report it as significant with regard to the length of smart phone possession and its problematic use (Gezgin, Şumuer, Arslan, & Yildirim, 2017; Yildirim, Sumuer, Adnan, & Yildirim, 2016). Taken together, these results could indicate that the length of mobile phone possession is related to its problematic use, primarily due to the prolonged experience of using the Internet, and also due to numerous applications that smart phones offer. Jenaro

et al. (2018a) who found that the length of using mobile phones was related to their problematic use in adults with ID, also noted that smart phones were actually used as laptops, which explains the tendency to use them as means of escape from unpleasant situations.

The results show that adolescents who used mobile phones more frequently were more likely to develop their problematic use. Other studies confirm a significant relation between the frequency of using a mobile phone and its problematic use. (Gezgin et al., 2018; Pavithra, Madhukumar, & Mahadeva, 2015; Sahin et al., 2013; Vally & El Hichami, 2019). Higher frequency of mobile phone use is related to behaviour reinforcement, i.e., any use of a mobile phone which has some kind of a reward (such as text messages, news, pictures, or "likes") ensures its re-use. Over time, such behaviour becomes habitual, routine and automatic (Furst, Evans, & Roderick, 2018).

Younger participants in our research were more prone to problematic mobile phone use than older ones. The results of other studies among adolescents do not give a clear picture. Two research studies which included a somewhat wider age range compared to our research (11–18 and 13–20 years of age) found that the frequency of problematic use increased with the participants' age (López-Fernández et al., 2014; Öz, Arslantaş, Buğrul, Koyuncu, & Ünsal, 2015), while another study determined that the problematic use increased with age in middle school and the first grade of high school, but then decreased in higher grades of high school, which the authors attributed to greater school responsibilities of older students and preparations for final tests (Louragli, Ahami, Khadmaoui, Mammad, & Lamrani, 2018). By comparing participants 3–11 and 12–19 years of age, Csibi, Griffiths, Demetrovics, and Szabo (2019) found that the younger group of participants was more prone to problematic mobile phone use, but also to various conflicts (being reprimanded by adults for overusing mobile phones), mood swings and lower self-control. In addition, the authors believe that children at younger ages are more willing to learn and are open to technologies, which may also be the reason for their tendency toward problematic use.

Gender is another factor which significantly predicted problematic mobile phone use in adolescents. Girls had significantly higher scores on MPPUSA than boys. This result is quite common, both in adolescents (Nayak, 2018; Pawłowska & Potembska, 2011; Sánchez-Martínez & Otero, 2009; Warzecha & Pawlak, 2017), and in younger adults (Augner & Hacker, 2012; López-Fernández et al., 2017; Takao, Takahashi, & Kitamura, 2009; Vally & El Hichami, 2019). These results are usually explained by emphasizing the significance women give to interpersonal communication. Their primary goal in using the phone is to establish and maintain social relationships (Billieux, Van der Linden, d'Acremont, Ceschi, & Zermatten, 2007; López-Fernández et al., 2017; Van Deursen et al., 2015). Women talk over the phone more often than men, create interpersonal relationships through text messages, use the phone to maintain social contacts and satisfy the need for closeness by accepting and expressing emotions (Warzech & Pawlak, 2017). Another explanation is that this is an attempt to overcome unpleasant and unwanted affective conditions, even in a non-functional way (López-Fernández et al., 2017).

Gender differences in interpersonal communication which may affect the frequency of problematic mobile phone use were also found in the population with ID. Women with ID less frequently make contacts with TD people (Dusseljee, Rijken, Cardol, Curfs, & Groenewegen, 2011) and are less successful in conversing and staying on conversation topic than men with ID (Đorđević, Glumbić, & Brojčin, 2015). Furthermore, men with ID experience greater alleviation of social problems over the years than women with ID, which is explained by greater job opportunities and the accompanying increase in social contacts (De Ruiter, Dekker, Verhulst, & Koot, 2007).

The results of regression analysis suggest that ID had a small, but significant influence on the MPPUSA scores. A significant relation between the level of intellectual functioning and the level of problematic behaviour was also found by other researchers who dealt with this topic (Flores et al., 2018; Jenaro et al., 2018a). The obtained results could be explained by a similar sequence hypothesis, which states that both ID and TD people go through the same stages of development in exactly the same way, and that they only differ in the pace of development and in the ultimate ceiling they achieve (Weisz & Zigler, 1979). This explanation becomes more important when we consider the finding of this research which showed that younger participants used phones in a problematic way more frequently. Other authors associate similar results in TD population with lower self-control of younger participants that contributes to a greater propensity for problematic mobile phone use (Bianchi & Phillips, 2005; Csibi et al., 2019).

People with ID of different ages and developmental levels, fall behind in the development of self-control and show deficits in self-regulation strategies (Bexkens, Ruzzano, Collot d'Escury-Koenigs, Van der Molen, & Huizenga, 2014; McClure, Halpern, Wolper, & Donahue, 2009; McIntyre, Blacher, & Baker, 2006; Willner, Bailey, Parry, & Dymond, 2010). Thus, it is possible that participants with MID were more prone to problematic mobile phone use due to the delay in the development of self-regulation strategies.

When low self-esteem is concerned, it is often said that it is related to different forms of addictive behaviour (Park & Lee, 2013; Takao et al., 2009). This was confirmed by the results of our research – participants with lower self-esteem expressed significantly more behaviours that indicated the problematic use of mobile phones. These findings are in accordance with other studies on adolescents and students, which, as a rule, found similar relations of self-esteem with addiction or problematic use of mobile phones (Argumosa-Villar, Boada-Grau, & Vigil-Colet, 2017; Ehrenberg et al., 2008; Hong, Chiu, & Huang, 2012; Leung, 2008; Vally & El Hichami, 2019).

Smetaniuk (2014) believes that, through a more intensive use of mobile phones, people with low self-esteem can satisfy their need for affirmation, reassurance and encouragement, and may thus seek contextual motivation. He also points out that we should be careful when making conclusions about the influence of self-esteem on problematic mobile phone use, since the effects of some other constructs can also affect self-esteem (e.g., depression, parental influence).

Loneliness is observed in addictive behaviours such as alcoholism, drug abuse, gambling, and Internet addiction (see Takao et al., 2009). Because of this fact, studies have focused on the relation between problematic use of mobile phones and loneliness. The results of our research showed that adolescents with a higher level of loneliness were more likely to develop problematic mobile phone use. These results are in accordance with the results of other studies (Gezgin et al., 2018; Lepp, Barkley, & Karpinski, 2014) according to which participants with more problematic behaviours while using mobile phones, were lonelier and felt less satisfied with their lives. There are several explanations of the relationship between loneliness and problematic use of mobile phones. Bian & Leung (2015) stated that mediated communication, such as texting or social networking, was more appealing to lonely people. Mobile devices provide them with appropriate surroundings in which they can feel less lonely. They can play games, look at or take photographs and video clips, read the news, chat with friends, or read books. Thus, lonely adolescents will have a more pronounced feeling of problematic use. Since they do not like face-to-face communication, they choose to communicate through text messages or social networking applications (Gezgin et al., 2018).

The relationship between problematic use of mobile phones and loneliness can also be observed through a social compensation hypothesis (Peter, Valkenburg, & Schouten, 2005; Valkenburg & Peter, 2007). This hypothesis primarily explains that the Internet can be especially beneficial to introverted persons. Due to the smaller need for auditory and visual signs, and due to anonymity, the Internet enables these persons to compensate for poorer social skills. Because of that, introverted persons can "open" more easily, which may facilitate forming online friendships. It seems that this theory can be placed in the context of ID and the results obtained in this research. People with ID often have difficulties in developing social skills (Brojčin, Banković, & Japundža-Milisavljević, 2011) and seem socially inept (Rosenberg & Abbeduto, 1993). Apart from that, they can have motor difficulties (Protić-Gava & Usković, 2016), speech and language disorders (Fidler, Philofsky, & Hepburn, 2007), and reading and writing disabilities (Di Blasi, Buono, Cantagallo, Di Filippo, & Zoccolotti, 2019). Many obstacles caused by these difficulties and disorders can be alleviated by using mobile phone functions and applications (highly emotional pictographs, short messages, visual speech support, easy input methods, etc.). These advantages facilitate communication and may reduce the feeling of loneliness, but at the same time, they increase the possibility of problematic use of mobile phones.

We should pay attention to some limitations of our study. The first limitation refers to the size of the sample of participants with MID – a larger sample would have been better, since a larger sample size is associated with a reduction in sampling error (Watt & van den Berg, 2002). The next limitation is related to gender disproportion in both subsamples. There were significantly more boys in the sample of adolescents with ID, while girls were more dominant among TDA. Furthermore, data was obtained from adolescents with MID who

attended schools for children with disabilities, but not from those who were educated in an inclusive environment. In addition, limitations are reflected in convenient sampling as well as in self-reporting, which can be subjective. Thus, additional data, such as records or additional more objective reports on the use of mobile phones, would help to reinforce the obtained results.

Conclusion

The use of mobile phones is common among adolescents with MID. About 10% of adolescents with MID and TDA used a mobile phone in a way that could be problematic, but there were twice as many adolescents with MID who may be showing risky behaviours in relation to mobile phone use. A greater risk for developing problematic patterns was found in younger female adolescents with MID who had a mobile phone longer and used it more often, as well as in those who were lonelier, and had less self-esteem.

These results suggest that adolescents, especially those with MID, need to be directed toward a more balanced use of mobile phones. However, this should be done in a way that does not discourage their use, because in the modern world, mobile phones are a potentially significant tool in educational, professional and social development.

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Problematična upotreba mobilnih telefona
kod adolescentata sa lakom intelektualnom ometenošću

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Ovo istraživanje je sprovedeno u cilju utvrđivanja učestalosti i prediktora problematične upotrebe mobilnih telefona kod adolescenata sa lakom intelektualnom ometenošću (LIO) i adolescenata tipičnog razvoja (TR). Uzorkom je obuhvaćeno 623 adolecenata TR i 67 adolescenata sa LIO. U istraživanju su korišćeni sledeći instrumenti procene: Skala za pocenu problematične upotrebe mobilnih telefona, Skala za procenu usamljenosti i socijalnog nezadovoljstva, kao i Rozenbergova skala samopoštovanja. Problematična upotreba mobilnih telefona utvrđena je kod 11,9% ispitanika sa LIO i 9,8% ispitanika TR, ali je u grupi ispitanika sa rizičnom upotrebom mobilnih telefona bilo dvostruko više onih sa LIO (20,9%), nego ispitanika TR (10,2%). Problematična upotreba mobilnih telefona je povezana sa dužinom i učestaloščću njihovog korišćenja, ženskim polom, mlađim uzrastom, nižim nivoom samopoštovanja i višim nivoom usamljenosti. U ovom istraživanju je pokazano da su adolescenti sa LIO skloniji problematičnoj upotrebi mobilnih telefona budući da gotovo trećina ispitanika iz ovog poduzorka pripada grupi problematičnih ili rizičnih korisnika ovih uređaja.

Ključne reči: mobilni telefon, usamljenost, samopoštovanje, intelektualna ometenost