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Changes in Internet use, problematic use, and public attitudes toward them in Hungary during the COVID-19 pandemic: a nationwide representative study

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Introduction

The **COVID-19 pandemic** was proven to be a challenging time for all, affecting the daily lives of individuals around the world.

Before the outbreak, some were already working and socializing online to some extent. However, prolonged home confinement shifted most activities entirely online, **increasing screen time** for everyone. These changes in lifestyle, coupled with the added stress related to the virus contribute to the **problematic use risk** in potentially **addictive behaviors**, such as the use of Internet, social media, video gaming and consumption of pornography[1,2].

The pre-pandemic estimates of technology related disorders such as, **Problematic Internet Use (PIU)**[3] and **Problematic Social Media Use (PSMU)**[4] were expected to rise, and through the solidification of the unhealthy patterns, the readaptation was predicted to be difficult after the passing of the COVID-19 crisis[5,6].

Methodological inconsistencies and varied sampling methods make it difficult to accurately assess the prevalence of these conditions[5]. Pre-pandemic research in Hungary shows that **PIU** affected **5.2% of adults**[7] and a **15-19.2% of adolescents**[8,9], while **PSMU** affected **4.5% of adolescents**[10].

As the dangers of technological addictions were recognized, it became important to inform the public and encourage the development of healthy habits around Internet use. During the pandemic, as the PIU risk increased, several attempts were made to raise awareness and change public knowledge and attitude[1,11].

The purpose of our research is to compare the state of internet use habits and problem use (PIU, PSMU), as well as public knowledge and attitudes toward to PIU **before and after the pandemic**, using the same methodology on **representative Hungarian samples**.

Methods

The target population of the current research was the general population of Hungary between ages 18 and 64 years. Participants were selected through **quota sampling** stratified by sex, age groups, geographic location and residence. **Computer-assisted personal interviewing (CAPI)** technique was used by professionals to collect participant data. Two samples were collected four years apart. Our sample comprised **3691 individuals** (2019: N=1691, 849 males; 2023: N=2000, 1010 males)

Participants were asked questions focusing on their sociodemographic backgrounds, internet access, internet and social media use habits. They rated statements related to PIU reflecting on their general knowledge and attitude. PIU was assessed by the **Problematic Internet Use Questionnaire-9 (PIUQ)**[12] and PSMU was assessed by the **Bergen Social Media Addiction Scale (BSMAS)**[13].

The nonparametric **Mann-Whitney U** test was used to compare the samples.

Results

We have found a significant **increase in Internet use** (Figure 1.), in all online activities except pornography consumption (Figure 2.), a significant **increase in PIU and PSMU** (Figure 3.). (For the statistical results see Table 1.). Based on our results, **public knowledge and attitudes shifted**, a larger percentage of individuals agree that Internet addicts are unable to stop using the Internet, their addiction negatively affects their relationships and work/academic career and internet addiction can have serious negative consequences such as anxiety, depression and suicide (Figure 4.). (For the statistical results see Table 2.).

Discussion

Our research aims to highlight the changes in Internet use and problem use in Hungary. The **increase in time spent online** is in line with some previous studies expecting lifestyle changes during the pandemic[1,6]. The only online activity we did not see changes in was pornography consumption, thus, this finding differed from our expectations[1,2]. With the increase in time spent on the Internet and time spent on social media PIUQ and BSMAS scores increased, showing the **heightened risk of problematic use,** as hypothesized[2,5]. Therefore, it is important to raise awareness of the dangers of PIU and PSMU. Our results show that there is an increase in public knowledge regarding PIU in the last few years, but further education is necessary to mitigate the adverse consequences of spending too much time on the Internet.

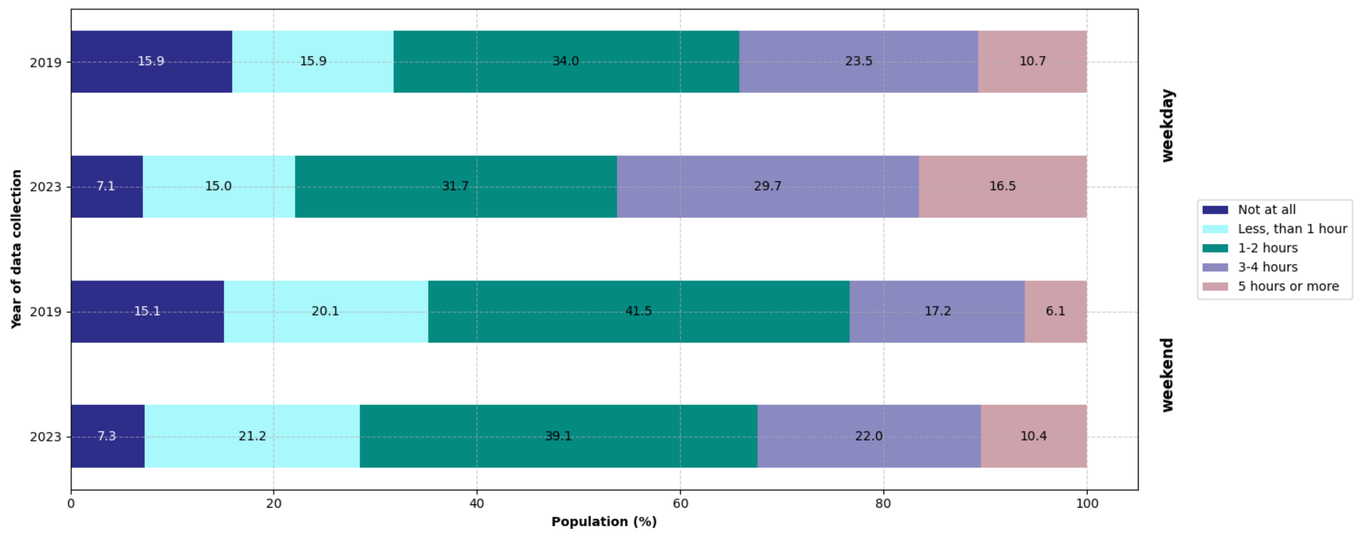

Figure 1. Changes in average daily time spent on the Internet.

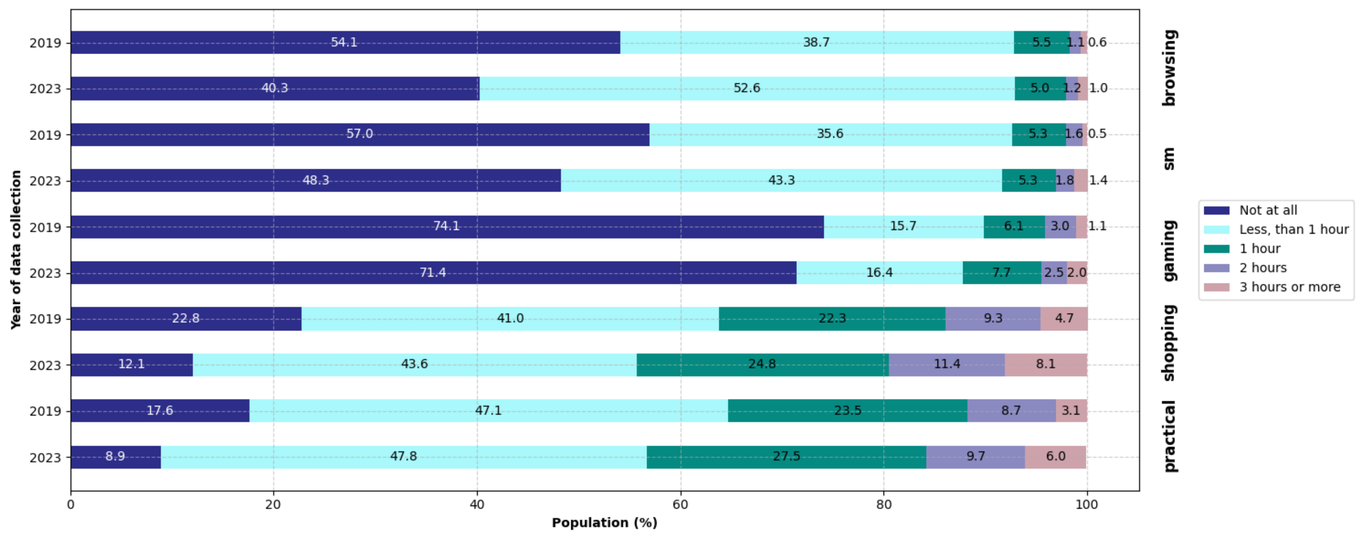

Figure 2. Changes in average time spent doing different activities (on the right) on the Internet on weekdays.

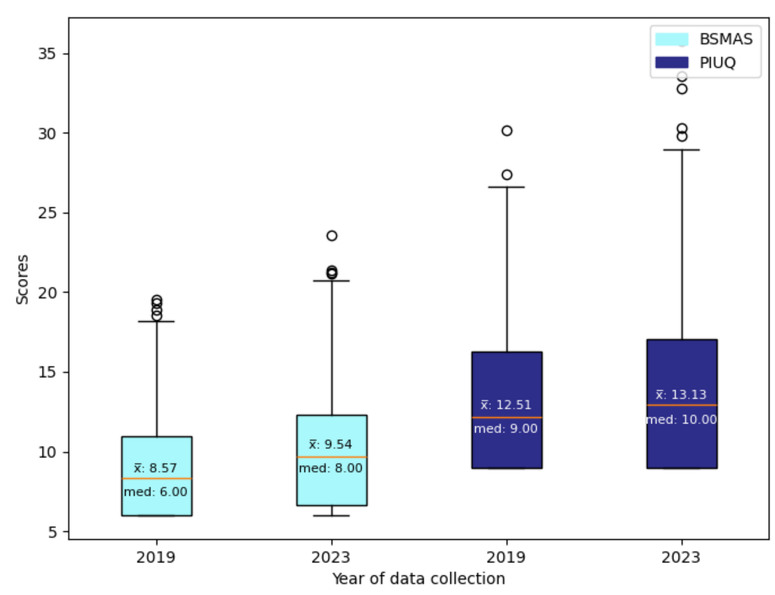

Figure 3. Changes in PSMU, measured by BSMAS (on the left) and changes in PIU, measured by PIUQ (on the right). Average score (x̄) and median score (med) highlighted.

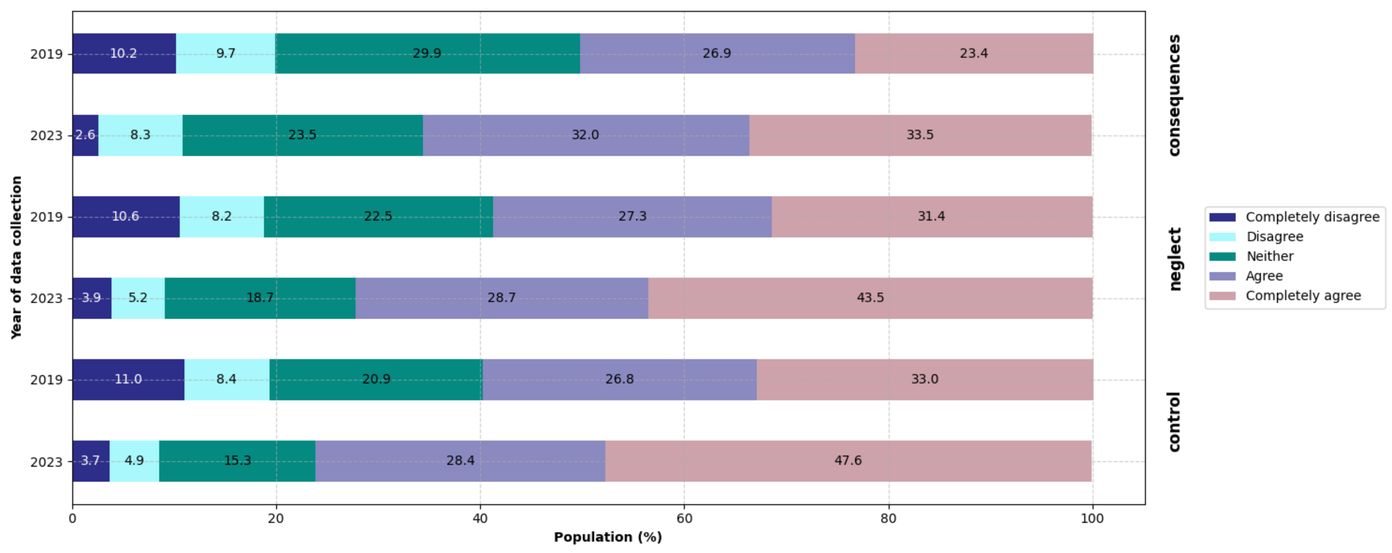

Figure 4. Changes in public knowledge and attitudes towards internet addiction mesured by using statements. The exact statements from top to bottom, consequences: Internet addiction can have serious consequences such as depression, suicide, symptoms of anxiety, neglect: Individuals addicted to the Internet neglect their relationships and their addiction negatively impacts their job/studies, control: Individuals addicted to the Internet are unable to stop using the internet.

	weekday			weekend		
	N	U	p	N	U	p
internet	3826	1497040	< .001	3825	1426754.5	< .001
browsing	3770	1489441	< .001	3765	1467856	< .001
social media	3774	1453337.5	< .001	3769	1439099	< .001
video gaming	3742	1633854	< .001	3743	1605117	< .001
pornography	3744	1731849.5	= 0,794	3742	1717719	= 0,394
online shopping	3748	1556065	< .001	3748	1618709.5	< .001
emailing	3744	1562891.5	< .001	3749	1590249.5	< .001
practical use	3732	1495316.5	< .001	3686	1588033.5	< .001

Table 1. Changes in average daily time spent on the Internet and doing different online activities. Results of the Mann-Whitney U statistical tests (U) sample size (N) and significance (p)

	N	U	p
consequences	3776	1438603	< .001
neglect	3769	1447562	< .001
control	3771	1403553	< .001

Table 2. Changes in public knowledge and attitudes towards internet addiction mesured by using statements. Results of the Mann-Whitney U statistical tests (U) sample size (N) and significance (p)

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