Martyna Kotyśko
ORCID: 0000-0001-6771-5121
University of Warmia and Mazury in Olsztyn

Internet Gaming Disorder Among Polish Adolescents: A Latent Profile Analysis of Disorder Symptoms

ABSTRACT

Gaming is an activity enjoyed by adolescents, but it is associated with the risk of developing internet gaming disorder (IGD). The aim of the study was to distinguish various profiles among adolescents from two Polish voivodeships based on the presence of the nine IGD symptoms. The study included 623 students (57.9% boys) from elementary schools (Years 5–7) and junior high schools (Years 2 and 3) who declared that they played video games. The Internet Gaming Disorder Scale 9—Short Form was used to measure IGD; the other variables were studied using a self-administered questionnaire. A latent profile analysis of all IGD symptoms distinguished four profiles: Problem-Free Players, Experiencing Withdrawal Symptoms and Escaping, Experiencing Negative Consequences and Escaping, and Preoccupied and Escaping. A symptom of escaping from negative emotions was revealed in each group. Significant differences between the profiles were observed for gender and parental control over gaming time, but not for developmental stage. The time spent gaming primarily differentiated the profile of Problem-Free Players from the other groups. Further analysis of the prevalence of IGD symptoms among young players is necessary to better understand the phenomenon in this population.

KEYWORDS
internet gaming disorder, games, adolescents, latent profile analysis, symptoms

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Introduction

Gaming activity, both offline and online, is an important functioning space for people of different age groups. Revenues of the video game market in 2022 amounted to about $320 billion, with online games for mobile devices generating the largest share (Statista 2022b). Information on the global number of gamers indicates that there are already more than 3 billion of players (Statista 2022a). Data from 2022 on Polish internet users between the ages of 15 and 65 shows that 67% of them describe themselves as gamers (*Polish Gamers 2022* 2022). A similar report was prepared for children and teenagers between the ages of 9 and 15 (*Polish Gamers KIDS 2022* 2022). Among them, 85% reported playing games, and the percentage who declared playing and/or watching games was 88%. In the 9–12 age group, playing and/or watching was undertaken by 87% of girls and 91% of boys, while in the 13–15 age group it was 80% of girls and 93% of boys. Among leisure activities in the aforementioned age groups, playing on a phone/smartphone ranked first and using a computer/console was in third place (*Polish Gamers KIDS 2022* 2022).

Gaming as a disorder

Gaming has become a subject of interest for researchers and clinicians because it can take the form of problematic use or addiction. The American Psychiatric Association's DSM-5 classification of mental disorders, in Section III, reports a disorder referred to as internet gaming disorder (IGD) and related to playing online games as an issue that requires further research (American Psychiatric Association 2013). Two disorders directly related to gaming appear in the latest ICD-11 classification: gaming disorder (GD) (World Health Organization 2019a) and hazardous gaming (World Health Organization 2019b).

IGD is described in the DSM-5 as "persistent and recurrent use of the internet to engage in games, often with other players, leading to clinically significant impairment or distress" (American Psychiatric Association 2013, quoted in Izdebski 2019: 149). The DSM-5 includes nine criteria that can be used to identify IGD. These can be described with keywords such as preoccupation with gaming,

withdrawal symptoms, increased tolerance, loss of control, loss of interest due to gaming, continuing despite problems, deceiving family or others about time spent gaming, escape from negative mood, and risk of exposure to loss or loss of a job or relationships due to gaming. A disorder can be diagnosed if five of the nine criteria occur over the past 12 months (American Psychiatric Association 2013).

Prevalence of internet gaming disorder among adolescents and related family factors

Studies conducted on IGD among adolescents report varying data on the prevalence of the disorder, which may be due to the type of research (general population vs. gamers only) or the tool used to measure the disorder. Among Iranian adolescents, 2.4% were identified as gaming addicts (Lin et al. 2019). Similar values were found among Slovenian elementary school students (Pontes, Macur, and Griffiths 2016). A higher percentage (3.1%) was recorded among Taiwanese adolescents playing games (Chiu, Pan, Lin 2018). Rates oscillating around 9% and higher have been reported in Korean (Kim et al. 2018), Dutch (van den Eijnden et al. 2018) and Swedish (Vadlin et al. 2015) studies. Polish data on the prevalence of IGD among school-aged children (Michalak et al. 2019) shows that less than 1% of students meet the criteria for the disorder. A meta-analysis of IGD studies conducted by an Australian research team (Stevens et al. 2021) found that the disorder is more common in boys than in girls, at a ratio of 2.5:1.

Among the variables that are considered risk factors or, on the contrary, the factors that protect young people against the disorder, are those related to the family environment. A study by Céline Bonnaire and Olivier Phan (2017) found that significant predictors of IGD (negative relationships), related to family functioning and parents' actions toward their child's gaming include prohibition of gaming, setting rules about gaming, gaming at night (as a manifestation of parents' lack of control), and the strength of the relationships in the family. The qualitative research by Irene Wong and Millicent Lam (2016) identifies the following family-related risk factors that may result in the development of the disorder: parents' approval of

their child's gaming, parents' lack of control over their child's gaming, and poor family relationships.

Using a person-centered approach in research on internet gaming disorder

The research on IGD or GD mainly focuses on determining the prevalence of the phenomenon in different social groups, as well as its significant correlates. Researchers also undertake analyses that focus on the individual instead of the variables. One example is the use of latent profile analysis (LPA) and latent class analysis (LCA), in which classification is based on a model (Bergman, Wångby 2014). Through their use, it is possible to group people, for example, by their mutual similarity in terms of a set of specific quantitative variables, as in LPA, or by qualitative variables, as in LCA.

In the studies that use a person-centered approach, IGD is treated as an element for profiling along with other variables among adults (e.g., Kovacs et al. 2022) and adolescents (e.g., Cerniglia et al. 2019). The possibility of identifying profiles or classes based on symptoms of the disorder is also being tested (e.g., Siste et al. 2019; Chang et al. 2022). The number of identified profiles/classes varies, typically either three (e.g., Pápay et al. 2014; Siste et al. 2019), four (e.g., Chang et al. 2022), or five (e.g., Myrseth, Notalears 2018). The solutions are described in terms of the intensity of symptoms or the likelihood of their occurrence in a given group, and then compared to each other due to other variables. This allows for a better understanding of the specific features of the extracted profiles/classes and the people who constitute them, which is not possible when using only variable-focused analyses.

Method

Research objective

The purpose of the analysis was to determine what profiles can be distinguished among adolescents from two Polish provinces based on the presence of IGD symptoms. This goal was inspired by research reports indicating that the symptoms occur with varying frequency

and severity and have different predictive power for diagnosing the disorder, among both adults (Király et al. 2017; Schivinski et al. 2018; Pontes et al. 2019) and adolescents (Macur, Pontes 2021). Due to the exploratory nature of the analysis, an attempt was made to determine whether there were differences in parental control among the profiles in terms of the child's playing time or sociodemographic characteristics, including the developmental stage and time spent playing on weekdays and weekends.

Participants and procedure

The respondents consisted of elementary and junior high school students aged 10–18 (at the time of the survey, the Polish educational system still included junior high schools). The information presented herein is part of the project called "Internet Gaming Disorder: Characteristics and Prevalence of the Phenomenon and its Psychological Correlates Among Elementary and Junior High School Students in the Kuyavian-Pomeranian and Warmian-Mazurian Voivodeships."[1] The survey was conducted in the first half of 2018 in two voivodeships: Kuyavian-Pomeranian and Warmian-Mazurian. The sampling of the survey was random. In the first step, four counties (eight counties in total) were randomly selected in each of the two voivodeships, within which two institutions were randomly chosen from the list of all schools: one elementary school and one junior high school (in each of the counties). In total, activities were carried out in 16 different institutions (eight elementary schools and eight junior high schools).

Students from Years 5, 6, and 7 of the elementary school and Years 2 and 3 of the junior high school took part in the research. The researchers visited the selected schools after obtaining the principals' consent. At the beginning of each meeting with the students, the researchers informed them about the purpose of the survey, its anonymity, and the fact that the questionnaires were not connected

1 Public projects financed from the Fund for Solving Gambling Problems under the supervision of the Minister of Health and from the funds of the Kazimierz Wielki University in Bydgoszcz (Agreement No. 165/HBK/2018).

with their grades. It was pointed out to the students that participating in the survey was voluntary and they could withdraw at any time without consequences. Questionnaires were filled out in the presence of the researchers only, who answered the students' questions and clarified their doubts, as necessary.

While the project used two different research toolkits, this study analyzed information only from students who completed the Internet Gaming Disorder Scale 9: Short Form (Pontes, Griffiths 2015) and selected the answer "Yes" to the question "Do you play video games?" There were initially 635 students, but after verifying the questionnaires, 12 participants were excluded from the analysis. Finally, 623 students were included, whose average age was 13.5±1.16 years. There were significantly more boys in the sample than girls. In terms of numbers, elementary school students predominated, but the number of students surveyed at different grade levels was similar. The largest number of participants were in early adolescence, while the smallest group was in middle school. More than 58% of those surveyed indicated that their parents/guardians are interested in what games they play and more than 65% responded that their parents/guardians control the amount of time they can spend playing (Table 1).

Table 1. Sociodemographic variables and variables related to gaming in the sample (*N*=623)

Variables	Categories	n (%)	χ^2	*p*
Sex	Boys	361 (57,9)	15,73	<0,001
	Girls	262 (42,1)		
Type of school	Elementary school (ES)	385 (61,8)	34,69	<0,001
	Junior high school (JHS)	238 (38,2)		
Grade	5 ES	127 (20,4)		
	6 ES	131 (21,0)		
	7 ES	126 (20,2)	6,3	0,178
	2 JHS	138 (22,2)		
	3 JHS	101 (16,2)		
Phase of development	Middle school age	62 (10,0)		
	Early adolescence	369 (59,2)	228,7	<0,001
	Late adolescence	192 (30,8)		

Variables	Categories	n (%)	χ^2	*p*
Parents' interest in the games the child plays*	Yes	363 (58,4)	17,39	<0,001
	No	259 (41,6)		
Parents' control of how much time their child spends playing video games	Yes	410 (65,8)	62,24	<0,001
	No	213 (34,2)		

Source: Own study.
*One person did not answer this question, so the total sample size for this question was *N*=622.

Research tools

The basic variable analyzed in this study was internet gaming disorder, measured using the Polish version of the Internet Gaming Disorder Scale 9: Short Form (IGDS9-SF) (Pontes, Griffiths 2015) developed by Paweł Izdebski, Mateusz Baranowicz, Martyna Kotyśko, and Maciej Michalak (Izdebski 2019). Among the variables included in the analysis were two aspects related to parents' actions toward their child's gaming: interest in the games the child plays and control over the time the child spends playing. The sociodemographic variables included in the comparisons were gender and stage of development. Time spent playing by adolescents was also included in the analysis.

The Internet Gaming Disorder Scale 9: Short Form (Pontes, Griffiths 2015) is used to assess internet gaming disorder. It takes into account nine criteria from which a potential diagnosis of the problem can be made. The scale was constructed with individual questions relating to a specific criterion. Tthe participant answers nine questions about their gaming behavior and experiences over the past 12 months. The answers are given on a Likert scale (1=never, 2=rarely, 3=sometimes, 4=often, and 5=very often). The scores range from 9 to 45; the higher the score, the greater the problem. The value of Cronbach's alpha for the instrument was α=0,74.

As part of the data collected in the study, two questions were selected for analysis regarding the perceived activities of parents/guardians in relation to their child's gaming. The first question asked respondents to state whether parents/guardians were interested in what games their children played (the coded responses were 0=No

and 1=Yes). The second question asked respondents about adult (parent/guardian) control of the time the child spends playing (0=No and 1=Yes). The sociodemographic variables selected for the analysis within this study due to their association with gaming activity were gender (0=boys and 1=girls) and developmental stage. The sample was divided into developmental phases according to the book *Niezbędnik dobrego nauczyciela* [The Essentials of a Good Teacher], edited by Professor Anna Izabela Brzezińska, PhD. Students aged 10 and 11 were described as middle school aged (8/9–11/12 years) (Rękosiewicz, Jankowski 2014). Another group was for early adolescence (11/12–14/15 years) (Piotrowski, Ziółkowska, Wojciechowska 2014), comprised of the respondents aged 12–14 years. The last group represented the late stage of adolescence: 14/15–19/20 (Piotrowski, Wojciechowska, Ziółkowska 2014), which included students aged 15–17 years. The participants in the study were also asked to identify how much time (in hours) on average they spend per day playing, distinguishing between school days and weekends.

Data analysis

The primary analysis performed on the data was latent profile analysis (LPA) for the nine items of the IGDS9-SF scale. LPA enables profiles to be extracted from groups of participants by the similarity of their responses to questions/indicators. The analysis was conducted in R (v. 4.2.0; R Core Team 2022) using the tidyLPA package (Rosenberg et al. 2018). Models with different numbers of profiles were compared with each other and the following indicators (Nylund, Asparouhov, Muthén 2007) were used to select the best model: the Akaike Information Criterion (AIC), the Schwartz Bayesian Information Criterion (BIC), and the Sample Size Adjusted Bayesian Information Criterion (SABIC). The better the fit of a model with a specific number of profiles, the lower the value of these indicators should be compared to other solutions. The *p*-value for the Bootstrap Likelihood Ratio Test (BLRT) supports the selection of a solution with a specific number of profiles. In this case, a *p*-value higher than 0.05 suggests the selection of a solution with fewer profiles than that which was chosen. The tidyLPA package provides the minimum number of observations (individuals) in the

extracted profiles: this information is labeled "N_Min" (Rosenberg et al. 2018). The selected solution should include observations in each profile, so a value of 0 for this indicator is undesirable. The last parameter that supports the process of selecting the number of profiles is entropy. The higher its value, the better; it should be higher than 0.8 (Muthén L.K., Muthén B.O. 2007). The software program IBM SPSS Statistics (version 28) was used to calculate the value of Cronbach's alpha for the IGDS9-SF scale and to compare the counts within the sample description of the subjects (chi-square test). The same test was also used to compare profiles by sociodemographic variables and those related to parental interest in what their child plays and control over their child's playing time. Cramér's V was used to determine the effect size of the identified relationship. The average time spent playing within the profiles was compared using Kruskal–Wallis ANOVA (due to the lack of a normal distribution).

Results

Latent profile analysis

The LPA assessed the nine IGDS9-SF scale items as variables. Models assuming equality of the variance within profiles and no covariance between profiles were tested (Rosenberg et al. 2018). The comparisons included solutions with one to eight profiles extracted (Table 2). The model with four profiles obtained the best metrics: the lowest AIC, BIC, and SABIC values and the highest entropy value. The *p*-value for the BLRT with a five-profile solution was statistically insignificant, thus recommending a solution with fewer profiles. Due to these results, the model with four profiles was selected as the target model.

Table 2. Model fit indices for solutions considering between one and eight profiles in the latent profile analysis

Model	AIC	BIC	SABIC	Entropy	N_Min	BLRT_p
One profile	14788,25	14868,07	14810,92	1,00	1,00	-
Two profiles	13962,01	14086,18	13997,28	0,88	0,24	<0,01
Three profiles	13425,41	13593,92	13473,27	0,92	0,06	<0,01

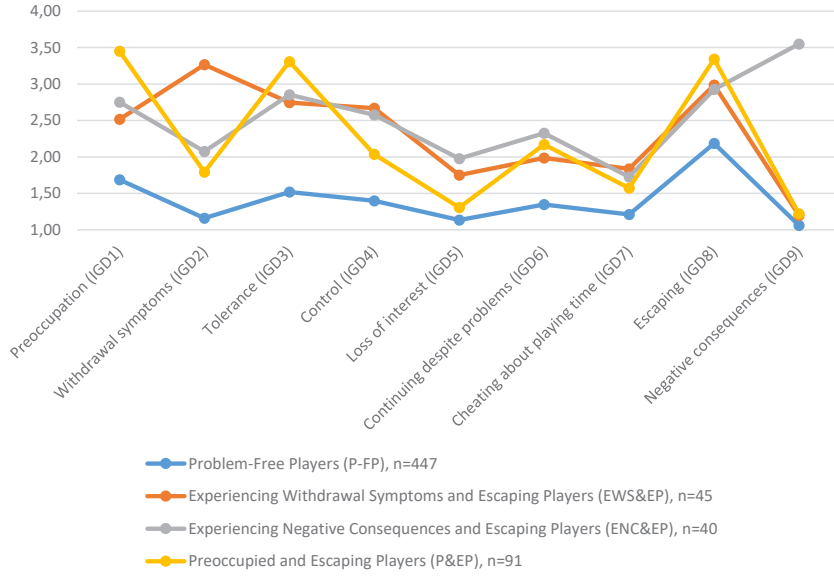
Model	AIC	BIC	SABIC	Entropy	N_Min	BLRT_p
Four profiles*	13287,21	13500,06	13347,67	0,92	0,06	<0,01
Five profiles	13307,22	13564,42	13380,28	0,63	0,00	1,0
Six profiles	13327,12	13628,67	13412,78	0,55	0,00	<0,01
Seven profiles	13196,29	13542,19	13294,55	0,59	0,00	<0,01
Eight profiles	13216,26	13606,50	13327,11	0,51	0,00	0,2

Source: Own study.
AIC: Akaike Information Criterion; BIC: Bayes Information Criterion; SABIC: Size Adjusted Bayesian Information Criterion; N_Min: smallest number of observations within the profile; BLRT_p: *p*-value for the bootstrap reliability quotient test.
* Model selected as the best.

Characteristics of the extracted profiles

Figure 1 graphically shows the profiles that emerged from the LPA, as well as the exact mean values recorded within the profiles for all nine items of the IGDS9-SF scale. The tool used in the study assumes a response scale from 1 to 5. It should be noted that the mean scores for all items did not exceed a value of 4.

Figure 1. The four-profile model that emerged after latent profile analysis, taking into account the averages for the nine items of the IGDS9-SF scale



Source: Own study.

Profile 1 includes the largest number of respondents (71.7%; *n*=447) and can be described as "Problem-Free Players" (P-FP). Their average scores on individual symptoms were the lowest among the profiles. However, it should be pointed out that while the symptom concerning escaping from problems and freeing oneself from negative emotions (IGD8 on the IGDS9-SF scale) was dominant in this profile, it was still lower than in the other profiles. Even if the P-FP group does not experience strong symptoms of online gaming disorder, the regulation of mood through games to free the individual from negative emotions is something that young gamers identify in themselves, albeit only slightly.

Profile 2 comprises 4.2% of the sample (*n*=45). It scored highest for item IGD2, which refers to experiencing withdrawal symptoms when either stopping or trying to reduce gaming activity. The second highest score in this profile is related to freeing oneself from negative emotions (IGD8). The name of this profile comes from the characteristic "Experiencing Withdrawal Symptoms and Escaping" (EWS&EP).

Profile 3 is the least numerous (6.4%, n=0) and it is distinguished by the mean for IGD9. This item refers to the symptom associated with experiencing negative consequences as a result of engaging in games. Also in this profile, escape or release from negative emotions is the second most intense symptom, although at a similar level to tolerance (IGD3) and preoccupation (IGD1). Students forming this profile are therefore referred to as "Experiencing Negative Consequences and Escaping" (ENC&EP).

The last one, Profile 4, is characterized by a pattern of scores for three symptoms: preoccupation (IGD1), tolerance (IGD3), and escape or release from negative emotions (IGD8) with low values for the other symptoms. This profile includes 91 individuals (14.6%) and will be described as "Preoccupied and Escaping" (P&EP).

When looking at the symptoms of internet gaming disorder as a whole, it can be seen that the symptom related to negative consequences resulting from gaming (IGD9) was only present in the profile ENC&EP (it was virtually absent in the other profiles). A similar situation occurred with regard to withdrawal symptoms (IGD2) manifesting exclusively in EWS&EP. Unsuccessful attempts at controlling play (IGD4) were revealed, although not as frequent,

in ENC&EP and P&EP. IGD5 (loss of interest), IGD6 (continuing despite problems), and IGD7 (hiding/lying about playing time) symptoms had a very similar pattern in each profile.

Comparison of the profiles

The profiles that emerged were compared with each other (Table 3) for two variables related to parents' actions toward playing games: interest in the games the child plays and control over their playing time. There were no significant differences for the variable related to parental interest in the games the child plays (p>0.05). In contrast, there were differences between the profiles for the variable related to perceived parental control over the time children spend playing. In the profile NKU, more students indicated that their parents do not control the time they spend on games than in P-FP and EWS&EP. The effect size for this regularity, as measured by Cramér's V, was low.

Differences between the profiles were also identified in terms of gender (Table 3). The Preoccupied and Escaping Players (P&EP) were predominantly boys and there were significantly more boys in this profile than in P-FP and EWS&EP, but a similar number as in ENC&EP. The effect size for this relationship was average. There were no significant differences in the proportions of different developmental phases by profile affiliation. Students in early adolescence were the most represented in each profile. The results of the Kruskal–Wallis ANOVA for average time spent playing indicate differences between the profiles (see Table 3 for details). These mainly concern P-FP, which had lower average scores than ENC&EP and P&EP.

Table 3. Comparison of profiles by parents' actions toward their child's gaming, sociodemographic variables and time spent playing games

Variables	P-FP, *n* (%)	EWS&EP, *n* (%)	ENC&EP, *n* (%)	P&EP, *n* (%)	χ^2	*H*
Parents' actions: interest in games						
Yes	259[a] (58,1)	28[a] (62,2)	19[a] (47,5)	57[a] (62,6)	2,92[n.i.]	–
No	187[a] (41,9)	17[a] (37,8)	21[a] (52,5)	34[a] (37,4)		
Parents' actions: control over the time spent gaming						
Yes	304[b] (68,0)	34[b] (75,6)	18[a] (45,0)	54[a,b] (59,3)	12,25**	–
No	143[b] (32,0)	11[b] (24,4)	22[a] (55,0)	37[a,b] (40,7)		
Sex						
Men	234[a] (52,3)	26[a] (57,8)	26[a,b] (65,0)	75[b] (82,4)	28,93***	–
Women	213[a] (47,7)	19[a] (42,2)	14[a,b] (35,0)	16[b] (17,6)		
Development phase						
Middle school age	45[a] (10,1)	7[a] (15,6)	6[a] (15,0)	4[a] (4,4)	12,26[n.i.]	–
Early adolescence	262[a] (58,6)	31[a] (68,9)	18[a] (45,0)	58[a] (63,7)		
Late adolescence	140[a] (31,3)	7[a] (15,6)	16[a] (40,0)	29[a] (31,9)		
Time spent on games; average rank (mean)						
On schooldays (*n*=532)	244,22[b] (2,12)	287,14[a,b] (2,62)	319,42[a] (3,03)	334,84[a] (3,11)	–	30,09***
On weekends (*n*=604)	270,77[b] (3,53)	339,43[a,b] (4,41)	392,38[a] (5,64)	407,15[a] (5,56)	–	58,04***

Source: own study.
P-FP: Problem-Free Players; EWS&EP: Experiencing Withdrawal Symptoms and Escaping; ENC&EP: Experiencing Negative Consequences and Escaping; P&EP=Preoccupied and Escaping; H: Kruskal–Wallis test statistic.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$; n.i.: statistically insignificant result.
Values in rows marked with different letters are significantly different from each other at $p<0.05$.

Discussion

Four profiles were extracted based on the expression of nine IGD symptoms. The variables that could be considered to differentiate the profiles were preoccupation with gaming, withdrawal symptoms, tolerance, escape from negative emotions, and experiencing negative consequences of gaming. The symptoms of loss of control, loss of previous interests, continuing in spite of problems, and hiding/lying about the time spent gaming did not differentiate the profiles.

Relating the data to other studies analyzing IGD symptoms with a person-centered approach, one can see a similarity in the number of profiles/classes identified. Four classes were also identified by Orsolya Király and colleagues (2017) in a study among adult gamers. In their study, a group emerged in which no IGD symptoms were present (approximately 75% of the sample). This can be compared to the group of Problem-Free Players (P-FP) from the current study, which was also the largest of all the groups. In a study by Királyi et al. (2017) there was a group (11.2%) that was characterized by preoccupation, continuing despite harm, and escaping from negative emotions. The group Preoccupied and Escaping (P&EP) in our study is similar in terms of the arrangement of variables, with the difference being that P&EP demonstrates the symptom "tolerance" more, while in the study by Király et al. (2017) "continuing despite harm" was higher.

A solution with four classes was also obtained in a study by Chi Ian Chang and colleagues (2022), conducted among Chinese adolescents during the COVID-19 pandemic. Among the classes identified by these researchers, a similarity can be seen between normative players, among whom IGD symptoms are practically absent, and the P-FP profile from our own analysis. The other profiles identified in this study (Occasional Players, Problem Players, and Addicted Players) are not similar to those identified in the analysis of Polish data. This may be due to differences in the period under study: in 2020 during the COVID-19 pandemic in China versus in 2018 in Poland. It is also significant that IGD is more prevalent in East Asian countries (Paulus et al. 2018). Additionally, the differences may be due to Chang et al. (2022) using LCA and a different survey tool being used to measure IGD, one which only takes into account yes/no responses.

The symptoms that received the lowest probability of occurring in this study, in all classes apart from the addicted group, were loss of interest, lying to others, and negative consequences such as the loss of an important relationship. In the case of our analysis, these symptoms, with the exception of negative consequences—which was dominant in the ENC&EP profile—were also the least severe.

The four profiles that emerged from the study were compared against each other in terms of five variables: (1) parental interest in what the child plays (yes vs. no), (2) control over playing time (yes vs. no), (3) gender (boys vs. girls), (4) developmental stage (middle school age vs. early adolescence vs. late adolescence), and (5) time spent playing games (quantitative variable). The students' subjective belief about their parents' or guardians' interest in the games they play did not appear to differentiate between the groups. With the exception of ENC&EP, "Experiencing Negative Consequences and Escaping," more than half of the students indicated that their parents are interested in the games they play. It is puzzling that in the P-FP group, about 40% of the survey participants indicated that there was no such interest on the part of their parents. This may result from incidental gaming which takes place, for example, outside the home or on devices that are not owned by the child.

Significant differences were noted among the profiles in relation to the subjective feeling of control over the time spent playing. ENC&EP differed significantly from the other profiles in that it overwhelmingly indicated that parents do not control their child's playing time. The aspect of control over playing time and rules related to playing in other studies (Bonnaire, Phan 2017) was a significant predictor of IGD. The profile ENC&EP may therefore require special attention due to the fact that it is dominated by the symptom of negative consequences resulting from gaming, such as experiencing problems at school.

The research on IGD indicates a higher proportion of males among those who can be described as experiencing the disorder (Stevens et al. 2021). In our study, each profile had a higher proportion of boys than girls. This was due to the larger number of boys participating in the study. However, within the profile comparisons, the dominant profile in terms of the proportion of boys was "Preoccupied and escaping" (P&EP) (82.4 vs. 17.6%). In this profile, in

addition to the symptoms of preoccupation with games and escaping from negative emotional states, there was an increase in tolerance: the need to spend more time playing in order to get pleasure from the game. However, comparisons that take into account the average time spent playing, on both weekdays and weekends, showed no differences between P&EP and EWS&EP or ENC&EP. Additionally, in a study by Király et al. (2017), the discriminatory power for the IGD criteria of preoccupation and escape was lower than for the others. The symptom of escaping from negative emotions also had a lower discriminatory power in a study by Bruno Schivinski et al. (2018).

Time spent gaming is a variable considered in IGD research where the individuals identified as addicted or at risk (e.g., Pápay et al. 2013; Pontes et al. 2014; Siste et al. 2022) spend more time gaming than those classified as non-problematic or occasional gamers. In the current study, the profile P-FP differed significantly from ENC&EP and P&EP in playing time on both school days and weekends. ENC&EP, P&EP, and EWS&EP did not differ from each other. The lack of similarity of these three profiles with respect to the groups identified in other studies and the gaming time patterns present in them may require additional research to better understand the relationship between gaming time and the presence of IGD symptoms among adolescents.

Limitations of the study and practical implications and indications for further research

The study presented herein is not without limitations. One of these is using a questionnaire to collect data on IGD, which does not fully allow for an accurate understanding of the respondents' situation. This is additionally important with group surveys, in which students may be reluctant to reveal some of their experiences, knowing that someone may see the answer they have chosen. For younger respondents to answer questions on the presence of IGD symptoms, they need to have a high degree of awareness of their actions and emotions, as well as a perspective spanning the last 12 months. Another limitation may be considering symptoms without determining whether a criterion for IGD is met, given that other studies using person-centered approaches, such as profile or latent class analysis,

have considered such measures. Having only one source of information, the students themselves, should also be identified as a limitation. Including an external source of information in the form of parents'/guardians' responses could have provided an important addition to the data not only on IGD, but also on parents' actions toward their child's gaming. Moreover, it would be necessary to distinguish between each parent/guardian, instead of treating them as one entity, which could reveal inconsistencies, for example, in terms of parental control over gaming time. The COVID-19 pandemic and its impact on children's and adolescents' online activities, including the use of online games, should be mentioned as a final limitation. Our own analysis was conducted on data collected in 2018 and therefore does not take into account the pandemic period, which negatively affected the functioning of the youngest members of society. For this reason, it is advisable to repeat the study, in particular on a representative sample, in order to assess the presence of IGD symptoms among Polish adolescents and to create a basis for identifying current gamer profiles.

The profiles of students defined in the analysis can help to better understand the phenomenon of online gaming disorder. A symptom that emerged in each profile was escaping from negative emotions. Games may therefore provide a kind of space for emotion regulation among younger gamers, which may require adult support. As shown in a study by Soyeon Lee and colleagues (2022), mothers' perception of games as a positive activity was a protective factor against the development of IGD, while the opposite stance was a significant risk factor. Making parents aware of the importance of their attitudes toward their child's gaming can form a bridge of mutual understanding about gaming, as well as raise awareness that their regulation of this activity can protect children from developing a possible disorder.

Although the IGD criteria themselves have been analyzed in terms of their suitability for use in diagnosis (Király et al. 2017; Schivinski et al. 2018; Pontes et al. 2019), such analysis among the youngest players is lacking. Further research in this area could determine whether applying uniform criteria to adults and adolescents yields similar solutions. This seems particularly relevant given the development of technology and the fact that the percentage of young people who are gamers is over 85% (*Polish Gamers KIDS 2022* 2022).

Summary

The study identified profiles that were differentiated by IGD criteria. The largest group was Problem-Free Players (P-FP; 71.7%), while the smallest was Experiencing Withdrawal Symptoms and Escaping (EWS&EP; 4.2%). In each profile, manifestations of a symptom related to escaping or releasing negative emotions was discernible. There was a difference between the profiles for only one of the two variables related to parents'/guardians' attitudes toward their child's playing: control over playing time. There were no differences regarding their interest in what games the child plays. Gender also significantly differentiated the profiles, particularly the profile of Preoccupied and Escaping (P&EP), which had the highest number of boys. The proportion of respondents at each developmental stage did not differ between the profiles. The time spent playing was significantly lower among Problem-Free Players compared to students in the groups Preoccupied and Escaping and Experiencing Negative Consequences and Escaping.

* * *

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ADDRESS FOR CORRESPONDENCE:

Martyna Kotyśko
University of Warmia and Mazury in Olsztyn
Faculty of Social Sciences
e-mail: martyna.kotysko@uwm.edu.pl