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Associations between gaming disorder, parent-child relationship, parental supervision, and discipline styles: Findings from a school-based survey during the COVID-19 pandemic in Vietnam

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FULL-LENGTH REPORT



ABSTRACT

Background and aims: Vietnam implemented numerous measures to reduce the transmission of COVID-19 among school students, including study-at-home/self-quarantine. During the study-at-home period, adolescents may engage in more video gaming than usual, potentially contributing to gaming disorder. However, the regionally-representative prevalence of gaming disorder and its association with parenting practice and discipline practice have not been described. We assessed the prevalence of gaming disorder among Vietnamese adolescents during the initial 6 months of the COVID-19 pandemic and the associations between gaming disorder and parenting practice and discipline practice. *Methods:* We conducted a school-based, self-administered cross-sectional survey of 2,084 students in Hanoi, Vietnam (response rate = 97.1%). The survey included standardized instruments translated from English to Vietnamese. We performed multilevel logistic regressions to assess the associations between parenting practice, discipline practice, and gaming disorder. *Results:* The prevalence of gaming disorder among the respondents was 11.6%. Healthy parent-child relationship was protective against gaming disorder (Adj OR = 0.36; 95% CI = 0.21, 0.62). Non-supervision, non-discipline, violent discipline were positively associated with gaming disorder. *Discussion and Conclusions:* We found associations between gaming disorder and parent-child relationship, parental supervision, and parental discipline. Future interventional studies should consider assessing the effect of fostering healthy parent-child relationships and appropriate discipline on the occurrence or prognosis of gaming disorders.

KEYWORDS

Gaming disorder, COVID-19, parent-child relationship, parental supervision, discipline styles, school, adolescent, Vietnam

INTRODUCTION

Gaming is now more popular than ever, but gaming can become a pathological and even addictive behavior (Kuss & Griffiths, 2012; Loton, Borkoles, Lubman, & Polman, 2016). At the time the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was published in 2013, it included Internet gaming disorder (IGD) in the chapter 'Conditions for further study' (American Psychiatric Association, 2013). IGD is defined as "persistent and recurrent use of the Internet to engage in games that lead to clinically

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significant impairment or distress in a period of 12 months” (American Psychiatric Association, 2013).

Gaming disorder (GD) is now officially described in the International Classification of Diseases 11th edition (ICD-11) as “a pattern of online/offline gaming behavior (“digital gaming” or “video-gaming”) that inflicts significant impairment in personal, family, social, educational, occupational or other important areas of functioning” (World Health Organization, 2018a). GD is an emerging issue in child and adolescent health amidst the increasing ease of access to the internet and video games (Freitas & Griffiths, 2008; Loton et al., 2016). Excessive gaming can result in negligence of relationships, school or work performance, and essential physical demands. Gamers can withdraw from other forms of entertainment and develop pathological or addictive behaviors (Kuss & Griffiths, 2012). Estimates of the prevalence of GD vary according to the screening tool (Stevens, Dorstyn, Delfabbro, & King, 2020), but the global prevalence of GD is 3.05% (Stevens et al., 2020). The prevalence of GD among students ranges from <1% in the USA, UK, Canada, and Germany in one study (Feng, Ramo, Chan, & Bourgeois, 2017) to as high as 24% in another report in Germany (Wartberg, Kriston, & Kammerl, 2017).

GD is positively associated with poor parent-child relationships (Beranuy, Carbonell, & Griffiths, 2013; Bonnaire & Phan, 2017; Kim & Kim, 2015; Zhu, Zhang, Yu, & Bao, 2015). Factors found to be protective against problem gaming include parent-child connectedness, perceived warmth in the family environment, child care, and parental supervision (Liau et al., 2015; Möble & Rehbein, 2013; Rehbein & Baier, 2013). However, findings on the association between parenting practices and GD are inconsistent. Two studies showed a negative link between parental supervision and GD (Kwon, Chung, & Lee, 2011; Rehbein & Baier, 2013), two other studies found no link (Choo, Sim, Liau, Gentile, & Khoo, 2015; Liau et al., 2015), and one study found a positive association (Bonnaire & Phan, 2017). However, these studies did not consider other aspects of parenting, such as punishment and abuse, which potentially confound the association between the parent-child relationship and GD (Vadlin, Åslund, Hellström, & Nilsson, 2016).

Vietnam is an emerging economy with a rapidly growing gaming sector and currently had the 27th highest gaming revenue in the world (Newzoo, 2019). Vietnam also has the fastest growth in the number of gamers in Southeast Asia (Grubb, 2014). In 2020, in response to the COVID-19 pandemic, the Vietnamese government took proactive measures to reduce its spread. One of these measures included school closures from January to May 2020. Students were urged to avoid social gatherings and to study online at home. During the stay-at-home period, there was a rise in gaming and related activities (e.g., video game live-streaming) (Javad, 2020; Perez, 2020). This increase in gaming could have increased the risk of gaming disorder among vulnerable people, including youths and those predisposed to GD (King, Koster, & Billieux, 2019), while the stay-at-home measures made monitoring adverse

outcomes of excessive gaming difficult (Saunders et al., 2017).

There have been studies on GD among Vietnamese adolescents (Đặng Ngọc Minh, 2015; Nguyễn Hoàng Giang, Đỗ Trà My, Lương Minh Tân, & Lê Thị Minh Ánh, 2011). However, these studies did not offer a regionally representative assessment of GD’s prevalence, especially amidst the pandemic, nor did these studies assess the association between GD, parent-child relationship, and parental disciplinary practices. Such information can serve as helpful baseline information for policy-makers and designers of youth behavioral health programs. The objectives of this study were: 1) to assess the prevalence of GD among Vietnamese adolescents in Hanoi, and; 2) to assess the associations between parent-child relationship, parental discipline styles, and GD.

METHODS

Study design and participants

A school-based cross-sectional study was administered in Hanoi (Vietnam) during June 2020, after the national lockdown eased and schools reopened. The survey included secondary school students (6th – 9th grade) and high school students (10th – 12th grade). The study recruited participants by multi-stage stratified clustered sampling. Firstly, all schools were stratified into public and non-public secondary schools (601 and 27 schools, respectively) and public and non-public high schools (125 and 101 schools, respectively), thus yielding a total of four strata. The research team then randomly selected two schools within each stratum. Secondly, the research team randomly selected two classrooms within each grade of the selected school. Thirdly, in the sampled classrooms, all students were eligible to participate in the survey.

In total, 2084 students were selected from 56 classrooms in 6 schools (there were 2 comprehensive schools with students in both secondary and high school levels). There were no previously-reported data to use for sample size calculation, so we assumed that the prevalence was between 5 and 25% (based on findings in other countries). We calculated the sample size using the lowest estimated prevalence of 5% (thus 2.5% precision) in order to yield the highest possible number of required sample, at 95% level of confidence and design effect of 6.85 and assuming 10 percent non-response. The design effect was calculated from this formula $(1 + (n-1) * ICC)$, when: n = average size of a cluster i.e., a classroom (40 students), and; ICC = intraclass correlation coefficient = 0.15 (Shackleton, Hale, Bonell, & Viner, 2016)). At the stated values and assumptions, the final sample size was $n = 2,223$ students.

Data collection

Prior to data collection, permission to conduct this study was obtained from the Hanoi Department of Provincial Education and Training. Afterward, we visited the sampled



school and informed the school administrators about the study details. We randomly selected classrooms based on the school-provided classroom list and made data collection appointments during a designated free class period. The schools had the right to refuse participation.

On the appointment date and time, we visited the sampled classroom and briefed the students about the study's objectives, methodology, and voluntary participation. We informed the students that their identity would remain confidential and requested the students to respond truthfully. We also asked students not to look into other students' responses or asking another student about responses. We also informed the students that completing the questionnaire would take approximately 25–30 min during the free class period. Students gave consent to participate verbally. After completing the questionnaire, the students placed their questionnaire in a collecting box placed outside the classroom, free from the sight of their teachers and other authority figures. Students who did not wish to complete the questionnaire would place the unfilled questionnaire in the same collection box. During the participant information, consenting and data collection processes, we requested the teacher in the classroom to go to another room. We then took the collection box back to the research office, opened the box, and checked the questionnaires for completion. Questionnaires with at least 20% missing information were excluded from the study.

Study instrument

The study instrument was a paper-based questionnaire that included three parts: (1) Internet gaming disorder test; (2) parent-child relationship, parental supervision and discipline styles; (3) socio-demographic and socio-economic information.

Internet Gaming Disorder Test

GD was measured using the Internet Gaming Disorder Test (IGD-20 Test). The IGD-20 Test included 20 questions to measure online and offline gaming activities that exist over 12 months and covered all three features of GD: impaired control over gaming, preference gaming over other daily activities, and continue playing despite consequences. Each question item had 5 response-options: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree, and; 5 = strongly agree. We considered participants with the IGD-20 Test score of 71 points or higher to have GD according to the suggestion in a previous study (specificity = 100%, sensitivity = 96%, PPV = 94%, and NPV = 100%) (Pontes, Király, Demetrovics, & Griffiths, 2014).

We translated this instrument into Vietnamese following the process for instrument's translation and adaptation of World Health Organization, including forward-translation, expert panel, and back-translation (World Health Organization, n.d.). Afterward, we pilot-tested the Vietnamese instrument in 30 students from the same population as the study participants, asked them for their feedback, and revised words or expressions that they did not understand

or found unsuitable. The Cronbach's alpha coefficient was 0.85.

Parent-child relationship and parental supervision and discipline styles

Parent-child relationship was measured by the parent-family connectedness scale (Resnick et al., 1997). The scale was used by previous studies with good internal consistency ($\alpha = 0.80\text{--}0.90$) (Foster et al., 2017; Mueller & Haines, n.d.; Sieving et al., 2001). The scale comprises six statements for each father/male guardian and mother/female guardian, for example: "I feel close to my father/mother", "I think he/she cares about me", "I am happy with the relationship with my father/mother". The response-options are based on 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree, and 5 = do not know. This scale was translated in Vietnamese by applying the WHO's guideline for translation and adaptation of instrument (World Health Organization, n.d.). Then, we pilot-tested the Vietnamese instrument in 30 students, asked them for their feedback, and revised words or expressions. We calculated arithmetic mean based on a total score of all six items (exclude "do not know"). A higher score means a closer relationship with a parent or guardian. The Cronbach's alpha coefficient was 0.94.

Parental supervision of gaming was measured with a question, "Do your parent supervise your gaming behaviors?", with responses of either "yes" or "no". Parental discipline styles were measured by the Child Discipline Module, including two overall scales: violent discipline and non-violent discipline. The details of the scales and sub-scales and their question items are listed in Box 1. If the student responded "yes" to at least one item listed in the scale or subscale, the student was defined as having been exposed to the form of discipline. The Vietnamese version of this questionnaire was used and validated in a previous survey (Vietnam General Statistical Office, 2006).'

Socio-demographic and socioeconomic information

The socio-demographic and socioeconomic information section included questions on gender, age, grade, school type, ethnicity, place of residence, ownership of electronic devices (computer, tablet, smartphone, gaming console), and perceived household wealth compared to other students in the school.

The section also contained questions on health-risk behaviors of the respondent's parents, family members, and friends as they are potential predicting variables of GD. These questions asked about the experience of problems with gaming, gambling, alcohol, tobacco and drug use, violence (verbal and physical), sexual behavior, suicide, and interpersonal violence.

Statistical analysis

We performed double data-entry using EpiData 3.1 and checked, validated, and corrected entries that were found to



Box 1. Scales and subscales for measurement of parental discipline styles according to the Child Discipline Module

Scales and subscales	Items	Responses
Do your parents/guardians practice discipline if you violate the gaming rules?		
Non-Discipline		No.....2
Discipline		Yes.....1
<i>Non-Violent Discipline</i>	Took away privileges, forbade something you liked or did not allow you to leave house	Yes.....1
		No.....2
	Explained why something was wrong	Yes.....1
		No.....2
Gave you something else to do	Yes.....1	
	No.....2	
<i>Violent Discipline</i>	Shouted, yelled at or screamed at you	Yes.....1
		No.....2
	Called you dumb, lazy or another name like that	Yes.....1
		No.....2
Physical punishment	Shook you	Yes.....1
		No.....2
	Spanked, hit or slapped you on the bottom with bare hand	Yes.....1
		No.....2
	Hit you on the bottom or elsewhere on the body with something like a belt, hairbrush, stick or another hard object	Yes.....1
		No.....2
Hit or slapped you on the hand, arm or leg	Yes.....1	
	No.....2	
Severe physical punishment	Hit or slapped you on the face, head or ears	Yes.....1
		No.....2
	Beat you with an implement (hit over and over as hard as one could)	Yes.....1 No.....2

be inconsistent. We performed descriptive bivariate analyses using frequency cross-tabulation to assess the extent to which the parent-child relationship, parental supervision, and discipline styles were associated with GD. We then performed multilevel logistic regression analyses to assess the extent that the mentioned variables were associated with GD while accounting for the hierarchical nature of data. In multilevel logistic regression analyses, we included parenting style, parent-child relationship, family and peer factors, and socio-demographic variables in level one. We included year of study (grade level) in level two and type of school in level three. Variables were selected into the model by comparing models with different variables using the likelihood ratio test. A two-sided *P*-value of <0.05 was considered statistically significant. All descriptive and regression analyses were adjusted for the sampling weights to consider the complex survey design (Lumley, 2010).

Ethical considerations

The study received ethical approval from the Human Research Ethics Committee, Faculty of Medicine, Prince of Songkla University (REC: 62-198-18-1). Parents or guardians were informed about the study objectives, students' information confidentiality by school administrators and teachers. Students were informed about the objectives of the study, their rights to participate or refuse in addition to

confidentiality of their information before answering the questionnaire. As anonymous, sensitive information was collected, a waiver of document of consent for minors was approved from the institutional review board. The research involved no more than minimal risk to subjects; therefore, the waiver of consent did not affect the rights or welfare of the subjects.

RESULTS

We were able to invite 2,147 students to participate in the study, 2,084 of whom agreed to participate and returned completed questionnaires (response rate = 97.1%, *n* = 2,084 students). The participants' mean age (\pm standard error) was 14.5 years \pm 0.04 years (Table 1). Nearly all participants were Kinh, the majority were non-religious and lived in rural areas, and about half were female. Personal ownership of computer, tablet, smartphone, and game console were 42.4, 17.7, 61.6, and 10.9%, respectively. Gaming use was the most commonly-reported behavior-related problems among the participants' family members and friends (Table 2).

Approximately 11.6% of participants suffered from GD (Table 1). The mean parent-child relationship scores were lower in the GD group than in the non-GD group (mean of 2.6 vs. mean of 3.4). The prevalence of GD was lowest among students whose parents provided supervision with

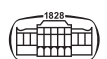


Table 1. Socio-demographic characteristics of participants ($n = 2,084$ students)

	Percent \pm SE, or Mean \pm SE*
<i>Gender</i>	
Female	50.2% \pm 4.1%
Male	47.4% \pm 4.1%
Third gender	2.4% \pm 0.1%
<i>Age</i>	
	14.5 \pm 0.04
<i>Grade</i>	
Grade 6	18.7% \pm 1.3%
Grade 7	19.1% \pm 0.2%
Grade 8	14.6% \pm 0.2%
Grade 9	14.9% \pm 1.1%
Grade 10	11.2% \pm 0.1%
Grade 11	11.7% \pm 0.7%
Grade 12	9.8% \pm 0.1%
<i>School type</i>	
Public	89.9% \pm 0.2%
Non-public	10.1% \pm 0.2%
<i>Ethnicity</i>	
Kinh	99.1% \pm 0.2%
Other	0.9% \pm 0.2%
<i>Religious</i>	
None	79.2% \pm 3.4%
Buddhism/other religious	20.8% \pm 3.4%
<i>Place of residence</i>	
Rural	61.7% \pm 0.8%
Urban	38.3% \pm 0.8%
<i>Household's economic status relative to the other households **</i>	
Poorer than most other households	5.6% \pm 0.3%
Same as most other households	89.8% \pm 1.0%
Wealthier than most other households	4.6% \pm 0.9%
Ownership of electronic devices	
<i>Computer</i>	
Device not available in the household	22.7% \pm 2.9%
Device available in the household but shared with others	34.9% \pm 5.7%
Had own devices for personal use	42.4% \pm 3.0%
<i>Tablet</i>	
Device not available in the household	65.6% \pm 0.8%
Device available in the household but shared with others	16.7% \pm 2.3%
Had own devices for personal use	17.7% \pm 1.6%
<i>Smartphone</i>	
Device not available in the household	14.4% \pm 0.3%
Device available in the household but shared with others	24.0% \pm 2.4%
Had own devices for personal use	61.6% \pm 2.3%
<i>Console</i>	
Device not available in the household	82.7% \pm 1.8%
Device available in the household but shared with others	6.4% \pm 1.2%
Had own devices for personal use	10.9% \pm 1.0%
<i>Gaming Disorder***</i>	
Negative	88.4% \pm 0.7%
Positive	11.6% \pm 0.7%

*All values were weighted for a complex survey design.

**According to respondent's own assessment.

***As assessed by the Internet Gaming Disorder Test (IGD-20 Test), Positive: Scored ≥ 71 points.

non-violent discipline (3.4%) and supervision with psychological aggression (5.8%). The prevalence of GD was highest among those who received supervision with severe physical punishment, those supervised without discipline, and those with no parental supervision (29.7, 31, and 28.4%, respectively; Table 3).

Table 2. Perceived behavior-related problems of family members and friends in the past 12 months ($n = 2084$ students)

	Percent \pm SE *
<i>Perceived behavior-related problems among family members</i>	
Gaming use	78.5% \pm 0.8%
Alcohol use	74.7% \pm 2.3%
Tobacco use	51.9% \pm 1.7%
Drug use	2.4% \pm 0.4%
Gambling/Betting	6.9% \pm 0.6%
Verbal violence	15.6% \pm 0.5%
Physical violence	7.1% \pm 0.3%
<i>Perceived behavior-related problems among friends</i>	
Gaming use	78.4% \pm 0.4%
Alcohol use	20.8% \pm 2.6%
Tobacco use	10.6% \pm 0.9%
Drug use	1.5% \pm 0.1%
Gambling/Betting	3.0% \pm 0.5%
Sexual behavior	3.4% \pm 0.1%
Suicide	0.9% \pm 0.5%
Interpersonal quarreling	24.2% \pm 3.3%
Fighting	19.1% \pm 3.7%

* All values were weighted for a complex survey design.

Table 3. Parent-child relationship, parental supervision and discipline style ($n = 2084$ students)

	Gaming disorder	
	No ($n = 1826$)	Yes ($n = 258$)
Parent-child relationship score ^a	3.4 \pm 0.01	2.6 \pm 0.12
<i>Parental supervision and discipline styles^b</i>		
Supervision, Non-violent discipline	96.6% \pm 0.6%	3.4% \pm 0.6%
Supervision, Psychological aggression	94.2% \pm 0.9%	5.8% \pm 0.9%
Supervision, Physical punishment	84.1% \pm 3.4%	15.9% \pm 3.4%
Supervision, Severe physical punishment	70.3% \pm 3.1%	29.7% \pm 3.1%
Supervision, non-discipline	69.0% \pm 3.4%	31.0% \pm 3.4%
Non-supervision	71.6% \pm 3.9%	28.4% \pm 3.9%

^a Mean \pm SE, weighted for a complex survey design.

^b Percent \pm SE, weighted for a complex survey design.

Association between parent-child relationship, parental supervision, and discipline styles and gaming disorder

Healthy parent-child relationship (higher score) was a protective factor for GD (Adjusted OR = 0.36, 95% CI: 0.21, 0.62). Non-supervision, non-discipline, physical punishment, and severe physical punishment all strongly and positively associated with GD (Adjusted ORs all above 4.00). Increased likelihood of having GD was observed among students who reported violent forms of discipline, compared to those who received supervision without violent discipline practice. However, those who received no discipline or no



Table 4. Association between parent-child relationship, parental supervision and discipline styles and gaming disorder ($n = 2084$ students)

	Model 1 ^a	Model 2 ^b	Model 3 ^c
Parent-child relationship score	0.30 [0.19, 0.46]	0.36 [0.21, 0.61]	0.36 [0.21, 0.62]
Parental supervision and discipline styles			
Supervision, Non-violent discipline	1.0 (Ref)	1.0 (Ref)	1.0 (Ref)
Supervision, Psychological aggression	1.72 [1.19, 2.48]	1.59 [1.35, 1.87]	1.63 [1.40, 1.90]
Supervision, Physical punishment	5.33 [1.58, 17.93]	4.66 [1.39, 15.66]	4.60 [1.26, 16.80]
Supervision, Severe physical punishment	11.82 [5.07, 27.54]	7.76 [2.50, 24.11]	8.10 [3.92, 16.73]
Supervision, non-discipline	12.65 [10.72, 14.93]	8.05 [5.97, 10.85]	8.12 [5.91, 11.16]
Non-supervision	11.38 [3.67, 35.23]	9.52 [4.06, 22.30]	8.86 [7.41, 10.61]

^a Model 1. Crude OR [95% CI].

^b Model 2. Adjusted OR [95% CI], adjusted for the co-exposure (parental supervision and discipline style or parent-child relationship score).

^c Model 3. Adjusted OR [95% CI], adjusted for all variables in Model 2 + potential confounders (gender, place of residence, ownership of electronic devices, household wealth, perceived health-risk behaviors among family members, perceived health-risk behaviors among friends, grade/year level and school type).

supervision from the parents also had 8 - 9 times higher odds of GD compared to those who received supervision without violent discipline practice (Table 4).

DISCUSSION

We assessed the prevalence of GD and its association with the parent-child relationship, parental supervision, and discipline styles by surveying 2,084 students in Hanoi. We found that unhealthy parent-child relationships, non-supervision, supervision without discipline, and violent child disciplinary practice were risk factors for GD.

In this study, the prevalence of GD was 11.6%, higher than the global average of 3.05% (Stevens et al., 2020). We collected data after the COVID-19 lockdown measures eased, and the interpretation of the prevalence of GD should only pertain to such context. Alarming information about a pandemic was found to affect mental health in the general population profoundly, as was the case during the SARS outbreak of 2003 (Ko, Yen, Yen, & Yang, 2006). Favored social mechanisms for coping with stress, such as organizing events, celebrations, and gatherings, were forbidden by the need for social distancing. The restrictions might have

influenced students to opt for video games as a temporary adaptive coping strategy (Russoniello, O'Brien, & Parks, 2009).

Our study findings indicated a possible pattern of association between parent-child relationship and GD, similar to the findings in other studies (Beranuy et al., 2013; Bonnaire & Phan, 2017; Charlie, HyeKyung, & Khoo, 2011; Choo et al., 2015; Kim & Kim, 2015; Zhu et al., 2015). Such pattern was also found with regard to internet addiction (Şenormancı, Şenormancı, Güç; Young, 2004). Adolescents may also resort to intense gaming to escape unhealthy parent-child relationships and develop GD (Choo et al., 2015; Park, Kim, & Cho, 2008). On the other hand, GD can also induce problems in parent-child relationships, and our cross-sectional study design did not enable the assessment of temporality in the observed associations. Future studies should consider prospective study designs or collect data in greater detail by including questions on the detail of the parent-child relationship and applying qualitative research methods.

In this study, we modified questions to measure discipline styles in greater details than in previous studies (Kwon et al., 2011; Möble & Rehbein, 2013) and found strong relationships between parental supervision and discipline styles and GD. In Vietnamese society, violence against children perpetrated by parents still commonly occurs despite existing legislation against child physical abuse (Vu Thi Thanh Huong, 2016). The notion of "Spare the rod, spoil the child" ("Thuong cho roi cho voi", lit. "spanking (with a rod) out of love for the child,") suggests that discipline through corporal punishment has been a cultural norm for generations. Vietnamese society is patriarchal and conservative. Children are expected to behave well and obey their parents, particularly the father. Parents regard gaming as a distraction from study and a transgression that warrants discipline. Vietnamese fathers generally have unquestionable authority with regard to how to discipline their children, and tend to believe that they can and should use corporal punishment to make their children act better and be more obedient; laws are secondary inside the home. Corporal punishments that are excessive or unjust may also be justified based on the idea that men have relatively low temperament by nature (Cappa & Dam, 2014).

A previous longitudinal study found that harsh verbal discipline was associated with adolescent behavioral problems and depression (Wang & Kenny, 2014). Adolescents may respond to harsh verbal discipline with dismissal or contempt (Evans, Simons, & Simons, 2012) and develop various problems (i.e., depression, problematic social interactions) through the negative perception of the parent-child relationship, self, or lack of self-control (Donovan & Brassard, 2011; Evans et al., 2012). Similarly, physical punishment is found to be associated with mental health problems among adolescents, including aggression, low self-esteem, low cognitive ability, hostility, emotional instability, anxiety, depression, antisocial behavior, and alcohol and drug abuse/dependence (Afifi et al., 2014; Afifi, Mota, Dasiewicz, MacMillan, & Sareen, 2012; Gershoff & Grogan-Kaylor, 2016). Those who work on the prevention or

treatment of GD should consider questions regarding parental supervision or discipline as part of their patient assessment. Future interventional studies on GD should consider assessing the effect of reasoned disciplinary actions and reduction of violent verbal and physical punishment. In that regard, students in this study were asked only whether they had experienced each disciplinary method. We did not collect details regarding the frequency or the intensity/duration of the action. Future studies should explore these associations in greater detail by including questions on the detail of disciplinary actions and employing qualitative research methods.

This study had several notable strengths. This study was the first to assess the association between parent-child relationship, parental supervision and discipline styles, and GD among Vietnamese adolescents. The survey design allowed for a regionally-representative assessment of the prevalence of GD among secondary students with adequate statistical power to assess the associations between GD and parenting practices. However, the limitations of the study should be taken into consideration of the study findings. The IGD-20 test was not psychometrically validated in Vietnamese. The cross-sectional design did not allow us to ascertain temporality in the association between variables nor make causal inferences. Furthermore, we conducted data collection after COVID-19 lockdown was implemented in Hanoi, and findings regarding gaming behaviors and GD may be generalizable only in this unique context.

CONCLUSION

We assessed the prevalence of GD among Vietnamese adolescents and assessed the association between GD, parenting practice, and discipline practice. Prevalence of GD was higher in our study population than in other settings, and we found robust associations between GD and parental punishment, particularly severe physical punishments. We collected data after the COVID-19 lockdown, and the findings may be generalizable only to the unique context of the study period.

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Author's contribution: VMC designed the study, developed a questionnaire, collected data, analyzed the data, and completed the manuscript. SA and WW advised in the study design and conceptualization, questionnaire development, data analysis and interpretation, manuscript review and edition. HTMH and VTMH advised in the study design and

questionnaire development, data collection, and manuscript review. All authors have access to the data and accept responsibility for the integrity of the data and the accuracy of the data analysis.

Conflict of interest: The authors declare no conflict of interest.

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