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PROBLEMATIC INTERNET USE: EXAMINING PARENTS-ADOLESCENT COMMUNICATION AND SELF-CONTROL WITH STRESS LEVEL AS MEDIATOR

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Abstract

Although the internet can provide benefits and convenience for many users, it can lead to risky behaviors such as problematic internet use (PIU). This study investigates the relationship between parents-adolescent communication, self-control, and PIU mediated by stress levels. Data were collected from 233 Indonesian high school students selected using disproportionate stratified random sampling. The Parents-Adolescent Communication Scale, Brief Self-Control Scale, Depression Anxiety Stress Scale, and Problematic Internet Use in Adolescent were the scales used to measure the four variables. Descriptive analyses, difference test, Spearman correlations, structural equation modeling, and analysis of variance were used for data analysis purpose. The results show direct effects of openness in the parents-adolescent communication, self-control, and stress levels on PIU. Problems in parents-adolescent communication and self-control have an indirect effect on PIU as mediated by stress levels. These findings demonstrate the need for endeavors to urge adolescents to improve their self-control and manage stress levels to avoid PIU risk.

Keywords: adolescents; communication; internet; Southeast Asia; stress

Penggunaan Internet Bermasalah: Menelaah Komunikasi Orang Tua-Remaja dan Kontrol Diri dengan Tingkat Stres Sebagai Mediator

Abstrak

Internet mampu memberikan manfaat dan kemudahan bagi penggunanya, namun internet dapat menimbulkan perilaku berisiko seperti penggunaan internet bermasalah (PIB). Penelitian ini bertujuan untuk menganalisis pengaruh komunikasi remaja-orang tua, kontrol diri, dan PIB yang dimediasi oleh tingkat stres. Data dikumpulkan dari 233 siswa menengah atas Indonesia yang terpilih sebagai sampel acak berstrata tak proporsional. Kuesioner *Parents-Adolesccent Communication Scale*, *Brief Self-Control Scale*, *Depression Anxiety Stress Scale*, *Problematic Internet Use in Adolescent* adalah skala yang digunakan untuk mengukur keempat variabel. Uji deskriptif, uji beda, korelasi Spearman, model persamaan struktural, dan analisis ragam digunakan untuk tujuan analisis data. Hasil penelitian menunjukkan bahwa ada pengaruh langsung dari keterbukaan komunikasi remaja-orang tua, kontrol diri, dan tingkat stres terhadap PIB. Permasalahan komunikasi remaja-orang tua dan kontrol diri berpengaruh tidak langsung terhadap PIB yang dimediasi oleh tingkat stres. Temuan ini menunjukkan perlunya upaya untuk mendorong remaja untuk meningkatkan kontrol diri dan mengelola tingkat stres untuk menghindari risiko PIB.

Kata kunci: Asia Tenggara; internet; komunikasi; remaja; stres

INTRODUCTION

The latest national survey results show that the ratio of internet users to the total population of Indonesia is 77.02 percent, meaning that more than 210 million Indonesians use the internet (Asosiasi Penyelenggara Internet Indonesia, 2022). The internet can be used as an additional effective learning medium (D'Aquila et al., 2019) as well as a medium that helps reduce stress (Pallavicini et al., 2021). During the Covid-19 pandemic, people's activities outside the home were limited, so people spent much time surfing the virtual world by using the internet for various things, especially in finding information, social networks, and online gaming (Fernandes et al., 2020; Nakayama et al., 2021). This condition can impact the emergence of problematic internet use (PIU), referred to as excessive or compulsive internet use that has detrimental consequences in daily life (Spada, 2014).

The age group with the highest percentage of internet users is between the ages of 13 and 18 (99.16%) (APJII, 2022). At the same time, adolescents are also the most vulnerable group with PIU compared to adults, which is possible because adolescents use the internet as a medium to avoid stress (Singh et al., 2022). A qualitative study by Park and Kim (2018) confirms the existence of adolescents who choose to surf the internet to find idol information and online gaming as strategies to deal with academic stress. Stress is negative energy in a motion state marked by trouble relaxing and being easily agitated (Lovibond & Lovibond, 1995). PIU may result from this condition, some of which are characterized by uncomfortable feelings about being unable to connect to the internet and neglecting tasks in the actual world to stay connected to the internet (Boubeta et al., 2015; Wong et al., 2015). Subsequently, to decrease PIU alongside the stress, proper advances are required, particularly for adolescents as the primary internet users.

Within the framework of Bronfenbrenner (1979), child development is influenced by the systems surrounding it, one of which is the family. Parents are part of the adolescent's microsystem, which means they readily engage in homes with adolescents. The family acts as a system that accommodates the dependence of family members to achieve common goals (welfare). Parents are tasked with training morale, disciplining, and guiding children's lives so that they can function beyond basic survival, as well as love children and respect them as independent individuals. Parents and children make efforts to provide emotional security and close relationships and carry out practical activities to achieve common goals. Collaboration between parents and children also helps prepare children to leave their homes and continue to grow (Puspitawati, 2012, 2018). The study by Nguyen et al. (2022) proves that adolescents with bad relationships with their parents tend to ignore their parents' suggestions regarding internet use. Moreover, it was known that open communication was an element against PIU in adolescents (Alt & Boniel-Nissim, 2018) and also against stress (Jiménez et al., 2019).

Adolescent self-factors, such as self-control or the capacity to resist temptation by controlling their attitudes and the initiative to make self-disciplines (Tangney et al., 2004), should also be considered. Impulsivity drives more time spent on social media, and the ability to stay focused on self-initiated and pleasurable activities helps prevent social media addiction (Cudo et al., 2020). Self-control is directly correlated with PIU (Zakiyyah & Latifah, 2022). The ability to restrain can help adolescents respond appropriately and focus on solving problems that cause stress. Upper self-control is linked with less negative mood (Galla & Wood, 2015).

In separate studies, PIU has been linked with parents-adolescent communication (Alt & Boniel-Nissim, 2018), self-control (Zakiyyah & Latifah, 2022), and stress levels (Lam & Wong, 2015), which have yet to be explored simultaneously. Unlike existing studies, the present study examines these variables within a single research framework. In addition, it was conducted when adolescents were getting closer to the internet since entering the pandemic, with the research location in Jakarta, a city with a high percentage of internet users, making it the distinguishing point of this study. In this age of rapidly developing technology, anticipating the emergence of the risk of PIU in adolescents is important for further study.

From these problems, it is hypothesized that 1) there is a difference between internet use duration, parents-adolescent communication, self-control, stress levels, and PIU based on adolescent genders, 2) adolescent characteristics (age, internet use) are associated with PIU, and 3) parents-adolescent communication and self-control predict PIU, mediated by the stress level.

METHODS

This study used an explanatory design and questionnaires to collect data in DKI Jakarta, the province with the highest percentage of internet users from the total population per province in Indonesia (Asosiasi Penyelenggara Internet Indonesia, 2022). Data were collected from January–March 2022 after being approved by the Commission on Research Ethics Involving Human Subjects, IPB University. The samples were drawn through disproportionate cluster random sampling. No less than 290 adolescents filled out the questionnaire, and after screening the participant criteria (having both living parents, being aged 15–18 years, and using the internet), the data amounted to 233 adolescents. Six high schools took part, both public and private high schools, as well as regular and vocational high schools. The mean age of adolescents in this study was 16.62 years (SD=0.907; range=15–18 years), and more than half were females (n=233; 62.7% females).

The research procedures are as follows: 1) the researcher sent a letter explaining the research

to six schools that have been randomly selected, 2) after listening to the research explanation and approving the research technique, the school gave a list of classes, 3) the class was selected by random sampling, and the research explanation was given to the selected class. The number of selected classes in each school was different, considering the permission and availability of classes in each school, and 4) students in selected classes who were willing to participate then filled out a questionnaire by attaching a letter of parental consent.

The main variables (parents-adolescent communication, self-control, stress level, and PIU) were measured based on the condition of adolescents over the past month. In addition, respondents were also asked about age, gender, and duration of internet use (hours/minutes/day in the past month).

Parents-adolescent communication. It is adolescents' perceptions of their experiences in sharing preferences, needs, and feelings with parents. Parents-adolescent communication was measured with Parent-Adolescent Communication Scale (PACS; Barnes & Olson, 1985). The measurement was divided into two subscales: openness in communication (CO) and problems in communication (CP). CO is adolescents' ease, trust, and satisfaction when they share their preferences, needs, and feelings with their parents. CP is adolescents' difficulties, doubts, and dissatisfaction when they share preferences, needs, and feelings with their parents. Each subscale referred to the mother (10 items) and father (10 items) with a 6-point of Likert scale (1=strongly inappropriate to 6=strongly appropriate). The appropriateness determination was based on the suitability of the item questionnaire to the adolescent's current state. Cronbach's alpha (α) value for CO is 0.923, and for CP is 0.788. A higher CO score indicates higher openness in communication. A higher CP indicates more problems in communication.

Self-control. It refers to adolescents' ability to control attitudes and behavior from temptation and build initiative to discipline. Self-control was measured using the Brief Self-Control Scale (BSCS; Tangney et al., 2004), consisting of 13 statements that were measured by a modified 6-point Likert scale (1=strongly inappropriate to 6= strongly appropriate). The instrument contains five dimensions: general capacity for self-discipline, inclination toward deliberate/non-impulsive action, healthy habits, self-regulation in service for work ethic, and reliability. The scale showed good reliability (α=0.783). Higher scores indicate higher levels of self-control.

Stress level. It is defined as negative energy in a motion state arising from life events, characterized by difficulty being relaxed, tense, irritable, overreacting, and impatient. The Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995) was referenced to measure the stress level of adolescents. The instrument was modified into Indonesian, but the answer scale remained unchanged. The instrument comprised seven items with a 4-point Likert scale (0=never/rarely; 3=always/almost always). The instrument contained five dimensions: difficulty relaxing, nervous arousal, easily getting upset/agitated, irritable/over-reactive, and impatient. The questionnaire has shown good reliability (α=0.809). Higher scores indicate higher stress levels.

Problematic internet use. It is the behavior of using the internet excessively and having a negative impact on daily life, characterized by difficulty staying away from the internet, neglecting assignments, or getting substandard grades because of prioritizing surfing in cyberspace, stopping real-world activities (e.g., traveling, hobbies, sports) in order to be connected to the internet. The Problematic Internet Use for Adolescent (PIUS-a; Boubeta et al., 2015) was a unidimensional scale and referenced to measure a continuum of risk of PIU with 11 items and a 5-point Likert scale from 0=never to 4=always. The instrument was modified into Indonesian, and the answer scale range was not changed. Reliability for this scale was good (α=0.833). Higher scores indicate higher PIU risks.

The data were analyzed by descriptive and inferential tests: difference test, Spearman correlation test, structural equation modeling/SEM, and one-way analysis of variance/ANOVA. For descriptive analysis, responses were summed to calculate a total score, mean, and standard deviation, which were then divided into categories. The total scores of parents-adolescent communication and self-control that had been indexed were categorized into low (<60), moderate (60–80), and high (≥80) based on Bloom's cut-off point. Categories of stress level variables were normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and very severe (≥34) using a total score that had been multiplied by two (Lovibond & Lovibond, 1995). The PIU categories were PIU (score ≥16) and non-PIU (<16) using the PIU total score (Boubeta et al., 2015).

For SEM analysis, a model was considered a relatively good fit if Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) were a minimum of

0.95, the Root Mean Square Error of Approximation (RMSEA) was a maximum of 0.060, and the Standardized Root Mean Squared Residual (SRMR) was a maximum of 0.080 (Hu & Bentler, 1999). SEM was run by Lisrel 8.80. ANOVA was utilized to find the distinction in PIU scores between various stress levels, followed by post hoc Dunn-Bonferroni.

There was missing data on the duration of internet use, specifically the total duration of internet use (3.9%), online gaming (2.1%), and online class (3.0%). Little's Missing Completely at Random (MCAR) test revealed that the data is likely missing at random ($p>0.05$), and since the missing data is below 5 percent, pairwise deletion can perform well (Lodder, 2014). We did not include the duration of internet use in the SEM because after listwise deletion (reducing samples from 233 to 223), the goodness of fit decreased, and the model produced biased results on the samples. Except for that data, adolescents have filled in other variable data completely.

RESULTS

Adolescent Characteristic

As presented in Table 1, the mean total duration of internet use was 8.03 hours per day. From the details, the maximum duration of playing online games was longer than taking classes. Although these results cannot be generalized, this shows that in a pandemic, some adolescents spend more time playing online games than attending classes. The means of online gaming were higher in males ($p<0.01$) than in females. The standard deviation value of online gaming was larger than the mean, which indicates that the data were dispersed over a wide range of values. After the data was categorized, it was found that more males (52.9%) than females (8.9%) played online games ≥61 minutes per day. The male online gaming mode was 60 minutes per day, while the median was 120 minutes per day.

Parents-Adolescent Communication

Openness in Communication (CO)

It represents a positive aspect expected in the communication process. More than three-quarters of adolescents had low (41.6%) and moderate (35.2%) openness in communication (Table 2), with a mean index of 63.08 and a standard deviation of 19.36. Males had higher CO with their parents than females ($p<0.01$) (Table 2). CO was composed of two dimensions: communication with the father and mother.

Openness in Father-Adolescent Communication. Adolescents recognized their fathers as good listeners (66.6%) and could give honest answers when they asked questions (80.7%). On the other hand, not so many adolescents felt the ease of expressing their true feelings to their fathers (43.3%).

Openness in Mother-Adolescent Communication. Adolescents perceived their mothers as good listeners (86.3%) and could give honest answers when they asked questions (85.4%). Adolescents also found it easier to express their true feelings to their mothers (68.7%).

Problems in Communication (CP)

It indicates a negative aspect expected to be as few as possible in communication. The largest proportion of CP was low (67.4%) and moderate (28.3%). Although adolescent openness was low, it did not indicate great communication problems (Table 2).

Problems in Father-Adolescent Communication. There were topics that adolescents avoided discussing with their fathers (67.3%), and they were not sure they could tell what they truly felt (73.9%). Nonetheless, fathers (71.7%) did not insult adolescents when fathers were angry.

Table 1 Internet use duration by gender

Internet use duration	Range	Mean±standard deviation			P-value
		Male	Female	Total	
Total (hours/day)	1.0–22.0	7.92±4.22	8.09±3.69	8.03±3.89	0.185
Online gaming (minutes/day)	0.0–900.0	149.90±174.28	24.27±8.77	70.55±127.64	0.000**
Online class (minutes/day)	0.0–720.0	168.23±139.36	170.32±141.42	169.53±140.34	0.932

Note. **p<0.01

Problems in Mother-Adolescent Communication Adolescents avoided discussing some topics with their mothers (69.5%), and adolescents were not sure if they could tell what their real feelings (66.2%). Nonetheless, mothers (77.2%) did not insult adolescents when mothers were angry.

Self-Control

Only a few adolescents had high self-control; some of them reported low (48.1%) and moderate (39.9%) self-control (Table 2). This indicates that more than 80 percent of adolescents have the opportunity to develop better self-control. Self-control was composed of the following five dimensions.

General capacity for self-discipline. This dimension shows the perception of an individual's ability to focus on tasks and refrain from other things that can damage focus when doing tasks. The largest proportion of adolescent self-discipline was in the medium (36.1%) to the low category (33.0%). Adolescents thought they sometimes could not stop doing something even though they knew it was wrong (42.4%).

The Inclination Toward Deliberate/Non-Impulsive Action. It indicates individual abilities to carry out tasks effectively, resist temptation/not be easily distracted by other things. Almost half of the adolescents had non-impulsive actions in the moderate category (45.55%). The majority of adolescents perceive good at resisting temptation (77.6%).

Healthy Habits. It shows an individual's ability to stop bad habits and fight laziness to achieve goals in assignments. Four of ten adolescents had good habits in the low category (44.2%). The highest proportion of the adolescents thought they were lazy (48.9%).

Self-Regulation in Service for Work Ethic. It represents an individual's ability to concentrate on tasks without being distracted by other pleasures outside the task. More than half of adolescents had low work ethics (66.5%). More than half of the adolescents sometimes admitted pleasure and fun keep them from getting work done (61.4%).

Reliability. It is an individual's ability to regulate behavior so that discipline is under predetermined goals. Nearly half of the adolescents showed a high level of reliability (40.8%). About one-third of the adolescents felt they lacked discipline (38.6%).

Table 2 Distribution of categories of variables with mean score and p-value by gender

Variable categorize (cut-off)	Male		Female		Total		Mean±Standard Deviation		P-value
	n	%	n	%	n	%	Male	Female	
Openness in communication							68.80±17.0	59.67±19.88	0.000**
Low (<60)	28	32.2	69	47.3	97	41.6			
Moderate (60–80)	34	39.1	48	32.9	82	35.2			
High (≥80)	25	28.7	29	19.9	54	23.2			
Problems in communication							53.56±16.68	53.92±13.35	0.859
Low (<60)	59	67.8	98	67.1	157	67.4			
Moderate (60–80)	22	25.3	44	30.1	66	28.3			
High (≥80)	6	6.9	4	2.7	10	4.3			
Self-control							60.25±15.29	61.06±14.72	0.687
Low (<60)	47	54.0	65	44.5	112	48.1			
Moderate (60–80)	27	31.0	66	45.2	93	39.9			
High (≥80)	13	14.9	15	10.3	28	12.0			
Stress level							22.37±9.72	25.30±8.77	0.014*
Normal (0–14)	19	21.8	17	11.6	36	15.5			
Mild (15–18)	16	18.4	12	8.2	28	12.0			
Moderate (19–25)	19	21.8	37	25.3	56	24.0			
Severe (26–33)	20	23.0	49	33.6	69	29.6			
Very Severe (>34)	13	14.9	31	21.2	44	18.9			
Problematic internet use (PIU)							22.76±8.57	21.82±7.89	0.397
Non-PIU (<16)	18	20.7	32	21.9	50	21.5			
PIU (≥16)	69	79.3	114	78.1	183	78.5			

Note. *p<0.05, **p<0.01

Table 3 Spearman correlation among observed variables

Variable	Correlation coefficient
	PIU
Adolescents' age (years)	0.037
Duration of internet use in total (hours/day)	0.088
Online gaming (minutes/day)	0.188**
Online class (minutes/day)	0.132*

Note. *p<0.05, **p<0.01, PIU=problematic internet use

Stress Level

The biggest proportion of adolescents reported severe (29.6%) to moderate stress levels (24.0%). There were at least 2 out of 10 resilient adolescents, considering that 27.5 percent were in the normal-mild stress. The number of female adolescents who experience severe and very severe stress was two times higher than male adolescents. Adolescent girls were more susceptible to stress (p<0.05) (Table 2), especially having difficulty relaxing and being irritable/overreacting compared to males. The findings of the five dimensions of stress level were as follows.

Difficulty Relaxing. From 0–6, the mean score for adolescents' difficulty to relax was 3.42, with a standard deviation of 1.693. More than half of the adolescents often or always/almost always found it difficult to calm down after doing something tiring or worrying (59.7%).

Nervous Arousal. From 0–3, the adolescents' mean score of this dimension was 1.75, with a standard deviation of 0.987. More than half of the adolescents often or always/almost used a lot of nervous energy (56.3%).

Easily Getting Upset/Agitated. From 0–3, the adolescents' mean score for their tendency to get upset/agitated was 1.63, with a standard deviation of 0.975. More than half of the adolescents often or always/almost always found themselves getting agitated (53.6%).

Irritable/Over-Reactive. From 0–6, the adolescents' mean score for this dimension was 3.42, with a standard deviation of 1.527. Many adolescents reported often or always/almost always feeling a bit touchy (71.7%).

Impatient. From 0–3, the mean score for this dimension was 1.89 with a standard deviation of 0.920. More than half of the adolescents often or always/almost did not let anything bother them (intolerant) while they were doing something (65.7%).

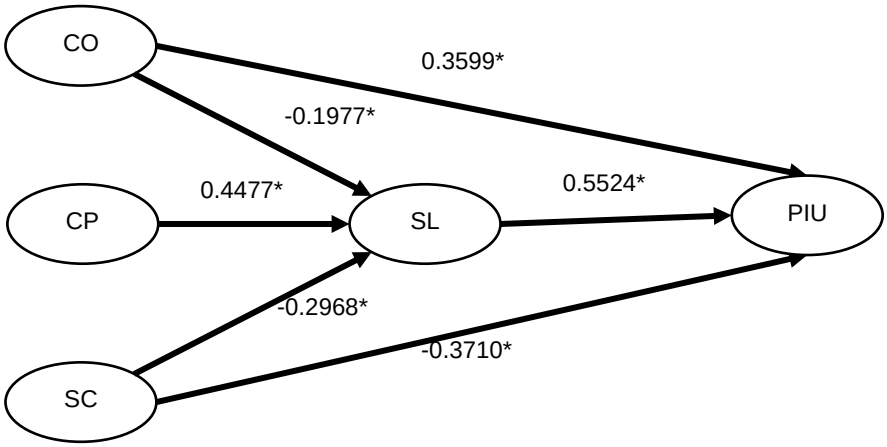
Problematic Internet Use (PIU)

More than three-quarters of adolescents in this study were problematic internet users (Table 2). This high number indicates that there needs to be attention to PIU risk. When all indicators were analyzed, it is found that male adolescents even managed to neglect certain tasks or perform below par (in exams, sports, etc.) because of connecting to the internet first than female adolescents. However, when viewed as a unit, there was no difference in PIU scores based on gender. In total, more than half of the adolescents often or always failed to control or reduce their internet usage (54.1%), and when they went online, they did not realize that time and many hours had passed (74.7%). Only a few (16.3%) of the adolescents neglected assignments or received substandard grades.

Table 4 Effect of variables on stress level and PIU

Variable	Effects			R-squared
	Direct	Indirect	Total	
Stress level				0.4839
CO→stress level	-0.1977*	-	-0.1977*	
CP→stress level	0.4477*	-	0.4477*	
Self-control→stress level	-0.2968*	-	-0.2968*	
Problematic Internet Use				0.5148
CO→PIU	0.3599*	-0.1092	0.2507	
CP→PIU	0.0264	0.2473*	0.2737*	
Self-control→PIU	-0.3710*	-0.1639*	-0.5350*	
Stress level→PIU	0.5524*	-	0.5524*	

Note. *significant at t>1.96; CO=openness in communication, CP=problems in communication, PIU=problematic internet use



Note: significant at t>1.96 are provided. CO=openness in communication, CP=problems in communication, SC=self-control, SL=stress level, PIU=problematic internet use

Figure 1 Standardized solution of the model proposed.

Adolescent Characteristics Correlation with PIU

The total duration of internet use was not correlated with PIU. Still, more specific internet use, such as online gaming and attending classes, was found to correlate with PIU. Online gaming ($p<0.01$) was more closely correlated to PIU than attending class ($p<0.05$) (Table 3).

Parents-Adolescent Communication and Self-Control Association with PIU, Mediated by the Stress Level

In this study, the proposed model was good (TLI=0.95; CFI=0.95; RMSEA=0.057; SRMR=0.067). The chi-square test was significant ($\chi2=466.63$; p-value=0.000). Moreover, the model indicates an acceptable fit because the ratio chi-square/degrees of freedom was below 2 (df=265; $\chi2/df=1.76$). Each observable variable loads significantly (t-value>|1.96|) means convergent validity is validated.

Figure 1 briefly describes the direct effects between variables whereas Table 4 provides more detailed results. From the total effects, it is known that stress level was the largest contributor to PIU (0.5524). Every increase of one mean stress score would increase the mean score of PIU by 0.5524. It means that stress level has become the important variable affecting PIU compared to other variables in this study. In the total analysis, all variables had an effect on PIU, except for CO. CO had a direct effect on PIU, but its contribution was not significant enough when analyzed further. An r-squared of 0.5148 revealed that variables (communication, self-control, stress) explained 51.48 percent of PIU in the model.

ANOVA showed significant differences among various stress levels (F-value=20.793; $p<0.001$). The result shows more PIU risk in very severe stress levels. Post hoc Dunn-Bonferroni analysis revealed that very severe stress level is not statistically different ($p>0.05$) from severe stress level. It can be concluded that adolescents' severe and very severe stress levels had a similar higher risk of PIU compared to other stress levels.

DISCUSSION

This current sample showed that 78.5 percent of adolescents had PIU. According to the correlation test, both online gaming and attending classes were correlated with PIU, but the stronger correlation was playing online games. On the other hand, adolescents who play more online games are males. This may be due to their need for online games, which can fulfill social needs and reduce stress. Previous studies found that adolescent males view online gaming as a higher social acceptance in their peer group (Leonhardt & Overå, 2021) and as their opt-in entertainment (Park & Kim, 2018) than females. One indicator of PIU is the neglect of time so it is reasonable that this study found the longer the duration of online gaming, the higher the PIU risk will be. This finding is also relevant to prior studies (Lam & Wong, 2015; Nakayama et al., 2021). Although this study did not measure the threshold value for online gaming duration, more than half of males played ≥61 minutes per day. Previous research shows that playing mobile games or interactive technology use for

entertainment for more than one hour per day increased digital eye strain (Mohan et al., 2021) and reduced school performance (Anthony et al., 2021).

Unexpectedly, the duration of taking classes was positively correlated with PIU, even though the correlation was not as strong as that between online gaming and PIU. This might be due to taking online classes could open up opportunities for adolescents to play online games. Although this study did not make further observations, Rosen et al. (2013) found that over a brief 15-minute observation period of students, they were aware of being monitored; they were keeping up on-task (studying) in their homes for a brief time, averaging under 6-minutes on the task and then changing to another task (texting, listening to music, accessing social media, taking a phone call, and watching television).

Other findings showed female adolescents experienced higher stress levels than males, in line with the study by Rajab et al. (2021). It may be because females reported more frequent worries about their schoolwork and education during the pandemic (Lessard & Puhl, 2021). In Bogor City (approximately 55 km from DKI Jakarta), female adolescents were also found to have lower online resilience (Hasanah & Latifah, 2021), which may cause stress. Female adolescents in the present study were also found to have lower CO with their parents than male adolescents, whereas evidence showed adolescents who experience higher CO report lower stress levels.

Stress levels are the main contributor to PIU. Severe and very severe stress levels lead to the highest PIU risk, similar to previous findings (Lam & Wong, 2015). The mechanism of stress levels in the emergence of PIU is possible because adolescents use the internet as stress relief and relaxing escape (Park & Kim, 2018; Snodgrass et al., 2014).

Concerning the stress level, higher CO and lower CP were associated with fewer stress levels. This finding is in line with Jiménez et al. (2019). It means that the perceived ease, trust, and satisfaction in how adolescents communicate with their parents and feel honest and comfortable responses from parents can be protective factors against adolescent stress levels. The present study also indicates that adolescents with CP had higher stress levels. It means that adolescents who feel difficulty, doubt, and dissatisfaction with the communication with their parents and get dishonest and unpleasant responses when interacting with parents can be at risk for high-stress levels. Similarly, good interaction with parents supports adolescent development (Bronfenbrenner, 1979), as the availability of emotional security requires cooperation between parents and children (Puspitawati, 2018). CP has an indirect effect on PIU through stress levels, and stress levels act as full mediators. It means CP no longer affected PIU after the stress level was removed. In addition to increasing CO, self-control was also associated with less stress.

High self-control had an inverse effect on stress levels and was supported by Liu et al. (2018). Self-control has a direct and indirect negative effect on PIU through stress levels. This finding complements Zakiyyah and Latifah's findings (2022) that self-control has a direct effect on PIU and does not have an indirect effect on PIU through self-esteem. That is, the stress level may explain the partial mediation of the effect of self-control on PIU. It means that even if the stress levels are removed, self-control and PIU are still related but only become less strong. Self-control, according to Tangney et al. (2004), is generally characterized by the ability to control oneself from temptation (self-destructive pleasures) and maintain self-discipline. In this case, it is expected to help limit internet use while on duty (academic) or other possible sources of stressors. So, instead of using the internet excessively as a stress reliever or boredom buster, adolescents can solve psychological problems more effectively. According to Galla and Wood (2015), self-control determines coping choices that are more adaptive to stress (cognitive reappraisal).

An intriguing discovery of this study was that CO could be associated with the risk of PIU, even though adolescents with better CO had lower stress levels, and stress level is a major contributor to PIU. This condition is possible for two reasons.

First, the parents of adolescents are also problematic internet users. In Hong Kong, Lam and Wong (2015) found that adolescents categorized as problematic internet users were 2.95 times more bound to also have parents who were problematic internet users. Adolescents with PIU parents in this study may have normalized PIU which is considered unproblematic, so it also influences adolescent habits and behavior in using the internet. As is known by Josua et al. (2020), the internalization of family values positively affects adolescent social behavior.

Second, adolescents who experience CO may not have parental guidance on internet use. Other studies have shown that giving children attention and affection is not effective enough to reduce PIU without parental supervision and discipline (Onyekachi et al., 2022). Moreover, the adolescent self-control in this study was categorized as low to moderate. In line with Oliva et al. (2019), adolescents aged 15–19 years have the lowest self-control throughout the 12–34 year range. It increasingly indicates that adolescents need a stronger drive to help promote their self-control.

CONCLUSION AND SUGGESTION

The issue taken in this study is PIU and the main objective of this study is to analyze the influence of predicting factors on PIU. The longer adolescents play online games and take online classes, the higher the risk of PIU. The structural model in this study supports stress level as a mediating factor for the impact of CP and self-control on PIU. Adolescents who experience greater CP and low self-control will experience higher stress levels, impacting higher PIU. In contrast, adolescents who experience lower CP and higher self-control are more likely to experience lower stress levels, leading to decreased PIU. Female adolescents experienced higher stress than males, but there is no contribution of gender to PIU, meaning both gender groups have the same risk. Thus, if the total effect is sorted from the largest, then the stress level contributes the greatest to PIU, followed by self-control and CP.

Some limitations need to point out in this study. No observation is available of how parents educate or communicate with adolescents about internet use and sources of stress for adolescents. Therefore, this study has yet to comprehensively identify the effect of parents-adolescent factors and stressors on PIU. However, this study has implications for the mechanism of PIU through stress levels. Intervention counseling needs to be promoted, considering that many adolescents experience stress. This effort can be directed through optimizing Guidance and Counseling (Bimbingan dan Konseling/BK) in high schools. Parents should be part of a safe microsystem for adolescents by reducing negative and uncomfortable responses when communicating with adolescents. Positive and comfortable parental responses to adolescents, such as listening carefully and giving honest answers, may help with adolescent stress. Additionally, adolescents need to continue to develop trust in communicating, considering that communication requires cooperation between family members. They need to strengthen their self-control, such as building discipline and resisting temptation, to improve the stress that may lead to PIU. For research and policymakers, it is suggested to further examine the limits on the duration of playing online games.

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