



# Parenting in the Prevention of Internet Gaming Addiction

Nur Hidayah<sup>1,3</sup>, Esti Yunitasari<sup>2</sup>, Kusananto Kusananto<sup>2</sup>, Hanik Endang Nihayati<sup>2\*</sup>, Wesiana Heris Santy<sup>3</sup>, Rahmadaniar Aditya Putri<sup>3</sup>, Firman Suryadi Rahman<sup>4</sup>

<sup>1</sup>Doctoral Candidate of Nursing Program, Faculty of Nursing, Universitas Airlangga Surabaya, Surabaya, Indonesia; <sup>2</sup>Faculty of Nursing, Universitas Airlangga Surabaya, Surabaya, Indonesia; <sup>3</sup>Department of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia; <sup>4</sup>Faculty of Public Health, Universitas Airlangga Surabaya, Surabaya, Indonesia

## Abstract

Game addiction, smartphone addiction, and Internet disorder in children and adolescents have become the subject of parental concern in recent years. Parenting interventions are the most appropriate choice for parents to reduce excessive use of problematic games, and this review has not been carried out by other researchers before. The purpose of this review was to describe the preventive management of parenting in children and adolescents who are at risk for game addiction, smartphone addiction, and Internet disorders. This paper reviews findings, trends, and new developments in the field concerned (n = 5 studies). The current research was conducted based on a literature search with Preferred Reporting Items for Systematic Reviews and Meta-analyses, and articles were searched with five databases: ProQuest, Ebscohost, Springer Link, PubMed, and Scopus. Furthermore, the keywords used are MeSH determination based on PICOS framework using keywords of Game Disorder OR Smartphone Addictions OR Internet Disorder, parenting, as well as prevention without a time limit for publishing articles. In conclusion, parenting programs are a preventive method that needs to be understood and developed in order to provide significant results in long-term management of game addiction, smartphone addiction, and Internet disorders.

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\*Correspondence: Dr. Hanik Endang Nihayati, Department of Nursing, Faculty of Nursing, Universitas Airlangga Surabaya, Surabaya, Indonesia. E-mail: anik-e-n@fkip.unair.ac.id

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## Introduction

Game addiction, smartphone addiction, and Internet disorders in recent years have continued to grow as digital media users around the world increase as well [1], [2], [3]. Cases of addiction to online games and the Internet in children and adolescents are increasing because the age of gadget users is getting younger, while their brain development stage tends to have lower levels of self-control over their impulses to pursue pleasure [4], [5], [6], [7]. The World Health Organization and many researchers stated that the problem of addiction and disorder needs serious treatment involving parents. Parents can choose the right treatment for their children, which includes two ways, pharmacological or non-pharmacological [8], [9], [10]. Pharmacological treatment varies widely. There are researchers who used Bupropion to suppress the desire to play, Methylphenidate to relieve symptoms of hyperactivity, escitalopram for obsessive–compulsion disorder, clonazepam to treat panic disorder, and clomipramine

treatment as an antidepressant, with all the risks of side effects and costs that are not cheap [11]. Prevention by parents is the most important compared to other non-pharmacological therapies like cognitive behavior therapy (CBT), reality therapy, multimodal counseling, online self-help [12], Integrated Health Care Network for Diagnostics, Counseling and Treatment [13], and also parental intervention, all of which are used to build time management skills, reduce excessive emotional symptoms, improve cognitive abilities, and change negative to positive behavior [3], [14], [15]. Parents are fully responsible for the physical and behavioral development of children from the threat of danger and the impact of excessive Internet use and gaming disorders. Therefore, parents need to understand and apply preventive measures for Internet Gaming Disorder (IGD), smartphone addiction, and Internet use disorders [6], [16].

Various studies have been conducted on parenting methods by previous researchers, including Love *et al.* (2015), who studied the feasibility (accessibility, involvement, and impact) of adding social media and game features and access via

smartphones to evidence-based parenting programs (Triple P Online [TPOL]). This research resulted in an evaluation of the future features of social media and games as a medium for increasing parental involvement in evidence-based online parenting programs [17]. Furthermore, research was also carried out by Krossbakken (2017) who examined the effectiveness of short parental guides with suggestions and strategies for managing video games in children. This study found that there was no effectiveness of psychoeducational parental guides proven in preventing problematic video games in children [2]. In the following year, Pornnoppadol *et al.* (2018) also conducted research on Therapeutic Residential Camp (S-TRC), Parent Management Training for Game Addiction (PMT-G), combined S-TRC and PMT-G, and basic psychoeducation (control). This study found that both S-TRC and PMT-G were effective psychosocial interventions for the ED and were superior to basic psychoeducation alone [18]. Meanwhile, Li *et al.* investigated the efficacy of a new program to develop the game over intervention (GOI) based on parents, which was designed based on the framework of ecological systems theory and self-determination theory. This study shows that GOI is effective in reducing game-related problems [14]. Haug *et al.* (2020) further also studied ready4life, which is a smartphone application-based training program. This research resulted in the effectiveness of the application of the following six program modules: stress, social skills, Internet use, tobacco/e-cigarettes, marijuana, and alcohol individually adjusted to prevent the addictive behavior of adolescent interns [19].

Although research involving parental mediation in Internet use is still limited and makes parents feel pessimistic that they can stop problematic Internet use and IGDs, coupled with children's non-compliant attitudes, there are hopes that can be realized [9], [20]. These hopes include having a high-quality parent-child relationship is essential for healthy child development, productive health and safety, and spreading cultural values from children into adulthood [20]. Prevention of gaming disorders, smartphone addiction, and Internet disorders with parenting was developed to empower parents through knowledge, attitudes, and skills to foster a positive parenting pattern and family environment, which serves as a protective factor against game disorders in children [21], [22].

The discussion above shows that parental involvement is very important. Although the articles we found were very limited, we are still optimistic that parents need to be strengthened and given hope in the ability to provide the best parenting for their children in the digital and technological era. Parents need support in motivating themselves to prevent and treat Internet, smartphone, and game addiction. Finally, we summarized recent findings from parental interventions in children and adolescents with various addiction

problems.

## Methods

### *Strategy searching for studies*

Literature searches were carried out in several databases such as Scopus, Ebscohost, ProQuest, and Springer Link. Meanwhile, the determination of keywords was conducted based on the PICOT framework, including P: each population of Game Disorder OR Smartphone Addictions OR Internet Disorder, I: Parenting, C: any comparison, O: Prevention IGD OR Game Addictions, and S: Randomized Control Trial. In this case, we used MeSH as a keyword.

### *Study selection*

Researchers found articles by identifying the appropriate keyword searches that were set according to the title. A set of minimum 3 databases was used, so that many research articles are found. After it is felt that it is still lacking, it can add 3 other databases, so that the article in question is found. Furthermore, the articles that have been found are adjusted according to the screening based on the title. Next, identification of abstract and fulltext with matching search keywords is done and can be used in this systematic review (Figure 1). This systematic review analyzed five articles that have met the inclusion criteria, such as written in English, searches from journals, availability in full text, and original articles. Strategies for searching the journals were carried out using the keywords of parenting, prevention, game addiction, and randomized control trial. The study was further conducted through a systematic review using the Preferred Reporting Items for Systematic Review and Meta-analysis.

## Results

### *Definition*

The term "parent" includes all those who provide comprehensive care for children at home and in the family environment. This designation of parents means biological parents but can include other important groups of caregivers, such as stepparents or adoptive parents [23], [24]. The first indicator of good digital parenting is maintaining an open dialogue between parents and children and discussing what is important to them, staying calm even if something is upsetting you, and being honest with each other. Parents can remind with good communication and maintain discipline in

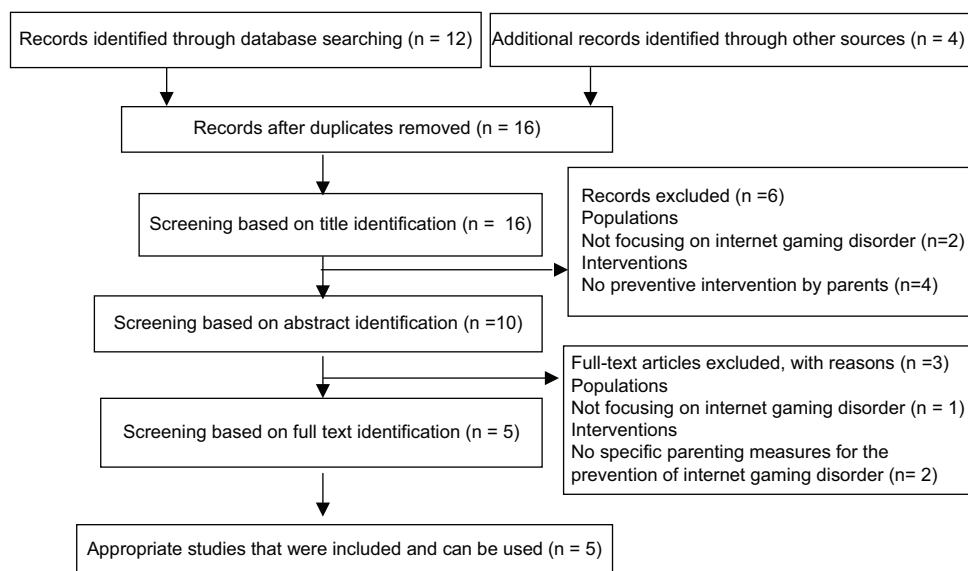


Figure 1: Article selection Process

using screen time when accessing games, YouTube, or the Internet because what parents will discuss is not new for the children. In the early childhood, children sometimes do silly and risky actions without consideration and paying attention to the consequences that life has taught adults to apply and parents should be wise in guiding them to learn [25], [26], [27], [28], [29].

### Elements of parenting practice

Parenting intervention means that parents have a role in raising children. Parenting consists of four elements: emotionally supportive practices, monitoring, recognition, and effective discipline. The first element is emotionally supportive practice which consists of three behaviors. In this case, the first behavior is affection which includes acceptance, warmth, hugs, bonding, affection, smiling, positive feelings, and intimate relationships. The second behavior is in the form of support, including emotional support, understanding, helping, and trust. Meanwhile, the third behavior is closeness, which includes involvement, attention, cohesion, attachment, attention, and care. Furthermore, the second element of parenting practices is monitoring (supervision), which includes tracking activities, checking homework, tracking whereabouts, and awareness. The third element is Recognition (Recognizing anti-social behavior), which includes the ability of parents to recognize when adolescents are involved in anti-social behavior. The fourth element is effective discipline, which is by using a fair and non-physical punishment method, including discussion, attention, consistent discipline, and proportional and responsive punishment [30], [31], [32].

### Use of effective parenting strategies

The following are ways that parents should not do in digital parenting so that children do not experience

addiction to games, smartphones, and the Internet. These ways include making children apologize for their bad behavior, giving lectures to children for their bad behavior, shouting or getting angry, making children feeling bad or guilty, arguing with the child about his misbehavior, giving up and doing the child's duties, threatening but not following up, hitting, and complying with the child's demands [32], [33], [34], [35].

### Barriers to parents participating in parenting programs

The obstacles that are often expressed by parents when asked to participate in parenting programs are due to the following reasons: Not paying attention to children's behavior, not knowing the program, held at an inconvenient time, having work commitments, being charged too much, held in a difficult and unreachable place, unreachable (place of worship), unable to find child care, culturally unacceptable, transportation difficulties, not feeling needed because someone else is taking care of children, not comfortable accessing the program, unsupportive family members, and not recommended by friends [32], [36].

Considering the naming of IGD, smartphone addiction and Internet disorders.

In the naming in this article review, we consider the three disorders, those are IGD, smartphone addiction, and Internet disorders to be the same, indicating an element of excessive use when calculated from access and length of screen time [3], [7] [16], [37].

The results showed parenting prevented addiction to games, smartphones and the Internet in children and adolescents. We had difficulty finding articles on parental prevention of IGD, Internet addiction, smartphone addiction, and social media addiction. The five articles on parental prevention below are in order,

Table 1: Parental intervention

Number	Study	Title	Method	Result
1	Li <i>et al.</i> , 2019 <sup>[14]</sup>	Development and validation of a parent-based program for preventing gaming disorder: The game over intervention	Design: A randomized controlled trial, with 39 primary schools ( $n = 16$ intervention) and ( $n = 23$ control) located in various districts of Hong Kong. Participant = 163 parent (woman) (intervention) and 199 parent (control). The independent variable is the efficacy of the new program used (children's gaming time, exposure to violent video games, and symptoms of gaming disorder), while the dependent variable is a program for effective learning. Measures: Growing up with media survey and Korean Internet Addiction Scale for Adolescents K-scale. Data were analyzed using Chi-square Analysis dan <i>t</i> -test, ANOVA, and <i>Post hoc</i> analysis	The results indicate a general reduction in these three criteria across the three-month period. This study provides tentative evidence demonstrating the effectiveness of the GOI in mitigating some gaming-related problems
2	Pornnoppadol <i>et al.</i> , 2020 <sup>[18]</sup>	A comparative study of psychosocial interventions for internet gaming disorder among adolescents aged 13–17 years	Designed with Quasi-experimental and is a prospective study (intervention and control only, without randomization). The samples are 104 parents and their adolescent (13–17 years) children (after assessment for eligibility). The variable is the effectiveness of psychosocial interventions for adolescents with IGD. Measures: The GAST, GAME-Q, GAME-P, and PSC-17 in the Thai version. The analysis was conducted using SPSS software version 18.0 analyzed descriptively, chi-square and one-way ANOVA, Cohen's <i>d</i> (Cohen 1988) as well as the intention to treat method	The mean difference among groups in GAST scores was statistically significant, with <i>p</i> values of $< 0.001$ , 0.002, and 0.005 at 1, 3, and 6 months post-intervention, respectively. All groups showed improvement over the control group. The percentage of adolescents who remained addicted or probably addicted was $< 50\%$ in the S-TRC, PMT-G, and combined groups
3	Krossbakken <i>et al.</i> , 2018 <sup>[2]</sup>	The effectiveness of a parental guide for the prevention of problematic video gaming in children: A public health randomized controlled intervention study	Designed with a random sampling of guardians. In this case, the samples were children between the age of 8–12 years old ( $n = 5864$ ). The independent variables are effectiveness of a brief parental guide with advices, while the dependent variable is strategies for regulating video gaming in children. The measures uses are the nine criteria proposed for IGD found in DSM-5, the "bedtime resistance" subscale of the CSHQ; six items, parental mediation scale, parental efficacy in terms of perceived ability and assessing general satisfaction with guide. Furthermore, the analysis was carried out using SPSS version 22, independent <i>t</i> -tests, and ANOVA	Independent <i>t</i> -tests revealed no significant differences between the two conditions ( $n = 1657$ , response rate 30.1%) on any outcome measure. An ANOVA with planned comparisons showed that respondents who reported that they had read and followed the parental guide reported more video game problems and used more parental mediation strategies than those who did not read and follow the guide No evidence for the effectiveness of the psychoeducational parental guide on preventing problematic video gaming in children
4	Haug <i>et al.</i> , 2020 <sup>[19]</sup>	Efficacy of a smartphone-based coaching program for addiction prevention among apprentices: study protocol of a cluster-randomized controlled trial	Design: Cluster-randomised controlled trial to test. Samples: 1318 apprentices with a minimum age of 15, recruited in approximately 100 vocational school classes in Switzerland. The dependent variable is Efficacy of ready4life, a smartphone-based life skills and addiction prevention coaching program, while the independent variable is preventive substance use among apprentices. Measures: The chatbot, baseline assessment on stress, self-efficacy, social skills, Internet, tobacco/e-cigarette, cannabis, and alcohol use. Analysis was done using generalized linear mixed models, longitudinal analysis, and nested data	The presented efficacy study on this program is high scientific and public health relevance. It revealed whether this universally implementable but individually tailored intervention approach is effective in increasing life skills and reducing risk behaviors in a group of adolescents with a particular high risk of addictive behaviors. If this program proves to be effective, it could be disseminated to apprentices in different settings, e.g., schools, companies, or via online platforms for apprentices or vocational students
5	Love <i>et al.</i> , 2016 <sup>[17]</sup>	Social media and gamification: Engaging vulnerable parents in an online evidence-based parenting program	Design: Single group repeated measures design (pre-, post-, 6-month follow-up). The samples are 155 disadvantaged high-risk parents. Variables are disruptive child behavior, dysfunctional parenting, parenting confidence, parental anger, and inter-parental conflict. Data collected included standardized self-report measures, post-intervention focus groups and interviews, website usage reports, and Google analytics. Data were analyzed using significant multivariate ANOVA, finding time effects, demonstrating reductions in child behavioral problems, reduced lax/permissive and over-reactive parenting, and decreased parental stress	No effects were found for parental confidence, attributions, or depression and anxiety (which were in the normal range at baseline). Positive effects were maintained or improved at 6-months follow-up. The participants engaged in the online community and valued its flexibility, anonymity, and shared learning. This foundational implementation trial provides support for future rigorous evaluation of social media and gaming features as a medium for increasing parental engagement in evidence-based parenting programs online - a public health approach to protect and improve the development of vulnerable children

GOI: Game over intervention, GAST: Game addiction screening test, GAME-Q: Game Addiction Quality of Life Scale, GAME-P: Game Addiction Protection Scale, PSC-17: Pediatric Symptom Checklist-17, ANOVA: Analysis of variance, CSHQ: Child Sleep Habits Questionnaire, IGD: Internet gaming disorder, SPSS: Statistical Package for the Social Sciences, S-TRC: Siriraj therapeutic residential camp, PMT-G: Parent management training for game addiction, DSM-5: Diagnostic and Statistical Manual of Mental Disorders.

the first article is about game prevention using GOI (Table 1). The second article is about game prevention using Psychosocial Interventions. The third article is about parental guide for prevention of problematic video gaming. The fourth article is about smartphone-based coaching programs for addiction prevention among apprentices. The fifth article is about an Online Evidence-Based Parenting Program.

The first article developed parental prevention with the GOI program. GOI is a parent-based program designed based on a theoretical framework of ecological systems theory and self-determination theory. In this research, seven primary schools located in various districts of Hong Kong were included in either the intervention ( $n = 35$ ) or control ( $n = 35$ ) condition. GOI exercises were then provided to 163 parents of the primary school students with 199 control groups. The implementation of the intervention consisted of

three modules, including parental monitoring, parental care, and psychoeducation. In addition to assessing the effect of GOI on children's levels of disruption of play, researchers also measured its impact on the frequency of their play and exposure to violent video games. The results obtained were that 3 months after the GOI, parents reported a significant reduction in their children's game play time, exposure levels to violent video games, and symptoms of gaming distraction [14].

The second article examines the psychosocial interventions including S-TRC, PMT-G, and a combination of S-TRC and PMT-G. The aim of the Goal of the S-TRC is to promote a balance between life and play and to promote healthy gaming behavior. One hundred four parents and their adolescent children were enrolled and allocated to one of the four treatment groups: 7-day Siriraj to application S-TRC alone, 8-week PMT-G alone, combined S-TRC and PMT-G,

and basic psychoeducation (control). All groups showed improvement over the control group. The percentage of adolescents who remained in addicted or probably addicted was less than 50% in the S-TRC, PMT-G, and combined groups [18].

The third article examined parental guide for the prevention of problematic video gaming in children. The purpose of this study was to determine the effectiveness of a short parental guide with suggestions and strategies for managing video games in children. A random sample of guardians of children aged 8–12 years old ( $n = 5864$ ) was taken from the Norwegian Population Registry and evenly randomized into the intervention and control conditions. Parental guidance based on the clinical and research literature was distributed by postal mail to those in the intervention condition. In this study, a 4-month follow-up survey of video game problems, gaming behavior, sleep activity, and video game regulatory behavior of parents was carried out. The results showed no significant difference between the two conditions ( $n = 1.657$ , response rate 30.1%) in any of the measures outcomes. Respondents who had read and followed parental guidelines reported more video game problems and used more parental mediation strategies than those who had not read and followed the guidelines and would do better at targeting those who already had problems than as a primary means of prevention [2].

The fourth article examined the efficacy of smartphone-based coaching programs. Ready4life is a smartphone app-based training program for apprentices, which pays attention the heterogeneity of adolescent addictive behavior by promoting life skills and reducing risky behavior. The main aim of this study was to test the efficacy of ready4life for addiction prevention. As many as 1318 apprentices with a minimum age of 15 years old were recruited from about 100 vocational school classes in Switzerland in a randomized cluster controlled trial for 6 months.

At the start of the program, each individual profile is shown according to the areas of coaching need by selecting two of the following six program modules: Stress, social skills, Internet use, tobacco/e-cigarettes, marijuana, and alcohol. Furthermore, individual coaching was carried out by a conversation agent (chatbot) for 4 months, depending on the motivational and sociocognitive principles of behavioral change. In the weekly dialogue, the trainer provided different information, such as video clips, text, or images. The results of mHealth may reveal that intervention approaches can be applied universally in improving life skills and reducing adolescent addictive behavior [19].

Furthermore, the fifth and final article is about an online evidence-based parenting program. This study aimed to examine the feasibility (accessibility, engagement, and impact) of adding social media features and games (e.g., social sharing with anonymity, badges to encourage skill practice, and accredited facilitators

for support) and access via smartphone to the evidence-based parenting program, Online Triple P. One hundred and fifty-five high-risk parents were involved in this study (for example, 76% had an annual family income of less than \$ 15,000; 41% had been incarcerated; 38% were on drug/alcohol treatment; and 24% had children who were expelled for abuse). The ethnic groups most frequently identified were African American (24%) and Hispanic (66%). The main respondents were mothers (86%) from five community programs in Los Angeles. This study used a single group repetitive size design (pre-, post-, 6-month follow-up). Data collected included standard self-report measures, post-intervention and interview focus groups, website usage reports, and Google Analytics. The results showed a reduction in children's behavior problems, less loose/permissive and overly reactive parenting styles, and a reduction in parental stress. However, no effects were found for parental trust, attribution, or depression and anxiety (which were in the normal range at baseline). Positive effects were maintained or enhanced at 6 months of follow-up [17].

## Discussion

### *Innovative parenting prevention*

There are five parental preventions studied including GOI Programs, Psychosocial Interventions, Parental Guidelines, Smartphone-Based Training Programs, and Online Evidence-Based Programs. These methods can be used as alternatives in preventing the impact of digital technology to reduce children's playtime, exposure to violent video games, and symptoms of game addiction by empowering parents through the knowledge, attitudes, and skills to foster positive parenting and a family environment, which serves as a protective factor against playing disorders in children.

Li, *et al.* have designed three modules at GOI, with each module addressing different basic needs. The three modules consist of parental monitoring, parental care, and psychoeducation, which were designed to encourage the fulfillment of the needs for autonomy, engagement, and competence, respectively [14].

Parental monitoring on Internet parenting style among adolescents has resulted in surveillance models such as Active mediation, restrictive, and covieing. Active mediation is a conversation between parents and children related to the Internet, which is an initiative to encourage their children to be more critical in using the Internet. Restrictive mediation is a strict limit on what can be accessed and the duration of access time, including online games that can be played. Meanwhile, covieing is a joint effort between parents and children in Internet activities [38]. Li,

*et al.* (2019) used the token system to have open discussions about monitoring activities with their children, which should minimize children's perceptions of controlling too much parenting [14]. Parental care is the way parents express warmth with a more open body posture, learn to detect distress by being good listeners, and take the initiative to come up with ideas for fun activities for the whole family to participate in [14]. Psychoeducation parents are introduced to the antecedents and consequences of gaming, find out what the child's motives are behind the game and its negative effects, and brainstorm alternative activities. In this case, parents are encouraged to have a discussion with their children and their partners concerning the expectations and rewards associated with alternative activities. All of them are summarized in the video presentation, which was then followed by a group discussion where parents were given the opportunity to ask questions and exchange ideas with both the program instructor and other participants. One of the possible drawbacks of this inclusion is that when parents acquire knowledge and techniques in learning, they can pass it on to their children and contribute to their sense of competence. This may have impaired the effect of the interaction of time and conditions on intervention targets. Future studies may consider including a control condition with only an assessment to describe the effects of GOI on child development [14].

S-TRC was developed by Pornnoppadol and colleagues in the Division of Child and Adolescent Psychiatry, Department of Psychiatry, School of Medicine, Siriraj Hospital, Mahidol University. The target of S-TRC is that participants stay in a dormitory for 7 days 6 nights where they are not allowed to bring digital devices that can be used to play games both online and offline. Medical and psychology students became mentors, training and counseling three participants. The S-TRC consisted of 10 group CBT sessions teaching literacy, communication, teamwork, leadership, emotional coping, and self-control skills. They acquired a cognitive framing of their self-confidence, which is linked to self-esteem and strengthens their self-regulation and social skills. The PMT-G Manual consists of eight 3-h sessions aimed at improving parents' understanding of the causes of game addiction, parenting skills, and conflict management in the family. This was conducted by expert psychologists. Combined S-TRC and PMT-G involved adolescents who take S-TRC intervention while their parents attend PMT-G, which starts 1 week after S-TRC was finished [18].

Krossbakken, *et al.*, (2017), studied about Parental Guide. In this case, parents received the guide, studied the content carefully, followed the recommendations in the guide, used a more rigorous and active mediation strategy, and categorized their children in the ER. The weakness of this study is the lack of guidance influence because the 4-month time

span between intervention and survey was too short to produce changes in parent or child behavior [2].

Haug *et al.* further studied about Ready4life intervention program. In this research, the participants downloaded the application on their smartphone and received individual profiles about their risks and resources and can select two topics (stress, social skills, Internet use, tobacco, marijuana, and alcohol) in which they would receive training for 4 months, (2 months per topic) by a chatbot. Follow-up assessments were then carried out in both study groups using the same procedure: Participants were invited to complete online follow-up assessments via SMS text messages [19].

Love, *et al.* further studied TPOL is an eight module of self-contained interactive positive parenting program. It provides instruction in the use of 17 core positive parenting strategies, incorporating elements designed to engage participants and enhance knowledge acquisition, positive self-efficacy, and behavioral activation. These elements include parenting skills; parental "voxpops;" goal setting, review, and feedback; parental problem-solving exercises, decision-making, and self-regulation; spreadsheets and podcasts; and automated text and e-mail messages to increase the likelihood of program completion. The program also includes a downloadable personal workbook that records program content, parental goals, and responses to exercises [17].

## Conclusions

Management of IGD with parenting preventions includes GOI Program (parental monitoring, parental care, and psychoeducation), psychosocial interventions, parental guide, smartphone-based coaching program, and online evidence-based program. Some researchers are less interested in involving parents in intervening their children who have IGD or Internet addiction, as evidenced by the small number of articles found. We suggest the importance of involving parents, making them understand about parenting that is culturally appropriate and related to digital technology, especially the world of games in children in order to reduce negative impact of digital technology.

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