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Treatment with the Self-Discovery Camp (SDiC) improves Internet gaming disorder

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HIGHLIGHTS

- We devised a therapeutic residential camp for Internet gaming disorder.
- This Self-Discovery Camp led to decreased gaming time at a 3-month follow-up.
- Problem recognition and self-efficacy scores similarly increased after the camp.
- Onset age of Internet gaming disorder and problem recognition were correlated.

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ABSTRACT

Introduction: Internet gaming disorder (IGD) is a novel behavioral addiction that influences the physical, mental, and social aspects of health due to excessive Internet gaming. One type of intensive treatment for IGD is the therapeutic residential camp (TRC), which comprises many types of therapies, including psychotherapy, psychoeducational therapy, and cognitive behavioral therapy. The TRC was developed in South Korea and has been administered to many patients with IGD; however, its efficacy in other countries remains unknown. We investigated the efficacy of the Self-Discovery Camp (SDiC), a Japanese version of a TRC, and the correlations between individual characteristics and outcome measures.
Methods: We recruited 10 patients with IGD (all male, mean age = 16.2 years, diagnosed using the DSM-5) to spend 8 nights and 9 days at the SDiC. We measured gaming time as well as self-efficacy (using the Stages of Change Readiness and Treatment Eagerness Scale, a measure of therapeutic motivation and problem recognition).
Results: Total gaming time was significantly lower 3 months after the SDiC. Problem recognition and self-efficacy towards positive change also improved. Furthermore, there was a correlation between age of onset and problem recognition score.
Conclusions: Our results demonstrate the effectiveness of the SDiC for IGD, especially regarding gaming time and self-efficacy. Additionally, age of onset may be a useful predictor of IGD prognosis. Further studies with larger sample sizes and control groups, and that target long-term outcomes, are needed to extend our understanding of SDiC efficacy.

1. Introduction

Internet gaming disorder (IGD) is a behavioral addiction characterized by compulsive overuse of and dependence on various types of online gaming, such as massively multiplayer online role-playing games (MMORPGs) and first-person shooting games. Demographic research has shown that only a small proportion of heavy gamers are likely to develop IGD (Baggio et al., 2016; Mentzoni et al., 2011). Patients with IGD immerse themselves in online games and present difficulties in physical, mental, and social aspects of health (American Psychiatric Association, 2013; Kim et al., 2016). Recently, IGD has gained prominence alongside the development of information technologies and Internet services (Griffiths, Kuss, & King, 2012).

IGD is characterized not only by compulsive overuse, but also by similarities with other behavioral addictions (Fauth-Buhler & Mann, 2015; Kuss, 2013). There are several arguments concerning whether Internet/computer overuse can become an addiction (Griffiths, 2004,

Abbreviations: SDiC, Self-Discovery Camp; IGD, Internet gaming disorder; TRC, therapeutic residential camp.

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2015). For instance, some claim that IGD simply characterizes other aspects of existing mental disorders (Blaszczynski, 2006; Shaffer, Hall, & Vander Bilt, 2000). However, researchers have generally reached the consensus that the overuse of or addiction to Internet gaming can be a psychiatric issue (Petry, Rehbein, Ko, & O'Brien, 2015).

Although the prevalence of IGD varies according to country, culture, and social background, many studies suggest that IGD typically occurs more in younger ages. Approximately 1.5–3% of children aged 13–16 years in the Netherlands may have IGD (Van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011). Studies from other countries have shown similar results that IGD has "peak ages" (Bakken, Wenzel, Gotestam, Johansson, & Oren, 2009; Papay et al., 2013; Rehbein, Kleimann, & Mossle, 2010; Wang et al., 2014).

Since IGD commonly occurs in adolescents or young adults, it means that their addictive behavior can critically affect their social development and interaction. For instance, individuals with severe IGD typically spend a long time gaming, occasionally exceeding 30 h or more a week (Bouna-Pyrrou, Muhle, Kornhuber, & Lenz, 2015). Furthermore, they tend to exhibit aggressive tendencies, which can influence their social well-being (Lemmens, Valkenburg, & Peter, 2011), and exhibit impaired sleep quality (Carli et al., 2013). Patients with IGD also often exhibit symptoms or comorbidities such as hostility, social phobia, anxiety, depression.

Typically, individuals with addictions have a high risk of comorbidities (Hogue, Henderson, & Schmidt, 2016; Marquez-Arrico, Lopez-Vera, Prat, & Adan, 2016). Comorbidities such as developmental disorders or anxiety disorders impair of the use of coping strategies and lower self-efficacy in addictive disorders (Hermsen et al., 2016). Moreover, comorbidities are related to the severity of IGD (Baggio et al., 2016; Han, Kim, Bae, Renshaw, & Anderson, 2015; Wei, Chen, Huang, & Bai, 2012).

It is important to provide effective treatment to patients with IGD that tend to have comorbidities. Since IGD is a novel disease, there is still insufficient evidence of therapeutic outcomes for IGD. However, there is a concordance on the efficacy of psychosocial or psychoeducational therapies for IGD. Hall and Parsons (2001) reported that cognitive behavioral therapy (CBT) is effective for college student patients. Furthermore, according to a review by King, Delfabbro, Griffiths, and Gradisar (2011), there are many reports of non-pharmacotherapeutic treatments for IGD, most of which focus on CBT, motivational interviewing, and counseling.

The treatment or therapeutic effects described in these reports vary widely. For instance, one study reported that the therapeutic effects of CBT were sustained in 78% of those patients 6 months later (Young, 2013). However, according to King et al.'s (2011) review, despite the large number of extant reports on IGD treatment, the efficacy of existing treatments remains inconclusive.

Many of the studies that have focused on IGD are from Southeast Asia (e.g., South Korea, Taiwan, and China; Wölfling, Beutel, Dreier, & Müller, 2014). In these countries, various therapeutic approaches are continually being developed. South Korea has been administering a government-provided therapeutic residential camp (TRC) as one option for treatment (Koo, Wati, Lee, & Oh, 2011). The TRC involves 11 nights and 12 days of camp-style residence and intervention comprising occupational therapy, exercise therapy, CBT, and recreational activities.

Most patients with IGD have their own gaming environment (e.g., personal computer or gaming console in their house). It is difficult to provide therapy while a patient is immersed in gaming in his or her own house. Consequently, the TRC has many advantages: 1) patients can maintain a distance from their gaming environment while in therapy, 2) patients are able to experience interpersonal relationships with other attendees and staff without electronic devices, and 3) patients are subjected to intensive psychoeducation and CBT. The beneficial outcomes of TRC for IGD have been confirmed (Koo et al., 2011).

Although the basis of a treatment program has been established, the efficacy of TRC in countries other than Korea has not yet been examined. Furthermore, the efficacy of TRC for patients with comorbidities such as attention-deficit hyperactivity disorder (ADHD) or developmental disorders is also unknown. Verifying the treatment effects and feasibility of TRC can help to spur further exploration of the effective treatment of IGD.

The Kurihama Medical and Addiction Center has contributed to both the treatment and research of Internet addiction in Japan (Tohyama, Yokoyama, Matsushita, & Higuchi, 2014). In this study, we implemented a Japanese version of the TRC, the "Self-Discovery Camp" (SDiC), and designed a measure of its efficacy.

This study estimated the effectiveness of the SDiC for IGD and confirmed whether the effects are durable over time. We also examined the correlations between participants' individual characteristics and outcome measures.

2. Methods

2.1. Participants

Participants were 10 males diagnosed with IGD according to DSM-5 criteria. They also fulfilled Griffith's six components of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 2005). More specifically, our inclusion criteria were as follows: 1) satisfied both Griffith's six components of addiction and the DSM-5 IGD criteria through an interview by one our center's psychiatrists and 2) spoke Japanese. The exclusion criteria were as follows: 1) have a substance use disorder or a past history of one, 2) have severe mental or somatic symptoms that influenced continuous attendance of the program (e.g. severe cognitive or intellectual dysfunction, severe depression, suicidal tendency, severe diabetes), as determined by the physician in charge; 3) have not provided oral and written agreement to participate (both themselves and their parents or representatives); and 4) are considered by their physician in charge to be at risk for deterioration of symptoms if they attend the SDiC.

All participants were recruited from our center's population of inpatients and outpatients with IGD. They were all diagnosed with IGD by psychiatrists in our center's addiction department during their first visit to our center, prior to being recruited. Seven outpatients had received regular counseling by a psychiatrist before attending the SDiC. However, their obsessive gaming continued despite this counseling, and all of them satisfied the DSM-5's criteria for IGD at baseline. Three inpatients, also evaluated by psychiatrists, started their treatment in our center's outpatient clinic. However, their frequency of obsessive gaming and aggressive behavior increased, so they were admitted to our center within 1 month before the SDiC. The clinical characteristics are shown in Table 1. We received applications from male participants only. From both medical records and the baseline interview, we found that all of the participants were absorbed in MMORPGs. This type of

Table 1
Participants' characteristics.

	Participants
Characteristics	$N = 10$
Age (years), mean ± SD	16.2 ± 2.15
Inpatient	3
Outpatient	7
Onset age of Internet/gaming (years), mean ± SD	9.1 ± 4.0
Onset age (years), mean ± SD	13.6 ± 0.89
Treatment history (years), mean ± SD	0.8 ± 1.23
Comorbidity	5 = attention deficit hyperactivity disorder 1 = pervasive developmental disorder 4 = none

Note: SD = standard deviation. The estimated onset age was identified as the age when they had satisfied at least one item of the 5th edition of The Diagnostic and Statistical Manual of Mental Disorders criteria.

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