Casino legalization and gambling disorder: A comprehensive review and recommendations

Hanako Murase

(Faculty of Psychology, Indiana University Northwest,
Psychologist, National Hospital Organization Kurihama Medical and Addiction Center)

Abstract

While many people across the world enjoy gambling as a form of leisure, approximately 1–5% of the population struggles with gambling disorder. This rate is known to be even higher in Japan. Although a clinical diagnosis for gambling has long existed, not many clinicians are familiar with its etiology or treatment methods. Casino operation was recently legalized in Japan; while an economic boost is expected, an increase in gambling-related problems is also of concern. Because of the growing interest on the impact of gambling and gambling disorder in Japan, this paper aims to provide a comprehensive review of literature on gambling-related issues. Specifically, the following topics are discussed: 1) the prevalence and diagnostic classification, 2) etiological factors, and 3) interventions. Due to similarities between Japanese and American treatment environments, findings from the studies conducted in the U.S. are the primary focus of this paper. Recommendations to Japanese researchers, treatment providers, and other stakeholders are also provided.

Key words: gambling disorder, addiction, etiology, interventions, dissemination

Introduction

Gambling has long existed in Japan in the form of, for example, horse, auto, and boat racing, as well as lotteries. In addition, there are approximately 12,000 pachinko parlors throughout Japan (The Economist, 2014). Due to the ease of accessibility to these gambling activities, Japan has been recognized to have a higher prevalence of individuals with gambling problems, compared to other countries (Higuchi, 2010). Yet, the availability of professional treatments for problem gamblers is limited in Japan.

After much debate, casino gambling was legalized in Japan in 2016. While Japanese government is expecting boosted revenues through increases in tourists and jobs, a potential epidemic of gambling disorder is seriously concerned (Johnston, 2016). Hence, legalization of casino gambling marks a critical time for the Japanese society, especially for treatment providers, to prepare for the potential surge of problem and pathological gamblers. One way to prepare for this potential increase of problem and pathological gamblers is to examine the impacts of gamble legalizations and its consequences in the other countries, such as the U.S., and to learn from their experiences. The U.S., in particular, has a long history of legalizing and banning gambling since 1621 (Sauer, 2001). Further, currently available treatment methods for gambling disorder, such as cognitive-behavioral therapy (CBT) and the 12-step approach, were originally developed in the U.S. In addition, similar to Japan, the field of addiction treatment in the U.S. has been facing challenges of making effective treatment available and accessible (Miller, Sorensen, Selzer, & Brigham, 2006). Thus, reviewing successful outcomes and challenges that the American society has experienced during their long history with gambling may provide some valuable insights into common issues around gambling, as the Japanese society prepares for the upcoming changes and potential increase of pathological gamblers.

The purpose of this paper is to review the literature on gambling-related issues in the U.S. More specifically, the following topics will be reviewed: 1) the prevalence and diagnostic classification, 2) the biopsychological

etiological factors, and 3) treatment options and their challenges. In particular, research pertaining to CBT will be reviewed as it is the treatment method most supported by research (Toneatto & Ladouceur, 2003). Recommendations based on the review of literature in the U.S. will be discussed at the end of relevant sections and in the conclusion.

Prevalence of Problem Gambling and Gambling Disorder

Approximately 125 million adults engage in gambling activities in a given year (National Gambling Impact Study Commission [NGISC], 1999). Yet, not everyone who gambles experiences problems. According to Diagnostic and Statistical Manual of Mental Disorders [DSM]-5, the past year prevalence of gambling disorder is estimated to be 0.2–0.3%, and the lifetime prevalence is approximately 0.4–1.0% of general population (American Psychiatric Association, 2013). However, these estimates are relatively lower than other estimates in the literature. For instance, according to an extensive review of literature conducted by the National Research Council in 1999, about 2% of individuals were identified as problem or at-risk gamblers, and about 0.9% were identified as pathological gamblers in the past 12 months (NGISC, 1999). In the same report, the lifetime prevalence of problem gamblers was 3.9%, and pathological gamblers was 1.5% (NGISC, 1999). In the most recent article reviewing prevalence rates of problem gamblers and gambling disorder based on American and Canadian data, the prevalence of the past year problem and pathological gamblers were 0.5%–5.5% and 0.3%–1.9%, respectively (Welte, Barnes, Tidwell, Hoffman, & Wiczorek, 2015). One possible explanation for those varied estimation rates is the use of different assessment methods. For example, where some researchers use the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987), others use diagnostic interviews (Welte et al., 2015).

In a national survey using the SOGS, 9.6% of Japanese men and 1.6% of Japanese women were estimated to meet diagnostic criteria for pathological gambling (Higuchi, 2010). A follow-up study showed that those rates have not changed significantly (Toyama et al., 2014). These results indicate remarkably higher rates of pathological gamblers in Japanese men, compared to other countries. The majority of male Japanese pathological gamblers (i.e., 93%) are addicted to pachinko (Toyama et al., 2014), a machine game that is played in similar conditions to slot machines (i.e., around loud music, gaming sounds, and bright flashing lights). Recent casino legalization will provide additional gambling opportunities to Japanese citizens. However, the current research investigating the effect of casino availability on a gambling epidemic has provided mixed results (St-Pierre, Walker, Derevensky, & Gupta, 2014). Hence, continuous assessment of gambling disorder prevalence in Japan during the next few decades is imperative to further our understanding of the casino legalization effect on a potential gambling epidemic. Moreover, such data will help the society respond promptly to the demands for improving treatment accessibility.

Diagnostic Classification

A clinical disorder of gambling was first introduced to DSM-III as “pathological gambling” in 1980, and was initially classified as a type of Impulse-Control Disorders. This classification was based on the core features of pathological gambling being: 1) inability to resist impulses to gamble, 2) increased tension before gambling, and 3) relief of tension and later experiences of guilt/regret by performing gambling (Petry et al., 2014). However, the dissimilarity between pathological gambling and other impulse-control disorders was noted among experts (Romanczuk-Seiferth, van den Brink, & Goudriaan, 2014).

Meanwhile, many experts conceptualized pathological gambling as a type of behavioral addiction because of their symptom similarities to substance use disorders (SUDs) (Petry et al., 2014). For instance, gamblers’ needs to wager progressively more money is considered a sign of tolerance. Their tendency to gamble when feeling distressed is considered a sign of withdrawal (Romanczuk-Seiferth et al., 2014). In addition, gamblers’ experiences of irritability and restlessness when unable to gamble is similar to craving and urge experienced by substance users (Romanczuk-Seiferth et al., 2014). Based on a growing number of empirical evidence, pathological gambling was re-named as “gambling disorder” and was classified under Substance-Related and

Addictive Disorders in DSM-5 (American Psychiatric Association, 2013). This new categorization is consistent with a recent empirical finding by Blanco et al. (2015). Using face-to-face assessment data from 43,093 adults living in the U.S., Blanco et al. (2015) conducted a series of factor analyses and confirmed that gambling disorder loads to the same factor as other addictive behaviors, namely nicotine, alcohol, and drug dependence.

In short, gambling disorder shares common characteristics of impulse control problems and addictive behaviors. In the following section, biopsychological factors supporting these two conceptualizations will be reviewed. Because the majority of journal articles on this topic were published before the diagnostic name change, the names “pathological gambling” and “gambling disorder” will be used indicating a clinical diagnosis of gambling but in a consistent manner with the original references.

Etiology

Biological factors

Genetic factors Family studies indicate that approximately 20% of individuals with pathological gambling have first-degree relatives with the same disorder (Ibáñez, Blanco, & Sáiz-Ruiz, 2002), with the paternal influence being the strongest (Walters, 2001). This estimate is consistent with a meta-analysis based on 19 studies that examined genetic influence on pathological gambling (Walters, 2001). The results indicated a mild effect of genetics on the development of pathological gambling, with the median of an overall genetic effect being 12%.

Neurobiological factors Existing studies reported several neurotransmitter systems making some individuals more vulnerable to gambling disorder. Those neurotransmitter systems include dopaminergic, serotonergic, noradrenergic, opioidergic, and glutamatergic systems. In order to be consistent with the focus of the etiology section, research findings on dopaminergic and serotonergic systems will be discussed in this paper.

Out of several neurotransmitter systems linked to gambling disorder, dopamine and serotonin functions are most cited. Because of its association with reward systems in the brain, dopamine sensitivity is frequently observed among individuals with SUDs (Clark et al., 2013). For instance, when individuals with SUDs are presented with visual stimuli (i.e., cues) of the substances of their choice, their brains release dopamine, which subsequently activates their brain reward system. With a rush of dopamine, those individuals experience temporary improvement in their affect and energy (Pihl & Stewart, 2013). Because pathological gambling shares the same latent factor of addiction with other SUDs (Blanco et al., 2015), similar dopamine activities (Leeman & Potenza, 2013) as well as cravings in response to gambling cue were observed (Ibáñez et al., 2002). The dopamine hypothesis for gambling disorder is also supported by the fact that individuals with Parkinson’s disease frequently experience an urge to gamble as a side effect of dopamine agonist drugs (Clark et al., 2013). Despite accumulating evidence supporting this hypothesis, studies observing dopamine activities through brain imaging report mixed finding (Leeman & Potenza, 2013; Shah, Potenza, & Eisen, 2004). Hence, additional research in this area with brain imaging techniques is needed.

Another frequently studied neurotransmitter system is serotonin, because of its known association to impulse control problems. Although some research findings regarding the association between serotonin deficiency and gambling disorder are non-significant (Ibáñez et al., 2002), a larger number of findings generally support such association (Blanco, Orensanz-Munoz, Blanco-Jerez, & Saiz-Ruiz, 1996; Ibáñez et al., 2002; Leeman & Potenza, 2013). The mixed finding in this association may be due to inconsistent use of the impulsivity assessment tools. Impulsivity is a broadly defined complex concept that is divided into five specific constructs with varying characteristics and functions: positive urgency, negative urgency, lack of planning, lack of perseverance, and sensation seeking (Cyders & Smith, 2007; Whiteside & Lynam, 2001). When using the 5-component model of impulsivity, not all factors predict alcohol use problems (Cyders, Flory, Rainer, & Smith, 2009; Shishido, Gaher, & Simons, 2013; Verdejo-García, Bechara, Recknor, & Pérez-García, 2007). Hence, in order to better understand the impact of serotonin deficiency on this disorder, additional investigations using the most updated impulsivity measure may be helpful.

In addition, varied levels of serotonin in cerebrospinal fluid has been found to influence dopamine activities

in the amygdala and orbitofrontal cortex areas differently, resulting in variations in impulsive behaviors (Cyders & Smith, 2008). Thus, examining serotonin-dopamine interaction effects on the development and maintenance of gambling disorder will likely provide additional knowledge on this topic.

Neuroimaging studies Several areas of the brain have been the focus of studies examining the functions of brain regions among individuals with gambling disorder. Those areas include the prefrontal cortex, the striatum, the amygdala, the basal ganglia, and others (Ashley & Boehlke, 2012; Leeman & Potenza, 2013; Romanczuk-Seiferth et al., 2014). Among these brain regions, the role the prefrontal cortex plays in the development and maintenance of pathological gambling is the most frequently discussed area, due to its association with reward sensitivity (Carver, 2005), impulse control (Ashley & Boehlke, 2012), and poor executive function (Zelazo & Cunningham, 2007). According to a review of several studies examining prefrontal cortex activities among pathological gamblers, hypoactivity of this region was found in most of the studies (Clark et al., 2013; Leeman & Potenza, 2013). However, some studies show hyperactivity in the prefrontal cortex areas among pathological gamblers (Clark et al., 2013; Leeman & Potenza, 2013). Similar to the problem in neurobiological research, these mixed findings may be due to different methods of assessment used (Leeman & Potenza, 2013). Hence, additional research is warranted to improve our understanding of this mechanism.

Although the research on biological factors of gambling disorder will continue to grow, these initial findings suggest the presence of biological factors in development and maintenance of this disorder. The empirically based understanding that certain people are biologically vulnerable to gambling disorder should be reflected in the attitude of treatment providers. Furthermore, such understanding should inform government policy decisions to protect those vulnerable populations.

Psychological Factors

Impulsivity Impulsivity is a predisposition toward rushed and spur-of-the-moment actions influenced by internal or external stimuli (DeYoung, 2011). Individuals who are impulsive tend to act before thinking through potential consequences of their actions (DeYoung, 2011). There is strong evidence indicating that impulsivity is a temperament that is heavily influenced by genetic and neurological factors (approximately 45%) (Congdon & Canli, 2008; Cyders & Smith, 2008). Thus, consistent with the biological factors of gambling disorder discussed above, higher levels of impulsivity among individuals with this disorder have been observed. In a study comparing individuals seeking gambling treatment to a control group, those with gambling disorder exhibited significantly higher levels of negative urgency, positive urgency, lack of planning, and lack of perseverance, but not sensation seeking (Michalczuk, Bowden-Jones, Verdejo-García, & Clark, 2011). Similarly, Kim & Grant (2001) found pathological gamblers are significantly more impulsive and extravagant than a healthy control group or individuals with obsessive-compulsive disorder. These findings provide additional support to the existence of dispositional vulnerability among those people who are addicted to gambling.

Behavioral model Positive and negative reinforcement models provide insights into the addictive nature of gambling. In the positive reinforcement model of operant conditioning, the presence of a reward increases a behavior. In the negative reinforcement model, the removal of an undesired stimulus following a behavior increases the likelihood of the behavior to occur again. Applying these models to gambling, winning money functions as a reward that increases the gambling behavior. However, gamblers win at intermittent schedules (i.e., a variable ratio schedule), which makes gambling behavior the most difficult type of behavior to be extinguished (Abrams & Kushner, 2004). In the negative reinforcement model, potential loss of money functions as an aversive stimulus that one tries to avoid by additional and continuous wagering (Abrams & Kushner, 2004). This explains why many pathological gamblers have difficulty leaving the game or machine when they have not experienced satisfactory levels of winning (Petry, 2005).

In addition, negative reinforcement models explain why individuals with high or low baseline arousal levels and those with mood or anxiety disorders are more likely to become addicted to gambling. Gambling seems to adjust their physiological arousal levels and provides a temporary relief from negative affect (Abrams & Kushner, 2004). The latter purpose explains comorbidity between gambling disorder and mood disorders (Blaszczynski & Nower, 2002) as well as anxiety disorders (Petry, 2005).

Positive and negative reinforcement models explain why gambling is addictive. However, they do not explain

why some, but not others, who gamble become addicted. According to Gray's reinforcement sensitivity theory, everyone has different levels of sensitivity to reward (SR) and sensitivity to punishment (SP) (Gray, 1991). Individual strengths of SR and SP are determined by neuroscientific factors, including the topics discussed in the biological factors section (Gray, 1991). Having higher levels of SR makes individuals more likely to experience positive affects in anticipation of rewards and to act in ways to approach rewards (Gray, 1991). On the other hand, having higher levels of SP increases one's levels of anxiety with an anticipation of punishment or non-reward, which in turn inhibits their behaviors (Gray, 1991). Empirical findings consistently indicate that individuals with high SR are more likely to experience gambling problems (Brunborg, Johnsen, Mentzoni, Molde, & Pallesen, 2011; Gaher, Hahn, Shishido, Simons, & Gaster, 2015; Kim & Lee, 2011). Although research findings on the association between SP and gambling is limited and mixed, one of the most recent studies showed a moderation effect of SP on the association between SR and gambling problems. When SR was low (i.e., low chance of gambling problems), higher SP functioned as an additional protective factor from gambling problems. However, when SR was high (i.e., higher chance of gambling problems), higher SP worsened the levels of gambling problems (Gaher et al., 2015). These findings support both positive and negative reinforcement models of gambling disorder. Further, these empirical findings supporting Gray's reinforcement sensitivity theory provide additional evidence for the biopsychological model of gambling disorder etiology.

Cognitive model Problematic and pathological gamblers are known to have several types of cognitive distortions (Blaszczynski & Nower, 2002). Such distorted thinking may not cause gambling disorder per se, but they are likely to influence poor decision making and difficulties to stop wagering even when losing.

One of the frequently observed cognitive distortions is illusion of control. Illusion of control comes from the concept of attribution bias (Petry, 2005). It is human nature to attribute positive outcomes to our own abilities and negative outcomes to external factors. Gamblers tend to attribute wins to their ability and losses to bad luck. Eventually, they start to believe they have skills to predict and control the outcome (Petry, 2005). Because of such beliefs, they may engage in superstitious and ritualistic behaviors (e.g., carrying a lucky charm), which is another type of cognitive distortion noted frequently (Raylu & Oei, 2002). On the contrary, those who believe they cannot control luck, as it comes and goes like waves, tend to wait for winning waves (Raylu & Oei, 2002). This type of belief may be further reinforced by occasional winning due to a variable ratio schedule.

It is our natural tendency to expect randomness when we make predictions for randomly occurring events, such as gambling. This tendency is known as gambler's fallacy (Petry, 2005). Using an example of coin tosses, when people see heads more frequently than tails, most people predict the next flip to be a tail (Corney & Cummings, 1985; Petry, 2005). However, because each single toss is independent from the results of previous tosses, the odds of getting a head or tail are equally 50%. Yet, this theory explains why many gamblers falsely believe that they will win soon and continue to play, especially after losing for some time (Raylu & Oei, 2002).

Loss-chasing is another commonly observed phenomenon among pathological gamblers. After they invest some money and time without winning, they believe that the only way to win back their losses is by winning; hence, they continue to wager (Abrams & Kushner, 2004; Petry, 2005). This tendency to chase losses, instead of realizing that the surest way to save their money and time is to cut their losses and stop gambling, is known as sunk cost effect (Abrams & Kushner, 2004; Petry, 2005).

Lastly, selective memories (e.g., the recency effect and vivid events) influence development and maintenance of gambling problems. Gamblers tend to remember their most recent (Petry, 2005) and vivid wins (Raylu & Oei, 2002), compared to distant and less vivid events, and thus overestimate their chances of winning again. Similar to other cognitive distortions thus far discussed, these phenomena are observed among non-gambling populations as well.

These are some examples of cognitive distortions frequently observed among gamblers, including those with gambling disorders. The list of irrational cognitive patterns observed among gamblers provides support and rationale for the use of CBT as a treatment method, which will be discussed next.

Interventions

Psychotherapy research

Several treatment methods for gambling disorder have been studied, including psychodynamic therapy, behavioral therapy, cognitive therapy, cognitive-behavioral therapy, couples/family therapy, self-help intervention (i.e., Gamblers Anonymous [GA] and workbook), and pharmacological intervention (Petry & Armentano, 1999; Toneatto & Ladouceur, 2003). Out of these treatment approaches, CBT is the most rigorously studied and supported for its efficacy (Petry & Armentano, 1999; Toneatto & Ladouceur, 2003). For example, in a study that compared individual CBT and a wait list control condition, individuals who received CBT reported significant decreases in gambling frequency and number of hours spent in gambling upon completion of the treatment (Sylvain, Ladouceur, & Boisvert, 1997). Among those individuals who completed CBT, significant changes in perception of control, self-efficacy, gambling desire, and the SOGS scores were observed between pretreatment and 6-month follow up (Sylvain et al., 1997).

In a study that employed a larger sample, Petry et al. (2006) compared the treatment outcomes of three groups: GA only, GA and CBT workbook (independently completed by participants), and GA and individual CBT. Although all three types of treatment decreased the severity of gambling problems assessed by the SOGS, individual CBT predicted abstinence significantly better than GA only at posttreatment assessment. This effect was strengthened by the number of GA meetings attended, indicating that attending GA meetings more frequently while receiving individual CBT strengthens the likelihood of achieving abstinence (Petry et al., 2006). Compared to the workbook condition, individual CBT showed significantly better effects in treatment completion and reduction of associated problems, such as legal and psychiatric problems (Petry et al., 2006). An additional analysis using data from pathological gamblers with and without comorbid mental illnesses also revealed superior effects of individual CBT to other conditions (Champine & Petry, 2010). Because high rates of individuals with gambling disorder have comorbid psychiatric conditions, such as substance use (28.2%) and mood disorders (23.1%) (Dowling et al., 2015), it is helpful to know that individual CBT for gambling disorder is still an efficacious treatment for clients with dual diagnoses. These findings together indicate that a combination of individual CBT and GA should be recommended as the most promising treatment option available at this time.

In addition to CBT, other psychological interventions for gambling disorder are in the process of development and their efficacy research is in progress. For instance, initial findings from the studies on mindfulness-based CBT (Toneatto, Pillai, & Courtice, 2014), mindfulness-based relapse prevention (Witkiewitz et al., 2014), and seeking safety (Najavitz, 2002) were promising; additional efficacy research is needed.

In Japan, addiction treatment facilities have frequently used the Serigaya Methamphetamine Relapse Prevention Program (SMARPP) (Matsumoto, Kobayashi, & Imamura, 2013) or its variations, developed based on the Matrix model. The Matrix model integrates several treatment models (e.g., CBT, relapse prevention, family therapy, and 12-step model) (Center for Substance Abuse Treatment, 2006). Although the Matrix model shares some components of CBT, to the author's knowledge, no studies to date have investigated its efficacy on gambling disorder. Based on the empirical findings in the U.S. and the current treatment trend in Japan, at least the following types of research are warranted: 1) efficacy of the Matrix model (or SMARPP) on gambling disorder, and 2) effectiveness of CBT for gambling disorder for the Japanese population.

Future challenges in psychotherapy research

Individual vs. group therapy The efficacy of CBT for gambling disorder is the most studied type of treatment approach (Petry & Armentano, 1999; Toneatto & Ladouceur, 2003), but no study to date has examined the efficacy of group CBT. Since group therapy for SUDs are as effective as individual therapy (Weiss, Jaffee, de Menil, & Cogley, 2004) and social support influences treatment outcome (Petry & Weiss, 2009), research on group therapy efficacy is warranted.

Abstinence vs. harm-reduction While abstinence has been a traditional goal in substance use treatment, a harm-reduction approach (e.g., controlled use or using in moderation) offers an alternative treatment goal option (Hodgins & Petry, 2004). Although research comparing the effect of goal selection on gambling treatment outcome is scarce, a recent assessment of this topic by Stea, Hodgins, & Fung (2015) suggests value in offering a

harm-reduction goal as an option to individuals with gambling disorder. Stea et al. (2015) provided motivational intervention via phone and compared treatment outcomes for 12 months. Participants selected their treatment goals from abstinence, quit problem gambling type, and controlled gambling. The two notable findings were 1) about 46% of participants changed their treatment goals at least once during their treatment, and 2) quit problem gambling type goal was as effective as abstinence goal in reducing the number of days gambled posttreatment. However, controlled gambling goal group gambled significantly more days than the other two goal types (Stea et al., 2015). Although additional research is needed, the existing findings indicate benefits of offering harm-reduction approach as an option to clients with gambling disorder, especially to those who are being wary of treatment or with low motivation to change.

Dissemination of evidence-based treatments Bridging between the research and clinical application has always been a challenge in the field of addiction treatment in the U.S. Historically, addiction was not recognized as a mental illness by the U.S. government, and thus was not treated by the mainstream treatment providers (Capuzzi & Stauffer, 2016). Stigma towards this population emerged and no one but the peers who shared the same problem were willing to help individuals with addiction. Alcoholics Anonymous (AA) emerged from this demand of peer-support among individuals with addiction (Miller et al., 2006). Eventually, many of them became addiction counselors and started to treat individuals with SUDs based on the 12-step model. Meanwhile, due to this historical separation of addiction treatment from the rest of mental health treatment, many clinical and counseling psychology programs have not offered or mandated training in addiction treatments (Miller et al., 2006). Although addiction treatment is starting to be integrated into the mainstream mental health and medical treatments, the discrepancies in theoretical understandings (e.g., the disease model vs. psychological model) and preferred treatment approaches associated with these theoretical understandings still exist due to differences in training backgrounds.

Miller et al. (2006) point out several barriers when disseminating a new treatment to clinical practice in a large society. First, many researchers who developed new efficacious treatments present their results in academic journals, but not many clinicians read academic journals periodically (Sobel, 1996). Further, many clinicians find it easier and more comfortable to stick to what they already know; thus, learning new treatment method demands extra effort and time from busy clinicians (Miller et al., 2006).

In order to fill these gaps between scientists and clinicians, researchers are recommended to publish new treatment methods in clinician-oriented journals (Sobel, 1996). Once clinicians learn about the theories and techniques of a new EBT through readings, providing opportunities to practice the skills with continuous supervision is the next recommended step (Miller et al., 2006). For example, Morgenstern, Morgan, McCrady, Keller, and Carroll (2001) provided a comprehensive CBT training to practicing counselors in the field of addiction treatment. They offered 1) 35 hours of didactic training (including theoretical overview and extensive role-play practices) over a 2-week period, and 2) weekly supervision from trainers while the trainees treated at least three clients with CBT for 12 sessions. For step 2, each session was video recorded and reviewed by supervisors. Overall, the majority of therapists learned and became able to provide CBT to substance-using clients at a satisfactory level (Morgenstern et al., 2001).

The demand for treatment providers, who can treat gambling disorder effectively, will likely increase in Japan, as casinos open in the next few years. To meet this demand, development and implementation of professional training systems is recommended (Miller et al., 2006). The importance of such system is also recognized by the NGISC (1999), and they recommend designating a certain percentage of gambling revenue for this purpose. The Japanese Ministry of Health, Labour and Welfare has appointed several medical institutions to lead treatment research and staff training (japan-addiction.jp, 2017), and their projects are expected to expand. Although rapid changes will be demanded to researchers and clinicians in the field of Japanese addiction treatment, casino legalization may provide numerous opportunities for this field to grow.

Conclusion

The prevalence of gambling disorder is significantly higher in Japan, compared to other countries (Higuchi,

2010; Toyama et al., 2014). This statistic is expected to further increase due to recent casino legalization. Thus, the demand for treatment programs and clinicians that can effectively treat addiction, especially gambling disorder, is expected to rise more than ever. The aim of this paper was to provide a comprehensive review of the U.S. literature on gambling-related topics to stakeholders in treatment, research, and policy making in Japan.

Although many people enjoy gambling, approximately 1–5% of gamblers experience significant problems (Petry & Armentano, 1999). The existing literature indicates the influences of biological and psychological factors contributing to the development and maintenance of gambling disorder. Hence, the society should recognize the existence of a sub-population that is particularly vulnerable to gambling disorder and take active measures to help this population. Among many types of treatments, CBT has gained the most research support; this result is understandable as CBT addresses empirically identified etiological factors. Research on effectiveness of CBT and related treatment methods on Japanese population is warranted, as nationwide clinician trainings are underway and addiction treatment is expected to become more accessible throughout the country.

Acknowledgement

I would like to thank Adam Roebuck for helpful comments that greatly improved the earlier versions of this manuscript.

Self-Declaration of Conflicts of Interest

Nothing to declare.

References

- Abrams, K., & Kushner, M. G. (2004). Behavioral Understanding. In J. E. Grant & M. N. Potenza (Eds.), *Pathological gambling: A clinical guide to treatment* (pp. 113–126). Arlington, VA: American Psychiatric Publishing.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: Author.
- Ashley, L. L., & Boehlke, K. K. (2012). Pathological gambling: A general overview. *Journal of Psychoactive Drugs*, 44(1), 27–37. doi:10.1080/02791072.2012.662078
- Blanco, C., Garcia-Anaya, M., Wall, M., Perez de los Cobos, J. C., Swierad, E., Wang, S., & Petry, N. M. (2015). Should pathological gambling and obesity be considered addictive disorders? A factor analytic study in a nationally representative sample. *Drug and Alcohol Dependence*, 150, 129–134.
- Blanco, C., Orensanz-Munoz, L., Blanco-Jerez, C., & Saiz-Ruiz, J. (1996). Pathological gambling and platelet MAO activity: A psychobiological study. *American Journal of Psychiatry*, 153(1), 119–121.
- Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction*, 97, 487–499.
- Brunborg, G., Johnsen, B., Mentzoni, R., Molde, H., & Pallesen, S. (2011). Individual differences in evaluative conditioning and reinforcement sensitivity affect bet-sizes during gambling. *Personality and Individual Differences*, 50(5), 729–734. doi:10.1016/j.paid.2010.12.026
- Capuzzi, D., & Stauffer, M. D. (2016). *Foundations of addictions counseling* (3rd ed.). Boston, MA: Pearson.
- Carver, C. S. (2005). Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review*, 9(4), 312–333. doi:10.1207/s15327957pspr0904_2
- Center for Substance Abuse Treatment. (2006). *Substance Abuse: Clinical Issues in Intensive Outpatient Treatment*. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Champine, R. B., & Petry, N. M. (2010). Pathological gamblers respond equally well to cognitive-behavioral

- therapy regardless of other mental health treatment status. *The American Journal on Addictions*, 19, 550–556. doi:10.1111/j.1521-0391.2010.00085.x
- Clark, L., Averbeck, B., Payer, D., Sescousse, G., Winstanley, C. A., & Xue, G. (2013). Pathological choice: The neuroscience of gambling and gambling addiction. *The Journal of Neuroscience*, 33(45), 17617–17623. doi:10.1523/JNEUROSCI.3231-13.2013
- Congdon, E., & Canli, T. (2008). A neurogenetic approach to impulsivity. *Journal of Personality*, 76(6), 1447–1483. doi:10.1111/j.1467-6494.2008.00528.x
- Corney, W. J., & Cummings, W. T. (1985). Gambling behavior and information processing biases. *Journal of Gambling Behavior*, 1(2), 111–118. doi:10.1007/BF01019864
- Cyders, M. A., Flory, K., Rainer, S., & Smith, G. T. (2009). The role of personality dispositions to risky behavior in predicting first-year college drinking. *Addiction*, 104(2), 193–202. doi:10.1111/j.1360-0443.2008.02434.x
- Cyders, M. A., & Smith, G. T. (2007). Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences*, 43(4), 839–850. doi:10.1016/j.paid.2007.02.008
- Cyders, M. A., & Smith, G. T. (2008). Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*, 134(6), 807–828. doi:10.1037/a0013341
- DeYoung, C. G. (2011). Impulsivity as a personality trait. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2nd ed., pp. 485–502). New York: Guilford.
- Dowling, N. A., Cowlishaw, S., Jackson, A. C., Merkouris, S. S., Francis, K. L., & Christensen, D. R. (2015). Prevalence of psychiatric co-morbidity in treatment-seeking problem gamblers: A systematic review and meta-analysis. *Australian & New Zealand Journal of Psychiatry*, 49(6), 519–539. doi:10.1177/000-4867415575774
- Gaher, R. M., Hahn, A. M., Shishido, H., Simons, J. S., & Gaster, S. (2015). Associations between sensitivity to punishment, sensitivity to reward, and gambling. *Addictive Behaviors*, 42, 180–184. doi:10.1016/j.addbeh.2014.11.014
- Gray, J. A. (1991). The neuropsychology of temperament. In J. Strelau & A. Angleitner (Eds.), *Explorations in temperament: International perspectives on theory and measurement* (pp. 105–128). New York: Springer.
- Higuchi, S. (2010). *Seijin no insuyujitai to seikatsusyukan ni kansuru jittaiacyosakenkyu* [A study on current status of drinking behavior and lifestyle-related disease among Japanese adults]. Ministry of Health, Labour and Welfare. Retrieved from <http://mhlw-grants.niph.go.jp/niph/search/NIDD00.do?resrchNum=200926008B>.
- Hodgins, D. C., & Petry, N. M. (2004). Cognitive and behavioral treatments. In J. E. Grant & M. N. Potenza (Eds.), *Pathological gambling: A clinical guide to treatment* (pp. 169–187). Arlington, VA: American Psychiatric Publishing.
- Ibáñez, A., Blanco, C., & Sáiz-Ruiz, J. (2002). Neurobiology and genetics of pathological gambling. *Psychiatric Annals*, 32(3), 181–185.
- japan-addiction.jp. (2017). Izensyo kyoten kikan jigyo. Retrieved from <http://japan-addiction.jp/>
- Johnston, E. (2016, December 6). Regions hop on casino bandwagon, but move blasted amid gambling addiction fears. *The Japan Times*. Retrieved from <http://www.japantimes.co.jp/news/2016/12/06/national/politics-diplomacy/regions-hop-casino-bandwagon-move-blasted-amid-gambling-addiction-fears/>
- Kim, D., & Lee, J. (2011). Effects of the BAS and BIS on decision-making in a gambling task. *Personality and Individual Differences*, 50(7), 1131–1135. doi:10.1016/j.paid.2011.01.041
- Kim, S. W., & Grant, J. E. (2001). Personality dimensions in pathological gambling disorder and obsessive-compulsive disorder. *Psychiatry Research*, 104, 205–212.
- Leeman, R. F., & Potenza, M. N. (2013). A targeted review of the neurobiology and genetics of behavioural addictions: An emerging area of research. *Canadian Journal of Psychiatry*, 58(5), 260–273.
- Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, 144(9), 1184–1188.
- Matsumoto, T., Kobayashi, O., & Imamura, F. (2013). *Yakubutsu alcohol izonsyo karano kaifuku shien workbook* [Drug and alcohol recovery workbook] (4th ed.). Tokyo: Kingo shuppan.
- Michalczuk, R., Bowden-Jones, H., Verdejo-García, A., & Clark, L. (2011). Impulsivity and cognitive distortions in pathological gamblers attending the UK national problem gambling clinic: A preliminary report. *Psychological Medicine*, 41, 2625–2635. doi:10.1017/S003329171100095X

- Miller, W. R., Sorensen, J. L., Selzer, J. A., & Brigham, G. S. (2006). Disseminating evidence-based practices in substance abuse treatment: A review with suggestions. *Journal of Substance Abuse Treatment*, 31, 25–39. doi:10.1016/j.jsat.2006.03.005
- Morgenstern, J., Morgan, T. J., McCrady, B. S., Keller, D. S., & Carroll, K. M. (2001). Manual-guided cognitive-behavioral therapy training: A promising method for disseminating empirically supported substance abuse treatments to the practice community. *Psychology of Addictive Behaviors*, 15(2), 83–88. doi:10.1037//0893-164X.15.2.83
- Najavitz, L. M. (2002). *Seeking safety: A treatment manual for PTSD and substance abuse*. New York: Guilford.
- National Gambling Impact Study Commission (1999). *National gambling impact study commission: Final report*. Retrieved from <http://govinfo.library.unt.edu/ngisc/reports/finrpt.html>
- Petry, N. M. (2005). *Pathological gambling: Etiology, comorbidity, and treatment*. Washington, DC: American Psychological Association.
- Petry, N. M., Ammerman, Y., Bohl, J., Doersch, A., Gay, H., Kadden, R., ... Steinberg, K. (2006). Cognitive-behavioral therapy for pathological gamblers. *Journal of Consulting and Clinical Psychology*, 74(3), 555–567. doi:10.1037/0022-006X.74.3.555
- Petry, N. M., & Armentano, C. (1999). Prevalence, assessment, and treatment of pathological gambling: A review. *Psychiatric Services*, 50(8), 1021–1027.
- Petry, N. M., Blanco, C., Auriacombe, M., Borges, G., Bucholz, K., Crowley, T. J., ... O'Brien, C. (2014). An overview of and rationale for changes proposed for pathological gambling in DSM-5. *Journal of Gambling Studies*, 30, 493–502. doi:10.1007/s10899-013-9370-0
- Petry, N. M., & Weiss, L. (2009). Social support is associated with gambling treatment outcomes in pathological gamblers. *The American Journal on Addictions*, 18, 402–408. doi:10.1080/10550490903077861
- Pihl, R. O., & Stewart, S. H. (2013). Substance use disorders. In L. G. Castonguay & T. F. Oltmanns (Eds.), *Psychopathology: From science to clinical practice* (pp. 241–274). New York: The Guilford.
- Raylu, N., & Oei, T. (2002). Pathological gambling: A comprehensive review. *Clinical Psychology Review*, 22(7), 1009–1061. doi:10.1016/S0272-7358(02)00101-0
- Romanczuk-Seiferth, N., van den Brink, W., & Goudriaan, A. E. (2014). From symptoms to neurobiology: Pathological gambling in the light of the new classification in DSM-5. *Neuropsychobiology*, 70, 95–102. doi:10.1159/000362839
- Sauer, R. D. (2001). The political economy of gambling regulation. *Managerial and decision economics*, 22(1–3), 5–15. doi:10.1002/mde.996
- Shah, K. R., Potenza, M. N., & Eisen, S. A. (2004). Biological basis for pathological gambling. In J. E. Grant & M. N. Potenza (Eds.), *Pathological gambling: A clinical guide to treatment* (pp. 127–142). Arlington, VA: American Psychiatric Publishing, Inc.
- Shishido, H., Gaher, R. M., & Simons, J. S. (2013). I don't know how I feel, therefore I act: Alexithymia, urgency, and alcohol problems. *Addictive Behaviors*, 38(4), 2014–2017. doi:10.1016/j.addbeh.2012.12.014
- Sobel, L. C. (1996). Bridging the gap between scientists and practitioners: The challenge before us. *Behavior Therapy*, 27, 297–320.
- St-Pierre, R. A., Walker, D. M., Derevensky, J. L., & Gupta, R. (2014). How availability and accessibility of gambling venues influence problem gambling: A review of the literature. *Gambling Law Review and Economics*, 18, 150–172. doi:10.1089/gire.2014.1824
- Stea, J. N., Hodgins, D. C., & Fung, T. (2015). Abstinence versus moderation goals in brief motivational treatment for pathological gambling. *Journal of Gambling Studies*, 31, 1029–1045. doi:10.1007/s10899-014-9461-6
- Sylvain, C., Ladouceur, R., & Boisvert, J.-M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Journal of Counseling and Clinical Psychology*, 65(5), 727–732.
- The Economist. (2014, September). Gambling in Japan: Balls in the air. *Author*. Retrieved from <http://www.economist.com/news/business/21620248-legal-gambling-and-changing-tastes-threaten-huge-pachinko-business-balls-air>
- Toneatto, T., & Ladouceur, R. (2003). Treatment of pathological gambling: A critical review of the literature. *Psychology of Addictive Behaviors*, 17(4), 284–292. doi:10.1037/0893-164X.17.4.284

- Toneatto, T., Pillai, S., & Courtice, E. L. (2014). Mindfulness-enganced cognitive behavior therapy for problem gambling: A controlled pilot study. *International Journal of Mental Health Addiction*, 12, 197–205. doi:10.1007/211469-014-9481-6
- Toyama, T., Nakayama, H., Takimura, T., Yoshimura, A., Maesato, H., Matsushita, S., ... Higuchi, S. (2014). Prevalence of pathological gambling in Japan: Results of national surveys of the general adult population in 2008 and 2013. *Alcohol and Alcoholism*, 49(suppl_1), i17–i17.
- Verdejo-García, A., Bechara, A., Recknor, E. C., & Pérez-García, M. (2007). Negative emotion-driven impulsivity predicts substance dependence problems. *Drug Alcohol Dependence*, 91(2), 213–219.
- Walters, G. D. (2001). Behavior genetic research on gambling and problem gambling: A preliminary meta-analysis of available data. *Journal of Gambling Studies*, 17(4), 255–271.
- Weiss, R. D., Jaffee, W. B., de Menil, V. P., & Cogley, C. B. (2004). Group therapy for substance use disorders: What do we know? *Harvard Review of Psychiatry*, 12(6), 339–350.
- Welte, J. W., Barnes, G. M., Tidwell, M. O., Hoffman, J. H., & Wieczorek, W. F. (2015). Gambling and problem gambling in the United States: Changes between 1999 and 2013. *Journal of Gambling Studies*, 31, 695–715. doi:10.1007/210899-014-9471-4
- Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor model of impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, 30(4), 669–689. doi:10.1016/S0191-8869(00)00064-7
- Witkiewitz, K., Bowen, S., Harrop, E. N., Douglas, H., Enkema, M., & Sedgwick, C. (2014). Mindfulness-based treatment to prevent addictive behavior relapse: Theoretical models and hypothesized mechanisms of change. *Substance Use & Misuse*, 49, 513–524. doi:10.3109/10826084.2014.891845
- Zelazo, P. D., & Cunningham, W. A. (2007). Executive function: Mechanisms underlying emotion regulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 135–179). New York: Guilford.

(Received June 1, 2017; Accepted September 24, 2017)