Gambling and Gambling Problem Perception Questionnaire as a tool to evaluate professionals’ attitudes towards problem gamblers and training programmes in Japan

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Abstract
Aim: To develop and measure the psychometric properties of the Gambling and Gambling Problem Perception Questionnaire (GGPPQ); a scale to evaluate professionals’ attitudes towards people with problem gambling in the Japanese context. Data collection: We held 12 workshops in Japan targeted at mental health professionals who consult people with gambling problems. Participants completed the survey before the workshop. Some were also asked to complete the survey after the workshop to measure workshop influence. Setting: Public and private healthcare facilities in all 47 prefectures of Japan. Participants: Medical doctors, nurses, social workers, clinical psychologists, and other professionals working in the aforementioned facilities (n = 653, response rate = 98.5%). Measurements: licence; knowledge about gambling and

Submitted January 8, 2022; accepted June 13, 2022

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Gambling problems (questionnaire); self-rating of knowledge and general confidence for helping problem gamblers; years of practice; frequency of working with clients; experience in attending workshops; overall satisfaction with the workshop. **Results:** A five-factor structure extracted by exploratory factor analysis showed a good fit by confirmatory factor analysis (CFI = .973, TLI = .967, RMSEA = .060, AIC = 28913.6, BIC = 29110.8). The GGPPQ showed good internal consistency and good concurrent validity with participants’ self-rating of their knowledge, general confidence, frequency of working with clients who have gambling problems, and experience in attending workshops. The workshop had a positive influence on participants’ attitudes. Japan’s unique gambling industry and lack of training opportunities on problem gambling were assumed to have influenced the psychometric properties of the measurement tool. **Conclusion:** The GGPPQ is a valid tool to measure the attitudes of healthcare professionals towards people with gambling problems, as well as workshop effectiveness in Japan.

**Keywords**

gambling disorder, gambling-related harm, GGPPQ, perception towards gambling disorder, staff attitudes, training

Gambling Disorder is defined in the DSM-5 as a “Persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress” (American Psychiatric Association, 2013, p. 585). This definition focuses on certain aspects of the harm problem gamblers face, but research states that the harm caused by gambling is not limited to what is mentioned in the diagnostic criteria. Gambling-related harm has been defined as “any initial or exacerbated adverse consequence due to an engagement with gambling that leads to a decrement to the health or wellbeing of an individual, family unit, community or population” (Langham et al., 2016). Gambling-related harm has multiple dimensions such as financial problems, negative contribution to physical and psychological health, relationship problems, reduced performance at work or school, and engagement in criminal activities, which can all affect the gambler as well as anyone related to the gambler (Langham et al., 2016). Thus, research emphasises the importance of professionals not specialised in the treatment of gambling disorder being equipped with sufficient knowledge and at the same time be free from having prejudicial views (John et al., 2020), as anyone they meet in their routine practice might potentially be suffering from these gambling-related harms.

**Gambling in Japan**

Social factors such as availability of gaming machines, jurisdiction, and accessibility to gambling venues also play an important role in forming gambling-related harms (Abbott et al., 2018). Differences in the prevalence rate of problem gambling among nations support this notion. A review comparing prevalence rates of problem gamblers among nations stated that the high 12-month prevalence rate in Hong Kong (5.8%) can be explained by the vast number of gambling opportunities available (Calado & Griffiths, 2016). As for Japan, the 12-month prevalence rate of problem gambling has been estimated at 2.2% (National Hospital Organization KURIHAMA Medical and Addiction Center, 2021). This may not be a high number compared to the rates in Hong Kong or other Asian states (South Korea: 0.5%, Singapore: 4.1%, Macau: 4.3%), but this does not necessarily mean that the rate is negligibly small compared to European nations, where rates range
The Japanese gambling industry has its own unique characteristics. Despite casinos being illegal, Japan is still known to have the third-largest gambling market in the world, as well as holding nearly 60% of the world’s gaming machines (Casino.org, n.d.; Ziolkowski, 2019). Unique gaming venues such as pachinko parlours and lottery booths can be found in front of train stations in both rural areas and large cities (Rockwell & Amano, 2019). Such venues are so common as not to be noticed by citizens any more than a grocery store would be. This is particularly different compared to many Asian countries where a few large casinos are heavily promoted, but only in a few major cities.

Still, the number of people who engage in gambling activities remains low compared to other Asian nations (12-month participation rates – Japan: 33.8%, South Korea: 41.8%, Singapore: 44%, Hong Kong: 62%, Macau: 67.9%) and many Western nations (e.g., Czech Republic: 25.5%, Slovenia: 35.5%, Austria: 42%, France: 56.2%, Belgium: 60%, USA: 76.9%, Finland: 78.0%) (Calado & Griffiths, 2016) despite age being the only restriction to engaging in gambling activities. This low participation rate in Japan may be partly explained by the negative image of gambling activities and people who engage in them (Samuelsson et al., 2022; Takiguchi & Rosenthal, 2011; Yokomitsu et al., 2021). Especially for pachinko, the industry has a strong connection to the Korean community in Japan (Han, 2007; Kim, 2008, 2011), which sometimes leads Japanese residents to project their racially discriminative views toward Koreans onto the industry (Neary, 2017). As a result of this negative perception of gambling in Japan, many hesitate to disclose their gambling problems when seeking help for gambling-related harms, resulting in delayed detection of the root cause and eventual recovery. Thus, discovering the attitudes of general healthcare professionals and raising awareness about gambling and gambling problems are of crucial importance in Japan in order to detect and minimise gambling-related harms.

Study aim

Studies measuring healthcare professionals’ attitudes towards people with gambling problems are very limited, and at the same time use either non-standardised measurements (Achab et al., 2014; Manning et al., 2020; Orford et al., 2003; Tikkinen et al., 2012) or take a qualitative approach (Rodda et al., 2018). None of the studies we found applied standardised scales. For substance use disorders, the Drug and Drug Problems Perception Questionnaire (DDPPQ) is a standardised scale widely used in quantitative research measuring staff attitudes (van Boekel et al., 2013). The scale consists of 20 questions evaluating the respondents’ attitudes towards people with substance use disorder (Watson et al., 2007).

In our study, we aimed to modify the scale so it might be applied to measure healthcare providers’ attitudes towards gambling and problem gambling as well as to evaluate its psychometric properties in the Japanese context. Content validity, factor construct validity, concurrent validity, and internal consistency were analysed for validity and reliability analysis. Additionally, we attempted to measure the influence of a workshop conducted to improve general healthcare professionals’ attitudes using the modified scale as the outcome measure. Taken together, the study is expected to provide a quantitative scale for further research in evaluating professionals’ attitudes towards people with gambling problems and to bring insight into how attitudes can be addressed through intervention.

Method

The scale was adapted from the Japanese version of the Drug and Drug Problem Perception Questionnaire (J-DDPPQ) which was validated from the English version of the scale (Watson et al., 2007) by Takano et al.
The following steps were taken for modification.

1. Permission for modification: Permission for modification was retrieved from the author of the J-DDPPQ.

2. Initial modification and reconciliation: Initial modification and analysis of the content validity were conducted by the authors; two psychiatrists and one clinical psychologist, all working in the field of treating gambling disorder. We retained the original format of the scale which consists of 20 questions asking about therapeutic attitudes on a seven-point Likert scale. The words “drugs” or “drug abusers” were replaced with “gambling” and “problem gamblers”. During this process, Question 3 was deemed to be in need of amendment. Whereas the original scale stated “I know enough about the physical effects of drug use to carry out my role”. The phrase “the physical effects of gambling” was thought to be confusing since, in general, physical harm would not be the main problem faced by problem gamblers. The diagnostic criteria of gambling disorder in DSM-5 (American Psychiatric Association, 2013) includes three items about the financial problems of gambling. Research points out that financial loss is one of the major harms caused by gambling (Langham et al., 2016). Healthcare providers are thus required to be equipped with knowledge on financial issues related to gambling. Therefore, this statement was changed to “I know enough about the financial effects of gambling to carry out my role”.

3. Cognitive debriefing and review of its results: The scale was then consulted at a gathered meeting by four independent experts all experienced in treatment of problem gamblers. The wording and content of the scale were carefully analysed in comparison to the Japanese and English versions of the DDPPQ. All items were deemed valid in terms of content and whether it could be understood by healthcare providers in Japan.

4. English translation: The scale was translated into English by the authors.

5. Review of the English translation: The English translation was reviewed in terms of its content and understandability by three independent native English speakers. Some wordings were fixed in the process.

Sample

Sample size should depend on the population of the targeted sample (Israel, 1992; Taherdoost, 2017). There are no data on the population of clinicians who support people with gambling disorder, but a previous study reported that there are 220 treatment facilities for gambling disorder in Japan (Katayama et al., 2018). Japan’s Ministry of Health, Labour and Welfare reported the average number of clinicians as 67.9 for psychiatric hospitals with inpatient care (Ministry of Health, Labour and Welfare, 2014), so we hypothesised that the population would exceed no more than 14,938, as the 220 facilities contain outpatient clinics and other types of facilities which are assumed to have fewer staff. Thus, we calculated the sample size of our study to be 645 with a 99% confidence interval and a 5% tolerable error rate. Some variables were collected with a smaller proportion of samples in order to compare them with the results from the previous study (Takano et al., 2015), as different sample sizes would have resulted in different significance values and caused misinterpretation of the analysis (Wilson et al., 2021). These variables were collected until they matched the sample size of the previous study. These variables are marked with an * in the following section at first appearance.
Data collection

We hosted 12 workshops to teach knowledge for treating problem gamblers from December 2017 to January 2022. The workshop was targeted at any clinician who is currently in the practice of treating gambling problems or has a plan to practice in the near future. A description of the workshop is given in Table 1.

Invitation to the workshop with information of this research was sent via email to all 69 Mental Health and Welfare Centres (MHWCs) in Japan; local governmental facilities assigned to provide counselling and consultation services to people in each region as stipulated by Japan’s “Law Related to Mental Health and Welfare of the Person with Mental Disorder”. The invitation was also distributed from each MHWC to treatment facilities in each area. Each MHWC collected the information of participants wishing to attend the workshop in their area and sent it to the workshop office. After registration, the participants were asked to complete the scale anonymously before the workshop. The participants were told that participating in this research was anonymous and purely voluntary, and were assured that deciding to participate or not had no bearing on their ability to attend workshop.

To measure the influence of the workshop, we requested the participants at two of our workshops to answer the scale post workshop as well.

Other scales and variables collected

Knowledge about Gambling and Gambling Problems (questionnaire). We asked six questions about the knowledge of gambling and gambling problems. Participants were asked to select the answer they thought was correct.

Self-rating on knowledge and general confidence for helping problem gamblers. We asked respondents to react to two statements to measure the participants’ subjective rating on their knowledge and general confidence in supporting problem gamblers in their recovery. The statements were “I have enough knowledge to support the recovery of problem gamblers” and “I feel that I am capable of supporting the recovery of problem gamblers whenever asked”. Participants were asked to rate themselves on a five-point scale from “strongly agree” to “strongly disagree” for each statement.

Years of practice in treating clients with problem gambling*. We asked about the participants’ years of experience in treating clients with gambling problems.

Frequency of consulting clients with problem gambling*. We asked the participants’ frequency of consulting clients with gambling problems. Participants were asked to choose how frequently they consulted clients with gambling problems, from (A) every day, (B) once a week or more, (C) once a month or more, (D) once a year or more, or (E) never.

Experience in attending workshops and programmes for gambling problems*. We asked the participants about their previous experience of attending workshops or any related learning experience

Table 1. Overview of the workshop.

| Duration | 5 hours |
|----------|---------|
| Content  | (a) description of gambling disorder (b) treatments (c) techniques for family consultation (d) how to consult clients using a textbook developed by the lecturers (e) roleplay using the textbook. |
| Trainer  | Psychiatrist (content (a), (b), (c)) Social worker (content (d), (e)) |
| Fee      | Free |
| Target population | Healthcare professionals who work with people suffering from gambling problems |
about problem gambling. Participants were asked to indicate whether they attended (A) workshops or lectures for clinicians (B) workshops or lectures for the general population (C) none.

**Overall satisfaction with the workshop.** We asked the participants whether the workshop was useful in terms of their clinical practice. The participants were asked to choose from the options “agree”, “somewhat agree”, “somewhat disagree” and “disagree” after the workshop. This question was collected from the participants in order to measure workshop influence, post workshop.

**Analysis**

**Factor construct.** Factor validity was first assessed using exploratory factor analysis (EFA). The suitability of data for factor analysis was examined using the Kaiser-Meyer-Olkin index (KMO) of sampling adequacy and Bartlett’s chi-square test of sphericity. The KMO index was compared with adequacy standards of 0.9, and \( p < 0.05 \) was set for Bartlett’s chi-square test of sphericity (Kaiser, 1974). EFA was performed using the maximum likelihood and the Harris-Kaiser independent cluster (HKIC) rotation method. The number of factors was determined by parallel analysis. The HKIC rotation was chosen because factors were believed to be correlated, and HKIC is preferred when targeting a simple pattern and a simple weight matrix (Kiers & ten Berge, 1994). Minimum factor loading was set at < 0.30.

Confirmatory factor analysis (CFA) was conducted based on the factor loading calculated by the EFA (Model 1). We used a combination of Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC) for evaluating the fit index of the model. We then compared our results to a model where the factor structure of the original DDPPQ was replicated (Model 2). Fit measures were compared to examine which model indicated a better fit. A model with a good fit is indicated by a number larger than 0.95 for CFI and TLI, and a number smaller than 0.06 for RMSEA (Hu & Bentler, 1999). AIC and BIC are measures that are used when comparing multiple models. A smaller value indicates a relatively better fit for the model (Kline, 2015).

**Internal consistency.** Internal consistency reliability was assessed by measuring Cronbach’s alpha coefficient for the total GGPPQ score and subscale scores. The minimal value for Cronbach’s alpha coefficient was set at 0.60 as recommended (Robinson et al., 1991).

**Concurrent validity.** Concurrent validity was examined by the following analysis. Correlation analysis of the GGPPQ was first conducted with the questionnaire score, self-rating of knowledge, and general confidence scores. Spearman’s rank correlation coefficient (\( \rho \)) was calculated. For each coefficient larger than 0.40, significance tests were conducted.

Next, a simple linear regression analysis was conducted setting the GGPPQ score as the dependent variable and years of practice in treating clients with gambling problems as the independent variable. Next, Welch’s ANOVA was conducted to analyse the GGPPQ score to each of “frequency of meeting clients with gambling problems” and “experience of attending workshops”. Post hoc analyses were conducted using Tukey’s honestly significant difference (HSD) post hoc test.

For measuring workshop influence, paired \( t \)-test for complete data of pre to post GGPPQ scores was conducted. Effect size (\( d \)) was calculated as well.

**Analysis software**

Sample size calculation was conducted via G*Power (Faul et al., 2009). All other statistical analyses were performed via R (R Core Team, 2021). CFA was conducted with the lavaan package.

**Results**

**Response rate and demographic data**

A total of 663 participants attended the workshop. The response rate was 98.5% \( (n = 653) \).
52.8% were working in Mental Health and Welfare Centres, and 17.3% were working in psychiatric hospitals or clinics. 17.9% were working in the public sector other than in Mental Health and Welfare Centres, and 11.9% were working in private facilities other than psychiatric hospitals (Table 2).

Regarding licences, 7.5% were medical doctors, 30.8% were nurses, 31.9% were social workers, 18.8% were clinical psychologists, 9.2% had other licences, and 8.0% had no particular licence.

For measuring workshop influence, a total of 250 participants completed the scale pre workshop and 189 participants did so post workshop. Three samples were excluded due to missing data; therefore, 186 samples were included for analysis (Table 2). Of the respondents, 88.9% agreed that the workshop was useful, and 11.1% somewhat agreed. Thus, we hypothesised that the workshop had a positive influence.

**Factor construct**

**EFA.** The results from the KMO index (0.92) and Bartlett’s chi-square test of sphericity ($p < .01$) indicated that the data were adequate for EFA. EFA was conducted with five factors suggested by parallel analysis. Factor loading from Question 8, Question 9, and Question 14 did not show an adequate fit to any of the five factors (all below .30), and these were therefore excluded (Table 3).

**CFA.** CFA was conducted based on the results of EFA (Model 1). The fit indices for the model were $CFI = .973$, $TLI = .967$, $RMSEA = .060$, $AIC = 28913.6$, $BIC = 29110.8$ (Figure 1). The results were then compared with the CFA based on the factor construct of the original DDPPQ (Model 2). The fit indices for Model 2 were $CFI = .931$, $TLI = .918$, $RMSEA = .082$, $AIC = 35275.2$, $BIC = 35499.3$. All fit indices for Model 1 were within the acceptable limits, in addition to showing a better fit than Model 2, therefore Model 1 was adapted as the proposed model for the GGPPQ (Table 4).

**Internal consistency**

Cronbach’s alpha coefficient for the total scale was .93. The coefficients for Factors 1 to 5 were: .97, .93, .73, .76, .76 respectively. All values were above the suggested minimum limit (Table 3).

**Concurrent validity**

**Questionnaire score.** Correlations between the questionnaire score and the GGPPQ were .22 for total scale, .18 for Factor 1, .20 for Factor 2, .17 for Factor 3, .17 for Factor 4, and .15 for Factor 5.

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**Table 2.** Demographic variables for the study participants.

| Variables                        | Total ($n = 653$) | Workshop ($n = 189$) |
|----------------------------------|-------------------|---------------------|
|                                  | $N$   | %     | $N$   | %     |
| **Professional Licence**         |       |       |       |       |
| Medical doctors                  | 49    | 7.5   | 7     | 3.8   |
| Nurses                           | 201   | 30.8  | 61    | 32.8  |
| Social workers                   | 208   | 31.9  | 63    | 33.9  |
| Clinical psychologists           | 123   | 18.8  | 40    | 21.5  |
| Other                            | 60    | 9.2   | 39    | 21.0  |
| None                             | 52    | 8.0   | 15    | 8.1   |
| **Workplace**                    |       |       |       |       |
| Mental Health and Welfare Centre | 345   | 52.8  | 100   | 53.8  |
| Psychiatric hospital/clinic      | 113   | 17.3  | 42    | 22.6  |
| Other public facility            | 117   | 17.9  | 33    | 17.7  |
| Other private facility           | 78    | 11.9  | 11    | 5.9   |

*The percentage do not add up to 100% because some participants hold multiple licences.*
Table 3. Means, standard deviations (SDs), factor-based validity (based on exploratory factor analysis with maximum likelihood extraction and HKIC rotation), and Cronbach’s alpha coefficients for the total scale and subscales of the GGPPQ.

| No. | Items (alpha = .93 for the total scale) ($$: Items were reverse scored) | Mean | SD  | Loading | Cronbach’s alpha coefficient if item was deleted for the total | For the subscale |
|-----|------------------------------------------------------------------------|------|-----|---------|-------------------------------------------------------------|-----------------|
|     |                                                                        |      |     |         |                                                             |                 |
| Factor 1 Role Adequacy (alpha = .97) | | | | | | | |
| 1   | I have a working knowledge of gambling and gambling-related problems. | 3.90 | 1.48 | .90 | .92 | .97 |
| 2   | I know enough about the causes of problem gambling to carry out my role. | 3.48 | 1.45 | .95 | .92 | .96 |
| 3   | I know enough about the financial effects of problem gambling to carry out my role. | 3.41 | 1.41 | .91 | .92 | .97 |
| 4   | I know enough about the psychological effects of problem gambling to carry out my role. | 3.80 | 1.44 | .95 | .92 | .96 |
| 5   | I know enough about the factors that put people at risk of developing gambling problems to carry out my role. | 3.64 | 1.43 | .97 | .92 | .96 |
| 6   | I know how to counsel problem gamblers over the long term. | 3.32 | 1.53 | .80 | .92 | .97 |
| 7   | I can appropriately advise my patients/clients about gambling and its effects. | 3.48 | 1.47 | .86 | .92 | .96 |
| Factor 2 Role Support (alpha = .93) | | | | | | | |
| 10  | I can easily find someone with whom I can discuss any personal difficulties that I might encounter. | 4.26 | 1.55 | .82 | .93 | .95 |
| 11  | I can easily find someone who would help me clarify my professional responsibilities. | 4.29 | 1.53 | .94 | .92 | .88 |
| 12  | I can easily find someone who would be able to help me formulate the best approach to a problem gambler. | 4.24 | 1.51 | .90 | .92 | .88 |
| Factor 3 Role-Related Self-Esteem (alpha = .73) | | | | | | | |
| 13  | There is little I can do to help problem gamblers. | 4.77 | 1.24 | .54 | .93 | NA |
| 15  | I am inclined to feel I am a failure with problem gamblers. | 4.00 | 1.30 | .69 | .92 | NA |
| Factor 4 Emotional Response (alpha = .76) | | | | | | | |
| 16  | I have less respect for problem gamblers than for most other patient/clients I work with. | 5.63 | 1.20 | .94 | .93 | NA |
| 17  | I often feel uncomfortable when working with problem gamblers. | 5.19 | 1.34 | .62 | .93 | NA |
| Factor 5 Job Satisfaction (alpha = .76) | | | | | | | |
| 18  | I can get satisfaction from working with problem gamblers. | 4.12 | 1.13 | .78 | .93 | .63 |
| 19  | It is rewarding to work with problem gamblers. | 4.37 | 1.06 | .92 | .93 | .57 |
| 20  | I can understand problem gamblers. | 4.66 | 1.11 | .31 | .93 | .81 |

(continued)
Table 3. (continued)

| No. | Items (alpha = .93 for the total scale) ($: Items were reverse scored) | Mean  | SD   | Cronbach’s alpha coefficient if item was deleted |
|-----|------------------------------------------------------------------|-------|------|--------------------------------------------------|
|     |                                                                  |       |      | For the total  | For the subscale |
| 8   | I have the right to ask patients/clients questions about their gambling problems when necessary. | 5.54  | .98  | NA  | NA |
| 9   | I have the right to ask patients for any information that is relevant to their gambling problems. | 3.85  | 1.38 | NA  | NA |
| 14  | I work with problem gamblers as well as other client groups.     | 4.45  | 1.32 | NA  | NA |

Figure 1. Confirmatory factor analysis of the GGPPQ with the model extracted by the EFA.
2, .17 for Factor 3, .10 for Factor 4, .13 for Factor 5. All values indicate that the correlation between the GGPPQ scale and quiz scores was negligible (Table 5).

**Self-rated knowledge and general confidence.** The two questions asking for the participants’ subjective rating of knowledge and general confidence both had a significant positive correlation with the total GGPPQ score (knowledge: .68, general confidence: .74), Factor 1 (knowledge: .74, general confidence: .78), and Factor 3 (knowledge: .47, general confidence: .51) at \( p < .001 \) level (Table 5).

**Years of practice.** A simple linear regression was calculated to predict the GGPPQ score based on the years of practice in treating clients with gambling problems. A significant regression equation was found (\( F(1, 364) = 48.2, p < .001 \)), with an \( R^2 \) of .105. The participants’ predicted GGPPQ score is equal to 66.4161 + 1.8940 (years of practice in treating clients with gambling problems) years. Although statistically significant, the \( R^2 \) value indicated that the correlation was very weak.

**Frequency of working with clients.** For comparison of the difference in GGPPQ score and the participants’ frequency of consulting clients with gambling problems, Welch’s ANOVA observed a significant difference in the participants’ GGPPQ scores and all five subscale scores (total GGPPQ: \( F = 25.909, p < .001 \); Factor 1: \( F = 33.812, p < .001 \); Factor 2: \( F = 4.1154, p = .036 \); Factor 3: \( F = 8.8492, p < .001 \); Factor 4: \( F = 5.0918, p < .001 \); Factor 5: \( F = 4.1433, p < .001 \)). For total GGPPQ, Factor 3 and Factor 4, post hoc analysis by Tukey HSD comparison observed a statistically significant difference in the value between those who had no experience and those who met clients once per year or more (\( p < .001 \)). For Factor 1, post hoc analysis by Tukey HSD comparison observed a statistically significant difference in the values between those who had no experience and those who worked with clients once per year or more (\( p < .001 \)), and those who work with clients once per year or more and those who work with clients once a month or more (\( p < .05 \)). For Factors 2 and 5, post hoc analysis by Tukey HSD comparison observed no statistically significant difference between any of the groups at \( p < .05 \) level (Table 6).

**Past experience of workshop attendance.** For comparison of the difference in GGPPQ score to the participants’ experience of attending workshops and lecture programmes about gambling problems, Welch’s ANOVA observed a

| Table 4. Fit indices for the two models of the GGPPQ tested in the confirmatory factor analysis. |
|---------------------------------------------|
| Model | CFI  | TLI  | RMSEA | AIC       | BIC       |
|-------|------|------|-------|-----------|-----------|
| Model 1 | .973 | .967 | .060  | 28913.6   | 29110.8   |
| Model 2 | .931 | .918 | .082  | 35275.2   | 35499.3   |

**Notes.** CFI = Comparative Fit Index; TLI = Tucker–Lewis index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria.

Model 1: Factor structure extracted from the EFA. Model 2: Factor structure replicated from the original DDPPQ scale.

| Table 5. Spearman’s rank correlation coefficient of the GGPPQ score and subscale scores to each variable. |
|---------------------------------------------|
| Questionnaire score | .22 | .18 | .20 | .17 | .10 | .13 |
| Subjective rating of knowledge | .68* | .74* | .30 | .47* | .10 | .35 |
| General confidence | .74* | .78* | .35 | .51* | .17 | .38 |

* \( p < .001 \).
significant difference in the participants’ GGPPQ scores and all five subscale scores (total GGPPQ: $F = 50.892, p < .001$; Factor 1: $F = 57.985, p < .001$; Factor 2: $F = 7.514, p < .001$; Factor 3: $F = 19.231, p < .001$; Factor 4: $F = 7.211, p < .001$; Factor 5: $F = 10.872, p < .001$). For total GGPPQ, Factors 1, 2, 3, and 5, post hoc analysis by Tukey HSD comparison observed a statistically significant difference in the value between those who had never attended workshops with those who had attended workshops for clinicians ($p < .001$), and those who had never attended workshops with those who had attended workshops for the general population ($p < .001$). For Factor 4, post hoc analysis by Tukey HSD comparison observed a statistically significant difference in the value between those who had never attended workshops with those who attended workshops for clinicians ($p < .001$), but no significant difference in those who had never attended workshops with those who had attended workshops for the general population (Table 6).

**Workshop influence measured by the GGPPQ**

Paired t-test of pre to post workshop GGPPQ scores observed a significant increase in the GGPPQ score and all factors at post workshop on a $p < .001$ level. The effect sizes (Cohen’s $d$) for total GGPPQ and Factors 1, 2, 3, 4, 5 were 1.10, 1.17, 0.50, 0.72, 0.21 and 0.62 respectively (Table 6).

**Discussion**

**Scale validity**

The five-factor model consisting of 17 items reported good factor construct, concurrent validity, and internal consistency. Fit indices from CFA indicated a good fit for the structure extracted by the EFA.

**Factor construct.** Of the three deleted items, Item 8 “I have the right to ask patients/clients questions about their gambling problems when necessary” and Item 9 “I have the right to ask patients for any information that is relevant to their gambling problems” constructed an independent subscale in the J-DDPPQ named “Role Legitimacy”. The J-DDPPQ study recruited staff from psychiatric facilities not specialised in treating the disorder. We assume that clinicians working in facilities where they work with people suffering from gambling problems would feel normal asking about the “client’s gambling problem” (Item 8), but would still be hesitant in asking for “any relevant information” (Item 9) due to their lack of knowledge, causing the gap in these two questions. This may have caused the difference in the results, so a study with different cohorts might show different results. For our analysis, we decided to extract the two items based on the fit indices of CFA.

Item 14 “I work with problem gamblers as well as other client groups” did not show any sufficient factor loading but was retained in the J-DDPPQ study to follow the factor structure of the English version of the DDPPQ developed by Watson and colleagues (Watson et al., 2007). The item constructed a factor with Items 18, 19 and 20. In our study, the factor loading of Item 14 to the factor constructed by these questions was only 0.14. We decided to eliminate this item based on the results of CFA as well, as the fit indices were poor when the item was retained.

**Concurrent validity.** Contrary to our expectations, questionnaire scores did not correlate with the GGPPQ score or any of the subscale scores. The mean correct answer rate was 72.8% (4.37 out of a possible six questions), which was higher than expected. We assume the questions might have been less relevant to clinical practice, and this caused the poor correlation coefficient.

Further validity analysis confirmed that frequency of meeting clients, history of attending workshops, and self-rating of being knowledgeable and confident were all strong indicators of higher GGPPQ scores. On the contrary, participants’ years of practice remained weak predictors of GGPPQ scores, if not negligible. The result replicates previous studies stating that attitude towards people with addiction cannot simply be
| Variable                                                                 | n   | Total GGPPQ | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|--------------------------------------------------------------------------|-----|-------------|----------|----------|----------|----------|----------|
|                                                                          |     | Mean        | SD       | Mean     | SD       | Mean     | SD       | Mean     | SD       | Mean     | SD       | Mean     | SD       |
| Frequency of consulting clients with gambling problems                   |     |             |          |          |          |          |          |          |          |          |          |          |          |
| Every day                                                                | 8   | 80.75       | 11.7     | 32.12    | 4.42     | 14.62    | 5.21     | 8.75     | 1.39     | 11.25    | 2.25     | 14.00    | 2.14     |
| Once a week or more                                                      | 44  | 79.89       | 12.2     | 30.93    | 6.53     | 14.77    | 3.39     | 9.66     | 1.84     | 10.75    | 2.42     | 13.77    | 2.16     |
| Once a month or more                                                     | 119 | 74.11       | 14.0     | 27.45^a  | 7.87     | 13.22    | 4.23     | 8.87     | 1.94     | 11.10    | 2.08     | 13.48    | 2.88     |
| Once a year or more                                                      | 92  | 70.51^c     | 15.5     | 23.83^b,c| 9.15     | 13.35    | 4.40     | 8.87^c   | 2.35     | 11.34^c  | 1.98     | 13.13    | 2.37     |
| Never                                                                    | 103 | 60.06^d     | 12.8     | 17.95^d  | 8.47     | 12.07    | 4.33     | 7.69^d   | 2.11     | 9.94^d   | 2.48     | 12.41    | 2.28     |
| p-value (ANOVA)                                                          |     | < .001      | < .001   | < .001   | < .001   | < .001   | < .001   |< .001    |< .001    |< .001    |< .001    |< .001    |< .001    |
| Past experience of attending workshops                                   |     |             |          |          |          |          |          |          |          |          |          |          |          |
| For professionals                                                        | 125 | 76.57       | 13.3     | 28.68    | 8.04     | 13.83    | 3.98     | 9.28     | 2.13     | 11.30    | 1.98     | 13.47    | 2.28     |
| For general population                                                   | 90  | 75.29^a     | 14.8     | 27.54^a  | 8.54     | 13.89^a  | 4.68     | 9.04^a   | 2.08     | 10.94^a  | 2.16     | 13.87^a  | 2.63     |
| None                                                                     | 151 | 61.63^b     | 13.3     | 18.95^b  | 8.08     | 12.13^b  | 4.13     | 7.84^b   | 2.00     | 10.28^b  | 2.49     | 12.42^b  | 2.51     |
| p-value (ANOVA)                                                          |     | < .001      | < .001   | < .001   | < .001   | < .001   | < .001   |< .001    |< .001    |< .001    |< .001    |< .001    |< .001    |
| Change of GGPPQ score after intervention                                 |     |             |          |          |          |          |          |          |          |          |          |          |          |
| pre                                                                      | 186 | 71.00       | 15.23    | 24.40    | 9.60     | 13.54    | 4.27     | 8.80     | 2.09     | 11.09    | 2.14     | 13.18    | 2.66     |
| post                                                                     | 186 | 85.89       | 11.60    | 33.80    | 6.16     | 15.46    | 3.38     | 10.28    | 2.04     | 11.53    | 1.97     | 14.82    | 2.61     |
| p-value (paired t-test)                                                  |     | < .001      | < .001   | < .001   | < .001   | < .001   | < .001   |< .001    |< .001    |< .001    |< .001    |< .001    |< .001    |
| Effect size (Cohen’s d)                                                  | 1.10| 1.17        | 0.50     | 0.72     | 0.21     | 0.62     |          |          |          |          |          |          |          |

Note. (a) had significantly higher scores than (b). (c) had significantly higher scores than (d).
improved through years of experience, but that providing training programmes as well as ongoing support during practice is important (el-Guebaly et al., 2000; Livingston et al., 2012; Manning et al., 2020; Rodda et al., 2018; Silins et al., 2007; van Boekel et al., 2013; Wieczorek & Dąbrowska, 2018). In Japan, complaints have been made by the government that many healthcare professionals enter clinical practice without sufficient training on problem gambling (Ministry of Health Labour and Welfare, 2021). The weak correlation between the respondents’ years of experience and GGPPQ score thus indicates that clinicians in Japan may be struggling to consult people suffering from gambling-related harms due to their lack of knowledge. Therefore, including learning opportunities in their pre-practice training curriculum may be important.

**Workshop influence**

Although the total score and all five subscale scores of the GGPPQ significantly improved after the workshop, the effect size ranged from 0.21 to 1.17. The subscale with the lowest effect size was Factor 4, which asked about the respondents’ emotional comfort when dealing with this client group and respect towards them. Studies aimed to address staff attitudes towards people with addiction have discovered that stigmatised views are difficult to change in comparison to improving professionals’ knowledge and self-esteem through simple lectures. In regard to addressing staff attitudes towards people with addiction, interaction with recovered peers is suggested (Bland et al., 2001; Cadiz et al., 2012; Crapanzano et al., 2014).

Given the high level of stigma people with gambling problems face in Japan, future workshops should consider inviting recovered problem gamblers to give speeches about their stories of recovery, as this was not included in our programme.

**The naming of the five factors**

The factor constructs of the first (Items 1, 2, 3, 4, 5, 6, 7), second (Items 10, 11, 12) and fifth factors (Items 18, 19, 20) were identical to those in the J-DDPPQ, therefore the naming of these subscales was retained (Subscale 1: Role Adequacy, Subscale 2: Role Support, Subscale 5: Job Satisfaction).

Items 13, 15, 16, and 17 constructed one subscale in the DDPPQ, named “Role-Related Self-Esteem”, whereas in the GGPPQ these items were grouped into two different subscales. Item 13 and item 15 constructed a single subscale, which asked about the respondents’ self-esteem towards working with problem gamblers. Thus, we named the subscale “Role-Related Self-Esteem”.

Item 16 and item 17 constructed a single subscale rather than associating with the “Role-Related Self-Esteem” subscale. Based on the results measuring workshop impact, we named the subscale “Emotional Response”.

**Implications for further research**

Further research should focus on the analysis of GGPPQ scores with differences in clinicians’ pre-practice education curriculums in each region as well as the availability of gambling opportunities and its relationship with society, which influence people’s perceptions towards gambling. As described earlier, pachinko, one of Japan’s most ubiquitous gambling platforms, is highly stigmatised as it is tied up with issues of racial discrimination. This might mean a worse perception of professionals towards gambling and problem gambling compared to in nations where the structure of the gambling industry is different. We believe further research using the GGPPQ in various regions with consideration for such characteristics will provide regionally comparable data which will shed light on professionals’ attitudes towards gambling and problem gamblers, how they are formed and how they can be improved (Wieczorek & Dąbrowska, 2018).

**Conclusion**

This study confirmed that the GGPPQ is a valid and reliable tool to measure therapeutic attitudes of clinicians consulting clients with gambling problems in the Japanese context. Higher
scores indicate that the answerer has a positive view of the item, and lower scores mean negative attitudes toward it. The scale can be applied to measure healthcare providers’ attitudes towards people with gambling problems and evaluate the effectiveness of interventions aimed to improve this.

Gambling is a social act (Gordon & Reith, 2019). This means that people’s perception of gambling and problem gambling is influenced by how gambling is recognised in each culture (Salonen et al., 2014), and healthcare professionals’ views are no different. This also means that there is no one-size-fits-all strategy for improving healthcare staff’s attitudes as cultural differences must always be taken into consideration. In light of the importance of addressing the attitudes of professionals in order to enhance the recovery of people who suffer from problem gambling worldwide, we believe that the GGPPQ can contribute to collecting cross-cultural data on what influences professionals’ attitudes towards gambling, and gather ideas of effective training programmes on how those attitudes could best be addressed in order to build a society with less gambling-related harm as well as to enhance the recovery of those who are suffering from gambling problems.

Data access
Data used in this study can be accessed through correspondence with the lead author.

Declaration of conflicting interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval and informed consent
The research was approved by the research ethics committee of the Zenkoku Seishin Hoken Fukushi Center Head Committee (Head Committee of Japan’s Mental Health and Welfare Center). All procedures followed were under the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Written informed consent was obtained from all participants included in the study.

Funding
The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Japan Agency for Medical Research and Development, (grant number 17dk0307055h002).

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Supplementary material
The supplementary material is available online with the article.

References
Abbott, M., Binde, P., Clark, L., Hodgins, D., Johnson, M., Manitowabi, D., Quilty, L., Spångberg, J., Volberg, R., Walker, D. & Williams, R. (2018). Conceptual framework of harmful gambling (third edition). Gambling Research Exchange Ontario. https://doi.org/10.33684/CFHG3.en
Achab, S., Chatton, A., Khan, R., Thorens, G., Penzenstadler, L., Zullino, D. & Khazaal, Y. (2014). Early detection of pathological gambling: Betting on GPs’ beliefs and attitudes. BioMed Research International, 2014, 360585. https://doi.org/10.1155/2014/360585
American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596
Bland, E., Oppenheimer, L., Brisson-Carroll, G., Morel, C., Holmes, P. & Gruslin, A. (2001). Influence of an educational program on medical students’ attitudes to substance use disorders in pregnancy. The American Journal of Drug and Alcohol Abuse, 27(3), 483-490. https://doi.org/10.1081/ada-100104513
Cadiz, D. M., O’Neill, C., Butell, S. S., Epeneter, B. J. & Basin, B. (2012). Quasi-experimental evaluation of a substance use awareness educational intervention for nursing students. The
Calado, F. & Griffiths, M. D. (2016). Problem gambling worldwide: An update and systematic review of empirical research (2000–2015). *Journal of Behavioral Addictions*, 5(4), 592–613. https://doi.org/10.1556/2006.5.2016.073

Casino.org. (n.d.). *Global gambling industry in recent years*. https://www.casino.org/features/gambling-statistics/

Crapanzano, K., Vath, R. J. & Fisher, D. (2014). Reducing stigma towards substance users through an educational intervention: Harder than it looks. *Academic Psychiatry*, 38(4), 420–425. https://doi.org/10.1007/s40596-014-0067-1

el-Guebaly, N., Toews, J., Lockyer, J., Armstrong, S., & Hodgins, D. (2000). Medical education in substance-related disorders: Components and outcome. *Addiction*, 95(6), 949–957. https://doi.org/10.1046/j.1360-0443.2000.95694911.x

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Gordon, R. & Reith, G. (2019). Gambling as social practice: A complementary approach for reducing harm? *Harm Reduction Journal*, 16(1). https://doi.org/10.1186/s12954-019-0342-2

Han, J. (2007). The pachinko entertainment industry and Korean-Japanese enterprises. *Socio-Economic History*, 73(4), 377–400. https://doi.org/10.20624/sehs.73.4_377

Hu, L. T. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Israel, G. D. (1992). Determining sample size. *Psycloshpere.com*. https://www.psycloshpere.com/Determining%20sample%20size%20by%20Glen%20Israel.pdf

John, B., Holloway, K., Davies, N., May, T., Buhociu, M., Cousins, A. L., Thomas, S. & Roderique-Davies, G. (2020). Gambling harm as a global public health concern: A mixed method investigation of trends in Wales. *Frontiers in Public Health*, 8, 320. https://doi.org/10.3389/fpubh.2020.00320

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36. https://doi.org/10.1007/BF02291575

Katayama, M., Tanabe, H., Koizumi, N., Kobara, K., Sakurai, Y., Baba, T. & Shirakawa, N. (2018). Current status and themes of treating gambling disorders among mental health and welfare centres (in Japanese) [Seishin hokenn fukushi Senta-ni okeru gynaburu shougai-no soudann taisei-no genjyo-to kadai]. *The Journal of the Japanese Society of Alcohol-Related Problems*, 20(2), 56–61.

Kiers, H. A. L. & ten Berge, J. M. F. (1994). The Harris-Kaiser independent cluster rotation as a method for rotation to simple component weights. *Psychometrika*, 59(1), 81–90. https://doi.org/10.1007/BF02294267

Kim, B. (2008). Bringing class back in: The changing basis of inequality and the Korean minority in Japan. *Ethnic and Racial Studies*, 31(5), 871–898. https://doi.org/10.1080/01419870701682279

Kim, B. (2011). Changes in the socio-economic position of zainichi Koreans: A historical overview. *Social Science Japan Journal*, 14(2), 233–245. https://doi.org/10.1093/ssjj/jyq069

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Langham, E., Thorne, H., Browne, M., Donaldson, P., Rose, J. & Rockloff, M. (2016). Understanding gambling related harm: A proposed definition, conceptual framework, and taxonomy of harms. *BMC Public Health*, 16(1), 1–23. https://doi.org/10.1186/s12889-016-2747-0

Livingston, J. D., Milne, T., Fang, M. L. & Amari, E. (2012). The effectiveness of interventions for reducing stigma related to substance use disorders: A systematic review. *Addiction*, 107(1), 39–50. https://doi.org/10.1111/j.1360-0443.2011.03601.x

Manning, V., Dowling, N. A., Rodda, S. N., Cheetham, A. & Lubman, D. I. (2020). An examination of clinician responses to problem gambling in community mental health services. *Journal of Clinical Medicine*, 9(7), 1–13. https://doi.org/10.3390/jcm9072075
Ministry of Health Labour and Welfare. (2014). Overview of medical facilities 2014 (in Japanese) [Heisei 26 nenn (2014) Iryou-Shisetsu (Seitai Doutai) Chousa, Byouin Jyoukyou-Houkoku no Gaikyo]. https://www.mhlw.go.jp/toukei/saikin/hw/iryosd/14/dl/1-4.pdf

Ministry of Health Labour and Welfare. (2021). Re-evaluating the training programme for psychiatric social workers (in Japanese) [Seishinhoken-fukushishi Yosei Katei ni okeru Naiyou tou no Minaoshi ni tsuite] Ministry of Health Labour and Welfare. https://www.nih.go.jp/h-crisis/wp-content/uploads/2019/07/20190701141402_content_12205000_000524181.pdf

National Hospital Organization KURIHAMA Medical and Addiction Center. (2021). Reports on the national situation on Gambling Disorder and Gambling Related Problems (in Japanese) [Gyanburu-shougai oyobi Gyanburu Kanren-Mondai no Jittai-Chousa Houkokusho]. https://www.ncasa-japan.jp/pdf/document41.pdf

Neary, L. (2017, February 6). “Pachinko” is a family saga of exile, discrimination, and Japanese pinball. NPR. https://www.npr.org/2017/02/06/513304628/pachinko-is-a-family-saga-of-exile-discrimination-and-japanese-pinball

Orford, J., Boulay, S., Copello, A., Graves, N., Purser, B. & Day, E. (2003). Gambling and problem gambling among clients, and staff attitudes, in an alcohol and drug problems treatment service in the English midlands. International Gambling Studies, 3(2), 171–181. https://doi.org/10.1080/1356347032000142270

R Core Team. (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Robinson, J. P., Shaver, P. R., & Wrightsman, L. S. (1991). Measures of personality and social psychological attitudes. Elsevier. https://doi.org/10.1016/C2013-0-07551-2

Rockwell, G. & Amano, K. (2019). Pachinko. Journal of the Japanese Association for Digital Humanities, 4(1), 72–89. https://doi.org/10.17928/jjadh.4.1_72

Rodda, S. N., Manning, V., Dowling, N. A., Lee, S. J. & Lubman, D. I. (2018). Barriers and facilitators of responding to problem gambling: Perspectives from Australian mental health services. Journal of Gambling Studies, 34(1), 307–320. https://doi.org/10.1007/s10899-017-9713-3

Salonen, A. H., Castrén, S., Raisamo, S., Orford, J., Alho, H. & Lahti, T. (2014). Attitudes towards gambling in Finland: A cross-sectional population study. BMC Public Health, 14(1), 982. https://doi.org/10.1186/1471-2458-14-982

Samuelsson, E., Törroinen, J., Hwang, C. & Takiguchi, N. (2022). The zone and the shame: Narratives of gambling problems in Japan. Critical Gambling Studies, 3(1), 83–95. https://doi.org/10.29173/cgs112

Silins, E., Conigrave, K. M., Rakvin, C., Dobbins, T. & Curry, K. (2007). The influence of structured education and clinical experience on the attitudes of medical students towards substance misusers. Drug and Alcohol Review, 26(2), 191–200. https://doi.org/10.1080/09595230601184661

Tahermoost, H. (2017). Determining sample size: How to calculate survey sample size. International Journal of Economics and Management Systems, 2, 237–239. http://www.ahooraltd.comhttp://www.hamta.org

Takano, A., Kawakami, N., Miyamoto, Y. & Matsumoto, T. (2015). A study of therapeutic attitudes towards working with drug abusers: Reliability and validity of the Japanese version of the drug and drug problems perception questionnaire. Archives of Psychiatric Nursing, 29(5), 302–308. https://doi.org/10.1016/j.apnu.2015.05.002

Takiguchi, N. & Rosenthal, R. J. (2011). Problem gambling in Japan: A social perspective. Electronic Journal of Contemporary Japanese Studies, 1(1). https://japanesestudies.org.uk/articles/2011/Takiguchi.html

Tikkinen, K. A. O., Leinonen, J. S., Guyatt, G. H., Ebrahim, S. & Järvinen, T. L. N. (2012). What is a disease? Perspectives of the public, health professionals and legislators. BMJ Open, 2(6), Article e001632. https://doi.org/10.1136/bmjopen-2012-001632

van Boekel, L. C., Brouwers, E. P. M., van Weeghel, J. & Garretsen, H. F. L. (2013). Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. Drug
and Alcohol Dependence, 131(1–3), 23–35. https://doi.org/10.1016/j.drugalcdep.2013.02.018
Watson, H., Maclaren, W. & Kerr, S. (2007). Staff attitudes towards working with drug users: Development of the Drug Problems Perceptions Questionnaire. Addiction, 102(2), 206–215. https://doi.org/10.1111/j.1360-0443.2006.01686.x
Wieczorek, Ł., & Dąbrowska, K. (2018). What makes people with gambling disorder undergo treatment? Patient and professional perspectives. Nordic Studies on Alcohol and Drugs, 35(3), 196–214. https://doi.org/10.1177/1455072518772397
Wilson, D. T., Hooper, R., Brown, J., Farrin, A. J. & Walwyn, R. E. A. (2021). Efficient and flexible simulation-based sample size determination for clinical trials with multiple design parameters. Statistical Methods in Medical Research, 30(3), 799–815. https://doi.org/10.1177/0962280220975790
Yokomitsu, K., Kamimura, E. & Somatori, K. (2021). Validation of the Japanese version of the pathological gambling adaptation of the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS-J) among subclinical Japanese gamblers. International Journal of Mental Health and Addiction, 19(5), 1716–1728. https://doi.org/10.1007/s11469-020-00258-4
Ziolkowski, S. (2019). The world count of gaming machines 2018. Australian Gaming Council. https://austgamingcouncil.org.au/latest-research/world-count-gaming-machines-2018