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Gambling risk and protective factors among community and clinical samples in Singapore

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Abstract

Objectives: Problem Gambling (PG) has been linked to several socio-cognitive risk and protective factors; However, knowledge on their impact on problem gamblers in Asia **remains limited**. This study compares gambling risk and protective factors between clinical problem gamblers and community individuals in Singapore.

Methods: Data on gambling risk and protective factors, and PG severity were collected from 150 clinical problem gamblers and 150 community individuals through paper surveys.

Results: Clinical problem gamblers scored significantly higher in PG severity, gambling-related negative thoughts and urge and psychological distress, and scored significantly lower in gambling refusal self-efficacy, hope, resilience and life satisfaction, than community participants. There were also more significant relationships between risk and protective factors among clinical than community participants.

Conclusion: Gambling-related protective factors are relevant to clinical problem gamblers in the Singapore context, which could be further leveraged upon to inform and refine existing PG rehabilitation efforts.

Introduction

Gambling as a leisure activity is found in most parts of the world, crossing cultures and geographical boundaries [1,2]. However, when leisure gambling develops into Problem Gambling (PG), gambling behaviours disrupts one's personal life and social functioning [3].

Present literature emphasizes the role of risk factors in the development of PG [4-7]. For example, gambling-related cognitions such as expectations, erroneous beliefs and illusion of control have been suggested to play important roles in the precipitation and perpetuation of gambling behaviour [8-10]. Studies on gambling urge have also suggested that individuals with low distress tolerance are more susceptible to gambling cues and urges and the eventual participation in gambling activities [11-13]. Both cognitive factors and emotional states have been implicated in the precipitation of PG.

With growing interest in understanding psychopathology from a holistic and preventative standpoint, gambling protective factors have received wider attention in research [4,6]. Existing research has noted that gambling refusal self-efficacy correlates negatively with gambling-related cognitions, gambling urge, negative psychological states and PG severity [5,14]. Life satisfaction was also noted to help reduce gambling participation across a wide age range [15,16]. In addition, Lussier and team [17] suggested that prosocial family and community ties

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and positive personal identity were related to lower gambling severity. Finally, hope has emerged as a positive motivational state that induced a perceived ability to create successful pathways towards accomplishing goals, which could be useful for the understanding of PG symptom remediation [18].

Rationale and implications of the current study

The PG literature is predominantly focused on gambling risk factors [19]. However, a sole focus on negative behaviours cannot fully represent the complexity of behavioural functioning in humans. Protective factors such as social support, role modeling and being meaningfully engaged have been suggested to buffer the risk of substance use among young adults [20,21]. Similarly, gambling protective factors could be examined alongside risk factors to emphasize a holistic approach in PG symptom remediation [5,8].

In addition, gambling behaviours could vary between different cultural groups [7,8,22]. Past research observed PG rates to be higher among Chinese gamblers in Australia and Hong Kong as compared to Caucasian samples [8,23,24]. In Singapore, studies by the National Council of Problem Gambling [25] and National Addiction Management Service (2007) indicated that the Chinese formed a majority of individuals who participated in gambling activities and sought treatment for problem gambling.

At present, there is limited understanding of the gambling risk and protective factors among clinical problem gamblers in Asian populations [2,5,7,11,26]. In a review on PG in Asia, Raylu, Loo and Oei [27] highlighted cultural nuances (e.g., treatment expectations, difficulties in identifying emotions, changing strong irrational beliefs) that could be critical for the successful treatment of Asian problem gamblers. Therefore, the present study also aimed to expand the PG literature by examining how gambling risk and protective factors manifest in an Asian-dominated, multi-cultural and multi-ethnic society such as Singapore.

Considering findings on various risk and protective factors of PG as well as potential cultural influences on gambling behaviours as discussed, it was thus hypothesized that:

(i) clinical problem gamblers would score significantly higher in risk factors (gambling urge, gambling-related cognition and psychological states) and PG severity as compared to community individuals.

(ii) clinical problem gamblers would score significantly lower in protective factors (hope, resilience, gambling refusal self-efficacy and life satisfaction) when compared with community individuals.

(iii) protective factors (hope, resilience, gambling refusal self-efficacy and life satisfaction) would be negatively correlated with the severity of PG while the risk factors (gambling urge, gambling cognition and psychological states) would be positively correlated with PG severity among clinical problem gamblers, and vice versa in community individuals.

Methods

Participants

A total of 300 participants completed the study. The community group (n = 150) comprised of Singapore citizens and Permanent Residents, which included James Cook University Singapore (JCUS) students, JCUS staff, and members of the Singapore public recruited via snowballing recruitment method. The clinical group (n = 150) included Singapore citizens and Permanent Residents who sought help for gambling problems at counselling centres in Singapore. The exclusion criteria for both populations are as follows: (a) younger than 18 years of age and (b) foreign citizens except for permanent residents of Singapore. Demographic information for all participants are presented in Table 1.

Materials

Demographics

All participants completed a demographical questionnaire to indicate their gender, age, marital status, nationality, race, mental health status, education, employment, income and whether participants are taking medications for any psychiatric disorders.

Measures

The Problem Gambling Severity Index (PGSI; [28]). Problem gambling was assessed by the 9-item PGSI (e.g., "Have you bet more than you could really afford to lose?"; [28] and are rated on a four-point Likert scale ranging from "0 – Never" to "3– Almost always", with higher scores indicating more problems with gambling behaviour. The scale has shown strong internal consistency in both its original (Cronbach's α = .84; test-retest reliability at .78 [28] and Chinese version (Cronbach's α= .77 [12]. Cronbach's alpha was strong for the present study for both community and clinical participants at .85 and .84 respectively.

The Gambling Related Cognitions Scale (GRCS) [29]. Erroneous gambling cognitions were measured using a scale containing 23 items that make up five subscales: GE - gambling expectancies, IC-Illusion of control, PC-Predictive control, IS- Inability to stop gambling, and IB-Interpretative bias. Responses are rated on a 7-point scale (1 =strongly disagree to 7= strongly agree) with higher scores indicating high cognitive distortions. The scale has a strong total reliability of Cronbach's alpha of .93 [29]. For the present study, the total reliability based on Cronbach's alpha was strong for both the community and clinical participants at .90 and .95 respectively.

The Gambling Urge Scale (GUS) [11]. The urge to gamble was measured using the 6-item GUS (e.g., 'I crave a gamble right now'), which is rated on a 7-point Likert scale (1 = strongly disagree to 7= strongly agree) with high scores indicating a strong urge to gamble. The scale has a high internal consistency (Cronbach's α= .81) and strong reliability with Cronbach's alpha of .81 [29,30]. Internal consistency for the current sample was strong (Community: Cronbach's α=.90; Clinical: Cronbach's α= .95).

Depression, Anxiety, and Stress Scale (DASS-21) [31]. The DASS-21 is a 21-item scale (rated on a 4-point scale ranging from 0 "did not apply to me at all" to 3 "applied to me very much or most of the time") that assesses symptoms of depression (DASS-D), anxiety (DASS-A), and stress (DASS-S). The scale reported strong internal consistency (α = .94, .87 and .91 for DASS-D, DASS-A and DASS-S respectively; [32]. Oei et al. [33] supported the validity and reliability of the use of DASS-21 in Asian samples. Internal consistency for the current samples was high: community (α = .89, .81 and .87 for DASS-D, DASS-A and DASS-S respectively) with a total reliability of Cronbach's alpha of .94; clinical (α = .88 for the subscales of depression, anxiety and stress respectively) with a total reliability of Cronbach's al-

pha of .96. In a study on gambling risk and protective factors in Singapore by Oei and Goh [5], the total reliability for the community group was α = .91.

Satisfaction With Life Scale (SWLS) [34]. The SWLS is a 5-item measure of global life satisfaction. Respondents rate their agreement with each statement on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater life satisfaction. The SWLS demonstrated good internal consistency in its original form (Cronbach's α= .84) and when validated in a Malaysian sample (Cronbach's alpha = .87) [35]. Internal consistency for the current sample was good (community: Cronbach's α= .91; clinical: Cronbach's α= .94).

Resilience Scale (RS) [36]. The RS is a 26-item measure of overall resilience. It is rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) and higher scores indicated greater perceived resilience. Studies that employed the RS found Cronbach's alpha coefficients to range from .72 to .94 [37]. Internal consistency for the current sample was good (community: Cronbach's α =.88; clinical: Cronbach's α= .95).

Gambling Refusal Self-Efficacy Questionnaire (GRSEQ) [14]. The GRSEQ is a four-factor, 25-item questionnaire whereby individuals rate their level of refusal to gamble on an 11-point Likert scale ranging from 0 (No confidence) to 100 (Extreme confidence). The GRSEQ composite and factor scores showed high internal consistency (Cronbach's alpha ranging from .92 to .98). Internal consistency for the current sample was good (Community: Cronbach's α = .95; Clinical: Cronbach's α= .93).

The Adult Trait Hope Scale (TATHS) [18]. The TATHS is a 12-item measure (8 items unscored) of hope based on two subscales: Agency and Pathways. Responses are rated using an 8-point Likert scale to indicate how false or true each of 12 statements is (e.g. 'I energetically pursue my goals', 1=definitely false to 8=definitely true).The TATHS items are internally consistent, with alpha coefficients ranging from .71 to .76 for the Agency subscale, .63 to .80 for Pathways subscale, and .74 to .84 for the overall scale [18]. In the present study, the internal consistency for the Agency subscale was high: Cronbach's α= .80 and .83 for the community and clinical groups respectively; internal consistency for the Pathways subscale was also adequate: Cronbach's α= .69 and .86 for the community and clinical groups respectively. The total internal consistency reliability for the overall scale for the community and clinical group were at alpha coefficients of .67 and .89 respectively.

Procedure

Ethics approval was obtained from the James Cook University Human Research Ethics Committee to conduct the proposed study. Approval was also obtained from counselling centres to recruit the clinical samples from their clientele.

Communit Participants. Participants were given a package that contained a study information letter, an informed consent form and study questionnaires. Study participation was emphasized to be voluntary and confidential by study investigator. Completed informed consent forms and questionnaires were returned to the investigator in person or via prepaid mail.

Clinical Participants. Participants in the clinical group were first-visit clients referred by attending therapists at respective counselling centres in Singapore. Informed consent pertaining to the voluntary and confidential nature of the study were conducted by attending therapists (trained by study investigator) before study commencement.

Participants took an average of 30 minutes to complete study questionnaires and were presented with a SGD$5 supermarket voucher as a token of appreciation for participation.

Data analyses

Study data were evaluated using Multivariate Analysis of Variance (MANOVA) with two-tailed *t*-test statistics to test for differences in total scale scores of risk and protective factors and PG severity reported by community participants and clinical problem gamblers. Independent samples *t*-tests based on the Hoteling statistic were used to test for differences between group means. Correlation analyses examined the relationships between study variables (i.e., PG severity, gambling urge, gambling-related cognitions and psychological states, hope, resilience, gambling refusal self-efficacy and life satisfaction). Study data were analysed using the Statistical Package for the Social Sciences (SPSS) version 22.0. All bivariate relationships were analysed using Pearson's correlation coefficients and statistical significance of study results was accepted at $p < .05$.

Results

Preliminary data analyses

Preliminary data screening showed that missing data accounted for less than 5% of overall data and was randomly distributed. Missing data were substituted using study variable mean scores. The final sample contained a total of 300 participants.

Histograms and normality statistical tests revealed positive skewness for PGSI, GUS and RS total scores, and all subscales of the DASS-21 and GRCS, and negative skewness for TATHS total scores and all subscales of the GRSEQ in general. For the clinical sample, positive skewness was observed for total and subscale scores of the GRSEQ and TATHS, RS total scores and SWL total scores, and negative skewness was observed for total and subscale scores of the DASS-21 and GRCS and GUS total scores. For the community group, positive skewness was noted in the total and subscale scores of DASS-21 and GRCS, and PGSI and GUS total scale scores; and negative skewness was observed for total and subscale scores of TATHS and GRSEQ, and RS and SWLS total scores. This may be expected because the study samples contained individuals with or without problem gambling who could potentially endorse PG severity ratings at either ends of the severity index spectrum.

Overall group differences in gambling risk and protective factors

A one-way Multivariate Analysis of Variance (MANOVA) based on the Hotelling's T^2 statistic for comparisons between two independent groups was conducted to highlight mean differences in the total scale and subscale scores of all study variables between the clinical sample and community individuals. Controlling for the effects of demographic variables, multivariate analyses of total scale scores reached statistical significance, Hotelling's $T^2 = 1998.98$, $F(8, 281) = 235.62$, $p < .05$, $\eta p^2 = .87$. There was 87% of the variance in total scale scores that was explained by differences in group membership. Similar to total scale scores, multivariate analyses of subscale mean scores attained statistical significance, Hotelling's $T^2 = 1060.88$, $F(10, 279) = 99.43$, $p < .05$, $\eta p^2 = .78$. A total of 78% of the variance in subscale mean scores was explained by group membership. Significant MANOVA effects suggest differences in problem gam-

bling severity, and gambling risk and protective factors between the clinical and community sample. Therefore, further analyses were conducted to understand group differences in the specific dependent variables.

Group differences in total scale and subscale mean scores of gambling severity, and risk and protective factors

A one-way Analysis of Variance (ANOVA) was conducted to examine differences in the total scale mean scores of all study variables between clinical problem gamblers and community individuals. Results from the ANOVA are summarised in Table 2.

PG severity

Clinical problem gamblers (95% CI [18.36, 19.94]) reported higher total scale mean scores on the PGSI than community individuals (95% CI [0.25, 0.59]). A *t*-test of PGSI group means reached statistical significance, which suggests that clinical problem gamblers experienced significantly more problems and behaviours associated with gambling than community individuals.

Gambling risk factors

Clinical problem gamblers reported higher total scale mean scores in gambling risk factors, i.e., GRCS scores (Clinical: 95% CI [120.81, 130.66]; Community: 95% CI [30.20, 34.90]), GUS scores (Clinical: 95% CI [31.74, 34.97]; Community: (95% CI [6.13, 6.79]), and DASS-21 scores (Clinical: 95% CI [37.74, 43.26]; Community: (95% CI [10.39, 14.05]), than community individuals. These differences in total scale mean scores reached statistical significance, which suggests that clinical problem gamblers experienced more gambling-related negative thoughts and cognitions, more problems in controlling gambling-related thoughts, and more psychological distress than community individuals.

Post-hoc *t*-tests also revealed that clinical problem gamblers reported significantly higher subscale mean scores on the GRCS than community individuals, $p < .05$. Figure 1 shows the subscale mean scores of GRCS for both clinical and community participants.

Gambling protective factors

Clinical problem gamblers reported statistically significant higher total scale mean scores in gambling protective factors, namely GRSEQ scores (Clinical: 95% CI [602.28, 798.65]; Community: 95% CI [2184.42, 2334.24]), TATHS scores (95% CI [47.32, 52.86]; Community: 95% CI [65.53, 68.27], SWLS scores (Clinical: 95% CI [15.81, 18.27]; Community: 95% CI [21.94, 24.17]) and RS scores (Clinical: 95% CI [78.25, 89.29]; Community: 95% CI [125.74, 132.67]), than community individuals, $p < .05$. It is suggested that clinical problem gamblers were significantly less confident to refuse gambling, less hopeful about their future, experienced significantly lower life satisfaction, and less resilient towards life challenges than community participants.

Post-hoc *t*-tests also demonstrated significantly higher GRSEQ subscale mean scores among clinical participants than community individuals. These differences reached statistical significance, $p < .05$. Figure 2 shows the subscale mean scores of GRSEQ for both clinical and community participants.

Correlations between gambling severity and gambling risk and protective factors

Table 3 summarises the correlation coefficients between problem gambling severity and related risk and protective factors among clinical problem gamblers. As expected, higher problem gambling severity was associated with more gambling-related cognitions, increased gambling urges, increased psychological distress, lower gambling refusal self-efficacy, diminished hope and lower resilience. All gambling risk factors were positively correlated with each other and negatively correlated with gambling protective factors (i.e., gambling refusal self-efficacy and hope). Although the construct of hope was significantly correlated

with several gambling risk factors (e.g., gambling cognitions,

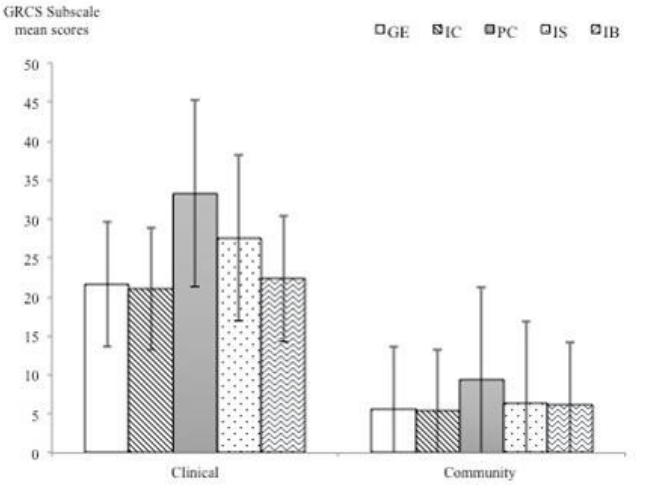

Figure 1: Comparison of GRCS Subscale mean scores between clinical problem gamblers and community individuals.

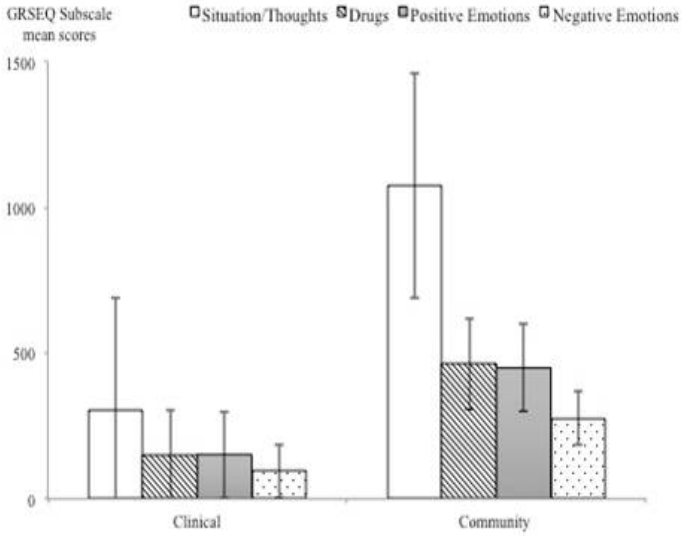

Figure 2: Comparison of GRSEQ Subscale mean scores between clinical problem gamblers and community individuals.

Table 1: Frequencies, percentages, means, standard deviations, T-test and Chi-square statistics of community participants and clinical problem gamblers in Singapore

	Community (N=150)		Clinical (N=150)		T-test
Age, Mean (SD)	29.13 (10.13)		35.49 (9.98)		-5.76**
	Frequency	%	Frequency	%	Chi-square statistic
Gender					40.64**
Male	96	64.0	109	72.7	
Female	54	36.0	41	27.3	
Ethnicity					24.71**
Chinese	92	61.3	125	83.3	
Malay	27	18.0	18	12.0	
Indian	31	20.7	6	4.0	
Other	0	0	1	0.7	
Marital Status					35.13**
Never Married	105	70.0	74	49.3	
Divorced/ Separated	5	3.0	39	26.0	
Married	40	26.7	2	1.3	
Widow	0	0	1	0.7	
Widowed	0	0	34	22.7	
Nationality					2.37
SG Citizen	138	92.0	142	94.7	
SG PR	12	8	7	4.7	
Others	0	0	1	0.7	
Mental Illness					1.01
No	149	99.3	147	98.0	
Yes	1	0.7	3	2.0	
Medication					3.03
No	149	99.3	147	98.0	
Yes	0	0	3	2.0	
Education (highest level)					35.64**
PSLE & below	84	56.0	28	18.7	
GCE 'O' level/ ITE/VITB	14	9.3	50	33.3	
GCE 'A' level/ Polytechnic	10	6.7	50	33.3	
University degree & above	41	27.3	20	13.3	
Others	1	.7	2	1.3	

**$p < .01$

gambling urge and gambling refusal self-efficacy) amongst clinical problem gamblers, these relationships were not significant when compared amongst community individuals.

Table 4 summarises the correlation coefficients between problem gambling severity and gambling risk and protective factors among community individuals. Similar to clinical problem gamblers, PG severity was positively correlated with gambling cognitions and urge among community individuals. Community individuals who reported increased gambling urge also reported decreased gambling refusal self-efficacy. Only psychological distress was significantly related to the non gambling-specific protective factors (i.e., hope, resilience and satisfaction with life).

Table 2: Group Means, Standard Deviations, and T-test comparisons for Total and Subscale Mean Scores of PGSI, GRCS, GUS, DASS, GRSEQ, RS, SWLS, and TATHS

	Clinical		Community		T-test	
	M	SD	M	SD	F (1, 288)	ηp^2
PGSI	19.15	4.93	0.42	1.07	1370.89**	.83
GRCS	125.73	30.52	32.55	14.56	790.33**	.73
Gambling Expectancies	21.63	5.87	5.65	2.97	632.33**	.69
Illusory Control	20.98	6.40	5.37	2.74	584.49**	.67
Predictive Control	33.27	8.34	9.41	5.63	570.93**	.66
Inability to Stop Gambling	27.6	6.47	6.29	2.44	933.93**	.76
Interpretive Bias	22.38	5.03	6.19	3.94	636.34**	.69
GUS	33.53	9.99	6.46	2.02	709.31**	.71
DASS-21	41.00	14.01	12.22	11.34	283.21**	.50
Depression	11.43	3.47	3.13	3.43	244.53**	.46
Anxiety	12.26	5.10	3.57	3.81	262.52**	.48
Stress	16.45	5.37	5.54	5.17	234.14**	.45
GRSEQ	700.47	608.57	2259.33	464.30	461.75**	.62
Situation/ Thoughts	303.13	279.32	1073	232.71	469.99**	.62
Drugs	151.40	138.54	461.67	93.41	397.57**	.58
Positive Emotions	151.27	139.15	448.93	106.58	339.88**	.54
Negative Emotions	94.67	87.13	275.73	58.65	354.88**	.55
TATHS	50.09	17.16	66.90	8.51	66.91**	.19
Agency	14.57	6.16	23.71	4.36	128.85**	.31
Pathway	15.07	6.89	24.12	3.95	102.35**	.26
SWLS	17.04	7.63	23.05	6.91	18.86**	.06
RS	83.77	34.22	129.21	21.47	105.72**	.27

Note: ANOVA: Analysis of Variance **p < .01

Discussion

Aligned with study hypotheses, clinical problem gamblers in this study endorsed higher frequencies of risk factors and lower frequencies of protective factors of gambling. In addition, correlation analyses suggested that protective factors could be more relevant for clinical problem gamblers than for community individuals.

In general consensus with previous research [7], clinical problem gamblers in this study reported higher scores in all sub-domains of gambling cognitions and psychological distress, and lower scores in all sub-domains of gambling refusal self-efficacy and hope. These findings suggest that sub-components that make up gambling risk factors such as gambling cognitions play significant roles in the development of PG. For example, erroneous beliefs about one's ability to control gambling outcomes (which is part of gambling cognitions) have been cited to precipitate or maintain PG via a illusory sense of manipulating gambling outcomes [2,7,10,38]. Moving forward, it is pertinent to understand the pathways linking the different facets of gambling risk and protective factors to PG development among problem gamblers in Singapore [8].

The examination of both risk and protective factors in the same study also offered a well-rounded view of how PG is represented in an Asian sample in Singapore. In the present study, lower endorsements of protective factors, and significant negative relationships between gambling protective factors and PG severity, were noted among clinical problem gamblers. This suggests that protective psychosocial factors and resources could be especially important for clinical problem gamblers in the understanding and rehabilitation efforts of gambling behaviours [4,7,16]. Previous studies have proposed to use empowerment and building positive life skills such as fostering resilience and hope, improving life satisfaction and strengthening gambling-specific mental resources (e.g., gambling refusal self-efficacy) to help clinical problem gamblers cope with life challenges effectively. In this way, use of gambling as a form of escape or avoidance from psychological distress when facing difficult life events could be minimised [4,5,26].

Finally, findings from this study offered some preliminary perspectives on the presentation of gambling risk and protective factors in an Asian population. Previously, Raylu and colleagues [27] discussed the challenges of PG intervention for Chinese.

Table 3: Bivariate correlations and internal consistencies (in diagonal) of the total PGSI, GRCS, GUS, DASS-21, GRSEQ, TATHS, SWLS, RS scale mean scores in clinical problem gamblers in Singapore

Variables	PGSI	GRCS	GUS	DASS-21	GRSEQ	TATHS	SWLS	RS
PGSI	.84	.55**	.36**	.50**	-.53**	-.40**	.15	-.20*
GRCS		.93	.43**	.52**	-.82**	-.38**	.23**	.02
GUS			.98	.50**	-.52**	-.25**	.12	.02
DASS-21				.88	-.58**	-.22**	.14	-.07
GRSEQ					.99	.45**	-.25**	.06
TATHS						.86	.10	.46**
SWLS							.94	.20**
RS								.98

**$p < .05$

Table 4: Bivariate correlations and Internal Consistencies (in diagonal) of the total PGSI, GRCS, GUS, DASS-21, GRSEQ, TATHS, SWLS, RS Scale Mean Scores in Community Individuals in Singapore

Variables	PGSI	GRCS	GUS	DASS-21	GRSEQ	TATHS	SWLS	RS
PGSI	.85	.37**	.29**	.08	.08	.03	-.16	.01
GRCS		.92	.36**	.19*	-.31**	-.06	-.11	-.10
GUS			.85	.13	-.25**	-.01	-.05	.01
DASS-21				.94	-.06	.01	-.38	-.27**
GRSEQ					.95	.10	.08	.07
TATHS						.69	.27**	.40**
SWLS							.91	.35**
RS								.95

** $p < .01$

gamblers; the practical benefits of immediate behaviour change are prioritized over the resources, and especially time, that are to be invested in strengthening cognitive resilience for long-term prevention and worsening of PG behaviours [27]. However, in this study, PG severity among Asian clinical problem gamblers were implied to be significantly related to gambling protective factors. There appears to be a gap in rehabilitation efforts that could benefit from a deeper examination of cognitive protective factors exhibited by clinical problem gamblers in the Asian setting [27]. Therapists working with Asian problem gamblers are urged to stay mindful of potential cultural influences that could moderate or impede intervention efforts, and leverage on these cultural factors for PG remediation where applicable [8].

There are several limitations to the study results. Firstly, findings from this study examined only group differences in gambling-related risk and protective factors and could not account for the interactional or causal relationships between the problem gambling and the studied factors. Past research has demonstrated significant interactional relationships between gambling risk and protective factors but these were not indicated in this study; yet, this was also the first study to report substantial differences in these factors among clinical problem gamblers in Asia. Future research could further delineate the relationships between gambling risk and protective factors in Asian problem gamblers.

Secondly, the study focused on the cognitive risk factors for PG. Other studies have highlighted potential influences from social and familial variables (e.g., presence of social support and familial cognitions; and the nature of games (e.g., whether continuous or discontinuous game, age span of gambling addiction); on either gambling behaviours or addiction problems in general [7]. Future research could account for the effects of different forms of gambling or compare between problem gamblers with varying years of gambling participation. The grounds by which PG develops could be more wholesomely understood with the inclusion of these external factors.

Thirdly, survey type questionnaires are generally prone to 'socially desirable' responses [39]. In this study, however, the survey method of assessment is relevant to the study's research aims as the study aimed to measure people's cognitions and perceived beliefs instead of quantifiable behaviours. To validate participant responses further, future studies could explore using more objective methods of data collection such as clinical interviews, behavioural observations or physiological measures of gambling behaviours. It is to note that several statistical tests were employed in this study for group comparisons of studied factors, which can inflate family-wise error rate. Thus, future studies examining gambling-related risk and protective factors using Asian populations are needed to validate and replicate these findings further. While the above limitations are pointed out, it must also be acknowledged that this was the first study that examined gambling risk and protective factors in both clinical and community groups in an Asian context and, thus, the findings added meaningfully to the gambling literature.

Conclusion

The present study showed that clinical problem gamblers reported more gambling-related negative thoughts and emotions, lower gambling refusal self-efficacy and life satisfaction, and hope than community individuals. Future research could further explicate the relationships among the risk and protective factors of PG in Asian gamblers to assist the development of PG intervention that is sensitive to potential cultural needs of this population.

References

1. Ministry of Community Youth & Sports. More than half of Singapore gambles; but only 2 in 100 at risk of gambling addiction. Ministry of Community, Youth & Sport. 2005.
2. Raylu N, Oei TPS. Role of culture in gambling and problem gambling. Clinical Psychology Review. 2004a; 23: 1087-1114.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 5th Edition (DSM-5). Washington, DC: Author. 2013.
4. Dickson L, Derevensky J, Gupta R. Youth gambling problems: Examining risk and protective factors. International Gambling Studies. 2008; 8: 25-47.
5. Oei TPS, Goh Z. Interactions Between Risk and Protective Factors on Problem Gambling in Asia. Journal of Gambling Studies. 2015; 31: 557-572.
6. Pollard J, Hawkins J, Arthur M. Risk and protection: are both necessary to understand diverse behavioral outcomes in adolescence. Social Work Research. 1999; 23: 145-158.
7. Raylu N, Oei TPS. Pathological gambling: A comprehensive review. Clinical Psychology Review. 2002; 22: 1009-1061.
8. Loo JMY, Raylu N, Oei TPS. Gambling among the Chinese: A comprehensive review. Clinical Psychology Review. 2008; 28: 1152-1166.
9. Oei TPS, Lin J, Raylu N. The relationship between gambling cognitions, psychological states, and gambling: A cross-sectional study of Chinese and Caucasians in Australia. Journal of Cross-Cultural Psychology. 2008; 39: 147-161.
10. Griffiths MD. The role of cognitive bias and skill in fruit machine gambling. Br J Psychol. 1994; 85: 351-369.
11. Oei TPS, Lin J, Raylu N. Validation of the Chinese version of the gambling related cognitions scale (GRCS-C). J Gambling Studies. 2007; 23: 309-322.
12. Loo JMY, Oei TPS, Raylu N. Psychometric evaluation of the problem gambling severity index-Chinese version (PGSI-C). J Gambling Studies. 2011; 27: 453-466.
13. Sharpe L. A reformulated cognitive-behavioral model of problem gambling: A biopsychosocial perspective. Clinical Psychology Review. 2002; 22: 1-25.
14. Casey LM, Oei TPS, Melville KM, Bourke E, Newcombe PA. Measuring Self-efficacy in gambling: The gambling refusal self-efficacy questionnaire. Journal of Gambling Studies. 2008; 24: 229-246.
15. Grant JE, Kim SW. Demographic and clinical features of 131 adult pathological gamblers. The Journal of Clinical Psychiatry. 2001; 62: 957-962.
16. Lai DWL. Gambling and the older Chinese in Canada. Journal of Gambling Studies. 2006; 22: 121–141.
17. Lussier I, Derevensky JL, Gupta R, Bergevin T, Ellenbogen S. Youth gambling behaviors: An examination of the role of resilience. Psycholo of Addictive Behaviors. 2007; 21: 165–173.
18. Snyder CR, Hoza B, Pelham WE, Rapoff M, Ware L, Danovsky M, et al. The development and validation of the Children's Hope Scale. Journal of Pediatric Psychology. 1997; 22: 399-421.
19. Leshner AI. Introduction. In Glantz MD, Johnson JL, (Editors), Re-

silience and development: Positive life adaptation (pp.1-4). New York: Academic/Plenum Publishers. 1999; 1-4.

20. Condiotte MM, Lichtenstein E. Self-efficacy and relapse in smoking cessation programs. Journal of Consulting and Clinical Psychology. 1981; 49: 648–658.

21. Stone AL, Becker LG, Huber AM, Catalano RF. Review of risk and protective factors of substance use and problem use in emerging adulthood. Addictive behaviors. 2012; 37: 747-775.

22. GAMECS Project. Gambling among members of ethnic communities in Sydney: Report on "Problem gambling and ethnic communities" (Part 3). Sydney: Ethnic Communities' Council of NSW. 1999.

23. Blaszczynski A, Huynh S, Dumlao VJ, Farrell E. Problem gambling within a Chinese-speaking community. Journal of Gambling Studies. 1998; 14: 359–380.

24. Chen CN, Wong J, Lee N, Chen-Ho MW, Lau JTF, et al. The Shatin community mental health survey in Hong Kong: II. Major findings. Archives of General Psychiatry. 1993; 50: 125-133.

25. National Council on Problem Gambling. Report of Survey on Participation in Gambling Activities Among Singapore Residents. 2015.

26. Loo JMY, Tsai JS, Raylu N, Oei TPS. Gratitude, hope, mindfulness and personal-growth initiative: Buffers or risk factors for problem gambling? PLoS One. 2014; 9: 1-11.

27. Raylu N, Loo J, Oei TP. Treatment of gambling problems in Asia: Comprehensive review and implications for Asian problem gamblers. Journal of Cognitive Psychotherapy. 2013; 27: 297-322.

28. Ferris J, Wynne H. The Canadian Problem Gambling Index. Final Report. Ottawa: Canadian Center on Substance Abuse. 2001.

29. Raylu N, Oei TPS. The Gambling Related Cognitions Scale (GRCS): Development, confirmatory factor validation and psychometric properties. Addiction. 2004b; 99: 757−769.

30. Raylu N, Oei TPS. The gambling urge scale: Development, confirmatory factor validation, and psychometric properties. Psychology of Addictive Behaviors. 2004c; 18: 100–105.

31. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck depression and anxiety inventories. Behaviour Research and Therapy. 1995; 33: 335-343.

32. Anthony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-items and 21-items versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. Psychological Assessment. 1998; 10: 176-181.

33. Oei TP, Sawang S, Goh YW, Mukhtar F. Using Depression Anxiety Stress Scale 21 (DASS-21) across cultures. International Journal of Psychology. 2013; 48: 1018-1029.

34. Diener E, Emmons RA, Larsen RJ, Griffin S. The Satisfaction With Life Scale. Journal of Personality Assessment. 1985; 49: 71-75.

35. Sinniah A, Thambu M, Hatta S, Nik Ruzyaner NJ, Oei TPS. Psychometric properties and validation of the Satisfaction With Life Scale in psychiatric and medical outpatients in Malaysia. Comprehensive Psychiatry. 2014; 55: 101–106.

36. Wagnild GM, Young HM. Development and psychometric evaluation of the Resilience Scale. Journal of Nursing Measurement. 1993; 1: 165-178.

37. Wagnild GM, Collins JA. Assessing resilience. Journal of Psychosocial Nursing. 2009; 47: 28-33.

38. Reid RL. The psychology of the near miss. Journal of Gambling Behavior. 1986; 2: 32–39.

39. Shaughnessy JJ, Zechmeister EB. Research methods in psychology. 1997.