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FULL-LENGTH REPORT



How gambling harms others: The influence of relationship-type and closeness on harm, health, and wellbeing

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ABSTRACT

Background and aims: Concerned significant others (CSOs) can experience gambling-related harm, impacting their health and wellbeing. However, this harm varies depending on the type and closeness of the relationship with the person who gambles. We sought to determine the type and closeness of relationships that are more likely to experience harm from another person's gambling, and examine which aspects of health and wellbeing are related to this harm. **Methods:** We examined survey data from 1,131 Australian adults who identified as being close to someone experiencing a gambling problem. The survey included information on relationship closeness, gambling-related harm (GHS-20-AO), and a broad range of health and wellbeing measures; including the Personal Wellbeing Index (PWI), the 12-item Short Form Survey (SF-12), and the Positive and Negative Affect Schedule Short Form (PANAS-SF). **Results:** CSOs in relationships where finances and responsibilities are shared were more likely to be harmed by another person's gambling problem, particularly partners (current and ex) and family members. This harm was most strongly associated with high levels of distress and negative emotions, impacting the CSO's ability to function properly at work or perform other responsibilities. **Discussion and Conclusions:** Support and treatment services for CSOs should consider addressing the psychological distress and negative emotions commonly experienced by CSOs.

KEYWORDS

gambling harms, concerned significant others, relationship closeness, health and wellbeing, finances, responsibilities, partners, family members

INTRODUCTION

Gambling is a significant public policy concern in Australia (Australian Gambling Research Centre, 2021). Around 1.2% of the adult population gambles at a problematic level (PGSI 8+), with another 9.3% gambling at a risky level (PGSI 1–7; Hing et al., 2021). The excessive time and money spent on gambling can harm both the person with the gambling problem and those close to them (Langham et al., 2016; Productivity Commission, 2010). In one of the more comprehensive frameworks of gambling harm, Langham et al. (2016) proposed that these harms could be experienced in seven areas: financial harms, relationship harms, impacts on health, emotional/psychological harms, impacts on work/study, cultural harms and harms associated with crime.

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Around 6% of Australian adults report being harmed by another person's gambling (Hing et al., 2021). Further, approximately 10–14% of Australian children live in households with parents who are experiencing some level of gambling problem (Suomi, Watson, & Butterworth, 2022; Tulloch, Hing, Browne, Rockloff, & Hilbrecht, 2022). Those harmed can include partners, parents, children, other family members, friends, colleagues, and others. Often called “concerned significant others” (CSOs), they can experience financial, relational, and work/study harm. In addition, experiencing gambling-related harm can lead to various health and wellbeing decrements (Langham et al., 2016). These include depression and low mood (Black et al., 2014; Sullivan, McCormick, Lamont, & Penfold, 2007; Wenzel, Øren, & Bakken, 2008), anxiety (Black et al., 2014), psychological or emotional distress (Chan, Dowling, Jackson, & Shek, 2016; Dowling, Rodda, Lubman, & Jackson, 2014; Lind, Castrén, Hagfors, & Salonen, 2022; Salonen, Alho, & Castrén, 2016; Svensson, Romild, & Shepherdson, 2013; Tulloch, Browne, Hing, & Rockloff, 2020), sleep problems (Wenzel et al., 2008) and a range of other physical health issues including stomach problems and high blood pressure (Lorenz & Yaffee, 1988).

Recently, researchers have tried to understand the harm and associated health and wellbeing impacts experienced across different relationships with a person experiencing a gambling problem. While the most common type of CSOs are close friends, more severe harm tends to be experienced by the partners (including ex-partners) and other close family members (Hing et al., 2022; Lind et al., 2022; Salonen et al., 2016). One large population study found that ex-partners reported the highest number of harms from another person's gambling, followed by current partners, parents and children (Hing et al., 2022). Those with non-family relationships reported fewer harms than family members.

In terms of health and wellbeing harms, Hing et al. (2022) found that a higher proportion of family members reported some form of emotional harm than non-family members. The highest proportion of CSOs with feelings of depression and stress-related health problems were partners, and both partners and family members were more likely to report stress or worry-associated sleep problems than non-family members. Similarly, Dowling et al. (2014) reported lower emotional impacts in friends than others; but no significant differences between the emotional harms experienced by partners and other family members. Lind et al. (2022) found that the relationship between being a concerned significant other (CSO) and experiencing health issues, specifically psychological distress and poor perceived health, was stronger for family members (including partners) than for close friends. Ferland et al.'s (2021) qualitative study aimed to understand the differences between partners and other close family members. Both groups reported psychological and emotional distress, although this was more pronounced for partners. Partners also reported more serious physical health issues; describing the development of new problems, such as chronic fatigue and eating disorders,

or the exacerbation of pre-existing issues. In contrast, other close family members reported more general and common issues, such as sleep problems. In sum, both the intensity of harm experienced and the specific profile of health and wellbeing outcomes reported, appear to differ across relationships with the person who gambles.

There is also some evidence to suggest that it is not only the type of relationship that may impact harm; but also the related notion of how close the relationship is. For example, some researchers propose that the level of emotional and financial interconnectedness impacts the likelihood of experiencing any type of harm (Ferland et al., 2021; Goodwin, Browne, Rockloff, & Rose, 2017). Similarly, in a recent qualitative study, Browne et al. (2023) concluded that for friends and colleagues, those with a closer relationship with the person experiencing a gambling problem were more likely to experience harm. Additionally, Castrén, Lind, Hagfors, and Salonen (2021, p. 7) suggested that emotional harm, in particular, may be associated not only with the “type and depth of the relationship but also depend on the distance from the gambler”.

Understanding the moderating effect of closeness on felt harm is complicated by the fact that gambling problems can damage relationships, and CSOs may consciously reduce their degree of closeness with the person who gambles to protect themselves from harm. For example, close family members have been found to distance themselves from their relatives to avoid the impacts of gambling (Browne et al., 2023; Petra, 2020). Similarly, Ferland et al. (2021) reported that emotional wellbeing increased when the CSO could detach or distance themselves from the person who gambles, particularly for those in non-partner relationships. In general, the evidence suggests that CSOs are not a homogenous group, and that harms may differ both across and within relationship types.

To better understand the way in which relationship type and closeness may moderate the impacts to CSOs, the current study incorporates a novel measure of relationship closeness, as well as relationship types, to explore to what extent harm depends on the closeness of the CSO to the person experiencing a gambling problem. Closeness was measured across four domains - financial, emotional, shared responsibilities, and day-to-day contact. These were developed with consideration of the key areas affected by another person's gambling: finances, relationships and work and study (Marionneau, Egerer, & Raisamo, 2022). We expected that closeness would covary somewhat with relationship type, but might also explain important variability in susceptibility to harm within relationship types. For example, it might be expected that those family members or friends who shared financial and day-to-day responsibilities should experience greater harm than other family members or friends. Similarly, ex-partners who have been able to separate more completely may experience less ongoing harm than those who still have an interdependent relationship, or shared parenting responsibilities. Within non-family members, a business partner might have a more financially interdependent relationship than another colleague who



may simply be concerned for the person experiencing a gambling problem.

This paper aimed to understand which CSOs are likely to experience harm due to another person's gambling. We examined how gambling problem severity, relationship type, and the closeness of the connection between the CSO and the person who gambles, are associated with gambling-related harm. Secondly, the paper describes a broad range of health and wellbeing factors across different relationships and levels of closeness with the person who gambles, and examined which of these aspects of health and wellbeing are related to gambling-related harm.

METHODS

Participants and procedure

Purposeful sampling was used to select participants who were close to someone with a gambling problem ($N = 1,131$). Respondents were recruited by survey aggregator, Qualtrics, through numerous online panels across Australia. Each recruited respondent received a small incentive from their panel for participating. This was valued between A\$3 and A\$4 for the 20-min survey (in cash or points depending on the panel). The panel providers contacted potential participants via email and online advertising, who were then given study information and invited to participate. Eligibility was limited to participants who were 18 years or older, current residents in New South Wales, Australia, and identified as close to someone with a gambling problem. A full information sheet was provided, and participants provided consent before completing the survey.

Measures

CSOs. Potential respondents were asked if they had been “close to someone (such as your partner, a family member, a friend or colleague, etc.) who you would say has had problems with their gambling within the past 12 months.” Those who replied ‘no’ were ineligible to complete the survey. Those who replied ‘yes’ were asked to identify how many people they were close to who had a gambling problem, and the nature of the relationship they had with the person whose gambling had affected them the most during the previous 12 months (i.e., current spouse/partner, former spouse/partner, sibling, child, friend, etc.).

Significant Other Closeness Scale. Participants were asked about the level of closeness of their relationship with the person whose gambling problem had most affected them in the previous 12 months. A brief scale was developed for this research, based on consideration of the key areas affected by another person's gambling: finances, relationships and work and study (Marionneau et al., 2022), in which four items identified aspects of their relationship: emotional, financial, shared responsibilities, and time spent together (see Appendix A). Questions included “Select the option that

best describes the emotional aspect of your relationship with your (affected person). For example, are they important in your life, do you have a strong connection, disclose personal information, or think about them a lot?” Responses were along a 6-point Likert scale from 0 (no emotional relationship) to 5 (the closest emotional relationship I have). Scores from each item were summed for a total score, with higher scores reflecting a closer relationship. The Cronbach alpha was 0.831, showing good internal consistency.

PGSI. The severity of the other person's gambling problem was assessed using the PGSI (Ferris & Wynne, 2001). The 9-item PGSI is a well-validated measure of gambling problems (Currie, Hodgins, & Casey, 2013) that identifies symptoms of potentially harmful gambling behaviours. The PGSI was completed second-hand, from the affected person's perspective (e.g., “Did they seem to need to gamble with larger amounts of money to get the same feeling of excitement?” and “Did gambling seem to cause them any health problems including stress or anxiety?”), which is a second-hand reporting technique that has been used previously (see Li, Browne, Rawat, Langham, & Rockloff, 2017). Summed scores range from 0 to 27, with higher scores representing more severe gambling problems. The Cronbach's alpha for this study was 0.848.

Gambling harms. Gambling harms were measured via the 20-item Gambling Harms Scale for Affected Others (GHS-20-AO; Browne et al., 2023). This 20-item scale assesses harm to the CSO during the previous 12 months. Participants were asked to think about the person whose gambling had affected them the most and indicate whether any of these issues had occurred to them as a result of the other person's gambling. Items included “reduction of my savings”, “feelings of hopelessness about their gambling”, and “loss of sleep due to stress or worry about the gambling or gambling-related problems”. Score responses are “No” (0) or “Yes” (1). Total scores are summed and consequently range from 0 to 20. Higher scores indicate higher levels of gambling harm attributable to someone else's gambling. The Cronbach alpha for this study was 0.905.

Wellbeing - objective health states. The SF-12v2 (Ware, Kosinski, & Keller, 1996) is a 12-item measure abbreviated from the SF-36 (Ware & Sherbourne, 1992); a 36-item measure of functional health and wellbeing. Each of the 12 questions assesses a dimension of functioning, including physical functioning, role-physical, bodily pain, general health, vitality, social functioning, mental health and role-emotional. Scores for each dimension, and combined physical (physical component) and mental (mental component) summary scales, were computed and normalised via PRO_CoRE software supplied by QualityMetric (Quality-Metric, 2022). Higher scores indicate greater functioning in that domain.

Psychological distress was measured by the Kessler-6 (K6; Kessler et al., 2010). This six-item scale asks respondents about their emotional state over the past 30 days.



Items include “... about how often did you feel nervous?” with responses along a five-point scale ranging from 0 (*none of the time*) to 4 (*all of the time*). Scores are summed, resulting in scores ranging from 0 to 24. Higher scores indicate higher levels of psychological distress. The current study showed excellent internal consistency, with a Cronbach’s Alpha of 0.920.

Wellbeing - positive and negative affect. Affect was assessed using the brief Positive and Negative Affect Schedule Short Form (Thompson, 2007; I-PANAS-SF; Watson, Clark, & Tellegen, 1988). This 10-item scale asks participants to indicate “to what extent you generally feel” about ten different feelings or emotions such as “alert”, “ashamed”, “determined”, and “attentive”. Responses are rated along a five point-scale from 1 (*never*) to 5 (*always*). Scores are summed for each subscale (positive and negative), with possible scores ranging from 5 to 25 on each of these 2 dimensions. Higher scores on the relevant subscale indicate a higher level of either positive or negative affect, depending on the subscale being used.

Wellbeing - subjective feelings and perceptions. Subjective wellbeing was measured using the Personal Wellbeing Index (PWI, International Wellbeing Group, 2013) and a single-item life satisfaction question often included alongside the index. General life satisfaction was measured by the question, “Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole?” and rated on a scale of 0 (no satisfaction at all) to 10 (completely satisfied). The PWI is a self-report subjective wellbeing measure covering seven core domains of quality of life (Cummins, Eckersley, Pallant, van Vugt, & Misajon, 2003). The PWI asks, “How satisfied are you with your standard of living” and is rated on a scale of 0 (*no satisfaction at all*) to 10 (*completely satisfied*). Participants are then asked to similarly rate other areas of wellbeing, including their health, achievements, personal relationships, safety, community, and future security. Scores are summed and standardised (International Wellbeing Group, 2013), resulting in scores ranging from 0 to 100. The PWI is a valid and reliable measure, and the current study results showed excellent internal consistency, Cronbach’s Alpha = 0.927. For further construct validity, see International Wellbeing Group (2013).

Control variables. Several additional variables were collected to control for some factors known to be associated with CSO health and wellbeing. These included age, gender, psychological co-morbidities and own gambling problem (Orford, Copello, Velleman, & Templeton, 2010; Salonen, Castrén, Alho, & Lahti, 2014; Wenzel et al., 2008).

Psychological Health was assessed by asking whether the participant “had a diagnosed mental health condition”. Options included “none”, “an alcohol or substance abuse disorder”, “a mood disorder such as major depressive disorder, bipolar, or dysthymia”, “an anxiety disorder such as generalised anxiety disorder, obsessive-compulsive disorder or panic disorder”, “a diagnosed feeding or eating disorder”,

“a trauma-related disorder such as PTSD”, “a diagnosed psychotic disorder such as schizophrenia” or “a personality disorder”.

The participant’s own gambling problems were assessed using the Lie/Bet Questionnaire (Johnson & Hamer, 1998). This two-item screening tool asks, “Have you ever had to lie to people important to you about how much you gambled?” and “Have you ever felt the need to bet more and more money?”. Answers are “yes” or “no”. Answering yes to one or both items indicates a possible gambling problem; answering no to both questions indicates a likelihood that no gambling problem exists.

Statistical analysis

Statistical analyses were conducted in IBM SPSS Statistics for Windows, Version 27 (IBM Corp., 2020). Bi-variate statistics were used to describe and explore harm, closeness and wellbeing data. ANOVA (and Turkey’s HSD) was used to assess group differences. The Welch *t*-test was applied in instances where the assumption of equal variances was not met. In regression analyses, all standard assumptions were met, including linearity, homoscedasticity, independence of errors, normality of errors, and lack of multicollinearity. The Durbin-Watson statistic ranged between 1.76 and 1.96, indicating no autocorrelation. Tolerance values were greater than 0.1, showing no evidence of multicollinearity. Residuals appeared normally distributed. Missing data was removed list-wise for SF-12 Component Scores (3% of responses; there was no other missing data). In all tests, a *p*-value less than 0.01 was considered statistically significant.

Ethics

The study procedures were carried out in accordance with the Declaration of Helsinki. Ethics approval was obtained from the Central Queensland University Human Ethics Committee (23,491). All subjects provided informed consent.

RESULTS

The age of participants ranged from 18 to 85, with an average age of 37.5 (*SD* = 14.59), 50.8% (*n* = 579) of participants identified as female, 48.5% (*n* = 552) as male, and 0.07% (*n* = 8) as non-binary/third gender/other. Other demographic characteristics are described in Table 1.

Participants reported being close to an average of 1.61 (*SD* = 1.18, range 1–12) people experiencing gambling problems. Table 2 shows the relationship of the CSO to the person whose gambling they felt had most affected them. Most were friends (32.3%), followed by current spouses or partners (17.3%). Relationships were categorised into four main types, and all further analyses were conducted using these groups. There were no significant differences in mean age across these groups: current partner (*M* = 36.81, *SD* = 13.05), family member (*M* = 38.69, *SD* = 15.36), non-family relationship (*M* = 37.03, *SD* = 14.42), ex-partner (*M* = 35.74, *SD* = 14.92). The mean PGSI scores of the



Table 1. Demographic characteristics of the participants

	N	%
Marital Status		
Single/never married	342	30.0%
Living with partner/de facto	263	23.1%
Married	440	38.6%
Divorced or separated	76	6.7%
Widowed	18	1.6%
Highest educational qualification		
Did not complete year 10	27	2.4%
Completed year 10 or equivalent	84	7.4%
Year 12 or equivalent	184	16.2%
A trade, technical certificate or diploma	300	26.3%
A university or college degree	415	36.4%
Postgraduate qualification	129	11.3%
Employment		
Full or part-time work (including self-employed)	867	78.4%
Unemployed and looking for work	36	3.2%
Full time student	46	4.0%
Full-time home duties	54	4.7%
Retired	74	6.5%
Sick, disability pension or other	45	3.1%
Annual Household Income		
\$0 to \$39,999	161	14.1%
\$40,000 to \$79,999	288	25.3%
\$80,000 to \$119,999	257	22.6%
\$120,000 to \$159,999	212	18.6%
\$160,000 or more	164	14.4%
Don't know	57	5.0%
ATSI		
Not Aboriginal or Torres Strait Islander	1,024	89.9%
Yes, Aboriginal	91	8.0%
Yes, Torres Strait Islander	21	1.8%
Yes, both Aboriginal and Torres Strait Islander	3	0.3%
Lie/Bet		
No problems	696	61.1%
Possible gambling problems	443	38.9%
Diagnosed Mental Health Condition*		
No	707	62.0%
Yes	432	38.0%

person who gambles, as reported by the CSO, ranged between 1 and 27. The bulk of the sample (87.9%) reported the person close to them had a score of 8+ (problem gambling), 11.1% reported scores between 3 and 7 (moderate-risk), and the remaining 1% reported PGSI scores of 1 or 2 (low-risk). PGSI scores were highest for former partners and lowest for non-family members. These two groups were significantly different, $F(31,135) = 4.08, p = 0.007$. For current partners, male CSOs reported that their partner had significantly higher PGSI scores ($M = 15.59, SD = 6.59$) than female CSOs ($M = 12.68, SD = 5.81$) $F(1,195) = 10.85, p = .001$, there were no other significant gender differences across the relationship types. Scores on the Significant Other Closeness Scale ranged from 0 to 20, with a mean score of 11.03 ($SD = 4.83$). Total closeness scores by each relationship are shown in Table 2. All differences between these relationship type groups were significant, $F(31,135) = 129.45, p < .001$.

Figure 1 illustrates the mean scores for each domain of closeness by relationship type. Current partners reported the closest financial connections, followed by ex-partners, family, and non-family relationships; and each group was significantly different, $F(3,313.26) = 143.72, p < .001$, Welch). For shared day-to-day responsibilities, current partners reported the highest level of closeness, followed by ex-partners, and then other family members and non-family relationships, $F(3,318.39) = 107.16, p < .001$, Welch). Current partners reported the highest levels of emotional closeness, followed by family members and ex-partners, and then non-family relationships, $F(3,318.61) = 75.10, p < .001$, Welch). With shared time together, a current partner was again the closest relationship, which was significantly higher than all the other groups, $F(3,305.70) = 64.15, p < .001$, Welch).

Our first aim was to understand which CSOs are likely to be harmed by another person's gambling. Of the total sample, 92.5% reported experiencing one or more harms from another's gambling, and 70% reported more than four harms. Ex-partners reported the highest mean harm scores

Table 2. Overall closeness and PGSI scores by relationship type

Relationship Type	N	%	PGSI of Gambler		Closeness to Gamblers			
			M	SD	M	SD	Min	Max
Current spouse/partner	197	17.3%	14.13	6.36	16.23	3.49	5	20
Former spouse/partner	82	7.2%	15.16	5.65	11.22	4.82	0	20
Family member	411	36.1%	13.83	5.46	10.28	4.32	0	20
Mother/mother-in-law	52	4.6%	14.06	6.43	10.77	4.30	2	20
Father/father-in law	82	7.2%	14.16	5.71	10.28	4.55	0	20
Sibling (sister/brother)	113	9.9%	13.77	5.39	10.82	3.87	2	20
Child/grandchild	43	3.8%	13.49	5.54	11.77	4.03	5	20
Grandparent	8	0.7%	11.75	4.86	11.25	2.82	6	15
Other family member/relative	113	9.9%	13.83	4.91	8.88	4.46	0	20
Non-family relationship	449	39.4%	13.12	5.01	9.39	4.20	0	20
Friend	368	32.3%	13.19	4.93	9.39	4.16	0	20
Flatmate/housemate	24	2.1%	13.29	5.14	11.00	3.51	4	16
Work colleague	57	5.0%	12.65	5.53	8.68	4.59	0	18



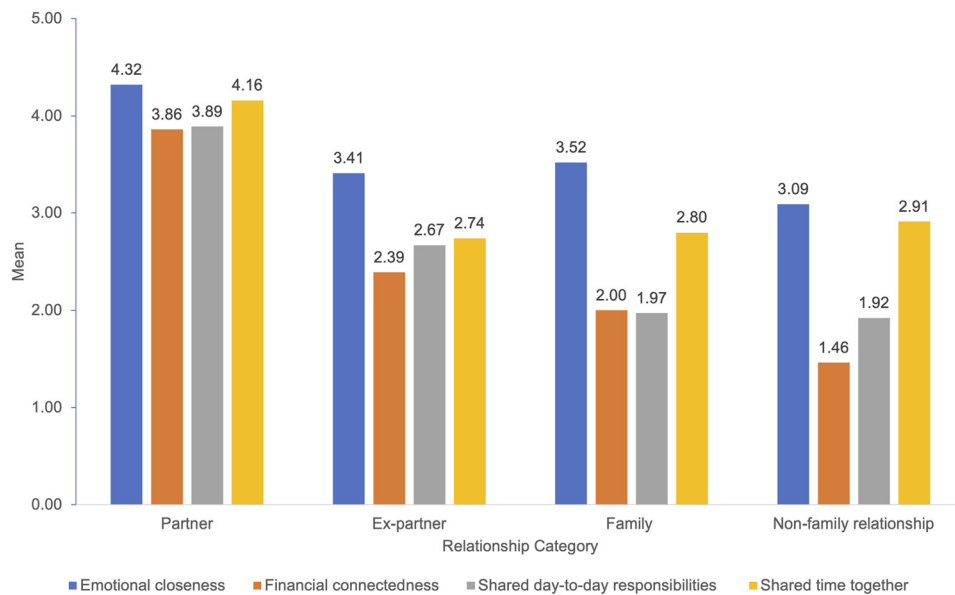


Fig. 1. Clustered bar chart of domains of closeness by relationship type

($M = 12.63$, $SD = 5.20$), followed by partner ($M = 11.19$, $SD = 5.68$), family member ($M = 9.30$, $SD = 5.45$) and non-family relationship ($M = 9.20$, $SD = 5.05$). All groups differed significantly, $F(31,135) = 64.15$, $p < .001$. For family members, male CSOs reported significantly higher mean harm scores ($M = 10.30$, $SD = 5.49$) than female CSOs ($M = 8.57$, $SD = 5.31$) $F(1,195) = 10.85$, $p = .001$, there were no other significant gender differences across the relationship types. As shown in Table 3, a series of correlations were computed to explore the relationship between harm and closeness across each relationship type. There were no significant correlations between harm and any closeness measure (emotional, financial, etc.) for current and ex-partners. For family members and non-family relationships, however, there were significant correlations between harm and the total closeness scale, as well as all domains of closeness, except emotional closeness in family members.

Regression analysis was used to explore the nature of the relationships where CSOs are likely to be harmed. A three-stage hierarchical multiple regression was conducted with harm as the dependent variable. The PGSI was entered at stage one of the regression, relationship type at stage two (using current partners as the reference group), and individual aspects of closeness at stage three. The regression

statistics are described in Table 4. At stage one, the severity of the gambling problem contributed significantly to the model, accounting for 22.5% of gambling-related harm experienced by CSOs. Adding relationship type resulted in the model accounting for 33.5% of harm to CSOs. With facets of closeness included, the final model accounted for 40.1% of gambling-related harm experienced by CSOs. R^2 change was significant for all stages, $p < .001$. In the final model, the strongest predictor of harm was the severity of the gambling problem. In terms of relationships, ex-partners were more likely to experience harm than current partners, and non-family relationships were less likely. Of the closeness domains, having a close financial connection was the strongest significant predictor of harm, followed by shared day-to-day responsibilities and, just approaching significance, shared time together. Having an emotionally close relationship did not significantly predict harm independent of the other predictors.

The study's second aim was to understand how gambling-related harm in CSOs was related to health and wellbeing. Descriptive statistics of all health and wellbeing variables by relationship type are shown in Table 5. Both current partners and ex-partners reported significantly higher levels of psychological distress and negative affect

Table 3. Intercorrelations between harm, domains of closeness, and combined closeness score by relationship type

	Harm			
	Current Partner N = 197	Ex-Partner N = 82	Family Member N = 411	Non-Family Member N = 449
Total Closeness	.12	.06	.46**	.50**
Emotional Closeness	-.02	.02	.11	.35**
Financial connectedness	.13	.02	.50**	.42**
Shared day-to-day responsibilities	.14	.08	.42**	.40**
Shared time together	.08	.05	.33**	.40**

** Correlation is significant at < 0.01 (2-tailed).



Table 4. Regression model predicting gambling-related harm from the severity of the gambling problem, relationship type, and domains of closeness to the gambler

Dependent Variable: Harm		B	Std. Error	Beta	t	p	95.0% CI for B	
1	(Constant)	1.85	0.40		4.59	.000	1.06	2.64
	PGSI	0.50	0.03	0.47	18.16	.000	0.44	0.55
	Model summary: $F(11,137) = 329.82, p < .001, r^2 = .225$							
2	(Constant)	4.67	0.49		9.54	.000	3.71	5.63
	PGSI	0.46	0.03	0.44	18.15	.000	0.41	0.51
	<i>Relationship (reference = Current Partner)</i>							
	Family member	−1.75	0.41	−0.15	−4.32	.000	−2.55	−0.96
	Non-family relationship	−4.53	0.40	−0.39	−11.29	.000	−5.31	−3.74
	Ex-Partner	0.97	0.62	0.04	1.58	.115	−0.24	2.18
	Model summary: $F(41,134) = 144.39, p < .001, r^2 = .335$							
	(Constant)	1.20	0.70		1.73	.084	−0.16	2.57
	PGSI	0.38	0.03	0.36	14.83	.000	0.33	0.43
	<i>Relationship (reference = Current Partner)</i>							
3	Family member	0.41	0.44	0.03	0.95	.343	−0.44	1.27
	Non-family relationship	−2.22	0.45	−0.19	−5.00	.000	−3.10	−1.35
	Ex-Partner	2.75	0.62	0.12	4.47	.000	1.54	3.96
	<i>Closeness domains</i>							
	Emotional Closeness	−0.14	0.15	−0.03	−0.92	.360	−0.43	0.16
	Financial connectedness	0.52	0.12	0.16	4.34	.000	0.29	0.76
	Shared day-to-day responsibilities	0.42	0.12	0.12	3.36	.001	0.17	0.66
	Shared time together	0.38	0.15	0.08	2.52	.012	0.09	0.68
	Model summary: $F(81,130) = 94.73, p < .001, r^2 = .401$							

Note: $p < 0.01$ is considered significant

than the other groups. Those with non-family relationships with the person who gambles had better functioning across all SF-12 domains. Non-family relationships also reported higher overall mental health functioning than the other groups, whereas current partners had significantly worse

physical functioning than other groups. CSOs with high levels of closeness, regardless of their relationship to the gambler, reported significantly worse health and wellbeing across most aspects except for subjective wellbeing measures and vitality (see Table 6).

Table 5. Mean and standard deviations of aspects of health and wellbeing by relationship type

Aspects of Health and Wellbeing	Relationship Category								ANOVA
	Current partner		Family member		Non-family relationship		Ex-partner		
	<i>N</i> = 197		<i>N</i> = 411		<i>N</i> = 449		<i>N</i> = 82		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
K6 Score	11.11a	6.26	9.68b	5.71	7.94c	5.67	11.66a	6.15	<.001
Panas – negative affect scale	14.46a	4.95	13.11b	4.66	11.88c	4.46	14.80a	4.68	<.001
Panas – positive affect scale	15.72	4.13	15.56	3.77	15.81	3.83	16.26	4.34	.483
Life satisfaction	5.71	2.54	5.90	2.33	6.29	2.29	5.79	2.50	.011
PWI total score standardised	57.54	22.86	59.94	20.40	62.94	19.52	58.68	22.24	.014*
SF-12 Domains									
Bodily Pain Norm-Based Score	42.07b	11.71	44.34b	10.28	46.56a	9.71	43.54b	10.80	<.001*
Mental Health Norm-Based Score	40.77b	9.05	42.13b	9.36	44.39a	9.10	40.98b	8.16	<.001
Physical Functioning Norm-Based Score	44.40b	11.42	47.85a	9.82	49.23a	9.36	45.35b	11.88	<.001*
Role Emotional Norm-Based Score	34.30c	12.17	38.28b	10.73	41.50a	11.08	34.98c	12.56	<.001
Role Physical Norm-Based Score	40.43b	10.51	43.74	9.22	45.64a	8.88	42.29	10.72	<.001*
Social Functioning Norm-Based Score	39.47b	10.78	41.88a	9.63	43.33a	9.89	38.68b	10.91	<.001
Vitality Norm-Based Score	45.37b	10.89	46.08b	9.73	48.65a	9.68	49.67a	11.39	<.001*
SF-12 Component Scores	<i>N</i> = 192		<i>N</i> = 398		<i>N</i> = 430		<i>N</i> = 80		
Mental Component Score	37.95b	9.67	39.77b	9.59	42.42a	9.69	38.48b	8.74	<.001*
Physical Component Score	45.68b	10.24	48.44a	9.19	49.93a	8.11	48.20a	9.51	<.001

* Welch. Letters denotes means which are significantly different (Student-Newman-Keuls)



Table 6. Mean and standard deviations of aspects of health and wellbeing by the level of closeness

Aspects of Health and Wellbeing	Closeness						ANOVA
	Low Closeness		Medium Closeness		High Closeness		
	N = 380		N = 379		N = 380		
	M	SD	M	SD	M	SD	
K6 Score	7.29c	5.56	9.17b	5.35	11.7a	6.13	<.001*
Panas - negative affect scale	10.91c	4.11	12.93b	4.19	15.11a	4.95	<.001*
Panas - positive affect scale	15.28b	3.82	15.62b	3.45	16.31a	4.31	.002*
Life satisfaction	5.89	2.44	6.02	2.19	6.13	2.48	.416*
PWI total score standardised	60.42	21.05	60.40	18.35	61.04	22.59	.898*
SF-12 Domains							
Bodily Pain Norm-Based Score	48.16c	9.98	44.95b	8.90	41.19a	11.26	<.001*
Mental Health Norm-Based Score	43.56b	9.91	42.90	8.81	41.66a	8.83	.016*
Physical Functioning Norm-Based Score	50.25c	9.36	48.46b	9.47	44.14a	10.87	<.001*
Role Emotional Norm-Based Score	43.37c	10.94	38.47b	10.42	34.04a	11.45	<.001
Role Physical Norm-Based Score	47.20c	9.47	43.77b	8.18b	40.47a	9.90	<.001*
Social Functioning Norm-Based Score	45.03c	10.02	41.27b	8.98	39.11a	10.50	<.001*
Vitality Norm-Based Score	46.84	9.70	47.46	9.46	47.38	11.21	.637*
SF-12 Component Scores							
Mental Component Score	42.32b	10.38	40.10a	9.46	38.76a	9.00	<.001*
Physical Component Score	50.61c	9.50	49.13b	7.94	45.82a	9.19	<.001*

* Welch. Letters denotes means which are significantly different (Student-Newman-Keuls)

Table 7 shows the correlations between harm and aspects of health and wellbeing. Negative affect, psychological distress and the SF-12 scale role emotion (limitations in performing work or activities due to emotional problems) were the most highly correlated aspects of health and wellbeing with respect to gambling-related harm. A series of hierarchical multiple regressions were conducted, with each aspect of health and wellbeing as the dependent variable. Gambling-related harm was entered alongside some control variables. These variables were used to control for some other factors that may influence health and wellbeing, including age, gender, having a mental health condition and having their own gambling problem. As shown in Table 8, harm significantly predicted

all aspects of health and wellbeing, except for positive affect. Gambling-related harm most strongly predicted negative affect, psychological distress, and role emotion.

DISCUSSION

The current study aimed to understand which CSOs are likely to experience harm due to another's gambling, and how this harm is related to a range of health and wellbeing domains. The paper is the first to incorporate a specific measure of relationship closeness while examining gambling-related harm to others. Ex-partners reported the highest level of harm, followed by current partners, family, and other relationships. This finding of ex-partners reporting the most harm is consistent with other research findings (e.g., Hing et al., 2022; Lind et al., 2022). In examining models predicting harm, before closeness was controlled for, there were no significant differences between current and ex-partners in predicting gambling-related harm, and family members experienced less harm than partners (current or ex). However, once the closeness of the relationship was considered, being an ex-partner was a significantly stronger predictor of harm than current partners; and harm to current partners and family members was similar. It may be that despite the relationship ending (possibly due to the gambling problem), ex-partners who continue to have shared commitments (such as child raising) may be unable to withdraw to protect themselves from harm. It may also be that the excessive harm may have contributed to ending the relationship. These findings support the assertion that harm is linked to both the relationship with the person who gambles, and how close that relationship is.

Table 7. Correlations between gambling-related harm and aspects of health and wellbeing

	Harm n = 1,139
K6 Score	.47**
Panas - negative affect scale	.48**
Panas - positive affect scale	.03
Life satisfaction	-.20**
PWI total score standardised	-.26**
Bodily Pain Norm-Based Score	-.32**
Mental Health Norm-Based Score	-.30**
Physical Functioning Norm-Based Score	-.24**
Role Emotional Norm-Based Score	-.43**
Role Physical Norm-Based Score	-.35**
Social Functioning Norm-Based Score	-.33**
Vitality Norm-Based Score	-.15**
Mental Component Score	-.35**
Physical Component Score	-.23**

** Correlation is significant at the 0.01 level (2-tailed).



Table 8. Multiple regressions (row-wise) predicting multiple aspects of health and wellbeing from gambling-related harm, controlling for age, gender, mental health, and own gambling problems

		Predictors										
Dependent Variables	N	Harm		Male		Age		MH Condition		Lie-Bet		Model
		Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Model summary
K6	1,131	0.35	<.001	0.00	.939	−0.16	<.001	0.28	<.001	0.11	<.001	$F(51,125) = 122.56, p < .001, r^2 = .353$
Negative Affect	1,131	0.35	<.001	0.04	.113	−0.17	<.001	0.27	<.001	0.15	<.001	$F(51,125) = 140.30, p < .001, r^2 = .384$
Positive Affect	1,131	0.04	.181	0.09	.006	0.03	.309	−0.09	.006	0.05	.118	$F(51,125) = 4.61, p < .001, r^2 = .020$
Life Satisfaction	1,131	−0.14	<.001	0.07	.018	−0.04	.013	−0.23	<.001	−0.02	.481	$F(51,125) = 23.81, p < .001, r^2 = .100$
PWI	1,131	−0.20	<.001	0.06	.030	−0.05	.062	−0.23	<.001	−0.02	.620	$F(51,125) = 31.02, p < .001, r^2 = .121$
SF-12 Domains												
Role Emotion	1,131	−0.32	<.001	0.01	.682	0.14	<.001	−0.23	<.001	−0.11	<.001	$F(51,125) = 88.85, p < .001, r^2 = .283$
Role Physical	1,131	−0.27	<.001	−0.04	.153	−0.03	.272	−0.18	<.001	−0.14	<.001	$F(51,125) = 50.76, p < .001, r^2 = .184$
Social Functioning	1,131	−0.24	<.001	0.00	.953	0.09	.002	−0.20	<.001	−0.07	.007	$F(51,125) = 46.08, p < .001, r^2 = .170$
Mental Health	1,131	−0.24	<.001	0.13	<.001	0.04	.164	−0.22	<.001	−0.01	.721	$F(51,125) = 44.11, p < .001, r^2 = .164$
Bodily Pain	1,131	−0.23	<.001	−0.07	.012	−0.09	<.001	−0.21	<.001	−0.19	<.001	$F(51,125) = 55.96, p < .001, r^2 = .199$
Physical Functioning	1,131	−0.15	<.001	−0.09	.002	−0.15	<.001	−0.24	<.001	−0.14	<.001	$F(51,125) = 41.72, p < .001, r^2 = .156$
Vitality	1,131	−0.13	<.001	0.17	<.001	−0.10	<.001	−0.17	<.001	0.02	.551	$F(51,125) = 21.69, p < .001, r^2 = .088$
SF-12 Mental Health Component	1,092	−0.28	<.001	0.14	<.001	0.15	<.001	−0.21	<.001	−0.01	.829	$F(51,086) = 62.26, p < .001, r^2 = .223$
SF-12 Physical Health Component	1,092	−0.16	<.001	−0.08	.004	−0.24	<.001	−0.20	<.001	−0.17	<.001	$F(51,086) = 47.22, p < .001, r^2 = .179$



The types of closeness most strongly associated with experiencing gambling-related harm were having a shared financial connection and shared day-to-day responsibilities. Gambling problems are understood to result from excessive time and money spent gambling (Browne et al., 2020; Ladouceur, 2004). This commitment of resources to gambling, rather than being spent on the gambler's family and friends, appears closely associated with harm. Having a close emotional connection was not independently predictive of harm in this study. This may mean that caring about and having a strong connection with a person with a gambling problem does not necessarily mean that the CSO will experience harm, but rather that more pragmatic aspects of interacting with, or sharing responsibilities are instrumental. Consequently, it may be that, rather than withdraw emotionally to protect from harm, it may be more effective for CSOs to withdraw in ways that do not make themselves dependent on the person who gambles on a day-to-day basis. It might be possible to continue providing the gambler emotional support while protecting themselves by reducing shared finances and responsibilities. Where this is not possible (i.e. in relationships with dependent children), these CSOs are likely to require extra support. Future longitudinal studies might attempt to understand which aspects of withdrawal are most protective for CSOs.

Our second aim was to describe health and wellbeing across different relationships and levels of closeness with the person who gambles. Partners and ex-partners reported the highest mean levels of psychological distress and negative affect, followed by family members and then non-family members. The distress found was high; the majority of current and ex-partners in this study recorded K6 scores of ten or higher, which is considered clinically significant and in need of treatment (Lace et al., 2020). These high levels of distress align with other research findings (Chan et al., 2016; Lind et al., 2022). However, we also measured the SF-12 domain of role emotion. Role emotion is a measure of limitations in fulfilling work and other everyday roles and duties due to emotional problems. Partners and ex-partners reported the highest levels of impairment associated with emotional problems. This result is consistent with research that has found that without adequate support, ongoing psychological distress can lead to lower work productivity, increased healthcare visits, and more serious physical and mental health problems (Gulliver et al., 2012). Reduced performance at work or study is one of the identified dimensions of harm in Langham et al.'s Conceptual Framework of Gambling Related Harm (2016). The cause of this work/study impact on CSOs may be due to the level of distress they experience due to another person's gambling problem. The subjective wellbeing measures (life satisfaction and the PWI) showed no significant differences across any relationship groups or levels of closeness. This null finding is similar to a study comparing subjective wellbeing in household and non-household Canadian CSOs (Tulloch, Hing, Browne, Rockloff, & Hilbrecht, 2021). While CSOs tended to report lower subjective wellbeing than others, recent longitudinal findings by Tulloch, Browne, Hing,

Rockloff, and Hilbrecht (2023) suggest that this does not appear to be directly associated with the gambling problem.

Regarding physical and mental health, people close to someone who gambles and in familial relationships tended to report worse functioning than those with non-family connections and those who were not very close. In examining the impact of gambling-related harm on domains of health and wellbeing, harm predicted decrements across all areas of health and wellbeing, except for positive affect. However, the models predicting psychological distress, negative affect, and role emotion were better fitting than those predicting other areas of health and wellbeing. Thus, the health and wellbeing factors most impacted by gambling-related harm in CSOs are the negative emotional effects, which impact the CSO's ability to perform their day-to-day responsibilities.

Limitations and future research

Our findings are consistent with population studies showing physical and mental decrements tend to occur more in CSOs than non-CSOs (Lind et al., 2022; Salonen et al., 2016; Svensson et al., 2013; Tulloch et al., 2021; Wenzel et al., 2008). However, the causal relationship is unclear. That is, physical and mental health issues may be a consequence of, or be exacerbated by, the gambling problem, or they may also be present for other reasons. For example, physical or mental health problems might be a risk factor for being a CSO (e.g., developing a relationship with someone having a gambling problem), or being more vulnerable to harm. Conversely, a CSO's physical or mental health problems might be a risk factor for the gambler. For example, gamblers with carer responsibilities might use gambling to cope with or escape this difficult situation (Corney & Davis, 2010; McCarthy et al., 2022). Alternatively, all these issues may be due to stressors common to both poor health and wellbeing and gambling problems, such as low socioeconomic status (Armstrong & Carroll, 2017; Glover, Hetzel, & Tennant, 2004) or other associated stressors. For example, household CSOs are eight times more likely to be experiencing serious stressors such as other addictions, violence, and crime, in addition to gambling problems (Tulloch et al., 2020). Longitudinal studies may again assist in gaining a clearer picture of the causal relationship between gambling and CSOs' health and wellbeing. A further limitation of this study is based on self-report from CSOs with their perception of the severity of another person's gambling problem and the harm they experience. This may result in participants either under or overreporting of these issues and their current health and wellbeing status. Purposeful sampling used in this study was not intended to be population-representative but was proposed to assess the relationships between the key variables accurately. The closeness scale developed for this research, provides researchers with a better understanding of which CSOs experience harm from another's gambling. Further development and use of this scale will continue to gain additional insights into the nature of those harmed by another's gambling.



Implications and conclusions

CSOs with a familial relationship, who share finances and day-to-day responsibilities, experience the greatest harm from another person's gambling. Support services might assist CSOs in appropriately separating finances and day-to-day responsibilities with the person who gambles, where possible, to reduce harm. This harm is strongly associated with experiencing psychological distress and negative emotions, which may impact the CSO's ability to function at work and perform everyday roles and duties. Regardless of whether the gambling problem is the primary or sole cause of this distress, it would likely contribute. Without support, this distress will continue to impact more and more aspects of the CSOs' lives (Gulliver, Griffiths, Christensen, & Brewer, 2012). Consequently, treatments aimed at reducing this distress may help to reduce the harmful impacts of gambling on others. A multitude of clinical treatments exist, ranging from pharmacological solutions for managing symptoms to various therapies, such as cognitive behaviour therapy and problem-solving therapy, which offer strategies for individuals to handle their distress (Meijer et al., 2013). Stress management interventions and practices such as meditation further provide self-regulated means for promoting relaxation and mindfulness (Goyal et al., 2014). These diverse treatment options emphasise the importance of personalised approaches in addressing psychological distress.

However, many CSOs do not seek professional help (ACIL Allen Consulting et al., 2017) and instead use self-management strategies to cope with their situation (Booth et al., 2021). Booth et al. (2021) investigated methods used by CSOs to reduce the impact of gambling harm by examining real-life stories posted online. Of all the strategies used, only a small proportion of CSOs discussed techniques focused on reducing the emotional and psychological toll associated with another's gambling problem, such as self-care or relaxation. Interventions designed to enhance mental health literacy can effectively boost attitudes towards seeking help among individuals with high psychological distress (Gulliver et al., 2012) and may be helpful if effectively targeted to CSOs. Those providing treatment to, or websites and forums aiming to inform and support CSOs, might ensure they include explicit education on managing stress. This education might consist of acknowledging the issue, including information on where to find self-help stress reduction tips and techniques online, what to do if it becomes overwhelming, and where to go for professional support.

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NH, MB, MR and MH: conceptualisation and design of the study, supervision, critical review and editing. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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APPENDIX A
Significant Other Closeness Scale (SOCS)

The following questions refer to your relationship with the person whose gambling has affected you the most - your (affected person).

Select the option that best describes the emotional aspect of your relationship with your (affected person). For example, are they important in your life, do you have a strong connection, disclose personal information, or think about them a lot?

0	1	2	3	4	5
No emotional relationship			The closest emotional relationship I have		

Select the option that best describes how connected your financial relationship is with your (affected person). For example, do you have shared financial responsibilities, or do you rely on them for finances, or do they rely on you?

0	1	2	3	4	5
No financial relationship			The closest shared or dependent financial relationship I have		

Select the option that best describes how connected your day-to-day responsibilities are with your (affected person). For example, do you have shared work responsibilities, or other shared tasks such as in the home, or parenting or caring responsibilities?

0	1	2	3	4	5
No shared responsibilities			The person I share the most daily responsibilities with		

Select the option that best describes how much time you spend with your (affected person). For example, do you live together, work closely with each other, or spend a lot of time together for another reason?

0	1	2	3	4	5
No time spent together			The person I spend the most time with		

Scores from each question are summed for a total score, giving a possible score between 0 and 20, higher scores reflect a closer relationship.

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