Collateral Damage: Assessing the Impact of Gambling Problems on the Health and Wellbeing of Concerned Significant Others

by

Catherine Tulloch

Thesis

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Supervisory Panel: Prof. Nerilee Hing, Prof. Matthew Browne,

Prof. Matthew Rockloff, Dr Margo Hilbrecht

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Abstract

The adverse effects of gambling are of current public health concern. Gambling-related harm originates with the person who gambles and extends to those close to them. This thesis seeks to discern how and when gambling problems impact the health and wellbeing of concerned significant others (CSOs) of people who gamble. Although CSOs often report health and wellbeing decrements, these studies tend to be cross-sectional, use a limited range of health and wellbeing measures, and are often conducted with small and specific groups of CSOs. Consequently, our understanding of this issue includes considerable gaps that justify further exploration.

This thesis conducted five studies to address these issues and examine the health and wellbeing of CSOs from distinct perspectives. The first two studies use large population-representative datasets to understand aspects of CSO health and wellbeing (adults, N=22,968; children, N=3,695). The third study explores health and wellbeing in CSOs exposed to different levels of gambling problem severity (N=13,698). Using longitudinal data spanning 18 years, the fourth research study examines CSO health and wellbeing prior to exposure to the gambling problem (N=13,661). The final study employs a novel measure of closeness (Significant Other Closeness Scale) to identify which CSOs are likely to be harmed. It examines the connection between gambling-related harm and CSO health and wellbeing outcomes based on the nature of the relationship with the person who gambles (N=1,131).

The main findings in these studies reveal that financial wellbeing is impacted in virtually all CSOs, while other health and wellbeing decrements are more likely to be present when the gambling problem is severe. These impacts occur most commonly where there is a close familial or partner connection, sharing responsibilities and finances. The body of work as a whole identifies some factors that are more strongly or directly impacted by another person’s...
gambling problems, such as CSOs experiencing psychological distress, negative emotions, and low financial and social wellbeing. Furthermore, this thesis identifies health and wellbeing decrements commonly experienced by CSOs, but found that some decrements are not necessarily a direct consequence of exposure to gambling problems. These include lower health-related quality of life, lower satisfaction with health and lower mental health functioning amongst CSOs. Although not directly caused by exposure to another person’s gambling problem, these conditions appear to be exacerbated by such exposure. The number of CSOs impacted by another’s gambling is estimated to range between one and six, depending on the severity of the gambling problems. Therefore, in terms of health and wellbeing, while the impact may not be as severe for CSOs, their numbers substantially exceed that of people with first-order gambling problems, suggesting that the overall societal burden may be more substantial.

The results of these studies have implications for policymaking by bringing attention to and providing new and rigorous evidence for gambling harm to CSOs. This information can be used in designing and implementing public health policies to reduce the burden of gambling harm in the community. This thesis includes recommendations for support providers, including areas of focus and CSO groups to target. The proposals include providing CSOs with holistic support addressing their feelings of distress, bespoke financial assistance, increasing social support and providing guidance on supporting the person who gambles. Finally, the thesis describes several topics as valuable areas for future research focus. These include longitudinal research, continued use of the closeness scale, the need to focus on financial wellbeing, and a greater understanding of the relationship between social support and health and wellbeing in CSOs. Overall, the thesis sheds light on the significant impact of gambling problems on the health and wellbeing of CSOs, and areas that need addressing, to reduce the overall societal burden and increase the quality of life for this vulnerable group.
Personal Acknowledgements

This thesis is dedicated to my daughter, Katie, as a testament that the seemingly inconceivable or impossible can indeed be achieved.

I would like to express my profound gratitude to the countless individuals who have provided assistance, support, and encouragement throughout this journey. First and foremost, I extend my heartfelt thanks to my supervisors – Nerilee Hing, Matthew Browne, Matthew Rockloff and Margo Hilbrecht. With your exceptional expertise and guidance, I could not have hoped for a better team. Your willingness to share your wealth of knowledge and invitations to be involved in new opportunities for growth and development as a researcher has been truly invaluable. Your kindness, support, and confidence in me have made this adventure an enjoyable one. I also wish to acknowledge the support from my fellow researchers in the Experimental Gambling Research Laboratory, who have consistently been there for me, offering help or advice whenever needed.

I want to thank my family, particularly my parents Dorothy and John, brother Ross, stepson Zach, and my friends. While not fully understanding what I do, you have always believed in me. Now, everyone can finally stop asking, "Are you still studying?". I want to thank Katie – my favourite child – for being her fabulous self: intelligent, interesting, funny, and an absolute joy in my life. And to Tess, my constant companion for over twenty years, you offered your own form of support, like sitting on my laptop and demanding attention; you are missed. Last but definitely not least, I want to express my deepest gratitude to my husband, Martin. He supported me, believed in me, and loved me. And he has diligently read every single word and draft of this thesis, often multiple times. Thank you for always being there.
RHD Thesis Declaration

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Previous Submission Statement

This paper has not been submitted for an award by another research degree candidate (Co-Author), either at CQUniversity or elsewhere.

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Declaration of Co-Authorship and Co- Contribution

See Appendix A to F.
# Table of Contents

Abstract ................................................................................................................................. i

Personal Acknowledgements ................................................................................................. iii

RHD Thesis Declaration ........................................................................................................ iv

Table of Contents ................................................................................................................... vi

List of Tables ........................................................................................................................ xi

List of Figures ........................................................................................................................ xiii

List of Publications Arising From this Thesis................................................................. xiv

Additional Publications During the Period of Candidature ........................................... xvi

Abbreviations and Glossary of Key Terms ....................................................................... xix

Chapter 1 - Introduction ....................................................................................................... 1

1.1 Background ..................................................................................................................... 2

1.2 Harms Associated with Gambling.................................................................................. 3

1.3 Harms to CSOs ............................................................................................................... 5

1.4 Impacts of Gambling-Related Harm ........................................................................... 7

1.5 Theoretical Frameworks ................................................................................................. 8

1.5.1 Public Health Framework ......................................................................................... 8

1.5.2 Biopsychosocial Model of Health .......................................................................... 10

1.6 Measuring Health and Wellbeing ................................................................................ 12

1.7 The Health and Wellbeing of People who Gamble .................................................. 14

1.8 The Health and Wellbeing of CSOs ............................................................................ 14
Chapter 2 - Literature Review ................................................................. 22

2.1 Overview .......................................................................................... 23

2.2 Manuscript ....................................................................................... 23

2.3 Update ............................................................................................... 43

Chapter 3 - Methodological Approach, Research Design, and Framework ............ 44

3.1 Research Design ................................................................................ 45

3.1.1 Literature Review .......................................................................... 45

3.1.2 Research Questions ....................................................................... 46

3.1.3 Secondary Data Analysis ............................................................... 46

3.1.4 Primary Data Collection and Analysis ........................................... 48

3.2 Studies ............................................................................................... 49

3.2.1 Study 1 – The Subjective Wellbeing of CSOs ............................. 49

3.2.2 Study 2 – The Health and Wellbeing of Children Exposed to Gambling Problems ................................................................................................................. 49

3.2.3 Study 3 – CSO Health and Wellbeing Across a Range of Gambling Problem Severity .............................................................. 50

3.2.4 Study 4 – A Longitudinal Investigation of CSO Health and Wellbeing .......................... 50
3.2.5 Study 5 – Who Experiences Harm, and How this Relates to Health and Wellbeing ................................................................. 50

3.3 Framework .................................................................................................................. 50

3.4 Ethics .......................................................................................................................... 52

Chapter 4 - The Subjective Wellbeing of CSOs (Study 1).................................................. 53

4.1 Introduction ................................................................................................................. 54

4.2 Manuscript .................................................................................................................. 55

Chapter 5 - The Health and Wellbeing of Children Exposed to Gambling Problems (Study 2) ......................................................................................... 68

5.1 Introduction ................................................................................................................. 69

5.2 Manuscript .................................................................................................................. 69

Chapter 6 - CSO Health and Wellbeing Across a Range of Gambling Problem Severity (Study 3) ................................................................................................. 90

6.1 Introduction ................................................................................................................. 91

6.2 Manuscript .................................................................................................................. 91

Chapter 7 - A Longitudinal Investigation of CSO Health and Wellbeing (Study 4) ..........101

7.1 Introduction ................................................................................................................. 102

7.2 Manuscript .................................................................................................................. 102

Chapter 8 - Who Experiences Harm and How this Relates to Health and Wellbeing (Study 5) ................................................................................................................. 121

8.1 Introduction ................................................................................................................. 122

8.2 Manuscript .................................................................................................................. 123
List of Tables

Table 2.2.1  Studies identified by inclusion criteria via database search ........................................28
Table 4.2.1  Household CSO relationships to PGs across Australia and Canada .........................59
Table 4.2.2  The proportion of Australian CSOs and associated risk factors .............................60
Table 4.2.3  The proportion of Canadian CSOs and associated risk factors ..............................61
Table 4.2.4  Subjective wellbeing of Canadians impacted by a gambling problem ..................62
Table 4.2.5  Multiple regression predicting life satisfaction for Australians, controlling
for demographic, sociographic and gambling-related factors ........................................62
Table 4.2.6  Multiple regression predicting life satisfaction for Canadians, controlling
for demographic, sociographic and gambling-related factors ........................................63
Table 5.2.1  Descriptive statistics of Cohort B by parental gambling risk level ..........................76
Table 5.2.2  Descriptive statistics of Cohort K by parental gambling risk level ..........................78
Table 5.2.3  Correlations between parental PGSI scores, socio-demographic factors,
and health and wellbeing characteristics of children in Cohort B ........................................80
Table 5.2.4  Correlations between parental PGSI scores, socio-demographic factors,
and health and wellbeing characteristics of children in Cohort K ........................................81
Table 5.2.5  Multiple regression analyses for predictors of children’s health and
wellbeing ........................................................................................................................................83
Table 6.2.1  Participant characteristics by household gambling risk ........................................96
Table 6.2.2  Domains of SF-36 across household gambling risk ................................................97
Table 6.2.3  Domains of subjective wellbeing across household gambling risk ........................98
Table 6.2.4  Multiple regression analysis for predictors of SF-6D, SF-36 mental health
subscales, satisfaction with financial situation and satisfaction with feeling
part of the local community .........................................................................................................99
Table 7.2.1  Participant characteristics in 2018 by total sample and CSO status ..........111
Table 7.2.2  Generalised linear mixed-effects model results for overall wellbeing variables ...........................................................................................................114
Table 7.2.3  Generalised linear mixed-effects model results for social wellbeing variables ...........................................................................................................114
Table 7.2.4  Generalised linear mixed-effects model results for health variables ..........115
Table 7.2.5  Generalised linear mixed-effects model results for financial wellbeing variables ...........................................................................................................115
Table 8.2.1  Demographic characteristics of the participants ........................................136
Table 8.2.2  Overall closeness and PGSI scores by relationship type ..............................137
Table 8.2.3  Intercorrelations between harm, domains of closeness, and combined closeness score by relationship type ........................................................................137
Table 8.2.4  Regression model predicting gambling-related harm from the severity of the gambling problem, relationship type, and domains of closeness to the gambler ........................................................................................................................141
Table 8.2.5  Mean and standard deviations of aspects of health and wellbeing by relationship type ...........................................................................................................142
Table 8.2.6  Mean and standard deviations of aspects of health and wellbeing by the level of closeness ...........................................................................................................143
Table 8.2.7  Correlations between gambling-related harm and aspects of health and wellbeing ...........................................................................................................144
Table 8.2.8  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 ...............................................145
List of Figures

Figure 1.10.1  The conceptual relationship between gambling problems, gambling harm and gambler and CSO health and wellbeing ........................................18
Figure 3.3.1  Conceptual framework including the program of studies ..................51
Figure 6.2.1  Mean SF-6D health state classification by household PGSI status ..........97
Figure 6.2.2  Clustered error bar means of SF-36 domains by household PGSI status ....98
Figure 6.2.3  Clustered error bar means of satisfaction domains by household PGSI status ........................................................................................................................................................................98
Figure 7.2.1  Primary sample selection, HILDA 2018 ...........................................108
Figure 7.2.2.a-c  The trajectories of overall wellbeing for CSO and non-CSOs ..........112
Figure 7.2.3.a-h  The trajectories of social, health and financial wellbeing for CSO and non-CSOs ........................................................................................................................................................................113
Figure 8.2.1  Clustered bar chart of domains of closeness by relationship type ..........138
List of Publications Arising From this Thesis

Published


Under Peer Review

Additional Publications During the Period of Candidature


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Abbreviations and Glossary of Key Terms

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>CSO</td>
<td>Concerned significant other, also referred to in the literature as “affected other”.</td>
</tr>
<tr>
<td>HILDA</td>
<td>Household Income and Labour Dynamics (HILDA) Survey (Department of Social Services &amp; Melbourne Institute of Applied Economic and Social Research, 2019).</td>
</tr>
<tr>
<td>LSAC</td>
<td>Growing up in Australia: The Longitudinal Study of Australian Children (Mohal et al., 2021).</td>
</tr>
<tr>
<td>PGSI</td>
<td>Problem Gambling Severity Index (Ferris &amp; Wynne, 2001).</td>
</tr>
<tr>
<td>QLS</td>
<td>Quinte Longitudinal Study (Williams et al., 2006).</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>OECD</td>
<td>The Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
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Key terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>Affect</td>
<td>Describes the experience of feeling or emotion. Affect can be broadly categorised into two types: positive affect and negative affect. Positive affect refers to emotions such as happiness,</td>
</tr>
<tr>
<td><strong>At-risk gambler</strong></td>
<td>This term describes a group of gamblers recording scores between 1 and 7 on the PGSI.</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Concerned Significant Other</strong></td>
<td>This refers to people who have a close and meaningful relationship with someone experiencing a gambling problem.</td>
</tr>
<tr>
<td><strong>Gambling-related harms</strong></td>
<td>These are generally described as some form of negative consequences due to an engagement with gambling – i.e. described by the Victorian Responsible Gambling Foundation as “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) and the UK Gambling Commission as “The adverse impacts from gambling on the health and wellbeing of individuals, families, communities and society” (Wardle et al., 2019).</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td>Refers to “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 2022).</td>
</tr>
<tr>
<td><strong>Low-risk gambler</strong></td>
<td>Describes a group of gamblers recording scores of 1 or 2 on the PGSI.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Moderate-risk gambler</td>
<td>Describes a group of gamblers recording scores between 3 and 7 on the PGSI.</td>
</tr>
<tr>
<td>Objective Wellbeing</td>
<td>This term describes concrete indicators of wellbeing, such as the presence or absence of physical or mental health conditions or socioeconomic disadvantage (Felce &amp; Perry, 1995; Schueller &amp; Seligman, 2010).</td>
</tr>
<tr>
<td>Problem gambler</td>
<td>This term is used to describe a group of gamblers recording a score of 8 or more on the PGSI.</td>
</tr>
<tr>
<td>Problem gambling</td>
<td>Refers to “difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community” (Neal et al., 2005, p. 125).</td>
</tr>
<tr>
<td>Subjective Wellbeing</td>
<td>The OECD (2013, p. 8) defines subjective wellbeing as “good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences.”</td>
</tr>
<tr>
<td>Wellbeing</td>
<td>This term has broad application, but in this thesis is described as “global judgments of life satisfaction and feelings ranging from depression to joy” (Centers for Disease Control and Prevention, 2018).</td>
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</table>
Chapter 1 - Introduction

“I feel like it's getting too much, and it's affecting not only him but me as well which is very overwhelming and hard”

[Sibling, Female, 30 years]

“(I feel) anxious and annoyed that I can’t help them with their addiction”

[Family member, Male, 22 years]

1 Note on the chapter title pages. This thesis explores CSO health and wellbeing at the population level, using large samples and quantitative statistical techniques. The quotes on the title pages were offered by participants as part of the data collection utilised in Chapter 8 (see Appendix F for details). These are included to provide a voice to the subjects of this thesis.
1.1 Background

Gambling is a significant public policy concern in Australia (Australian Gambling Research Centre, 2021). Australians experience the highest per-capita gambling losses in the world, at around A$25 billion annually (Letts, 2018; Queensland Government Statistician’s Office, 2021) or approximately A$1,200–1,300 per adult. While for many Australians, gambling can be seen as a relatively harmless recreational activity, for others, it is not. 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). These harms can then lead to impacts on health and wellbeing. To date, gambling research has focused mainly on the person who gambles. This current research extends knowledge about the impacts of gambling on health and wellbeing to include concerned significant others (CSOs).

The term CSO, along with another commonly used term ‘affected other’, describes people who have a close and meaningful relationship with someone experiencing a gambling problem. These can include partners, children, parents, other relatives, and close friends or colleagues (Salonen et al., 2014; Svensson et al., 2013). However, neither term has a standardised definition, and definitions and study participants classified as such, vary across studies (Tulloch, Browne et al., 2021). For example, some research includes immediate family members like parents, grandparents, spouses, siblings, and children, or close friends (Salonen et al., 2016, 2014), while others broaden the definition to include work colleagues, neighbours, ex-partners, and others (Salonen et al., 2018). Other studies are vague about the relationship, merely mentioning ‘someone close to them’ (Svensson et al., 2013) or ‘a close relative’ (Wenzel et al., 2008).

Overall, the thesis aims to understand how and when gambling problems impact the health and wellbeing of CSOs. To accomplish this task, a broad range of CSO health and
wellbeing factors needs to be understood, including which CSOs are most vulnerable to adverse impacts and how these outcomes relate to the gambling problem. Adopting a public health framework for this thesis means these issues must be understood at the population level and across a broad range of gambling risk levels. This method provides practical information for developing public health policy, guiding education and support, and identifying areas of future research needs. The following is a review of these concepts in greater detail.

1.2 Harms Associated with Gambling

Some individuals have impaired control over their gambling and thus experience serious and potential ongoing harms or consequences (Ferris & Wynne, 2001). Gambling harms refer specifically to the negative consequences resulting from excessive money or time spent on gambling (Neal et al., 2005). These harms lead to negative impacts to the health and wellbeing of the person who gambles, their family and community, and the wider population (Langham et al., 2016). In Australia, 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). This equates to around 1 in 10 Australian adults experiencing some potential for harm due to their own interactions with gambling. Gambling harms can occur to anyone, but the greatest burden of these negative impacts tends to occur in the most vulnerable populations. That is, more severe gambling problems are likely to occur within socioeconomically disadvantaged groups such as those with lower levels of education, lower income, lower status occupations, and among ethnic minorities (Armstrong & Carroll, 2017; Elton-Marshall et al., 2017; Fell & Rae, 2022; Jeannot et al., 2023). Additionally, gambling disproportionately affects those with other vulnerabilities, with severe gambling problems associated with loneliness, lack of social
support (Mohamed et al., 2022; Sirola et al., 2023), drug and alcohol problems, symptoms of depression and anxiety, and problems with emotional regulation (Mide et al., 2023).

Several conceptual frameworks categorise gambling-related harm (see Marionneau et al., 2022). In one of the more comprehensive frameworks, 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. These harms can interact with each other. For example, issues caused by financial harm, such as lack of money to pay bills, can lead to conflict within relationships. Langham et al. (2016) proposed that harms could be experienced at different time periods. That is, they can occur during a crisis period, be legacy harms that continue to occur after gambling ceases, or appear as general harms arising at any time from the initial interaction with gambling through to a crisis period.

Gambling problems are multifaceted and are influenced by a myriad of determinants that operate at various levels (Blaszczynski & Nower, 2002; John et al., 2020). The underlying causes of these issues cannot be attributed solely to individual behaviours or predispositions (John et al., 2020; Johnson et al., 2023; Livingstone & Rintoul, 2020). For example, the larger ecological context, such as the supply side of gambling, is pivotal in precipitating and exacerbating gambling problems (Gilmore et al., 2023; John et al., 2020). This broader environment, encompassing the accessibility, design, and promotion of gambling opportunities, has a profound influence on individual behaviours and vulnerabilities (Abbott, 2020). While it is crucial to consider the health and wellbeing of those close to the person who gambles, to understand the problems and repercussions associated with harmful gambling, this thesis does not assume that individuals bear sole responsibility for the genesis or perpetuation of these issues. Instead, by adopting a public health approach, this work
acknowledges the broader socio-ecological determinants and aims to avoid oversimplifying the issue as one of individual culpability.

The terms “problem gambler” or “pathological gambler” have been used historically in research and clinical settings to describe people with gambling problems (National Research Council, 1999). However, this terminology is both stigmatising (Blaszczynski et al., 2020) and implies that the gambling problem is an essential and permanent characteristic of the person (Royal Society for Public Health, 2021). More recently (see, for example, Atayde et al., 2021; Blaszczynski et al., 2020; Royal Society for Public Health, 2021), there has been a call to change the language used around gambling problems to be less stigmatising and more person centered. This change includes using language such as “person with a gambling problem” rather than “problem gambler”. Where possible, this thesis uses this type of language. The thesis does at times refer to “problem gambler” in relation to the commonly used PGSI classification (Ferris & Wynne, 2001); however, attempts have been made to minimise this use.

1.3 Harms to CSOs

Originating with the person who gambles, gambling harms act “like a contagion, spreading through social connections” to surrounding family and friends (Browne, Bellringer, et al., 2017, p. 23). It has been estimated that those categorised as “problem gamblers” (PGSI 8+) affect around six others (Goodwin et al., 2017), while those with less severe problems affect between one and three others. While around 1.2% of the Australian adult population gambles at a problematic level, a much larger proportion of adult CSOs, around 6%, 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, et al., 2022; Tulloch et al., 2022). It would be expected
that CSOs share the same socioeconomic vulnerabilities as people with gambling problems. However, several representative Australian studies have found no difference in education level or income between CSOs and non-CSOs in the population (Hing, Russell, et al., 2022; Tulloch et al., 2020). These studies include a broad range of CSOs (including friends and colleagues); therefore, it may be that those in closer relationships (such as partners) do share the gamblers’ socioeconomic vulnerabilities. However, this relationship-factor does not appear to have been examined.

CSOs who report the most harm from another’s gambling are partners (current and ex), followed by other close family members (Hing, Russell, et al., 2022; Lind et al., 2022; Salonen et al., 2016). Similarly, those who seek counselling due to another’s gambling problem are most commonly partners (over 60%), followed by children (around 18%) (Dowling, Rodda, et al., 2014). Therefore, it is assumed that an elevated risk of adverse effects can be expected when the CSO has a close familial relationship with the person with the gambling problem (Goodwin et al., 2017; Orford et al., 2017; Productivity Commission, 1999). These CSOs are likely to be more directly involved with the person who gambles, sharing close emotional ties and financial responsibilities. Non-family relationships report fewer harms (Hing, Russell, et al., 2022; Lind et al., 2022; Salonen et al., 2016) but can still experience harm. Examples include feeling distressed, angry or hopeless about the other person’s gambling, having increased responsibilities (at work or providing childcare, for example), or needing to provide financial assistance (Ferland et al., 2021; Hing, Russell, et al., 2022). Harm transmits to others through various pathways – both directly and indirectly; for example, via less time spent with the person who gambles or less money available for general spending or household expenses. Alternatively, harm can be transmitted more indirectly, as conflict or violence within
relationships that is triggered by the absence of the person who gambles, or by the financial burdens associated with a gambling problem (Ferland et al., 2021).

The areas of impact for CSOs can be categorised as the same as those with the first-order gambling problem, as described by Langham et al. (2016). The type of harm most commonly experienced by adult CSOs tends to be emotional (e.g. worrying about the person who gambles or feelings of hopelessness), relational (e.g. increased tension and conflict), and financial (Hing, Russell, et al., 2022; Lind et al., 2022; Salonen et al., 2016). For children, the experience of being close to someone with a gambling problem has been described as “pervasive loss” (Darbyshire et al., 2001). According to Darbyshire et al., parental gambling can cause losses in all areas of children’s lives. They can lose their relationship with their parents and others, their sense of trust and security, and a stable home environment, as well as the impact of reduced finances available in the household.

1.4 Impacts of Gambling-Related Harm

Gambling harms, by definition, are negative outcomes that lead to a reduction in health and wellbeing (Langham et al., 2016; Wardle et al., 2019). That is, the combined effects of living with gambling harms can damage or diminish a person’s health and wellbeing. These impacts carry a society-level burden. It has been estimated that, as a whole, gambling produces more ongoing harm at the population level than conditions such as diabetes and arthritis (Browne, Greer, Rawat, et al., 2017). For those with severe gambling problems, the associated burden is similar to bipolar disorder and severe alcohol abuse (Browne, Rawat, et al., 2017). As gambling-related harms extend to CSOs, they would be expected to suffer corresponding health and wellbeing impacts. Rockloff et al. (2019) attempted to measure the “quality of life” burden of gambling to CSOs using two different methods in a Tasmanian population-representative sample of 5,000 persons. Of people who said they were in some
way “affected” by another person’s gambling, 53% (direct elicitation method) and 69% (time trade-off method) reported being worse off. However, a greater understanding of CSO health and wellbeing impacts (who is impacted and in what ways) is required before the population level burden associated with CSOs can be more accurately calculated.

1.5 Theoretical Frameworks

There are two broad models that frame the relationship between gambling-related harm and health and wellbeing. The first model is the public health framework (Korn & Shaffer, 1999), which encompasses broad individual, situational and environmental factors associated with gambling (Oksanen et al., 2021). This framework views gambling as a public health issue rather than just an individual behaviour, and, as such, it addresses multiple levels of influence to understand the impacts of gambling-related harm. The second model is the biopsychosocial model of health (Engel, 1977, 1980), which identifies the biological, psychological, and social factors that shape health outcomes.

1.5.1 Public Health Framework

Korn and Shaffer (1999) proposed adopting a public health perspective towards gambling. The authors presented that gambling could be both beneficial and harmful, the need for balance towards gambling, and the requirement to protect the vulnerable. They recognised that gambling harm is not limited to the individual who gambles but can also affect their families, communities, and society as a whole. Therefore, interventions should be aimed at reducing harm to all those impacted by gambling, not just the individual who gambles.

Additionally, Korn and Shaffer suggested that gambling harms are not only experienced by a few people with clinical-level gambling disorders, but also by a broader range of people gambling across a continuum of gambling risks (Korn & Shaffer, 1999; Langham et al., 2016). The distribution of gambling risk in the population has implications when identifying
population-level harm. Only a small percentage of people who gamble experience severe problems, while a much larger proportion experience mild or moderate problems. Due to this distribution, the greatest burden of harm in the community can be attributed to those with less severe problems (Browne & Rockloff, 2019; Browne et al., 2020; Canale et al., 2016). For example, Browne et al. (2020) reported that the majority of the more serious financial harms in the community, such as difficulty paying bills, increased credit card debt and needing additional employment, occur to those who gamble at low or moderate risk levels. These gamblers significantly outnumber those with severe gambling problems, leading to a much larger burden in the community. Therefore, it is important to understand harm experienced across the continuum of risk and, where required, implement prevention measures that target the broader population of people who gamble and their CSOs, rather than only those with more severe problems with gambling.

Since Korn and Shaffer’s (1999) paper, there have been consistent and growing arguments that governments should adopt a public health approach to gambling harm prevention (see, for example, Elton-Marshall et al., 2017; Johnstone & Regan, 2020; Price et al., 2021). As a result, gambling-related harm is now increasingly recognised by governments in this way (Fell & Rae, 2022). Jurisdictions adopting this model include most states in Australia, New Zealand, Canada, and the United Kingdom (Gambling Research Exchange Ontario, 2019). By adopting a public health approach to gambling harm, policy and interventions can be designed to reduce the risks associated with gambling and lead to better outcomes for individuals and communities, ultimately reducing the economic, social, and health costs related to gambling harm.

Within a public health perspective, the social ecological model has been used to understand gambling problems (Oksanen et al., 2021). The model involves a number of nested
levels encompassing both individual and situational factors and looks at interactions between individuals and their broader environments (Centers for Disease Control and Prevention 2022; Oksanen et al., 2021). At the core are individual factors, such as gender, age, traits and identity, which influence how a person behaves (Centers for Disease Control and Prevention 2022; Oksanen et al., 2021). Around this is the interpersonal level which are key relationships and social networks (Centers for Disease Control and Prevention 2022; Oksanen et al., 2021). For CSOs, the person who gambles is an integral influence in this level. The organisational level examines the setting in which social relationships occur; the wider communities and institutions, such as gambling venues (Oksanen et al., 2021). The final level encompasses the wider societal factors that influence people’s lives and how they may contribute (positively or negatively) to the impact of gambling (Centers for Disease Control and Prevention 2022; Oksanen et al., 2021). These can include social and cultural norms, health and socioeconomic policy, and legislation such as gambling advertising regulations or accessibility to gambling venues and platforms. By addressing multiple levels of influence, the social ecological model in a public health context provides a framework for broader community and policy interventions (Centers for Disease Control and Prevention 2022).

1.5.2 Biopsychosocial Model of Health

Compared to the social ecological model, the biopsychosocial model of health leans more towards understanding the individual in relation to the health and wellbeing impacts of gambling-related harms. The biopsychosocial model of health, a comprehensive approach to health and wellbeing, was developed by George L. Engel (1977, 1980) and has since become a significant model for healthcare. This model encompasses a range of factors that can influence a person’s overall health and wellbeing. These include biological factors such as genetics and physical health, psychological factors such as mental health and stress levels, and
social factors such as social support networks and socioeconomic status. The biopsychosocial determinants of health and wellbeing offer an integrated approach that focuses on the interplay between these factors and emphasises the importance of providing holistic care that considers all these factors and their interactions. Gambling harms experienced by CSOs have the potential to impact a range of these areas and, consequently, negatively affect health and wellbeing.

These models are two distinct yet complementary frameworks that aim to improve health and wellbeing. They come from different perspectives: the biopsychosocial model emphasises individual-level characteristics that influence people’s health; the public health model focuses on the more expansive social influences on the population’s health, such as the impact of gambling. However, both models can work together. Shaffer and Kidman (2004) emphasised the need to use both individual and population-based frameworks to understand the impact of gambling on health. They describe how:

- insights gained from study of a broad, population-based analysis will eventually necessitate a return to an individual level of analysis to ascertain how the social, economic, and cultural variables translate into health outcomes. Similarly, epidemiological studies of the general population will become relevant again when it becomes necessary to determine the success of new gambling-related policy, prevention, and treatment efforts. (2004, p. 5)

Shaffer and Kidman argue that researchers can develop a more integrated strategy that informs and enhances gambling-related policy, prevention, and treatment efforts by employing both approaches.
1.6 Measuring Health and Wellbeing

The terms “health” and “wellbeing” are often used interchangeably, but they have different meanings (Centers for Disease Control and Prevention, 2018). The World Health Organization (World Health Organization, 2022) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Whereas wellbeing is defined as being “global judgements of life satisfaction and feelings ranging from depression to joy”; judgements which can encompass various dimensions such as physical, emotional, social, intellectual, spiritual, and occupational wellbeing (Centers for Disease Control and Prevention, 2018). Health is a key part of wellbeing, but not the only factor (Centers for Disease Control and Prevention, 2018). For any individual, wellbeing has a theoretical maximum, that is, an ideal state of functioning, and a minimum, that is, a life not worth living.

As discussed in greater detail in Chapter 2, measuring health and wellbeing should encompass a broad range of subjective and objective measures (Felce & Perry, 1995; Lambert et al., 2019; Schueller & Seligman, 2010; Western & Tomaszewski, 2016). Objective wellbeing measures are concrete indicators, such as the presence or absence of physical or mental health conditions or socioeconomic disadvantage (Felce & Perry, 1995; Lambert et al., 2019; Schueller & Seligman, 2010; Western & Tomaszewski, 2016). These objective measures are often used in gambling research, such as when examining mental health issues or psychological distress (Chan et al., 2016; Dowling et al., 2009; Salonen et al., 2014; Wenzel et al., 2008). In contrast, subjective wellbeing comprises an approach which measures an individual’s cognitive and emotional perceptions and evaluations of their life (Diener, 2002; Schueller & Seligman, 2010). The model has three main parts: frequent positive affect, less frequent negative affect, and the cognitive element which encompasses evaluations about the
person’s life (Diener, 2002). There are many conceptualisations around subjective wellbeing; however, in the psychology and public health fields, the literature lacks a clear and consistent theoretical or methodological framework related to subjective wellbeing (Das et al., 2020). Nevertheless, most subjective wellbeing measures take the abovementioned approach, and use core areas to ask people about their feelings and to evaluate their satisfaction with various areas of their life. These measures range from single-item questions probing aspects of wellbeing (e.g. "Overall, how happy do you feel?") to scales interrogating multidimensional aspects of people’s lives, including work, family, health, social/relational, financial, safety, community, and self (Diener et al., 1999; Ong et al., 2021).

While strongly and positively associated, objective and subjective measures of wellbeing are not the same (Western & Tomaszewski, 2016). As an illustration, a mental health problem is not necessarily associated with low wellbeing, with some researchers arguing they sit on separate continuums (Keyes, 2005; Westerhof & Keyes, 2010). For example, the relationship between anxiety and life satisfaction is not very strong (Headey et al., 1993). Similarly, financial wellbeing is a subjective measure of a person’s perception of their financial situation. It is similar but conceptually different to objective financial measures, such as income, debt, or inability to pay bills (Brüggen et al., 2017). Financial wellbeing is not reliably associated with income (Tahir & Ahmed, 2021), and even people experiencing financial stress can report different levels of financial wellbeing (Garman et al., 2004). However, in people with low incomes, the addition of current financial stress does have a detrimental impact on financial wellbeing (Netemeyer et al., 2018). Both objective and subjective measures contribute to the broader understanding of health and wellbeing and, consequently, should both be employed in research and analysis (Lambert et al., 2019; Schueller & Seligman, 2010).
1.7 The Health and Wellbeing of People who Gamble

Research has shown that problem gambling is associated with various physical and mental health problems for the person who gambles. These include depression, anxiety, suicidal ideation and attempts, high levels of psychological distress, substance use disorders, and physical problems, including cardiovascular disease, gastrointestinal problems, and headaches (Armoon et al., 2023; Dowling et al., 2015; Mide et al., 2023; Paterson et al., 2020; Petry et al., 2005). Mental health issues are found across the risk spectrum in people who gamble, with the severity of these problems positively associated with gambling problem severity (Mide et al., 2023). Harmful gambling is also associated with reductions in subjectively measured wellbeing. For example, gambling problems are linked to decreased subjective wellbeing (Awaworyi Churchill & Farrell, 2020; Blackman et al., 2019; Farrell, 2018). Despite financial losses often being the first and most prominent harm experienced by people who gamble (Langham et al., 2016), little is known about their subjectively measured financial wellbeing. Only one quantitative study has been identified, which found financial wellbeing decreased as gambling problem severity increased (Swanton et al., 2021).

1.8 The Health and Wellbeing of CSOs

Existing research demonstrates that CSOs experience a wide range of harms attributable to another person’s gambling (e.g. Hing, Russell, et al., 2022; Lind et al., 2022; Riley et al., 2018; Salonen et al., 2016). However, it is also crucial to determine whether these harms lead to measurable impacts on their health and wellbeing. Systematic reviews by Kourgiantakis et al.(2013) and Riley et al.(2018) report that CSOs commonly experience physical and mental health decrements, including mood disorders, anxiety, psychological or emotional distress, headaches, insomnia and stomach problems. Regarding wellbeing, these reviewers found that
CSOs report negative affect (e.g. anger) and impacts on social wellbeing (e.g. social isolation, lack of social support). However, little is known about any aspect of CSO subjective wellbeing. Notably, no quantitative studies have been identified that include subjective measures of financial wellbeing.

The literature review conducted for this thesis (Chapter 2) builds upon these earlier reviews to explore what is known about CSO health and wellbeing in greater detail. It examines how CSO research has been conducted, including the research methods and populations used, how health and wellbeing are measured, and how the results are reported.

1.9 Bi-directional Effects

The relationship between gambling and health and wellbeing is bi-directional. In people who gamble, longitudinal studies indicate that gambling problems can both precede or follow the diagnosis of psychiatric disorders (Dussault et al., 2011; Hartmann & Blaszczynski, 2018). Gambling can directly harm health. For example, harms associated with excessive gambling, such as financial stress, relationship problems and social isolation, may lead to symptoms of anxiety or depression (Dussault et al., 2011; Hartmann & Blaszczynski, 2018). The risk of developing these problems is related to the severity of the gambling problem, with a greater risk associated with more severe problems (Parhami et al., 2014). Similarly, the experience of gambling-related harm by CSOs may lead to experiencing symptoms of anxiety or depression. This is supported via qualitative interviews (e.g. Holdsworth et al., 2013) and reported in quantitative studies (Sullivan et al., 2007; Vitaro et al., 2008). However, there is little evidence about the direction of this relationship. Very limited longitudinal research has examined the relationship between harm and health and wellbeing in CSOs (Dussault et al., 2011; Svensson et al., 2013). None has investigated CSO health and wellbeing prior to exposure to the gambling problem.
Alternatively, health problems can precede the gambling problem. For instance, in people who gamble, gambling can distract those already experiencing negative emotions or mental health problems. In these cases, gambling provides a temporary escape or respite (Cameron & Ride, 2023; Mide et al., 2023; Parke et al., 2018). Through this mechanism, CSO health may negatively impact the person who gambles. People who experience stressors associated with another’s health or who have carer responsibilities may use gambling to provide some respite from their situation (Corney & Davis, 2010; McCarthy, Thomas, Pitt, Marko, et al., 2022).

Similar bi-directional relationships exist in other areas of wellbeing. For example, some people, especially older individuals, gamble to satisfy unmet social needs. They may engage in gambling as a social activity for connection and interaction, to decrease social isolation, as a reason to leave the house, and to reduce boredom and loneliness (Johnson et al., 2023; Pattinson & Parke, 2017; Tse et al., 2012). However, where gambling becomes problematic, it can begin to erode social connections and support options for both the gambler and those around them (Ferland et al., 2021; Riley et al., 2020; Wood & Tirone, 2013).

1.10 Conceptual Framework

Figure 1.10.1 illustrates the relationship between gambling problems, gambling harms, and the health and wellbeing of both the person who gambles and CSOs. It includes a brief synthesis of the current knowledge discussed in this chapter. Overall, excessive gambling can lead to gambling-related harms, the extent of which (for the CSO) is influenced by the type of relationship with the person who gambles. These harms can then negatively impact health and wellbeing. For people who gamble (illustrated in grey), there is a reasonably comprehensive understanding of which health and wellbeing areas are impacted; that they can occur across the spectrum of gambling problem severity; and that health and wellbeing
problems can be both antecedents and consequences of a gambling problem. However, at this time, there are still gaps in knowledge regarding the impacts on CSOs (white).
Figure 1.10.1  The conceptual relationship between gambling problems, gambling harm and gambler and CSO health and wellbeing

- Financial
- Relationships
- Emotional/ Psychological
- Health impacts
- Work/study
- Crime
- Cultural harm

Gambling harms and health and wellbeing impacts can extend to gamblers with less severe problems

Poorer physical health and increased mental illness than others, and engage in risky health behaviours

CSOs report poorer physical health and increased mental illness than others, and engage in risky health behaviours

Health and wellbeing decrements can either precede or follow gambling problems

Indirect/Objective measures
- Mental health issues
- Psychological distress
- Physical health indicators

Subjective measures
- Self-report wellbeing scales
- Satisfaction with life
- Affect

Empty boxes represent a lack of scientific data.
1.11 Research Aim

Compared to the knowledge about the person experiencing the first-order gambling problem, much less is known about CSOs. CSO health and wellbeing have not been directly explored across a full range of health and wellbeing measures. Nor has the relationship between gambling and reported health and wellbeing decrements been fully explored concerning causal direction. Additionally, it is currently unclear how the severity of the gambling problem relates to CSO health and wellbeing. As a result, there is a relatively limited understanding of how and when a CSO's health and wellbeing are affected by another person's gambling problems. This thesis aims to explore existing findings in more depth and expand our understanding to cover a broad range of health and wellbeing measures.

The core aim of this thesis is to understand how and when gambling problems impact the health and wellbeing of CSOs of people who gamble. The objectives of the thesis are:

– To understand a broad range of health and wellbeing outcomes associated with CSOs
– To understand how these outcomes relate to the gambling problem
– To understand which CSOs are most vulnerable to health and wellbeing impacts
– To understand these issues at the population level
– To provide new and relevant information to assist policymakers, healthcare professionals, service providers, and researchers.

1.12 Relevance of the Research

Being close to someone with a gambling problem has been identified as a cause of significant ill-health for individuals and therefore has major implications for public health costs (Orford et al., 2013). One of the three pillars of a public health approach to gambling is to “protect vulnerable groups from gambling-related harm through responsible gambling.”
Governments are required to design and implement policies that prevent harm, fund community programs and education campaigns, and assist in supporting those who have been harmed (Fell & Rae, 2022; Wardle et al., 2019). However, the key to developing these policies is understanding the exact scale and nature of the issue (Wardle et al., 2019). To protect the vulnerable, there needs to be a comprehensive understanding of these groups – who and how many are impacted, their characteristics, and the nature of the impacts. By virtue of the fact that a single gambler with problems can affect multiple other people, there are strong grounds to suspect the aggregate “burden of harm” to CSOs may be commensurate to that borne by people who gamble. However, the study of the quality, quantity, and mechanisms by which CSOs are impacted has lagged that of gamblers. Accordingly, the present program of research will address a meaningful shortcoming in the literature.

This thesis aims to contribute to the evidence base associated with gambling-related harm, specifically population-level evidence of health and wellbeing harms associated with CSOs. This information can be drawn upon to assist policy development, and target and allocate funding for education, support, and treatment. A recent systematic review (Merkouris et al., 2020) identified the need for support that addresses issues specifically faced by gambling CSOs, rather than being adapted from other addiction treatments. This research will provide valuable information to those providing CSO support and interventions by identifying people at higher risk of experiencing decrements to their health and wellbeing, as well as the exact nature of these decrements. Finally, this body of work will identify areas for future research to understand and alleviate the burden faced by this vulnerable CSO population.
1.13 Thesis Structure

This thesis is presented as a thesis by publications, with nine chapters as follows. Chapter 1, as presented above, introduces the thesis and includes discussions about key concepts. Chapter 2 is a narrative literature review, presented as a published journal article (Tulloch, Browne, et al., 2021). Chapter 3 outlines the research design, including research questions, methodology and a summary of the aims and results of each study. Chapters 4–8 are empirical research studies. Chapters 4–7 are each presented as reproductions of published journal articles, while Chapter 8 is currently under peer review. Chapter 9 is a summary and discussion, including the combined findings, strengths and limitations, implications for public health policy, support and education, and areas for further investigation.
Chapter 2 - Literature Review

“(The gambling problem) was so horrible. It affected my health. And gave me headaches”

[Current spouse/partner, Female, 32 years]

“(I’m) worried about what might happen”

[Father, Male, 58 years]3

3 These quotes were offered by participants as part of the data collection utilised in Chapter 8.
2.1 Overview

Two previous literature reviews have specifically examined the impacts of gambling on CSOs. These focused on the type of harm experienced by families (Kourgiantakis et al., 2013) and, in the case of Riley et al. (2018), broader groups of CSOs. The literature review conducted for this thesis focuses more narrowly on what is known about the outcomes of these harms on CSO health and wellbeing. The current review aims to understand the types of research conducted to date, including research methods and populations used. It examines how health and wellbeing have been measured and how CSO health and wellbeing are reported. The research gaps identified in this review guide the areas of investigation in this thesis.

2.2 Manuscript

This chapter contains a copy of a published manuscript. See Appendix A for the Declaration of Co-Authorship and Copyright.

How gambling harms the wellbeing of family and others: a review

Catherine Tulloch, Matthew Browne, Nerilee Hing, Matthew Rockloff and Margo Hilbrecht

School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, Australia; School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, Australia; Evidence Services, GREO, Ontario, Canada; Dept. of Recreation and Leisure Studies, University of Waterloo, Ontario, Canada

ABSTRACT

Problem gambling can have negative impacts on both harmed gamblers, and those people close to them (concerned significant others; CSOs). Experiencing these gambling-related harms can have a significant impact on a person’s wellbeing and quality of life. Recently, the focus of research on people with gambling problems has expanded from exploring gambling-related harms and specific psychological outcomes, to include global evaluations of health and wellbeing. However, it is also important to understand the degree to which these impacts extend to CSOs. This narrative literature review presents what is known about the impact of gambling-related harms on CSOs’ wellbeing and identifies areas of future enquiry. The review identified both knowledge and methodological gaps, including that relatively little is known about impacts to CSOs’ subjective wellbeing. What is known, is confounded by different methods of identifying CSOs across studies, and the use of predominantly small, non-representative, and treatment-related samples. Addressing these gaps will lead to a greater understanding of the impact of problem gambling on the community.

Introduction

Gambling-related harms are specific negative consequences emanating from excessive time or money spent on gambling (hereafter ‘excessive gambling’; Neal et al., 2005). The areas of impact are wide-ranging and encompass multiple domains: financial, relationship, health, emotional/psychological, work/study, culture, and crime (Langham et al., 2016). Whilst those excessively gambling are the first to experience harm, harms also extend, either directly or indirectly, to those around them (e.g. Li et al., 2017). The term ‘concerned significant other’ (CSO) refers to those family, friends, colleagues, and others who have a close and significant relationship to a person with a gambling problem and therefore are likely to also experience negative impacts. CSOs have been shown to experience harm...
attributable to another’s gambling, both individually (e.g. distress, physical and mental health problems, financial difficulties) and within their relationships (e.g. conflict and violence; Kourgiantakis et al., 2013; Riley et al., 2018). Jeffrey et al. (2019) found CSOs experienced a similar number of gambling-related harms to the person with a first-order problem, however they tend to occur in different areas, with CSOs more likely to experience relationship and emotional/psychological problems. They also reported a different typology of impact within each domain (e.g. they experienced different kinds of emotional harms). The most important outcome of gambling-related harms, and a key component of the definition (Langham et al., 2016, p. 4), is that they subsequently lead to a ‘decrement to the health or wellbeing’ of those reporting them. Therefore, to fully understand the degree of personal impact associated with gambling-related harms, it is important to understand the relationship of those harms to health and wellbeing.

**Measuring wellbeing**

Wellbeing can be defined as an individual feeling and functioning well. For example, the Centers for Disease Control and Prevention (2018, sec. 4) defines wellbeing as ‘judging life positively and feeling good.’ Wellbeing can be measured subjectively and objectively (Felce & Perry, 1995; Lambert et al., 2019; Schueller & Seligman, 2010; Western & Tomaszewski, 2016). The OECD (2013, p. 8) defines subjective wellbeing as ‘good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences.’ Subjective wellbeing is generally measured by direct self-report and comprises an individual’s cognitive judgment of their life, as well as an assessment of their emotional state (Schueller & Seligman, 2010). Measures range from single-item questions through to scales interrogating various aspects of people’s lives, including work, family, health, finances and self (Diener et al., 1999). Objective wellbeing consists of less direct measures and includes more concrete indicators; such as safety, education, employment, as well as an absence of diagnosed mental and physical illness (Felce & Perry, 1995; Lambert et al., 2019; Schueller & Seligman, 2010; Western & Tomaszewski, 2016). The OECD (2013) differentiates subjective and objective wellbeing measures as the latter not being based on the measurement tools themselves (e.g. the use of self-report), instead, whether the subject matter could be observed by another person (e.g. poverty or health). Therefore, a self-rated health question or the Kessler Distress Scale (Kessler et al., 2010) would be seen as objective wellbeing measures, while questions or scales probing a person’s satisfaction with their physical or mental health, would be classified as a subjective wellbeing measure.

Objective and subjective wellbeing measures are strongly positively associated (Western & Tomaszewski, 2016). However, they are not the same thing. Taking health as an example, some researchers argue that health and wellbeing sit on separate continuums (Keyes, 2005; Westerhof & Keyes, 2010). Someone can have a well-managed mental health diagnosis or a chronic medical condition and still be content with their lives (Headey et al., 1993). Additionally, Schueller and Seligman (2010) found that while objective wellbeing indicators effectively measure a good or successful life, they may not adequately capture the third important factor of wellbeing – pleasure. The authors argue
that objective and subjective wellbeing measures each contribute to part of the picture, and only when combined can researchers gain a ‘more complete view’ of wellbeing (p. 253). Overall, and in line with these findings, it has been recommended that data collection utilizes multiple measures, to accurately reflect wellbeing (Lambert et al., 2019; OECD, 2013).

**Wellbeing and problem gambling**

Problem gambling research has hitherto focussed on gambling-related harms and their associated psychological health impacts (objective wellbeing factors). However, more recently the focus has expanded to include examining subjective wellbeing. There has been an increased focus on the effects of experiencing gambling-related harms on subjective wellbeing, not surprisingly finding a significant negative relationship between subjective wellbeing and gambling problems (Awaworyi Churchill & Farrell, 2020; Blackman et al., 2019; Farrell, 2018). Additionally, Pickering et al. (2018) identified the need to include more subjective wellbeing measures when assessing problem gambling treatment outcomes. However, it is also important to understand if the subsequent decrease in wellbeing or quality of life experienced by the person with the first-order gambling problem extends to CSOs; that is, whether the impacts they experience as a result of another’s gambling leads to measurable decrements to their wellbeing.

This narrative review aims to understand what is known about the impact of gambling-related harms on the wellbeing of CSOs and identify areas for further research. Specifically, the review aims to assess how CSO wellbeing has been investigated, including:

1. How CSO research has been conducted, including research methods and populations used;
2. How wellbeing has been measured in these studies; and,
3. How CSO wellbeing is reported.

**Method**

A search of English language, peer-reviewed papers was conducted using electronic database searches on Scopus and PubMed. No date range was specified. Search terms used were: gamb| AND CSO or ‘concerned significant other’* OR ‘affected other’* OR ‘significant other’* OR family OR families OR spouse OR partner OR husband OR wife OR wives OR child OR parent OR mother OR father OR grandparent OR friend* OR neighbour* OR co-worker* AND wellbeing OR well-being OR ‘well being’ OR happiness OR ‘life satisfaction’ OR ‘quality of life’ OR QOL OR ‘QOL OR health OR violence OR relationship OR ‘mental health’ OR harm OR ‘ill-being’. Reference lists were reviewed to identify any additional relevant articles. Ethics approval was not required for this study.

The literature review aimed to find a wide range of literature. As such, the search covered all CSOs (i.e. any relationship to the person with the gambling problem, any age, any gender), a broad definition of wellbeing (both objective and subjective measures), and all research designs. Studies were considered eligible for the current review if they:
(1) Empirically explored the link between being a CSOs and experiencing an impact on wellbeing;

(1) Included participants across any age, gender or relationship to the person with the first-order gambling problem;
(2) Were based on the CSO’s direct report of harm and wellbeing impacts;
(3) Were published in a peer-reviewed journal, and the full text was available in English.

Therefore, the following were considered out of scope:

(1) CSO treatment and their involvement in problem gambling treatment;
(1) CSO help-seeking or coping styles, practices, and methods;
(2) Papers based on another person’s view of CSO’s harm and/or wellbeing, rather than the CSO’s own viewpoint;
(3) Papers primarily concerned with calculating disability weights from harms, where they do not specifically report wellbeing measures (e.g. Browne et al., 2017).
(4) Studies published as ‘grey literature’ such as research reports etc. While excluded from the search, we acknowledge a body of grey literature particularly relevant to prevalence studies (Baxter et al., 2021) and have included a limited discussion around these within the results.

Results

A total of 758 papers were identified through the database and reference list searches. Papers were screened in line with inclusion criteria. After title and abstract screening, a total of 161 duplicates were removed, and 442 papers were excluded due to not fitting inclusion criteria. A further 112 papers were excluded after a more detailed examination of these papers’ methodology. In total, 43 papers were included in the literature review.

A summary of the identified studies can be seen in Table 1.

The review discusses each of the three research aims in turn: how CSO research is currently being conducted; how wellbeing is measured; and what is known about CSO wellbeing. We first outline the identified research and then discuss the findings and implications related to each of these aims.

How CSO research is conducted

To evaluate knowledge concerning the wellbeing of CSOs, it is important to understand the populations on which CSO wellbeing research has been conducted. The literature was grouped by research type (qualitative or quantitative) and sample population (community or specialist population). CSO research is commonly conducted using specific populations of interest. For example, selection for inclusion may be based on a person seeking treatment due to another’s gambling or, more commonly, having an existing relationship with a person undergoing treatment for a gambling problem.
Table 1. Studies identified by inclusion criteria via database search.

<table>
<thead>
<tr>
<th>Prevalence</th>
<th>Country</th>
<th>Method</th>
<th>Sample Description</th>
<th>Wellbeing Areas</th>
<th>Subjective Wellbeing Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salonen et al. (2014)</td>
<td>Finland</td>
<td>Cross-sectional</td>
<td>N = 4,484, 19.3% CSOs</td>
<td>General health, mental health, loneliness, smoking, alcohol, gambling</td>
<td>-</td>
</tr>
<tr>
<td>Salonen et al. (2016)</td>
<td>Finland</td>
<td>Cross-sectional</td>
<td>N = 4,515, 19.3% CSOs</td>
<td>Gambling harms via structured questions</td>
<td>-</td>
</tr>
<tr>
<td>Salonen et al. (2018)</td>
<td>Finland</td>
<td>Longitudinal</td>
<td>N = 7,186, 13% CSOs</td>
<td>Gambling harms via 72-item Harms Checklist</td>
<td>-</td>
</tr>
<tr>
<td>Svensson et al. (2013)</td>
<td>Sweden</td>
<td>Longitudinal</td>
<td>N = 8,165, 18.2% CSOs</td>
<td>Physical health, K6, gambling, alcohol, family violence, finance, major life events</td>
<td>-</td>
</tr>
<tr>
<td>Wenzel et al. (2008)</td>
<td>Norway</td>
<td>Cross-sectional</td>
<td>N = 3,483, 2% CSOs</td>
<td>Finance, subjective health, harms, mental health, addictions</td>
<td>-</td>
</tr>
<tr>
<td>Quantitative Specialist Population – Community</td>
<td></td>
<td></td>
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<tr>
<td>Izmirli et al. (2014)</td>
<td>Turkey</td>
<td>Cross-sectional</td>
<td>N = 260 female CSOs</td>
<td>Domestic violence</td>
<td></td>
</tr>
<tr>
<td>Jacobs et al. (1989)</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>N = 844 (52 CSOs, 6%)</td>
<td>37 item health survey – general, self-rated ‘quality of youth’</td>
<td>Single-item</td>
</tr>
<tr>
<td>Jeffrey et al. (2019)</td>
<td>Australia/New Zealand</td>
<td>Cross-sectional</td>
<td>N = 5,036 (80% PGs and 20% partners)</td>
<td>Self-reported harms across various domains</td>
<td>-</td>
</tr>
<tr>
<td>Zealand</td>
<td></td>
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<tr>
<td>Li et al. (2017)</td>
<td>Australia</td>
<td>Cross-sectional</td>
<td>N = 2019 CSOs</td>
<td>All harms, including health and emotional/psychological harms</td>
<td>-</td>
</tr>
<tr>
<td>Schluter et al. (2008)</td>
<td>New Zealand</td>
<td>Cross-sectional</td>
<td>N = 700 couples (2.1% PG/CSO)</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Sullivan et al. (2007)</td>
<td>New Zealand</td>
<td>Cross-sectional</td>
<td>N = 1,580 (7.5% PGs and 18% CSOs)</td>
<td>Health, psychological distress, major stressors</td>
<td>-</td>
</tr>
<tr>
<td>Tulloch et al. (2020)</td>
<td>Australia</td>
<td>Cross-sectional</td>
<td>N = 15,475, 1.7% of households had a gambling problem</td>
<td>Depression, conduct/antisocial problems</td>
<td>-</td>
</tr>
<tr>
<td>Vitaro et al. (2008)</td>
<td>Canada</td>
<td>Longitudinal</td>
<td>N = 1,872 (children aged 16 and 23 years), 2% CSO</td>
<td>Depression, conduct/antisocial problems</td>
<td>-</td>
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<tr>
<td>Quantitative Specialist Population – Treatment-related</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Balci and Ayranci (2005)</td>
<td>Turkey</td>
<td>Cross-sectional</td>
<td>135 female victims of intimate partner violence</td>
<td>Psychological disorders including antisocial personal disorder, social anxiety disorder and posttraumatic stress disorder</td>
<td>-</td>
</tr>
<tr>
<td>Black et al. (2014)</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>537 relatives of treatment seeking PGs</td>
<td>Psychological distress, physical health, single-item ‘quality of life’ question</td>
<td>Single-item</td>
</tr>
<tr>
<td>Chan et al. (2016)</td>
<td>China</td>
<td>Cross-sectional</td>
<td>103 family members of PGs (87% female)</td>
<td>Quality of life, family functioning, relationship, psychological health</td>
<td>QOL</td>
</tr>
<tr>
<td>Cunha and Relvas (2015)</td>
<td>Portugal</td>
<td>Cross-sectional</td>
<td>19 PGs (84% male) and 13 Spouses (70% female)</td>
<td>Mental Health (depression/anxiety scales) and functioning</td>
<td>-</td>
</tr>
<tr>
<td>Dannon et al. (2006)</td>
<td>Israel</td>
<td>Cross-sectional</td>
<td>52 PGs and 93 first degree relatives</td>
<td>Financial, emotional, relationship, social life, employment, physical health</td>
<td>-</td>
</tr>
<tr>
<td>Dowling et al. (2014)</td>
<td>Australia</td>
<td>Cross-sectional</td>
<td>366–84% female, 61% partners</td>
<td>Psychological health – depression and anxiety, relational</td>
<td>-</td>
</tr>
<tr>
<td>Dowling et al. (2009)</td>
<td>Australia</td>
<td>Cross-sectional</td>
<td>29 partners (28 male) of female PGs, and 40 children</td>
<td>Psychological health – depression and anxiety, relational</td>
<td>-</td>
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<thead>
<tr>
<th>Country</th>
<th>Method</th>
<th>Sample Description</th>
<th>Wellbeing Areas</th>
<th>Subjective Wellbeing Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferland et al. (2008)</td>
<td>Cross-sectional</td>
<td>7 couples (1 x male PG, 1 spouse)</td>
<td>Psychological wellbeing</td>
<td>-</td>
</tr>
<tr>
<td>Gokler et al. (2014)</td>
<td>Cross-sectional</td>
<td>800 women (2.5% CSOs)</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Hodgins et al. (2007)</td>
<td>Cross-sectional</td>
<td>186 CSOs – 82% female/mean age 45</td>
<td>Relationship, psychological distress</td>
<td>-</td>
</tr>
<tr>
<td>Lesieur and Rothschild (1989)</td>
<td>Cross-sectional</td>
<td>105 children of PGs (55% female)</td>
<td>Psychological problems, health behaviors, family violence</td>
<td>-</td>
</tr>
<tr>
<td>Liao (2008)</td>
<td>Cross-sectional</td>
<td>31 CSOs of PGs</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Lorenz and section</td>
<td>USA Cross-sectional</td>
<td>144 spouses of PG (98% women) aged 23–70.</td>
<td>Affect and physical and mental health</td>
<td>-</td>
</tr>
<tr>
<td>Lorenz and Yaffee (1989)</td>
<td>USA Cross-sectional</td>
<td>151 couples (PG and their spouse)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mazzoleni et al. (2009)</td>
<td>Cross-sectional</td>
<td>50 wives (25 PG/25 non PG) mean age 40</td>
<td>Mental Health (depression/anxiety scales) and social adjustment</td>
<td>-</td>
</tr>
<tr>
<td>Muelleman et al. (2002)</td>
<td>USA Cross-sectional</td>
<td>286 women who presented for emergency hospital treatment</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Palmer Du Preez et al. (2018)</td>
<td>New Zealand Cross-sectional</td>
<td>370 PGs and 84 CSOs</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Suomi et al. (2013)</td>
<td>Cross-sectional</td>
<td>120 family members of PGs</td>
<td>Family violence</td>
<td>-</td>
</tr>
<tr>
<td>Qualitative Darbyshire et al. (2001)</td>
<td>Australia Cross-sectional</td>
<td>15 children aged 7–18 years (11 male)</td>
<td>Impacts related to loss that is deemed to threaten wellbeing</td>
<td>-</td>
</tr>
<tr>
<td>Goh et al., 2016</td>
<td>Cross-sectional</td>
<td>105 CSOs of PGs</td>
<td>Financial, relational, and mental impacts</td>
<td>-</td>
</tr>
<tr>
<td>Holdsworth et al. (2013)</td>
<td>Cross-sectional</td>
<td>18 partners of PGs</td>
<td>Financial, relational, emotional, mental and physical impacts</td>
<td>-</td>
</tr>
<tr>
<td>Klevan et al. (2019)</td>
<td>Cross-sectional</td>
<td>9 female partners of problem gamblers</td>
<td>Partners live with increased household responsibility and little support</td>
<td>-</td>
</tr>
<tr>
<td>Kwan et al. (2020)</td>
<td>Cross-sectional</td>
<td>23 female spouses of male PGs</td>
<td>Areas of impacts on partners – relationships, finances, the meaning of life</td>
<td>-</td>
</tr>
<tr>
<td>Landon et al. (2018)</td>
<td>Cross-sectional</td>
<td>10 CSOs of PGs (8 female)</td>
<td>General impacts of gambling on the participant including psychological, relational, violence</td>
<td>-</td>
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Table 1. (Continued).

<table>
<thead>
<tr>
<th>Country</th>
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<th>Sample Description</th>
<th>Wellbeing Areas</th>
<th>Subjective Wellbeing Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathews and Volberg</td>
<td>Cross-sectional</td>
<td>50 CSOs (40 F/10 M)</td>
<td>Finance, emotional impact, relational impact</td>
<td>-</td>
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<td>(2013)</td>
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<tr>
<td>Patford (2009)</td>
<td>Cross-sectional</td>
<td>23 women (partners/ex of PGs)</td>
<td>Quality of life, finance, relationship problems, impacts on children/friendships</td>
<td>-</td>
</tr>
<tr>
<td>Patford (2007a)</td>
<td>Cross-sectional</td>
<td>15 parents/in-laws of PGs (14 F, 1 M) aged 43–76</td>
<td>Diminished enjoyment of life, physical and emotion stress, financial/relationships impacts</td>
<td>-</td>
</tr>
<tr>
<td>Patford (2007b)</td>
<td>Cross-sectional</td>
<td>15 adult children of late-onset PGs (11 F, 1 M) aged 18–45</td>
<td>Range of impacts, including relationship and financial impacts</td>
<td>-</td>
</tr>
<tr>
<td>Riley et al. (2020)</td>
<td>Cross-sectional</td>
<td>15 partners (12 F) of non-treatment-seeking gamblers</td>
<td>Themes included conflict, health issues, hypervigilance, worry, exhaustion and isolation</td>
<td>-</td>
</tr>
<tr>
<td>Wurtzburg and Tan</td>
<td>Cross-sectional</td>
<td>13 households (14 parent/19 children aged 11–16)</td>
<td>Broad</td>
<td></td>
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<tr>
<td>(2011) discussion, relationships, impacts etc</td>
<td></td>
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The review identified five prevalence studies of CSOs, which used large population-representative samples. All were conducted in Scandinavian countries. The prevalence of CSOs varied between 2% and 19%, mainly due to methodological differences in determining CSO status. The range of relationships to the person with the gambling problem varied across studies, as was the way they were identified as CSOs. For example, some studies included parent, grandparent, spouse, sibling, children or close friends (Salonen et al., 2016, 2014), while another had a wider definition, also including work colleagues, neighbors, ex-partners, others in the household, and other people (Salonen et al., 2018). Others ask about ‘someone close to them’ (Svensson et al., 2013, p. 3), or ‘a close relative’ (Wenzel et al., 2008, p. 2), without defining the relationship. In identifying participants as CSOs, the majority of studies asked about whether they believe any significant other (by the definition of the researchers) ‘had problems with gambling’ (Salonen et al., 2014, p. 3, 2016, p. 800), ‘had or previously had problems with gambling’ (Svensson et al., 2013, p. 3), or ‘gambles too much’ (Salonen et al., 2018, p. 218). On the other hand, Wenzel et al. (2008) defined a CSO very specifically as someone who had been lied-to by a close relative about their gambling.

In addition to peer reviewed studies, there is a large body of high-quality gambling population studies published as grey literature. While some use similar methods to those detailed above to identify CSOs (e.g. Centre for Social and Health Outcomes Research and Evaluation & Te Ropu Whariki, 2008), others use another uniquely different method to identify CSOs – via harm. These reports ask not about whether they were close to someone with a gambling problem, but whether they had experienced harm (e.g. Rockloff et al., 2019; Stevens, 2017), problems (e.g. Wiebe, 2000), or had been affected by another person’s gambling (e.g. ACIL Allen Consulting, Deakin
University, Central Queensland University & Social Research Centre, 2017; Paterson et al., 2019; Woods et al., 2018). Prevalence of CSOs in these studies ranged from around 5% (ACIL Allen Consulting, Deakin University, Central Queensland University & Social Research Centre, 2017; Paterson et al., 2019; Woods et al., 2018) to 13% (Stevens, 2017).

Several further quantitative studies using CSOs identified in community-based samples were identified. Sullivan et al. (2007) asked patients in general medical practices in New Zealand if they or someone close to them had been impacted by problem gambling. They identified 18% of the sample as CSOs, similar to many of the Scandinavian prevalence studies. Jeffrey et al. (2019) used datasets which included self-identified CSOs recruited through an online panel. Schluter et al. (2008) identified CSOs through a New Zealand study which followed a cohort of infants born in a hospital in Auckland. Of the children’s mothers, 2.1% had partners who were identified as having a gambling problem. Using a nationally representative sample of Australian adults, Tulloch et al. (2020) found that 1.7% of households reported gambling as a current family stressor. Two other studies specifically looked at children, using school-based samples which identified parental gambling problems (Jacobs et al., 1989; Vitaro et al., 2008). Prevalence varied between 2% and 6%, which again may be due to methodological differences. Vitaro et al. (2008) identified parental gambling problems through a gambling screen, while in Jacobs et al. (1989) the children self-identified as having parents with gambling problems.

A large group of quantitative studies used treatment-related samples. Many comprised partners/spouses of people with gambling problems (Balci & Ayranç, 2005; Cunha & Relvas, 2015; Ferland et al., 2008; Liao, 2008; Lorenz & Shuttlesworth, 1983; Lorenz & Yaffee, 1989; Mazzoleni et al., 2009; Muelleman et al., 2002), one used children (Lesieur & Rothschild, 1989), and one partners and children of females experiencing a gambling problem (Dowling et al., 2009). The remaining studies (Black et al., 2014; Chan et al., 2016; Dannon et al., 2006; Dowling et al., 2014; Hodgins et al., 2007; Palmer Du Preez et al., 2018) included a more extensive range of CSOs, although partners still consisted of the majority of respondents.

The review identified several qualitative studies. These tended to use small samples of very specific CSOs such as partners (Holdsworth et al., 2013; Klevan et al., 2019; Kwan et al., 2020; Patford, 2009; Riley et al., 2020), children (Darbyshire et al., 2001; Patford, 2007b; Wurtzburg & Tan, 2011), parents (Patford, 2007a), families (Mathews & Volberg, 2013), or broader groups (Goh et al., 2016; Landon et al., 2018) and tend to focus on the CSOs of gamblers in treatment. An advantage of qualitative research is the level of depth regarding the narrative experiences of CSOs that can be achieved (Turner, 2010). However, the nature of this type of research means that comparisons, such as wellbeing impacts across groups or generalizations to the broader CSO population, are not possible.

**Summary and implications of how CSO research is conducted**

In evaluating the quality of extant CSO research, there are a few areas of note. Firstly, these findings highlight the diverse ways in which CSOs are identified and classified. For example, some CSOs are self-identified by having a person in their life who they believe gambles too much (e.g. Salonen et al., 2018) or having a close family member with
a gambling problem (e.g. Wenzel et al., 2008). Self-identification of CSOs is a useful methodology. However, people may potentially over- or under-attributing problems to another’s gambling. For example, some CSOs do not recognize a gambling problem until it is quite severe (Kourgiantakis et al., 2013). Therefore, these people may not attribute their family’s financial problems to gambling. In other cases, people may over-attribute their own mental health issues or poor financial skills to another’s persons gambling (Browne & Rockloff, 2018). While well-validated and widely used measures identify gambling problems (such as the PGSI; Ferris & Wynne, 2001), no tool is commonly used to help identify CSOs.

Another set of studies identify CSO as being harmed or affected by another’s gambling (e.g. Stevens, 2017). Identifying CSOs purely by them having experienced harm means they are arguably more likely to experience associated negative wellbeing impacts. This method of identifying CSOs does not allow for the inclusion of people who may be CSOs but not experience any associated harm or wellbeing impacts from another person’s gambling. In comparison, other CSOs are selected due to the CSO (e.g. Dowling et al., 2014) or the person with the gambling problem (e.g. Kwan et al., 2020) seeking treatment concerning a gambling problem. These samples are convenient and allow access to large samples of CSOs. However, they are not necessarily representative of a wider group of CSOs, as many people with gambling problems do not seek treatment (Kourgiantakis et al., 2013; Riley et al., 2018). Therefore, they are likely to reflect the most severe end of the spectrum. Treatment can also improve the functioning of the individual and the family, which may impact reported wellbeing (Kourgiantakis et al., 2013; Riley et al., 2018).

While each method of CSO identification has its own strengths and weaknesses, the differences can make comparisons between findings difficult. Studies using harm or clinical populations as a criterion for identifying CSOs are finding subsets of people who are close to the gambler but they are arguably important subsets. When defining CSOs, therefore, it is important to be clear if the definition is based on everyone who knows that gambler, people who are close contacts, or people who are harmed by their gambling activities. This would allow for increased ease in the comparability between studies.

There are also issues with the type of samples used in CSO research. Overall, there is a lack of research using large population-representative samples outside Scandinavia. This limits our understanding of the prevalence of CSOs outside this region. Additionally, due to the use of specific sampling that predominantly uses female partners of treatment-seeking gamblers, many studies do not cover a complete range of CSOs. For example, except for Dowling et al. (2009), who intentionally set out to redress the imbalance, most CSOs across all studies were female. Given that Salonen et al.’s (2014) population study found almost half the CSOs were male, and the most commonly impacted person was a close friend, these studies do not appear to be representative of the entire population of CSOs. Using a more comprehensive and representative range of respondents would enable researchers to compare harms and their impact across a wide range of CSOs and explore any differences across gender or relationships to the person with the gambling problem. This would give policymakers valuable information as to exactly who might be impacted by another’s gambling and allow for correctly targeted interventions.
How CSO wellbeing is measured

Most prevalence and specialist community-based studies focus on gambling-related harms experienced by CSOs and measure those alongside some objective wellbeing indicators, such as the presence of a mental health diagnosis or feelings of anxiety and depression. Only a single study used a subjective wellbeing measure. Jacobs et al. (1989) administered a 37-item health survey, including a single subjective wellbeing item which asked children of parents with a gambling problem to self-rate their ‘overall quality of youth’ (p. 265).

The specialist population studies also primarily focused on gambling-related harms and objective indicators of wellbeing; most commonly measuring depression and anxiety symptoms (see Table 1). Two studies used subjective wellbeing measures. Cunha and Relvas (2015) used the 20-item Quality of Life (QOL) instrument to assess the quality of participants’ family life across four domains (family, friends and health, time, media and community, and financial wellbeing). Chan et al. (2016, p. 5) used a single-item measure of subjective wellbeing, asking participants to rate their ‘quality of life’ from (1) very poor to (5) very good. Across the qualitative studies, the focuses were across participants’ subjective perception of the types of harms they experience due to another’s gambling; mainly financial, relational and health impacts.

Several studies explore family or intimate partner violence experienced by CSOs. Apart from Svensson et al. (2013), these predominantly consist of quantitative studies using specialist or treatment-related populations.(Balci & Ayrancı, 2005; Gokler et al., 2014; Izmırlı et al., 2014; Liao, 2008; Palmer Du Preez et al., 2018; Suomi et al., 2013). These studies tend not to measure wellbeing directly; however, family violence has been shown to impact the wellbeing of those involved (Poutiainen & Holma, 2013).

Summary and implications of CSO wellbeing measurement

Overall, in reviewing how wellbeing is measured, there is limited use of subjective wellbeing measures. Instead, the literature tends to focus on harms experienced by CSOs and infer decrements to wellbeing based on objective measures, such as the presence of mental health, financial, and relationship problems. Objective measures are an important tool in understanding gambling-related harms and wellbeing. However, the exclusive use of this type of measure is not recommended (OECD, 2013). Subjective measures of wellbeing should be used to complement objective measures, leading to a more holistic picture of CSO’s global wellbeing.

How CSOs’ wellbeing is reported

In the prevalence and other large studies, researchers reported their findings in relation to specific gambling-related harms experienced by CSOs and any mental health impacts. Most researchers reported some elements of wellbeing, including mental, physical, relational, community and financial health, but did not necessarily conceptualize them as ‘wellbeing.’ Many studies found that CSOs were more likely than non-CSOs to experience issues such as financial problems, relationship problems,
and poor psychological and/or physical health (Salonen et al., 2016, 2014; Svensson et al., 2013; Tulloch et al., 2020; Wenzel et al., 2008). Salonen et al. (2018) reported that harms, commonly psychological and relational, were more common in women, and that these harms were experienced by less than half of the respondents who identified as CSOs.

In the smaller community-based studies, two measured only depression as an outcome, both finding depressive symptoms more common in CSOs than non-CSOs (Sullivan et al., 2007; Vitaro et al., 2008). Looking at a variety of health-related factors, Jacobs et al. (1989) found children of parent/s experiencing gambling problems had increased risk of engaging in unhealthy behaviors (smoking, drinking, overeating). The children also reported their overall quality of youth as poorer than other children.

In the studies with treatment-related populations, mixed results were reported across both objective and subjective wellbeing measures. Using objective measures, two studies found no difference in the psychological health of CSOs compared to the general population (Dowling et al., 2009; Mazzoleni et al., 2009). In contrast, the other studies (see Table 1) reported that CSOs showed impacts across areas including finance, relationships, and health. In a small study of Chinese CSOs, Chan et al. (2016) used both objective and subjective measures of wellbeing. The researchers found that over 70% of respondents reported moderate or high psychological distress. However, regarding the single-item wellbeing question, only 10% reported poor quality of life, 54% reported neither good nor bad, and 30% reported a good quality of life. This incongruence may indicate there is not always a direct parallel between the two measures. Cunha and Relvas (2015) also used a subjective wellbeing measure, the QOL Inventory, in their study of 13 spouses. They found the total QOL scores for CSOs were similar to population norms. However, in looking at each of the four domains separately, CSO wellbeing was significantly reduced in two areas: family friends and health, and financial wellbeing. Given the different areas where gambling-related harm can impact CSOs, it follows that their wellbeing could be impacted in only some domains. This may partially explain some of the mixed findings in the larger studies, yet the small sample in this study makes generalization difficult.

The qualitative studies consistently reported CSOs experienced harms due to other’s gambling and found they are impacting the quality of life and wellbeing of CSOs. For example, researchers such as Holdsworth et al. (2013) and Mathews and Volberg (2013) found partners experience a range of negative impacts, including uncertainty around financial security, emotional distress, and frustration and fear, which impact their quality of life and wellbeing. Similar wellbeing impacts were found in children, with Darbyshire et al. (2001, p. 24) concluding the pervasive loss experienced by children living in families with gambling problems is a ‘threat to their overall well-being’.

Regarding family violence, all studies except Schluter et al. (2008), reported that CSOs are more likely to experience family violence than non-CSOs (Balci & Ayranci, 2005; Gokler et al., 2014; Izmirli et al., 2014; Lesieur & Rothschild, 1989; Liao, 2008; Suomi et al., 2013; Svensson et al., 2013). These findings are consistent with the current understanding that family violence is relatively common in households where there is a gambling problem (Dowling et al., 2018, 2019; Roberts et al., 2018, 2020; Suomi et al., 2018). Balci reported that over 80% of women sent by the police to the Forensic Medicine Council in Turkey had a partner with gambling and/or alcohol
problems. Over a third of the women directly attributed their assault to these problems. Muelleman et al. (2002) found women presenting to hospital emergency rooms were at increased odds of having experienced intimate partner violence if their partner was experiencing a gambling problem. Unexpectedly, and contrary to other findings, Schluter et al. (2008) found no association between intimate partner violence and gambling problems, which the authors partly attributed to the small number of people with gambling problems identified in their study. In these types of studies, family violence was not usually reported as a direct impact on wellbeing; however, there are demonstrated links between them (Poutiainen & Holma, 2013).

Only two longitudinal studies explored CSO wellbeing. Vitaro et al. (2008) examined whether a parental gambling problem during a child’s mid-adolescence was related to adjustment problems in early adulthood. They found an increase in depressive symptoms during this time; however, they found this to be associated with ineffective parenting rather than the parental gambling problems. Svensson et al. (2013) compared participants who had originally identified as CSOs with those who were either still CSOs, or ex-CSOs, a year later. They found ex-CSOs reported improved mental health, fewer arguments, fewer difficulties paying bills, and fewer legal problems the following year. These studies are important because, while the designs used were not designed to imply a causal relationship, they did allow the researchers to draw conclusions about the relationship between being close to a person with a gambling problem and aspects of wellbeing. The lack of large-scale population-based longitudinal studies was noted by Paterson et al. (2020) as a significant limitation in gambling-related research and should be a future focus of research in this area.

Summary and implications of CSO harms

In summary, there is consensus across the bulk of studies that CSOs can experience significant harms due to another’s gambling. However, there also appears to be some conflicting findings around psychological health and wellbeing, with some studies finding health and wellbeing impacted in CSOs compared to non-CSOs, and others showing no significant difference between the groups. There may be several possible explanations for this, which need further exploration. Firstly, the previously discussed methodological differences in selecting CSOs are likely to be impacting findings. Also, some studies involved very small samples and as such, a lack of statistical power. The studies finding no psychological impact used treatment-related samples, and treatment may increase family functioning and subsequently, psychological health and wellbeing (Riley et al., 2018). Additionally, the results of Salonen et al. (2018) and Dowling et al. (2009) may indicate a gender difference associated with the impact of gambling-related harms on wellbeing. Finally, when looking at subjective wellbeing, gambling problems might have more specific areas of impact, rather than impacting a person’s overall judgment of wellbeing. Understanding who and how CSOs’ wellbeing is impacted by gambling harms is key to effectively targeting of assistance and support.
Limitations

This study was not conducted as a systematic review, and it is possible that some relevant articles were excluded in our search. Additionally, while we included some examples of grey literature relating to population studies, an exhaustive search of grey literature was not conducted, which again may result in potentially relevant literature being omitted from our discussion. Overall, the narrative literature review is not intended to exhaustively examine the quality of the identified research but rather identify gaps in current understanding and highlight areas for future research.

Conclusions

This broad review identified both knowledge and methodological gaps in the current understanding of the wellbeing impacts of gambling-related harms on CSOs. Firstly, we found that most research assessed wellbeing through objective wellbeing measures, such as via increased incidence of mental health issues and psychological distress. This means little is known about CSOs’ subjective wellbeing. The studies that did explore subjective wellbeing were mainly in small, specific samples and had somewhat conflicting results, warranting further investigation to confirm their findings. There is also some limited evidence that not all areas of wellbeing are being impacted in CSOs. CSO wellbeing needs to be further explored using multi-dimensional objective and subjective wellbeing measures, enabling a meaningful quantification of the degree to which CSOs are affected by gambling-related harm, including a detailed analysis of specific areas of impact.

The literature review also revealed methodological gaps in existing research. Overall, the generalizability and comparability of much of the literature is limited. This is due to the use of small samples, primarily comprising partners of treatment-seeking gamblers, or alternatively the use of widely disparate criteria to identify CSOs. Extensive community-based research, using large samples which contain a more comprehensive range of CSOs (rather than just partners or those identifying as harmed), needs to be conducted. This approach would enable researchers to compare the impact of gambling-related harms on the wellbeing of CSOs across different relationships to the person with first-order gambling problem. Additionally, there is very little research looking at how gambling-related harms impact CSO wellbeing over time, or which attempts to explore the causal relationship between variables. Greater use of longitudinal data will allow researchers to explore these issues. Lastly, a critical distinction needs to be made in future research that addresses how CSOs are defined. CSOs could be defined as anyone who knows a gambler, the gambler’s close contacts, the gambler’s family members (only), or people harmed by a gambler. Each of these definitions has important implications for findings, particularly in relationship to the experience of harm.

To our knowledge, this is the first paper to specifically examine wellbeing among CSOs, rather than focusing on harms. Understanding and addressing both the knowledge and methodological gaps associated with CSO wellbeing will lead to a more complete understanding of CSOs at the population-level and the extent of the impact of gambling-related harms on health and wellbeing. In addition, identifying the range of CSOs harmed by another’s gambling is key to the effective targeting of assistance and help
for this vulnerable group. Finally, a fuller understanding of the range of ways in which gambling impacts the health and wellbeing of CSO is relevant to help-providers and might be used to potentially identify CSOs as well as inform treatment and prevention efforts.

Note: Data sharing is not applicable as no new data was generated.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

**Notes on contributors**

*Catherine Tulloch* is a PhD candidate and research assistant at Central Queensland University, Sydney. Her research focus is on understanding the impact of gambling-related harm on health and wellbeing.

*Matthew Browne* completed a PhD in psychophysiology methodology in 2002, publishing several novel methods for the analysis of EEG recordings. He has held continuing posts in major international research organizations including CSIRO. His main interests lie in the application of statistical and machine learnings methodologies across several disciplines.

*Nerilee Hing*, PhD, is a Research Professor in the Experimental Gambling Research Laboratory, School of Health, Medical and Applied Sciences at Central Queensland University Australia. Her research focuses on gambling behaviour, problems and harm, impacts of gambling on vulnerable groups, and harm minimization and consumer protection in gambling.

*Matthew Rockloff* received a PhD (Psychology) from Florida Atlantic University in 1999. He was honored as a Jack Walker Scholar and an Aurel B. Newell Fellow (twice). He was named in the Top 15 Unijobs Lecturer of the Year Awards thrice (2011-2013) and received the 2017 Ig Nobel award (Economics).

*Margo Hilbrecht* received a PhD in leisure studies in 2009 from the University of Waterloo and completed a postdoctoral fellowship at the Centre for Families, Work, and Well-Being, University of Guelph. She is the Interim Program Director at the Vanier Institute of the Family and holds an adjunct appointment at the University of Waterloo, Canada.

**ORCID**

Catherine Tulloch [http://orcid.org/0000-0002-2842-5110](http://orcid.org/0000-0002-2842-5110)
Matthew Browne [http://orcid.org/0000-0002-2668-6229](http://orcid.org/0000-0002-2668-6229)
Matthew Rockloff [http://orcid.org/0000-0002-0080-2690](http://orcid.org/0000-0002-0080-2690)


2.3 Update

In the time since this review (July 2020) and thesis submission (2023), there have been several additional papers which warrant discussion. These papers were identified over the course of the thesis, predominantly by various publisher and Google Scholar ‘alerts’. However, at the time of writing, for completeness, a new search was conducted using the same search terms and procedures as in the published literature review.

This update found several additional prevalence studies conducted in Australia (Hing, Russell, et al., 2022; Suomi, Watson, et al., 2022) and Finland (Castrén et al., 2021; Lind et al., 2022). One focused exclusively on the prevalence of children impacted by another’s gambling (Suomi, Watson, et al., 2022). The others measured harms using Langham et al.’s (2016) broad categories. These studies are similar in methodology and findings to the prevalence studies discussed in the literature review. The harms most commonly reported were emotional, relational, and financial, and, where health and wellbeing were examined, it was via objective measures. There was an additional focus in these studies on examining differences between CSO types (such as family vs non-family members), with those with familial relationships reporting the greatest harm. Ferland and colleagues’ (2021) qualitative study had a similar focus, finding that the harm experienced was based on the financial and emotional relationship with the gambler. There were also more general harm-focused, small qualitative studies (Azemi et al., 2023; McCarthy, Thomas, Pitt, Warner, et al., 2022; Suomi et al., 2023; Takiguchi et al., 2022) consistent with those discussed in the literature review.

The literature reviews identified key gaps in the literature, which informed the methodological approach and key research questions in the thesis. This process is discussed in Chapter 3.
Chapter 3 - Methodological Approach, Research Design, and Framework

“They are in a whirlwind of chaos and they pick you up, so you get caught up in it too”

[Friend, Female]⁴

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⁴ These quotes were offered by participants as part of the data collection utilised in Chapter 8.
This chapter outlines the research design and introduces the series of studies used to address the research aim: understanding how and when gambling problems impact the health and wellbeing of CSOs of people who gamble.

3.1 Research Design

Below is a brief recap of the main literature review findings and research questions developed from these insights. The empirical research consists of two distinct stages, secondary data analysis and primary data collection and analysis, which will be described in turn.

3.1.1 Literature Review

The literature review identified key methodological and knowledge gaps in CSO health and wellbeing. This information informed the methodological framework used to approach the research problem. A key methodological issue with existing research is that it predominantly uses small samples, primarily comprising partners of people who seek treatment for their gambling problems (see Table 1, Chapter 2). This narrow focus limits the generalisability of these findings. It means there is little known about CSOs associated with less severe problems or those associated with gamblers who do not seek treatment. Another methodological issue is the lack of longitudinal investigation. There is minimal research exploring how gambling-related harms impact CSO wellbeing over time or research that attempts to explore the temporal and causal relationship between variables. In terms of knowledge gaps, the literature review identifies a lack of knowledge about CSOs' subjective wellbeing. Existing research predominantly uses objective wellbeing measures, with a very small number of studies (utilising small specialist populations) examining any aspects of
subjective wellbeing. Additionally, there is conflicting or limited evidence around which health and wellbeing areas are impacted, possibly due to the methodological issues around samples, or lack of longitudinal investigation. Overall, these factors make it unclear exactly which CSOs are likely to experience health and wellbeing harm and in what way. From these insights, the methodological approach for this thesis was formulated, and a list of key research questions developed.

3.1.2 Research Questions

- How does CSOs' subjective wellbeing compare to that of non-CSOs?
- How does exposure to gambling problems impact the health and wellbeing of children?
- Are the health and wellbeing impacts limited to CSOs of people with severe gambling problems (PGSI 8+), or do they extend to CSOs exposed to less severe problems?
- Are the health and wellbeing decrements found in CSOs directly attributable to gambling problem exposure?
- How do different relationships and closeness to the person who gambles affect CSOs' health and wellbeing?

3.1.3 Secondary Data Analysis

A critical methodological gap is a need for large, longitudinal, community-based quantitative studies exploring the health and wellbeing of a broader range of CSOs than partners or those identifying as having been harmed. Collecting large, population-based datasets requires considerable time and money (Boslaugh, 2017). Therefore, the use of secondary data analysis of publicly available datasets can provide significant advantages. For example, according to Boslaugh (2017) and Vartanian (2010), these datasets can be larger and more comprehensive than primary data collected for a specific purpose. For instance, large-
scale secondary datasets often involve longitudinal designs and are population-representative. Large-scale multi-purpose datasets often offer higher quality design and collection practices, including complex sampling techniques. Finally, they can be economically advantageous. Secondary analysis has been previously used in gambling research. For example, it has documented the magnitude of health problems associated with gambling, such as the extent of physical and psychological health problems in people experiencing first-order problems with gambling (Bonnaire et al., 2017; Griffiths et al., 2010).

This thesis aims to conduct secondary analyses utilising high-quality datasets – those collected by highly credible, reputable sources which use sophisticated sampling techniques to obtain large and relatively representative community samples. Three appropriate datasets were identified:

- The Household Income and Labour Dynamics in Australia (HILDA) Survey (Department of Social Services & Melbourne Institute of Applied Economic and Social Research, 2019). HILDA is a population-representative, longitudinal survey of Australian households which has been running since 2001 (Watson & Wooden, 2012). It is funded by the Australian Government and designed and managed by the University of Melbourne. The survey collects a broad range of social and economic information and has included questions on gambling behaviour in two of its 18 years (2015 and 2018).

- The Quinte Longitudinal Study (QLS: Williams et al., 2006). The QLS is one of very few large-scale (N=4,121) longitudinal gambling-focused studies (Williams et al., 2015). The study was commissioned by the Ontario Problem Gambling Research Centre and conducted in the Quinte regions of Ontario, Canada. The study was designed to follow the impacts of a new gambling venue. However, this did not happen, and the original study was terminated. Instead, the cohort was maintained to understand the stability
of problem gambling over time. The study had an extremely high retention rate, with a five-year cohort retention of 94% (McLaughlin et al., 2013). While not intentionally designed to be representative, the QLS sample is generally considered to accurately reflect the demographic characteristics of the Canadian adult (15+) population. The survey collected a range of gambling and wellbeing data.

- The Longitudinal Study of Australian Children study (LSAC; Department of Social Services et al., 2022; Mohal et al., 2021). The LSAC is a longitudinal study that began in 2004 and follows two large representative samples of Australian children: cohort B began assessing participants from birth, and cohort K started at kindergarten age (4–5 years). Participants were recruited using a probability sample design. The study focuses on development and wellbeing topics such as health, family, education, parenting, and peers. In addition, it includes questions about gambling completed by the parents.

### 3.1.4 Primary Data Collection and Analysis

Alongside the advantages of using population-based samples come some limitations. Population surveys tend to have a relatively low prevalence of people experiencing problems with gambling and those exposed to them. This is partly due to the actual low prevalence of problem gambling in the community. However, it may also be due to other factors, such as those outlined by Roberts et al. (2022). Roberts et al. purport that population surveys will likely under-report gambling-related harm for two reasons. First, the populations used usually exclude people who are homeless or residing at institutional addresses (who are at elevated risk of problems with gambling). Second, under-reporting may occur due to the unreliability of self-report, the use of socially desirable responses, and long surveys which would tend to discourage completion by those with high impulse levels (such as those with gambling
problems). The ultimate issue with the low prevalence of CSOs is the associated low statistical power. Statistical methods in our studies attempt to address these issues (as outlined in the individual methods chapters). However, to complement the population studies, this thesis also incorporates a quantitative study using a large non-treatment-related purposeful sample of CSOs. This study uses a range of measures covering our conceptual model (Figure 1.10.1), including the severity of the gambling problem, gambling harms experienced, and a broad range of subjective and objective wellbeing measures. Collecting these in one study allows for examining the relationship between the variables and understanding which CSOs are harmed, and on which aspects of health and wellbeing this harm has the most significant impact.

3.2 Studies

3.2.1 Study 1 – The Subjective Wellbeing of CSOs

Study 1 (Tulloch, Hing, et al., 2021) uses the HILDA and QLS datasets to explore CSOs’ general subjective wellbeing. The study describes the prevalence and risk factors of CSOs, compares the differences between CSO and non-CSO subjective wellbeing, and examines whether the relationship to the person who gambles (i.e. family, friend) impacts CSO subjective wellbeing.

3.2.2 Study 2 – The Health and Wellbeing of Children Exposed to Gambling Problems

Using the LSAC dataset, this study (Tulloch et al., 2022) explores the health and wellbeing of children exposed to household gambling problems. The study expands upon understanding of the relationship between the severity of parental gambling problems and a broad range of health and wellbeing-related variables.
3.2.3 Study 3 – CSO Health and Wellbeing Across a Range of Gambling Problem Severity

This study (Tulloch, Hing, et al., 2023) uses HILDA data to explore the health and wellbeing of CSOs exposed to a range of gambling problem severity in their household. The study aims to understand whether measurable health and wellbeing decrements are limited to CSOs living with those with severe gambling problems (PGSI 8+) or extend to CSOs exposed to less severe problems (PGSI 1–7). This study also broadens the type of subjective wellbeing analysed, examining a range of different domains rather than just general wellbeing as analysed in Study 1.

3.2.4 Study 4 – A Longitudinal Investigation of CSO Health and Wellbeing

This longitudinal study (Tulloch, Browne, et al., 2023) builds upon cross-sectional investigations by utilising 18-years of HILDA data to explore the health and wellbeing of CSOs in the years prior to them being exposed to a gambling problem. The study aims to understand which aspects of health and wellbeing are likely to be directly related to exposure to a gambling problem.

3.2.5 Study 5 – Who Experiences Harm, and How this Relates to Health and Wellbeing

This study (Tulloch et al., Submitted 13-2-2023) uses a large purposeful sample of CSOs to understand which CSOs are most vulnerable to health and wellbeing harms. Specifically, it examines how different relationships and closeness to the gambler impact the experience of CSO harm and how this relates to a broad range of CSO health and wellbeing measures.

3.3 Framework

Figure 3.3.1 illustrates how each of the studies fits within the conceptual model illustrated earlier.
Figure 3.3.1 Conceptual framework including the program of studies
3.4 Ethics

Ethics statements are included within each of the studies.
Chapter 4 - The Subjective Wellbeing of CSOs (Study 1)

“(I felt) extremely stressed and overwhelmed by the situation,
I tried and tried to help but he kept saying it will be fine, it will be fine, it will all work out,
but that scared me more”

[Sibling, Female, 44 years]

“I get very stressed when I hear he loses so much money and can’t see the gravity of his losses”

[Other family member, Male, 69 years]5

5 These quotes were offered by participants as part of the data collection utilised in Chapter 8.
4.1 Introduction

Study 1 investigates the general subjective wellbeing of CSOs using two large population datasets, HILDA and QLS. This study is the first to explore subjective wellbeing in large population samples. It adds knowledge on this previously unknown area of CSO health and wellbeing – how CSOs feel about and evaluate their lives. The study addresses three identified gaps in the literature. First, the lack of knowledge about CSOs’ subjective wellbeing. The literature review identifies that most research employs only objective wellbeing measures, such as increased incidence of mental health issues and psychological distress, in assessing wellbeing. This finding means that little is known about CSOs’ subjective wellbeing. Studies that do explore subjective wellbeing use small, specific samples and report conflicting results that need further investigation (Cunha and Relvas 2015; Chan et al. 2016; Jacobs et al. 1989). Second, the literature review identified a lack of information about CSOs at the population level outside Scandinavia. Finally, the literature review finds potential issues about how CSOs are identified for research due to the wide variations of how CSOs are identified. Some studies rely on self-identification (e.g., Salonen et al. 2016; Wenzel et al. 2008), which has merits but can result in over- or under-attribution of gambling problems. Other research identifies CSOs based on experienced harm (e.g. Stevens 2017), which may only capture those most negatively affected and overlook others. Other studies focus on treatment-seeking samples (e.g Dowling et al. 2014; Kwan, Tse, and Jackson 2020), which, while convenient, aren’t necessarily representative. Each identification method has pros and cons, affecting the comparability and generalisability of findings and hindering easy comparison between studies. The current study uses two methods of identifying CSOs in the community to allow for discussion about the consistency
of the results across methods. One group of participants self-identified as being close to someone with a gambling problem (QLS), while the other group was identified as living in a household with someone scoring 8+ on the PGSI (HILDA). Using non-first-hand methods of identifying CSOs (HILDA) has advantages. Not all CSOs are aware of the gambling problem (Kourgiantakis et al., 2013) or, due to the stigma associated with gambling problems (Hing et al., 2014; Holdsworth et al., 2013), not all CSOs might be comfortable disclosing this information. However, it is also important to note that people who gamble sometimes try to reduce or downplay the harms they have experienced from gambling and, consequently, may also underreport the severity of the problem (Productivity Commission, 2010). Using both methods in this study enables greater insight into similarities and/or differences in results across distinct CSO identification methods.

4.2 Manuscript

This chapter contains a copy of a published manuscript. See Appendix B for the Declaration of Co-Authorship and Copyright.

The effect of gambling problems on the subjective wellbeing of gamblers’ family and friends: Evidence from large-scale population research in Australia and Canada

CATHERINE TULLOCH¹, NERILEE HING², MATTHEW BROWNE², MATTHEW ROCKLOFF² and MARGO HILBRECHT³,⁴

¹ School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, NSW, Australia
² School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, QLD, Australia
³ Greo, Ontario, Canada
⁴ University of Waterloo, Ontario, Canada

ABSTRACT

Background and Aims: Excessive time and money spent on gambling can result in harms, not only to people experiencing a gambling problem but also to their close family and friends (“concerned significant others”; CSOs). The current study aimed to explore whether, and to what extent, CSOs experience decrements to their wellbeing due to another person’s gambling. Methods: We analysed data from The Household Income and Labour Dynamics in Australia Survey (HILDA; N = 19,064) and the Canadian Quinte Longitudinal Study (QLS; N = 3,904). Participants either self-identified as CSOs (QLS) or were identified by living in a household with a person classified in the problem gambling category by the PGSI (HILDA). Subjective well-being was measured using the Personal Wellbeing Index and single-item questions on happiness and satisfaction with life. Results: CSOs reported lower subjective wellbeing than non-CSOs across both countries and on all three wellbeing measures. CSO status remained a significant predictor of lower wellbeing after controlling for demographic and socio-economic factors, and own-gambling problems. There were no significant differences across various relationships to the gambler, by gender, or between household and non-household CSOs. Discussion and Conclusions: Gambling-related harms experienced by CSOs was reliably associated with a decrease in wellbeing. This decrement to CSO’s wellbeing was not as strong as that experienced by the person with the first-order gambling problem. Nevertheless, wellbeing decrements to CSOs are not limited to those living with a person with gambling problems in the household and thus affect many people.

KEYWORDS

problem gambling, concerned significant others, gambling harms, subjective wellbeing, HILDA, Quinte Longitudinal Study

INTRODUCTION

Intrinsic to gambling-related harm, and a crucial part of its definition, is a reduction of health and wellbeing suffered by affected gamblers and potentially also to those around them (Langham et al., 2016). Several researchers have modelled this relationship between gambling problems and wellbeing (e.g. ACIL Allen Consulting et al., 2017; Browne & Rockloff, 2019). Gambling exceeding sustainable resources of time and money and/or behavioural addiction,
can result in experiencing gambling-related harms, leading to a reduction in wellbeing. However, it is not clear whether this impact on wellbeing also applies to those in close relationships with people experiencing gambling problems (i.e., CSOs). The purpose of the current study is to discover whether, and to what extent, CSOs experience decrements in subjective wellbeing as a consequence of another person’s gambling.

CSOs often experience gambling-related harms, which are understood to originate with the actions of the gambler themselves, and then spread to surrounding family and friends (Jeffrey et al., 2019; Riley, Harvey, Crisp, Batterbye, & Lawn, 2018). Kourgiantakis, Saint-Jacques, and Tremblay (2013) and Riley et al. (2018) identified a range of harms experienced by CSOs. These harms can be experienced directly by the CSO via financial difficulties, physical and mental health problems, and psychological distress. They may manifest within their relationships as, for example, increased conflict and violence. As well as direct financial or health-related impacts, their wellbeing may also be impacted by emotional contagion; where the negative emotions and related behaviours of one person may trigger similar emotions and behaviours in others (Fowler & Christakis, 2008). Harm can also be directed to CSOs from outside the relationship, such as the experience of discrimination and stigma, or involvement with legal problems brought about by the gambling. From the basic definition of gambling-related harm, these experiences are assumed to have an impact on a CSO’s wellbeing.

The concepts of health and wellbeing are often conflated. Health is “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity” (World Health Organization, 2020, para. 1), while wellbeing can be conceptualised as individuals “judging life positively and feeling good” (Centers for Disease Control and Prevention, 2018, sec. 4). Health has typically received much more attention than wellbeing with respect to gambling problems, however, this is changing. In examining subjective wellbeing, or a “person’s cognitive and affective evaluation” of their life (SWB; Diener, Oishi, & Lucas, 2012, p. 63), recent studies have shown that having a gambling problem is associated with decreased SWB (Awaworyi Churchill & Farrell, 2020; Blackman, Browne, Rockloff, Hing, & Russell, 2019; Farrell, 2018). In research exploring CSO wellbeing, CSOs have been found to show signs of high psychological distress (Chan, Dowling, Jackson, & Shek, 2016; Hodgins, Shead, & Makarchuk, 2007) and mood disorders (Dannon, Lowengrub, Aizer, & Kotler, 2006; Svensson, Romild, & Shepherdson, 2013; Wenzel, Ören, & Bakken, 2008). Lower SWB has been reported in children (Jacobs et al., 1989) and adults (Centre for Social and Health Outcomes Research and Evaluation & Te Ropu Whariki, 2008), however another study reported no SWB impacts to the majority of CSOs (Bellringer et al., 2013). Cunha and Relvas (2015) found total Quality of Life (QOL) Inventory scores for CSOs were similar to population norms; however, wellbeing was significantly reduced across two domains “family friends and health” and “financial wellbeing.” Overall, most existing studies use small, specialised samples making it difficult to evaluate or generalise the findings.

It is difficult to establish how many people are negatively affected by another person’s gambling. Large population-representative studies examining gambling-related harm to CSOs have been conducted in Scandinavian countries (Svensson et al., 2013; Wenzel et al., 2008) and in some Australian states (ACIL Allen Consulting et al., 2017; Paterson, Leslie, & Taylor, 2019; Rockloff et al., 2020; Stevens, 2017; Woods, Sproston, Brook, Delfabbro, & O’Neil, 2018). These studies found the general population prevalence of CSOs varied widely, between 2% and 19%, which may be due to methodological differences in identifying and defining CSOs. Taking a different approach, Goodwin, Browne, Rockloff, and Rose (2017) estimated that around six people are impacted significantly by each problem gambler (Goodwin et al., 2017). Despite the evidence of absolute harm among CSOs, no population-representative studies have analysed the scale of impacts from gambling on CSOs’ SWB.

Aims and objectives

The paper uses secondary analysis of existing population studies to explore the SWB of CSOs, specifically aiming to:

1. Describe the prevalence and risk factors of CSOs in Australia and Canada
2. Assess if the SWB of CSOs is lower than people without a person with a gambling problem in their lives, and how this compares to the SWB of the person with the gambling problem
3. Assess whether the relationship to the person experiencing the gambling problem (e.g., spouse, friend) impacts CSOs’ wellbeing, and
4. Identify the unique impact of being a CSO on SWB, after controlling for potential personal gambling problems of the CSO, as well as demographic and socioeconomic factors of the CSO/household.

METHODS

Participants and procedure

This study conducted secondary analysis of The Household Income and Labour Dynamics in Australia Survey (HILDA3; Department of Social Services & Melbourne Institute of Applied Economic and Social Research, 2019) and the

3This paper uses unit record data from Household, Income and Labour Dynamics in Australia Survey [HILDA] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS’ contractors or partners. DOI: 10.26193/IYBXHM.
Canadian Quinte Longitudinal Study (QLS; Williams et al., 2006). These datasets provide the necessary information to identify CSOs, and appropriate SWB measures. Australia and Canada provide a useful point of comparison. They have similar socioeconomic and cultural characteristics, as well as similarities in policy frameworks (such as transitioning to public health policy models [Productivity Commission, 2010]), and gambling behaviours, including problem gambling prevalence rates (Armstrong & Carroll, 2017; Williams et al., 2021). However, they have different regulatory approaches to gambling and areas of research focus, as detailed in Baxter, Hilbrecht, and Wheaton (2019). The following provides an overview of the datasets. Full information for HILDA can be found in Summerfield et al. (2019) and Watson and Wooden (2012), and information on the QLS in Williams et al. (2015).

HILDA is an ongoing Australian longitudinal survey that began in 2001. The survey collects a broad range of social and economic information. Wave 1 started with a large national probability sample of 7,682 Australian households and extended to include new household members as household compositions changed. The sample was selected using a multi-stage approach covering all Australian households, except those in very remote locations (0.8%; Australian Institute of Health and Welfare, 2019). In Wave 11, the sample was topped up with an extra 2,153 households. By wave 18, there were 9,639 responding households, comprising a total of 23,237 persons, including 4,831 children under 15 years. Participants aged 15 and over were asked to respond to a “Person Questionnaire”, which included questions about wellbeing, and was conducted via face-to-face interview, and a paper-based, privately completed “Self-Completion Questionnaire”, which included gambling-related questions.

The QLS is a large-scale gambling study conducted in the Quinte regions of Ontario, Canada between 2006 and 2011. It was originally designed to follow the impacts of a project to support gambling reform in the Quinte regions of Ontario, Canada between 2006 and 2011. It was originally designed to follow the impacts of a project to support gambling reform in the Quinte regions of Ontario, Canada between 2006 and 2011. However, they have different regulatory approaches to gambling and areas of research focus, as detailed in Baxter, Hilbrecht, and Wheaton (2019). The following provides an overview of the datasets. Full information for HILDA can be found in Summerfield et al. (2019) and Watson and Wooden (2012), and information on the QLS in Williams et al. (2015).

In HILDA, CSOs were identified as people living in the same household as others classified as being “problem gamblers” by the PGSI (PG). While all people aged 15 and over (“adults”) were asked to complete the Self-Completion Questionnaire containing the PGSI, some did not. In this case, where one or more adults in the household did not complete the PGSI, all household members were excluded from this study (n = 4,173) as their CSo status was unknown. If all other adults in the household did complete the PGSI and were not a PG, the individual was allocated to the “non-CSO” group. If any other adult in the household was identified as a PG, then the person was categorised as a “household CSO”, regardless of their own PGSI status (i.e., if two PGs lived in the same household, they would both be categorised as CSOs as they were living with a PG). PGs who were not also CSOs were categorised exclusively as “PG.” This ensured the “non-CSO” group contained only people without a gambling problem in the household. Personal gambling-risk status was accounted for as a covariate in analysis, so as not to confound personal gambling problem impacts with CSO-related impacts. Once identified, the CSO’s relationship to the PG was classified by the groups: “partner”, “parent/grandparent”, “child/grandchild under 15 years”, “child/grandchild 15 years and over”, “sibling”, “friend” and “other/unknown”.

In the QLS, participants were asked, “how many of your close friends/family would you say have had gambling problems in the past 12 months? Note: Someone is a “problem gambler” if significant problems (e.g., psychological, health, financial, school/employment, social, illegal activity) have occurred to the individual, someone in the person’s immediate social network as a consequence of that person’s gambling”. A similarly phrased question then asked about PGs “in their household”. Responses were “yes”, “no” and “unsure”. We presented “unsure” in the descriptive statistics but excluded them from further analysis to guarantee the inclusion of only those CSOs who positively identified gambling as a problem. An integrated variable was then created from these two questions. This variable identified people without a PG in their life (non-CSO); or with at least one close friend/family member (“non-household CSO”), or member of their household (“household CSO”), with a gambling problem. Again, PGs who were not also household CSOs were categorised as “PG”, meaning there are no PGs within the non-household CSO or non-CSO categories. Participants were asked about their relationship to the person with the gambling problem within their household, and these were classified as per HILDA.

Subjective Wellbeing: HILDA utilises a single-item life satisfaction question: “All things considered, how satisfied are you with your life?” Responses are rated on an 11-point scale from 0 (totally dissatisfied) to 10 (totally satisfied). The QLS contains the Personal Wellbeing Index (PWI, International Journal of Behavioral Addictions 3:60/31/32/...
Wellbeing Group, 2013), a self-report measure covering seven core domains of quality of life (Cummins, Ekersley, Pallant, van Vugt, & Misajon, 2003). The first question asks, “How satisfied are you with your standard of living?” and is rated on a scale of 0 (completely dissatisfied) to 10 (completed satisfied). Participants are then asked to similarly rate other areas of wellbeing, including their health, achievements, personal relationships, safety, community and future security. Scores were summed and standardised, resulting in a score ranging from 0 to 100 (International Wellbeing Group, 2013). Reported Cronbach alpha range between 0.70 and 0.85 (International Wellbeing Group, 2013); in this study, Cronbach alpha was 0.88. Additionally, single-item life satisfaction and happiness questions asked participants: “In the past 12 months I would rate my overall level of (life satisfaction/happiness) as” from 1 (extremely low) to 7 (extremely high). While conceptually different to PWI and life satisfaction, happiness is closely related (Medvedev & Landhuis, 2018) and an important construct to understand in relation to CSO global wellbeing. SWB score distributions in this study showed a typically-found skew, with most respondents reporting within the higher range (OECD, 2013).

Control Variables – Both datasets assessed a range of socio-demographics. Where possible, these were grouped to contain a set of common responses. For example, marital status variables were condensed in both datasets to reflect “never married”, “married/cohabiting”, “separated/divorced”, and “widowed”; education as “did not complete high school”, “completed high school” and “completed further education”; and employment as “part-time”, “full-time”, “unemployed”, “retired”, or “other.” Household income could not be standardised across both datasets due in part to (unstable) currency differences and, in each case, uses a condensed version of the original groupings. In HILDA, household debt was collected as an absolute number, while the QLS collected nominal debt categories containing figure ranges.

Statistical analysis

Although the source datasets are longitudinal, the current study applies a cross-sectional analysis on selected waves only. We analysed QLS Wave 3, the first to collect comprehensive wellbeing data, and HILDA Wave 18, the most recent to collect gambling-related data. Analysis for each dataset was conducted separately. Data weights (supplied; Watson & Wooden, 2012) were used where noted to weight the HILDA results to the Australian population. While not designed to be representative, the QLS sample is described as overall reflective of the demographic profile of the Canadian adult (15+) population, except for the following minor differences. Younger ages (18–24) were slightly under-represented, and couples in relationships, post-secondary education, and gambling problems were over-represented. QLS sampling weights are not available.

Initial prevalence statistics in Australia included all participants identified as “Household CSOs” or “Non-CSOs” \((N = 19,064, 51.2\% \text{ female})\). For subsequent analysis, respondents aged under 15 and others who did not complete the SWB question were removed, leaving a sample of 14,768. Descriptive statistics detailed the prevalence and risk factors, and group differences were assessed using chi-square tests and t-tests. One-way between groups ANOVAs were conducted to explore the impact of gambling on SWB, as measured by each dataset. Ordinary least squares regression was used to isolate CSO status’ impact on SWB whilst controlling for other factors. Ordinal independent variables (income and debt) were treated as continuous. Assumptions of normality, linearity, independence of residuals, and homoscedasticity were met, and there was no evidence of multicollinearity in either regression calculation.

Results

Prevalence and risk factors

In Australia, 1.4% \((n = 276)\) reported living in the same household as a PG (“household CSOs”), with PGs representing a further 1.0% of respondents \((n = 158)\). Weighted for the Australian national population at the time, this equates to approximately 250,000 people impacted by another person’s problem gambling in Australia \((n = 250,640)\). These CSOs ranged in age from 0 to 91 years, with a mean age of 27.5 years. As seen in Table 1, the majority of household CSOs were children under 15 years (33.3%), followed by partners (28.3%) and parents/grandparents (13.0%).

In the Canadian sample, comprising only adults, 14.7% of respondents were identified as CSOs. Of these, 2% \((n = 78)\) were household CSOs, while the remainder (12.7%, \(n = 494)\) identified non-household family members and/or close friends as PGs (“non-household CSOs”). A further 11% of the sample \((n = 429)\) were unsure whether any close friends or family members had a gambling problem and were excluded from further analysis. PGs comprised 1.4% of the sample \((n = 40)\). The majority of household CSOs were partners (59.0%), followed by parents/grandparents (14.1%) and friends (10.3%). While children under the age of 15 were

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Australia</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child/Grandchild</td>
<td>92</td>
<td>50.0</td>
</tr>
<tr>
<td>Partner</td>
<td>78</td>
<td>70.5</td>
</tr>
<tr>
<td>Parent/Grandparent</td>
<td>36</td>
<td>63.9</td>
</tr>
<tr>
<td>Child/Grandchild</td>
<td>31</td>
<td>6.7</td>
</tr>
<tr>
<td>Sibling</td>
<td>21</td>
<td>38.1</td>
</tr>
<tr>
<td>Friend</td>
<td>16</td>
<td>31.3</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>2</td>
<td>50.0</td>
</tr>
</tbody>
</table>

*Note: children under 15 were not included in the Canadian data.
In the Canadian sample (Table 3) household CSOs are significantly younger than non-CSOs, however, there were no significant differences found between non-household CSOs, household CSOs, and non-CSOs for the demographics of gender, marital status, education, employment, income or household debt. CSOs were more likely to be a moderate-risk gambler than non-CSOs, and 13.9% of household CSOs were also PGs.

**Subjective wellbeing**

In the Australian data, there was a significant difference between the life satisfaction scores of PGs, CSOs and people without a gambling problem in the household (Welch $t$ $(212.128) = 20.64$, $P < 0.001$). Respondents who were PGs ($M = 7.06$, $SD = 1.99$), and CSOs ($M = 7.57$, $SD = 1.67$)
reported significantly lower life satisfaction than non-CSOs ($M = 7.98$, $SD = 1.40$). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for House- hold CSOs was significantly lower than non-CSOs ($P = 0.001$), although significantly higher than for PGs ($P = 0.004$). There was no significant interaction effect with gender ($P = 0.418$, ns). Regarding the relationship to the PG on wellbeing, there was no significant difference between partners, parents/grandparents, children 15 and over, sib- lings, friends, or others ($f (5,165) = 1.99$, $P = 0.083$, ns).

In the Canadian data, there was a significant difference between the PWI scores of PGs, Household CSO's, non-

<table>
<thead>
<tr>
<th>Table 3. The proportion of Canadian CSOs and associated risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (% in sample)</td>
</tr>
<tr>
<td>(n = 78)</td>
</tr>
<tr>
<td>All respondents</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Marital Status</td>
</tr>
<tr>
<td>Never married</td>
</tr>
<tr>
<td>Married/Cohabiting</td>
</tr>
<tr>
<td>Separated/Divorced</td>
</tr>
<tr>
<td>Widowed</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Did not complete high school</td>
</tr>
<tr>
<td>Completed high school</td>
</tr>
<tr>
<td>Completed further education</td>
</tr>
<tr>
<td>Employment Status</td>
</tr>
<tr>
<td>Employed Part-time</td>
</tr>
<tr>
<td>Employed Full-time</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Retired</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Household Income (Canadian Dollars)</td>
</tr>
<tr>
<td>Less than $20,000</td>
</tr>
<tr>
<td>Between $20,000 and $39,999</td>
</tr>
<tr>
<td>Between $40,000 and $59,999</td>
</tr>
<tr>
<td>Between $60,000 and $89,999</td>
</tr>
<tr>
<td>Between $90,000 and $119,999</td>
</tr>
<tr>
<td>More than $120,000</td>
</tr>
<tr>
<td>Household debt (Canadian Dollars)</td>
</tr>
<tr>
<td>$1,000 or less</td>
</tr>
<tr>
<td>$1,000 to $9,000</td>
</tr>
<tr>
<td>$10,000 to $25,000</td>
</tr>
<tr>
<td>$30,000 to $90,000</td>
</tr>
<tr>
<td>$100,000 to $300,000</td>
</tr>
<tr>
<td>Over $300,000</td>
</tr>
<tr>
<td>PGSI</td>
</tr>
<tr>
<td>Non-problem gambler</td>
</tr>
<tr>
<td>Low-risk gambler</td>
</tr>
<tr>
<td>Moderate risk gambler</td>
</tr>
<tr>
<td>Problem gambler*</td>
</tr>
</tbody>
</table>

^ Excluding PGs and "unsure", ^ excluded from Chi-Square test as PGs who were not also household CSOs were categorised as "PGs" and therefore not reported here, ** P < 0.01, *** P < 0.001.
household CSOs, and non-CSOs (Welch t (103.64) = 23.57, \( P < 0.001 \)). PGs reported the lowest mean PWI score, followed by household and non-household CSO, with non-CSO reporting the highest PWI. Significant differences were also found across the groups for life satisfaction (Welch t (104.69) = 20.84, \( P < 0.001 \)) and overall happiness (Welch t (104.67) = 14.83, \( P < 0.001 \)) as described in Table 4. There was no significant interaction effect of gender for either PWI (\( P = 0.393, \text{ns} \)), life satisfaction (\( P = 0.652, \text{ns} \)) or happiness (\( P = 0.492, \text{ns} \)). There were no significant differences across the various relationships of household CSOs to the PG for either PWI, \( f(5,72) = 2.13, P = 0.071, \text{ns} \), life satisfaction (\( f(5,72) = 1.21, P = 0.314, \text{ns} \)) or happiness (\( f(5,72) = 1.10, P = 0.367, \text{ns} \)).

After controlling for demographic and socioeconomic factors that may impact SWB (age, gender, marital status, education, employment, household income and debt and gambling problems), being a household CSO was significantly associated with lower wellbeing in both samples (Tables 5 and 6).

**DISCUSSION**

To our knowledge, this is the first study to use quantitative methods to explore SWB in CSOs and make comparisons to both people with first-order gambling problems and non-CSOs. The results confirm that CSOs experience

| Table 4. Subjective wellbeing of Canadians impacted by a gambling problem |
|-----------------|-----------------|-----------------|-----------------|
|                  | Non-Household CSO | Household CSO | PG              |
| PWI              |                  |                |                 |
| Non-CSO          | 71.06 (16.02)    | 5.12***        | 9.54***         |
| Non-Household CSO| 65.94 (17.63)    | –              | 4.42            |
| Household CSO    | 61.52 (20.36)    | –              | –              |
| PG               | 55.38 (17.59)    | –              | –              |
| Life Satisfaction|                  |                |                 |
| Non-CSO          | 4.81 (1.04)      | 0.19**         | 0.046**         |
| Non-Household CSO| 4.61 (1.11)      | –              | 0.26            |
| Household CSO    | 4.34 (1.34)      | –              | 0.57            |
| PG               | 3.77 (0.82)      | –              | –              |
| Happiness        |                  |                |                 |
| Non-CSO          | 4.75 (1.01)      | 0.16**         | 0.29            |
| Non-Household CSO| 4.60 (1.04)      | –              | 0.13            |
| Household CSO    | 4.46 (1.11)      | –              | 0.59*           |
| PG               | 3.87 (0.86)      | –              | –              |

*Identifies the mean difference is significant at the \( P < 0.05 \) level using posthoc comparisons with Turkey’s HSD, **\( P < 0.01 \), ***\( P < 0.001 \).

| Table 5. Multiple regression predicting life satisfaction for Australians, controlling for demographic, sociographic and gambling-related factors |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | B               | SE              | Beta            | t               | \( P \)          |
| Constant         | 7.59            | 0.07            | –               | 104.66          | 0.000           |
| Gender (1 = male, 2 = female) | 0.06            | 0.02            | 0.02            | 2.60            | 0.009           |
| Age (years)      | 0.00            | 0.00            | -0.03           | -2.59           | 0.010           |
| Marital Status (reference = married) |    |                |                 |                 |                 |
| Never married    | -0.24           | 0.03            | -0.07           | -7.13           | 0.000           |
| Divorced         | -0.42           | 0.04            | -0.10           | -11.31          | 0.000           |
| Widowed          | -0.03           | 0.06            | 0.00            | -0.44           | 0.657           |
| Education (reference = completed further education) |    |                |                 |                 |                 |
| Did not complete high school | 0.20            | 0.03            | 0.06            | 6.55            | 0.000           |
| Completed high school | 0.08            | 0.04            | 0.02            | 2.39            | 0.017           |
| Employment (reference = full-time employment) |    |                |                 |                 |                 |
| Part-time employment | 0.10            | 0.03            | 0.03            | 3.22            | 0.001           |
| Unemployed       | -0.36           | 0.07            | -0.05           | -5.27           | 0.000           |
| Retired          | 0.55            | 0.05            | 0.16            | 12.25           | 0.000           |
| Other            | -0.12           | 0.04            | -0.03           | -2.94           | 0.003           |
| Household Income | 0.07            | 0.01            | 0.12            | 10.87           | 0.000           |
| Household Debt   | 0.00            | 0.00            | 0.01            | 0.81            | 0.418           |
| CSO (0 = no, 1 = yes) | -0.31           | 0.11            | -0.02           | -2.82           | 0.005           |
| PG (0 = no, 1 = yes) | -0.66           | 0.11            | -0.05           | -5.93           | 0.000           |

\( R^2 = 0.005 \)

\( F = 51.43, P < 0.001 \)

Bold indicates significant.
impairments to their wellbeing, based on multiple measures and in two large population samples. These effects are consistent with that found by the Centre for Social and Health Outcomes Research and Evaluations & Te Ropu Whariki (2008). These negative wellbeing impacts for CSOs are also similar to those found for substance-use issues, such as CSOs of people attending in-person treatment for substance abuse (Tait, 2018) and heavy drinkers (Casswell, You, Whariki, & Costanza, 2018). For context, the mean differences found between PGs and CSOs, and CSOs and non-CSOs (0.41–0.51) are comparable to differences found between employed and unemployed, those who do daily physical activity versus those who do not, and those with long term health conditions versus no long term health condition (0.31–0.50) (Kubiszewski, Zakariyya, & Costanza, 2018).

Our study found no significant differences between household and non-household CSOs across any measures (PWI, life satisfaction and happiness), with similar wellbeing impacts regardless of if the CSO was living in the same household with the gambler. While we would expect that people living in the same household as a person with a gambling problem would be at the greatest risk of experiencing harm (cf., Goodwin et al., 2017), our results did not find a detectable difference. However, it needs to be explored whether CSOs within and outside the household are affected in different ways. For example, it might be that household CSOs are more impacted financially, given they are more likely to share finances. Alternatively, non-household CSOs may experience more stress or worry about their family member’s situation.

Congruent with existing research exploring the wellbeing of people with gambling problems (Awaworyi Churchill & Farrell, 2020; Blackman et al., 2019; Farrell, 2018), our study found that those with first-order gambling problems reported lower mean wellbeing scores than CSOs. In Australia, these differences were significant. However, while Canadian CSOs had significantly higher happiness than the person with the gambling problem, there was no significant difference between household CSOs and the gambler in the realms of either life satisfaction or PWI, indicating that while CSOs’ affective evaluation of their life (i.e., happiness) was generally more positive than those experiencing the gambling problem, their cognitive evaluation was similar. Further analysis showed that after controlling for a range of socioeconomic and demographic factors associated with SWB (Diener, Suh, Lucas, & Smith, 1999), CSO status remained a significant predictor of SWB, although the effect was smaller than that of personal gambling problems. These effect sizes in the regressions were small and should be interpreted cautiously. However, this is not unusual. Many factors, including societal characteristics, personal characteristics, genetics and demographic variables, can influence SWB, with not all individual predictors exerting large effects (Dolan, Peasgood, & White, 2008; Geerling & Diener, 2020).

CSOs tend to be younger and less well-educated than non-CSOs and more likely to have a gambling problem themselves. However, there was no significant difference in gender or marital status between these two groups. The most common household CSOs (where measured) were children under 15 years of age, although, this study could not focus on wellbeing impacts on these children as these outcomes were not measured. Most of the remaining household CSOs were partners, followed by parents and adult children. In the

### Table 6. Multiple regression predicting life satisfaction for Canadians, controlling for demographic, sociographic and gambling-related factors

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>t</th>
<th>P</th>
<th>95% CI for B Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>75.79</td>
<td>2.71</td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (1 = male, 2 = female)</td>
<td>−0.42</td>
<td>0.66</td>
<td>−0.01</td>
<td>−0.64</td>
<td>0.523</td>
<td>−1.71</td>
<td>0.87</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0.06</td>
<td>0.03</td>
<td>0.05</td>
<td>1.81</td>
<td>0.07</td>
<td>−0.01</td>
<td>0.12</td>
</tr>
<tr>
<td>Marital Status (reference = married)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>−9.98</td>
<td>1.20</td>
<td>−0.18</td>
<td>−8.34</td>
<td>0.000</td>
<td>−12.33</td>
<td>−7.63</td>
</tr>
<tr>
<td>Divorced</td>
<td>−9.64</td>
<td>0.94</td>
<td>−0.21</td>
<td>−10.24</td>
<td>0.000</td>
<td>−11.48</td>
<td>−7.79</td>
</tr>
<tr>
<td>Widowed</td>
<td>−3.87</td>
<td>1.63</td>
<td>−0.05</td>
<td>−2.38</td>
<td>0.017</td>
<td>−7.06</td>
<td>−0.68</td>
</tr>
<tr>
<td>Education (reference = completed further education)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not complete high school</td>
<td>0.12</td>
<td>0.05</td>
<td>0.00</td>
<td>0.12</td>
<td>0.907</td>
<td>−1.94</td>
<td>2.19</td>
</tr>
<tr>
<td>Completed high school</td>
<td>0.17</td>
<td>0.68</td>
<td>0.01</td>
<td>0.24</td>
<td>0.807</td>
<td>−1.16</td>
<td>1.49</td>
</tr>
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<td>Employment (reference = full-time employment)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part-time employment</td>
<td>−2.02</td>
<td>1.07</td>
<td>−0.04</td>
<td>−1.89</td>
<td>0.060</td>
<td>−4.13</td>
<td>0.08</td>
</tr>
<tr>
<td>Unemployed</td>
<td>−11.78</td>
<td>1.51</td>
<td>−0.16</td>
<td>−7.81</td>
<td>0.000</td>
<td>−14.74</td>
<td>−8.82</td>
</tr>
<tr>
<td>Retired</td>
<td>1.61</td>
<td>1.05</td>
<td>0.04</td>
<td>1.53</td>
<td>0.126</td>
<td>−0.45</td>
<td>3.66</td>
</tr>
<tr>
<td>Other</td>
<td>−4.55</td>
<td>1.05</td>
<td>−0.09</td>
<td>−4.33</td>
<td>0.000</td>
<td>−6.60</td>
<td>−2.49</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.00</td>
<td>0.00</td>
<td>−0.01</td>
<td>−0.45</td>
<td>0.654</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Household Debt</td>
<td>0.00</td>
<td>0.00</td>
<td>−0.04</td>
<td>1.94</td>
<td>0.052</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>CSO (0 = no, 1 = yes)</td>
<td>−4.00</td>
<td>1.91</td>
<td>−0.04</td>
<td>−2.09</td>
<td>0.037</td>
<td>−7.75</td>
<td>−0.25</td>
</tr>
<tr>
<td>PG (0 = no, 1 = yes)</td>
<td>−24.95</td>
<td>5.05</td>
<td>−0.11</td>
<td>−4.94</td>
<td>0.000</td>
<td>−34.86</td>
<td>−15.04</td>
</tr>
</tbody>
</table>

R² = 0.015

*Bold indicates significant.*
Australian sample, partners of people with gambling problems were slightly more likely to be female; however, in the Canadian sample, the gender split across partners was similar. Male CSOs were more likely to live in households where the person with the gambling problem was a sibling or friend. Overall, regardless of the CSO’s gender or the relationship to the person with the problem, this study found no substantial difference in impact, with all groups similarly experiencing lower wellbeing than non-CSOs.

This study found household adult CSO prevalence rates ranged between 1.1% and 2% across the two countries. The higher proportion of household CSOs in Canada may be due to two factors. Firstly, there was a slight oversampling of “at-risk” gamblers in the Canadian dataset. Gambling problems often cluster in groups of close friends and family (Mazar, Williams, Stanek, Zorn, & Volberg, 2018; Meisel et al., 2013), and indeed, a much higher percentage (13.9%) of household CSOs in this dataset were experiencing their own gambling problem compared to the Australian dataset (5.2%). Secondly, the Canadian sample comprises self-identified CSOs, rather than the other person completing a formal instrument designed to measure gambling problems, as used in the Australian sample. This means that the extent of the actual gambling problem is arguable. People may over-attribute their difficulties to gambling or be experiencing harms caused by low or moderate-risk gambling.

Limitations and further research

The results of this study should be interpreted considering several limitations. The Australian sample only included people currently living in the same household as people with gambling problems and not those separated or divorced (possibly due to gambling-related problems) or other close family members who reside in separate homes. Directly exploring the wellbeing of CSOs is generally under-researched, with a need to examine potential differences in domains of wellbeing impacted, as impacts may be felt in different areas. The availability of appropriate publicly accessible datasets also limited the study, and future research should be extended to other countries.

It is also important to note the bidirectional relationship between many gambling-related harms and gambling. For example, as well as gambling impacting finances and mental health, gambling may also be used in an attempt to improve financial situations (Tabri, Dupuis, Kim, & Wohl, 2015) or be a coping mechanism for psychological problems (Hartmann & Blaszczynski, 2018). As such, the cause of reduced SWB may predate the gambling problem. Further, it is difficult to isolate the direct effects of gambling harms on wellbeing. People living in a household with gambling problems often have a variety of co-morbid issues (Dowling et al., 2015a, 2015b; Yakovenko & Hodgins, 2018), as well as many other significant stressors in their lives (Tulloch, Browne, Hing, & Rockloff, 2020). Future research may attempt to control for more of these elements to further isolate the impact of gambling on the wellbeing of CSOs.

CONCLUSIONS

Overall, significantly reduced wellbeing in CSOs compared to non-CSOs was found across different countries, time periods, SWB measures, and methods of identifying CSOs. Li, Browne, Rawat, Langham, and Rockloff (2017, p. 223) described people with gambling problems as appearing to “export about half of the harms they experienced to those around them”, which, while recommending caution due to the directional nature of this statement, seems to apply to our findings. These harmful effects of excessive time and money spent gambling are associated with a decrease in wellbeing in CSOs. Although these impacts are not as severe as those experienced by the person with the gambling problem, they also do not appear to be limited to people within a PG’s household. Although the individual wellbeing impact per CSO is less than that experienced by gamblers, because CSOs outnumber gamblers by a significant factor, it appears possible that the aggregate impact to CSOs is larger. As such, the broader cost of gambling harm in the population rests not only with harmed gamblers but includes a much larger group of CSOs who need to be taken into account by policymakers attempting to reduce the burden of gambling-related harms. Therefore, policy considerations and investments should focus on strategies to prevent these harms from occurring initially, such as detailed in Blank, Baxter, Woods, and Goyder (2021), alongside the provision of support and assistance to CSOs.

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Authors’ contribution: CT: conceptualisation and design of the study, data preparation, analysis and interpretation, original draft preparation review and editing. NH, MB, MR and MH: supervision, critical review and editing. The paper uses existing, high quality, publicly available datasets, the authors take responsibility for the accuracy of data analysis.

Conflict of interest: The authors declare no conflict of interest for this study.

The 3-year declaration of interest for each author follows:

• CT is the recipient of a CQUiversity Research Stipend Scholarship and a New South Wales Office of Responsible Gambling part-PHD scholarship.

• NH has received research funds from the Victorian Responsible Gambling Foundation; New South Wales Office of Responsible Gambling; Queensland Justice and Attorney-General; Gambling Research Australia; New Zealand Ministry of Health; Australian Communications and Media Authority; the Alberta Gambling Research Institute; Australian Government Department of Social Services; New Zealand Ministry of Health; and Australia’s National Research Organisation for Women’s Safety.
• MB has received funding from the New South Wales Office of Liquor and Gaming, the Victorian Responsible Gambling Foundation, the Queensland Government Department of Health, the Tasmanian Department of Treasury and Finance, the Alberta Gambling Research Institute, Gambling Research Australia, the New Zealand Ministry of Health, the Department of Families, Housing, Community Services and Indigenous Affairs, the Australian Department of Innovation, Industry, Science and Research, and the Department of Foreign Affairs and Trade.

• MR has received research grants from the Queensland Treasury, the Victorian Treasury, the Victorian Responsible Gambling Foundation, the New Zealand Ministry of Health, the NSW Dept of Industry and Trade, the Department of Social Services, the Alberta Gambling Research Institute and Gambling Research Australia.

• MH has received funding from the Alberta Gambling Research Institute (AGRI) for conference travel.

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Chapter 5 - The Health and Wellbeing of Children Exposed to Gambling Problems (Study 2)

“(I was) constantly homeless, never saw my mother, shoved in a kids room my whole life.

Lived off donations and hand me downs,

*didn’t have the girls’ necessary items such as bras, pads, tampons*”

[Daughter, Female, 28 years]

“(I’m) worried about losing him due to his health and financial conditions”

[Son, Male, 34 years]⁶

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⁶ These quotes were offered by participants as part of the data collection utilised in Chapter 8.
5.1 Introduction

The second study extends knowledge about the potential impacts of gambling harms on children. While qualitative studies in the literature review reported health and wellbeing impacts to children, few community-based quantitative studies examine the health and wellbeing of children affected by another person's gambling. Only one used any measure of subjective wellbeing (Jacobs et al., 1989), and none include a broad range of health and wellbeing variables. The following research addresses these gaps using population-representative data. It investigates various health and wellbeing outcomes of children living with a parent/s experiencing a gambling problem and compares them to children not exposed to a gambling problem.

5.2 Manuscript

This chapter contains a copy of a published manuscript. See Appendix C for the Declaration of Co-Authorship and Copyright.


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Parental Gambling and the Health and Wellbeing of Children Derived From Two Nationally Representative Cohorts of Australian Children

Catherine Tulloch · Nerilee Hing · Matthew Browne · Matthew Rockloff · Margo Hilbrecht

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Abstract
Gambling-related harms can impact the lives of children living with someone experiencing a gambling problem. These harms have been associated with impacts across a number of domains. However, previous studies exploring gambling-related effects on the health and wellbeing of children have had conflicting results. This study aimed to further understand the impact of parental gambling problems on children’s health and wellbeing using nationally representative data from Growing up in Australia: The Longitudinal Study of Australian Children. The subsample of interest contained 3,695 children (49.1% female) across two cohorts aged around 12 and 16 years. Parental gambling problems were measured by the Problem Gambling Severity Index (PGSI). Child health and wellbeing was measured via the Child Health Utility 9D (CHU9D), the Spence Anxiety Scale, the Short Mood & Feelings Questionnaire, the Strengths and Difficulties Questionnaire (SDQ), and self-harm and happiness questions. Across both cohorts, the study found significant associations between parental gambling problems and poorer health, anxiety and/or low mood symptoms, and behavioural and emotional problems in children. The study found that more than 10% of Australian children were living in households with adults experiencing some level of gambling problems, including 1.2% in households with severe problems. Policymakers and educators might help ensure that the appropriate information and support is being provided to these children.

Keywords Gambling harm · Gambling problems · Children · Health · Wellbeing

* Catherine Tulloch
cathie.tulloch@equnmail.com

Extended author information available on the last page of the article

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Introduction

Harms associated with excessive gambling can affect the health and well-being of people close to the affected gambler (close significant others [CSO]; Langham et al., 2016) and can especially have an impact on children living in households where someone is experiencing a gambling problem. These harms affect many areas of the children’s lives. Financial problems are one of the more significant harms associated with gambling. Patford (2009) found that children are often unaware or too young to understand the financial issues related to harmful gambling. However, they can experience their consequences (Langham et al., 2016; Wurtzburg & Tan, 2011), such as missing out on necessities (Landon et al., 2018) or school supplies and trips (Darbyshire et al., 2001; Langham et al., 2016). In addition, gambling problems are associated with relationship difficulties between parents, and between parents and children (Wurtzburg & Tan, 2011), which can contribute to stress and tension within the household, and lead to a child’s loss of trust in the parent (Darbyshire et al., 2001). Many studies have found that children of gamblers are likely to be victims of violence or anger towards them from parents (Iusitini et al., 2011; Landon et al., 2018; Lorenz & Shuttlesworth, 1983). However, using a large nationally representative sample, Afifi et al. (2010) found problem gamblers were less likely to perpetrate minor physical assaults on their children than those classified as non-problem gamblers. Thus, the full picture of how gambling problems affect children is still to be discovered. Overall, households with people living with gambling problems can be tense and chaotic places (Darbyshire et al., 2001; Patford, 2009) that have householders who often struggle with multiple comorbid stressors (Tulloch et al., 2020).

A person who gambles with attendant problems spends less time with their family (Langham et al., 2016), and this has been associated with ineffective (Vitaro et al., 2008) and absent (Darbyshire et al., 2001) parenting, and can lead to children being left unattended (Landon et al., 2018) or neglected (Li et al., 2017). In some cases, other family members are required to support the children (Landon et al., 2018). There is a risk of separation from parents due to divorce (Darbyshire et al., 2001; Jacobs et al., 1989) or the child’s removal from the household (Langham et al., 2016). The children tend to take on increased responsibility (Wurtzburg & Tan, 2011), including household tasks normally viewed as parental responsibilities. Older children and adolescents help in managing finances and providing support to the other parent (Landon et al., 2018; Langham et al., 2016). Children can suffer from stigma, social isolation and lack of social support due to difficulties talking about family problems with those outside the household (Wurtzburg & Tan, 2011), or estrangement from extended family due to gambling problems (Darbyshire et al., 2001). Socialisation to gambling is also associated with the increased risk of the child developing their own gambling problems (Vachon et al., 2004; Walters, 2021; Wurtzburg & Tan, 2011).
Gambling-related harms have been associated with decrements in health and wellbeing. However, findings around the impacts of parental gambling problems on the health and wellbeing of children have been mixed, particularly concerning psychological health. For example, poor child health outcomes are associated with financial problems within the household (Langham et al., 2016), such as a lack of healthy food (Darbyshire et al., 2001) or limited funds for medications, health or dental care (Darbyshire et al., 2001; Dickson-Swift et al., 2005). In addition, children of a parent with a gambling problem have also been shown to experience conduct (Vitaro et al., 2008), delinquency (Walters, 2021), and behavioural problems (Lorenz & Shuttlesworth, 1983), and increased impulsivity-hyperactivity and inattention (Carbonneau et al., 2018). Furthermore, they can have feelings of anger (Lesieur & Rothschild, 1989; Patford, 2009) and distress (Darbyshire et al., 2001; Patford, 2009), and increased risk of suicide attempts (Lesieur & Rothschild, 1989). There are also associations with tobacco, drug and alcohol use (Jacobs et al., 1989) and eating problems (Jacobs et al., 1989; Lesieur & Rothschild, 1989). Overall, Jacobs et al. (1989, p. 265) found that children of problem gamblers reported poorer “quality of youth” than others.

In looking specifically at psychological health, Vitaro et al. (2008) found parental problem gambling associated with symptoms of depression in their children. However, other studies have found no significant difference between children who are CSOs and non-CSOs concerning their psychological health. Comparing children of parents categorised as ‘problem gamblers’ to a normative sample, Dowling et al. (2009) found no statistically significant differences in either depression or anxiety. Lesieur and Rothschild’s (1989) study had a larger percentage of controls unexpectedly experiencing an unhappy state of mind or low mood when compared with children of treatment-seeking gamblers. There may be several reasons for these differences. Vitaro et al.’s (2008) participants were drawn from an extensive community study, while Lesieur and Rothschild (1989) and Dowling et al. (2009) used smaller samples related to treatment-seeking gamblers. Treatment may have a positive effect on the family’s psychological wellbeing (Kourgiantakis et al., 2013).

Additionally, many other factors are associated with a child’s mental health and wellbeing. For example, sports participation is associated with both physical and psychological health benefits (Granger et al., 2017; Graupensperger et al., 2021) and children have reported utilising activities like sports to cope with gambling problems in the family (Wurtzburg & Tan, 2011). However, sports participation can reduce during early adolescence (Rullestad et al., 2021), and there may be barriers to participation such as gender diversity (Storr et al., 2021) or socioeconomic status (Rullestad et al., 2021; World Health Organization (WHO), 2020), although findings can be inconsistent (Sagatun et al., 2008). Overall, a Scottish Government (2020) report found that in children, general health, physical activity, and experiences at home and school were stronger predictors of mental health and wellbeing than socio-demographic factors. In short, household gambling problems are only one determinant, amongst many, that can potentially impact on children’s health and wellbeing.
Aims and Objectives

This study aimed to understand further the impacts of a parental gambling problem on the health and wellbeing of children using population-representative data on Australian children. Specifically, it explores whether harms to the health and wellbeing of children increase with parental problem gambling severity, and if so, whether these associations continue after controlling for selected factors that contribute to children’s wellbeing.

Methods

Study Design

The cross-sectional study is a secondary analysis using data from the Growing up in Australia: The Longitudinal Study of Australian Children\(^1\) study (LSAC; Mohal et al., 2021). The LSAC is a longitudinal study that began in 2004 and follows two large representative samples of Australian children; cohort B began assessing participants from birth, and cohort K started at kindergarten age (4–5 years). The study has a broad focus, examining development and wellbeing topics such as health, family, education, parenting, and peers. Participants were recruited using a probability sample design. Full details of the study design can be found at Mohal et al. (2021) and Usback et al. (2018).

Participants and Procedure

This study utilised only LSAC Wave 7, conducted in 2016. Wave 7 was the only wave in which parental gambling and children’s health and wellbeing were both measured. The LSAC follows two age cohorts separated by around 4 years. Both age cohorts were used in the current study; however, they were analysed and reported separately due to slight differences in variables across cohorts and the differences across age and development. Therefore, no statistical comparison of the two cohorts was conducted. At the time of Wave 7, participants in cohort B were aged around 12 years and cohort K was about 16 years. The sub-samples of interest are described in the results and consisted of participants who completed the health and wellbeing questions and whose parent/s completed the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001).

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\(^1\) This paper uses unit record data from The Longitudinal Study of Australian Children [LSAC] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS’ contractors or partners. https://doi.org/10.26193/BAA3N6
Measures

Parental problem gambling severity was assessed via the PGSI (Ferris & Wynne, 2001), which was self-completed by the adults in the household. The 9-item PGSI is a well-validated measure of gambling problems and identifies symptoms of potentially harmful gambling behaviours (Currie et al., 2013). Summed scores range from 0 to 27, with higher scores representing more severe gambling problems. From these scores, parents can be classified as either a “non-problem gambler” (total score of 0), “low-risk gambler” (1 or 2), “moderate-risk gambler” (3 to 7), or “problem gambler” (8+).

Health-related quality of life (HRQoL) was assessed via the Child Health Utility 9D (CHU9D; Stevens, 2009). The CHU9D is an HRQoL instrument for young people, validated for use in Australia (Stevens & Ratcliffe, 2012). The utility scores range from 0 to 1, representing the worst health status to full health, respectively.

Mental Health was assessed via several measures. Anxiety symptoms were measured by 8-items drawn from the Spence Anxiety Scale (S. Spence, 1998; S. Spence et al., 2014), which has reported good internal consistency (Cronbach alpha = 0.80; S. Spence et al., 2003). Participants were asked to rate “how often these things happen to you” on a 4-point scale from 0 (never), 1 (sometimes), 2 (often), or 3 (always). Total scores range from 0 to 24, with higher scores reflecting greater anxiety symptoms. Depressed feelings were measured by the 13-item Short Mood & Feelings Questionnaire (Angold et al., 1995). Participants were asked about how much they “felt or acted this way in the past two weeks” about aspects such as “I felt miserable or unhappy” or “I didn’t enjoy anything at all”. Valid responses were true (0), sometimes (1), and not true (2). Total summed scores ranged from 0 to 26, with higher scores indicative of a lower mood. Self-harm and suicide intentions were assessed in the older children (Cohort K). Participants were asked to respond Yes (1) or No (0) to the following questions referring to the previous 12 months. “Have you thought about hurting yourself on purpose in any way?”, “Have you hurt yourself on purpose in any way?”, “Did you ever seriously consider attempting suicide?” and “Did you make a plan about how you would attempt suicide?” Responses were summed to create total ‘self-harm’ scores ranging from 0 to 4, with higher scores indicating greater self-harm thoughts or actions.

Subjective wellbeing was assessed via a single-item question about happiness. Participants were asked, “In general, I am happy with how things are for me in my life right now”. Responses range from strongly disagree (1) to strongly agree (5).

Behavioural attributes are measured by the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), a brief behavioural screen developed to identify behavioural and emotional problems in children and adolescents. Participants are asked to rate each question as “not true”, “somewhat true”, or “certainly true”. The 25 questions assess behavioural attributes across five subscales (prosociality, hyperactivity, emotional symptoms, peer problems and conduct problems), with scores ranging from 0 to 10 for each scale. Higher scores on the prosocial subscale reflect greater strength, higher scores on the remaining subscales reflect greater difficulties. A total score is also generated by summing scores from all
scales except prosociality (which is analysed separately). Valid scores range from 0 to 40, with higher total scores reflecting greater difficulties.

A binary sports participation variable was derived from questions which asked the parent in the case of the younger cohort: “In the last week, has the child participated in any of the following activities? Regularly? means at least once a week, for three months or more, e.g. a sports season. Team sport (e.g. football, cricket or netball)” and a similar question asking about “Individual sport, coached or lessons (e.g. swimming, tennis, karate or gymnastics)”. In the older cohort, the children were asked “In the last 12 months, did you regularly participate in any of the following organised activities outside of school hours/organised activities? Team sport” and a similar question about “Individual sport, coaching or lessons”. “Yes” answers to either question were categorised as “yes” for the variable sports participation.

Socioeconomic and demographic characteristics of the household were assessed with questions probing weekly household income, the parents’ age and their highest level of education. Education was ranked from postgraduate degree (1) through to no non-school qualification (6). The Index of Relative Socioeconomic Disadvantage (IRDS; Australian Bureau of Statistics, 2018) summarises a range of economic and social factors. Low scores indicated greater disadvantage in the area, and high scores reflect a lack of disadvantage.

**Statistical Analysis**

Both cohorts were analysed separately. Descriptive statistics were used to describe the samples. Due to the skewed nature of the health and wellbeing variables, non-parametric tests (Spearman’s rho correlations) were used to explore the relationship between parental problem gambling severity and the health and wellbeing of children in the household. Logistic regression was conducted to examine the significant relationships while controlling for demographic and socio-economic factors. Skewed variables were transformed for these analyses. There was independence of residuals, as assessed by Durbin-Watson. There was no evidence of multicollinearity, as evaluated by tolerance values greater than 0.1 and variance inflation factor (VIF) values less than 10. Visual inspections of plots confirmed the assumption of normality and homoscedasticity. Bonferroni adjusted significance values were used due to the increased risk of Type 1 errors associated with multiple analyses. Supplied data weights were used for all analyses; for details, see Usback et al. (2018).

**Ethics**

The LSAC study was approved by the Australian Institute of Family Studies Ethics Committee. Approval for secondary analysis was granted by Central Queensland University Human Research Ethics Committee (#23,269).
Table 1  Descriptive Statistics of Cohort B by Parental Gambling Risk Level

<table>
<thead>
<tr>
<th>Cohort B—12 years</th>
<th>Total Sample</th>
<th>Parental PGSI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1979.00</td>
<td>1805.80</td>
</tr>
<tr>
<td>Age</td>
<td>12.46</td>
<td>0.05</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50.0%</td>
<td>50.2%</td>
</tr>
<tr>
<td>Male</td>
<td>50.0%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Health Utility CH9D</td>
<td>0.80</td>
<td>0.19</td>
</tr>
<tr>
<td>Happiness</td>
<td>3.90</td>
<td>1.14</td>
</tr>
<tr>
<td>Short Mood &amp; Feelings Questionnaire</td>
<td>4.53</td>
<td>6.18</td>
</tr>
<tr>
<td>Strengths and Difficulties (SDQ)—Total Score</td>
<td>9.66</td>
<td>5.81</td>
</tr>
<tr>
<td>SDQ Prosociality scale</td>
<td>7.71</td>
<td>1.78</td>
</tr>
<tr>
<td>SDQ Hyperactivity scale</td>
<td>3.75</td>
<td>2.40</td>
</tr>
<tr>
<td>SDQ Emotional symptoms scale</td>
<td>2.80</td>
<td>2.26</td>
</tr>
<tr>
<td>SDQ Peer problems scale</td>
<td>1.60</td>
<td>1.63</td>
</tr>
<tr>
<td>SDQ Conduct problems scale</td>
<td>1.52</td>
<td>1.61</td>
</tr>
<tr>
<td>Sport Participation</td>
<td>Yes</td>
<td>59.3%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>40.7%</td>
</tr>
<tr>
<td>Parents and Household</td>
<td>Mean age of parent/s</td>
<td>44.44</td>
</tr>
<tr>
<td></td>
<td>PGSI of parent with the most severe problem</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>PGSI Score</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGSI Categories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-problem gambler</td>
<td>91.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>low-risk gambler</td>
<td>4.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>moderate-risk gambler</td>
<td>3.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>problem gambler</td>
<td>0.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>Postgraduate degree</td>
<td>5.9%</td>
</tr>
<tr>
<td></td>
<td>Graduate diploma/certificate</td>
<td>9.2%</td>
</tr>
<tr>
<td></td>
<td>Bachelor degree</td>
<td>16.3%</td>
</tr>
<tr>
<td></td>
<td>Advanced diploma</td>
<td>14.2%</td>
</tr>
<tr>
<td></td>
<td>Certificate or other non-school qualification</td>
<td>46.6%</td>
</tr>
<tr>
<td></td>
<td>Non non-school qualification</td>
<td>7.8%</td>
</tr>
<tr>
<td>Household Income (weekly)</td>
<td>2490.18</td>
<td>1725.90</td>
</tr>
<tr>
<td></td>
<td>Index of Relative Socioeconomic Disadvantage</td>
<td>1011.22</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, ***p < .001
Results

Descriptive statistics of Cohort B are detailed in Table 1. Cohort B (N=1,979) has a mean age of 12.5 years (SD=0.50; 50.0% females). The parental PGSI scores ranged from 0 to 23. In this cohort, looking at the parent in the household with the most severe gambling problem, 0.9% had at least one parent categorised in the problem gambling category of the PGSI, and a further 7.9% categorised as ‘at risk’ (i.e. low- or moderate-risk gamblers, scores 1–7). As outlined in Table 2, Cohort K’s (N=1,716) mean age was 16.5 years (SD=0.50; 48.2% females). The parental PGSI scores ranged from 0 to 24. In this cohort, 1.6% of children had at least one parent in the problem gambling category of the PGSI, and a further 11.0% had at least one parent at risk.

As detailed in Tables 1 and 2, across both cohorts, parents scoring one or greater on the PGSI were slightly younger, less educated, had a lower household income and lived in an area of greater disadvantage than those without a gambling problem. Children across both cohorts, whose parental PGSI score was one or greater, reported significantly worse HRQoL, lower mood and greater anxiety symptoms than those with a parental PGSI score of 0. The younger children also reported significantly lower happiness scores when the parental PGSI score was one or greater, and the older children had a greater number of self-harm thoughts and behaviours when the parental PGSI score was one or greater in comparison to those with a parental PGSI score of 0. Children living with parental gambling problems reported increased difficulties across the total SDQ, and its four subscales (hyperactivity, emotional symptoms, peer problems and conduct problems). In both cohorts, there was no significant difference in sports participation between children who had a parent who scored one or more on the PGSI and those who were not experiencing a gambling problem.

Tables 3 and 4 provide correlation matrices of all variables for both cohorts. There was a significant relationship between parental PGSI scores and mood and anxiety in both younger and older children. The children in both cohorts reported greater anxiety and feelings of low mood as the parent’s gambling problems increased. Parental gambling problems were also associated with worse health and lower happiness in the younger children. In the older cohort, increasing parental gambling problems were also associated with greater self-harm thoughts and behaviours. There was a significant association between the children’s SDQ total scores and parental gambling in both cohorts, with overall increased difficulties associated with more severe parental gambling problems. Specific areas of association in the younger cohort were conduct problems, emotional problems and peer problems. In the older children, there were significant correlations between parental gambling and conduct problems, emotional symptoms, hyperactivity and peer problems.

Multiple regressions were conducted for each cohort to control for the children’s gender and other parental and household factors that could plausibly affect health and wellbeing. As shown in Table 5, in the younger group, parental PGSI was no longer a significant predictor of health or wellbeing factors. In the older cohort,
Parental Gambling and the Health and Wellbeing of Children…

Table 2 Descriptive Statistics of Cohort K by Parental Gambling Risk Level

<table>
<thead>
<tr>
<th>Cohort K—16 years</th>
<th>Total Sample</th>
<th>Parental PGSI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1716</td>
<td>1500 (87.4%)</td>
</tr>
<tr>
<td>Age</td>
<td>16.46</td>
<td>0.50</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48.2%</td>
<td>50.2%</td>
</tr>
<tr>
<td>Male</td>
<td>51.8%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Health Utility CH9D</td>
<td>0.78</td>
<td>0.22</td>
</tr>
<tr>
<td>Short Mood &amp; Feelings Questionnaire</td>
<td>3.67</td>
<td>1.08</td>
</tr>
<tr>
<td>Spence Anxiety Scale</td>
<td>6.83</td>
<td>5.42</td>
</tr>
<tr>
<td>Self-Harm Scale</td>
<td>0.55</td>
<td>1.10</td>
</tr>
<tr>
<td>Strengths and Difficulties (SDQ)—Total Score</td>
<td>11.66</td>
<td>5.98</td>
</tr>
<tr>
<td>Happiness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67.6%</td>
<td>68.4%</td>
</tr>
<tr>
<td>No</td>
<td>32.4%</td>
<td>31.6%</td>
</tr>
<tr>
<td>Parent/s and Household</td>
<td></td>
<td></td>
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<tr>
<td>Mean age of parent/s</td>
<td>47.92</td>
<td>5.34</td>
</tr>
<tr>
<td>PGSI of parent with the most severe problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGSI Score</td>
<td>0.47</td>
<td>1.90</td>
</tr>
<tr>
<td>PGSI Categories</td>
<td></td>
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</tr>
<tr>
<td>non-problem gambler</td>
<td>87.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>low-risk gambler</td>
<td>7.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>moderate-risk gambler</td>
<td>3.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>problem gambler</td>
<td>1.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>10.4%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Graduate diploma/certificate</td>
<td>10.5%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>14.6%</td>
<td>15.5%*</td>
</tr>
<tr>
<td>Advanced diploma</td>
<td>13.6%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Certificate or other non-school qualification</td>
<td>38.7%</td>
<td>38.1%</td>
</tr>
<tr>
<td>Non non-school qualification</td>
<td>12.2%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Household Income (weekly)</td>
<td>2736.89</td>
<td>1823.66</td>
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<td>68.59</td>
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</tbody>
</table>

*p < .05, **p < .01, ***p < .001
parental PGSI continued to significantly predict mood, with increasing gambling problems associated with lower mood.

**Discussion**

This study used a representative sample of Australian children to explore the relationship between the health and wellbeing of the children and parental gambling problems. In the older cohort, 1.6% lived in a household with a parent categorised as a 'problem gambler', 3.8% with a 'moderate-risk gambler', and 7.2% 'low-risk gambler'. The prevalence rates were slightly lower in the younger cohort; however, these proportions are generally consistent with the national prevalence of problem gambling in Australia (Armstrong & Carroll, 2017; Hing et al., 2021). Households where gambling problems were present tended to have younger, less well-educated parents, lower incomes and be located in areas of greater disadvantage. This is consistent with known problem gambling risk factors (Armstrong & Carroll, 2017).

Across both the younger and older cohorts, the study found significant associations between parental gambling problems and HRQoL, symptoms of anxiety, feelings of low mood, and behavioural and emotional problems in the children. Significant relationships between gambling problems and (low) happiness were also found in the younger cohort. The current study found no significant relationship between sports participation and parental PGSI. However, sports participation was associated with higher household income, less disadvantage and more highly educated parents.

Both younger and older children showed significantly increased behavioural difficulties as the parental gambling problem increased in severity. These manifested as conduct problems, emotional symptoms, hyperactivity and peer problems. This result supports previous findings associating parental gambling problems with conduct problems, delinquency and behavioural problems (Lorenz & Shuttlesworth, 1983; Vitaro et al., 2008; Walters, 2021). Conduct problems have also been found to be strongly associated with negative family experiences (Scottish Government, 2020). There was a significant relationship between parental gambling problems and self-harm, and suicidal thoughts and behaviours in this study; Lesieur and Rothschild (1989) had similar findings of increased suicide attempts amongst children of a parent with a gambling problem.

The current findings of an association with anxiety and low mood is in line with results found by (Vitaro et al., 2008) but not those of Lesieur and Rothschild (1989) and Dowling et al. (2009). This incongruence again may be due to our use of a community sample rather than a treatment-related sample. However, there may be an age factor involved too. Once other factors were controlled, the impact on mood only continued to have a significant relationship with the older children. It may be that younger children are less aware or more protected from gambling problems in the household. Older children are the ones who might be more likely to take on the physical and mental weight of extra responsibilities in the households, such as housework, managing finances, care of younger siblings, and emotionally
Table 3  Correlations Between Parental PGSI Scores, Socio-demographic Factors, and Health and Wellbeing Characteristics of Children in Cohort B

<table>
<thead>
<tr>
<th></th>
<th>Parent</th>
<th>Child</th>
<th>Parent/Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental PGSI</td>
<td>1</td>
<td>-.045*</td>
<td>-.046*</td>
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<td>1</td>
<td>.073**</td>
</tr>
<tr>
<td>Happiness</td>
<td>.064**</td>
<td>.079**</td>
<td>.005</td>
</tr>
<tr>
<td>Mood</td>
<td>.017</td>
<td>.076**</td>
<td>.049**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.334**</td>
<td>.471**</td>
<td>.293**</td>
</tr>
<tr>
<td>SDQ Total</td>
<td>.305**</td>
<td>.305**</td>
<td>.051*</td>
</tr>
<tr>
<td>Prosociality</td>
<td>-.238**</td>
<td>.224**</td>
<td>-.229**</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>.238**</td>
<td>.224**</td>
<td>.199**</td>
</tr>
<tr>
<td>Emotional</td>
<td>.005</td>
<td>.005</td>
<td>.306**</td>
</tr>
<tr>
<td>Emotion</td>
<td>-.019**</td>
<td>-.019**</td>
<td>.003</td>
</tr>
<tr>
<td>Peer</td>
<td>.013</td>
<td>.013</td>
<td>.013</td>
</tr>
<tr>
<td>Conduct</td>
<td>.022**</td>
<td>.022**</td>
<td>.013</td>
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<tr>
<td>Short Mood &amp; Feelings Questionnaire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spence Anxiety Scale</td>
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<td>.073**</td>
<td>.005</td>
</tr>
<tr>
<td>SDQ Prosociality Total Score</td>
<td>-.005</td>
<td>.086**</td>
<td>.224**</td>
</tr>
<tr>
<td>SDQ Hyperactivity scale</td>
<td>.017</td>
<td>.334**</td>
<td>-.224**</td>
</tr>
<tr>
<td>SDQ Emotional symptoms scale</td>
<td>.076**</td>
<td>.471**</td>
<td>-.297**</td>
</tr>
<tr>
<td>SDQ Peer problems scale</td>
<td>.049*</td>
<td>.293**</td>
<td>-.304**</td>
</tr>
<tr>
<td>SDQ Conduct problems scale</td>
<td>.085**</td>
<td>.305**</td>
<td>-.306**</td>
</tr>
<tr>
<td>Strengths and Difficulties (SDQ)— Total Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport Participation</td>
<td>-.038</td>
<td>.051*</td>
<td>.054*</td>
</tr>
<tr>
<td>(0 = no, 1 = yes)</td>
<td>-.099**</td>
<td>-.130**</td>
<td>-.156**</td>
</tr>
<tr>
<td>Gender</td>
<td>-.012</td>
<td>-.122**</td>
<td>.016</td>
</tr>
<tr>
<td>(1 = male, 2 = female)</td>
<td>.062**</td>
<td>.156**</td>
<td>-.020</td>
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<tr>
<td>Parent’s Mean Age</td>
<td>-.068**</td>
<td>-.012</td>
<td>.032</td>
</tr>
<tr>
<td>Household Income</td>
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<td>.051*</td>
<td>.038</td>
</tr>
<tr>
<td>Index of Relative Socioeconomic Disadvantage (IRDS)</td>
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<td>.023</td>
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<td>Parent’s Highest Education</td>
<td>.068**</td>
<td>-.008</td>
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</table>

* Correlation is significant at the 0.05 level (2-tailed) and ** at the 0.01 level (2-tailed)
## Table 4: Correlations Between Parental PGSI Scores, Socio-demographic Factors, and Health and Wellbeing Characteristics of Children in Cohort K

<table>
<thead>
<tr>
<th>Cohort K—16 years</th>
<th>Parent</th>
<th>Child</th>
<th>Parent/ Household</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parent PGSI</td>
<td>Health</td>
<td>Happiness</td>
</tr>
<tr>
<td>Parent</td>
<td>Parent PGSI</td>
<td>-0.057</td>
<td>-0.045</td>
</tr>
<tr>
<td>Child</td>
<td>Health Utility CH9D</td>
<td>-0.057</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Happiness</td>
<td>-0.045</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Parent/Household Income (IRSD)</td>
<td>0.087***</td>
<td>-0.449**</td>
</tr>
<tr>
<td></td>
<td>Parent's Mean Age</td>
<td>-0.045</td>
<td>0.399**</td>
</tr>
<tr>
<td></td>
<td>Parent's Highest Education</td>
<td>0.068***</td>
<td>-0.395**</td>
</tr>
<tr>
<td></td>
<td>Sport Participation</td>
<td>0.069***</td>
<td>-0.510**</td>
</tr>
<tr>
<td></td>
<td>Gender (1 = male, 2 = female)</td>
<td>0.069***</td>
<td>-0.510**</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed) and ** at the 0.01 level (2-tailed)
supporting their parents (Langham et al., 2016). They may also be more aware of the stigma associated with gambling problems (Wurtzburg & Tan, 2011).

**Limitations**

The results of this study should be interpreted in light of several limitations. First, gambling problems are relatively uncommon in general population samples, especially severe problems. Therefore, this study may lack the statistical power to detect some small effects. For instance, the lack of findings for wellbeing decrements in younger children of households with gambling problems, after controlling for other factors, may only remain undetected due to low power. Second, as discussed, children’s health and wellbeing are also impacted by many factors (Scottish Government, 2020). Therefore, any single contributor tends to exert a small individual impact (Dolan et al., 2008; Geerling & Diener, 2020) and may be difficult to isolate due to the complex nature of the relationship of these variables. Further work might attempt to control for as many other health and wellbeing influences as possible as well as explore interaction effects. This might be achieved by using a more purposeful sample of children with many parents classified as at-risk and problem gamblers. Finally, our study was limited by a cross-sectional design. The LSAC did not begin asking about gambling until recently. Longitudinal studies that can follow children would be highly beneficial, since a time course of early gambling problems for parents impacting on later problems experienced by children would better support a presumed causal connection.

**Conclusions**

Across the cohorts, an average of more than 10% of Australian children reside in households with people experiencing some level of gambling problems, with around 1.2% living in homes with at least one parent with a severe gambling problem. In addition, many other children may be impacted by a parent with a gambling problem living outside their household due to divorce, separation or estrangement. Our study found associations between these parental gambling problems and the health and wellbeing of their children living in the same household. While the harm appears to manifest more seriously when children are older, preventative efforts and support might be provided to all children of parents with a gambling problem to minimise the impact of their harms. The results from this study could inform gambling education programs both for parents and children. The findings could be used to increase parental awareness of how their own gambling can affect their children. And programs, particularly school based as they cover most children, can educate and build awareness to reduce the harms associated with a child’s own gambling. They also might help ensure that they include education about how and where children can seek support for any problem they are experiencing due to another person’s gambling. Access to available interventions, particularly in the early teenage years may be vital in supporting children later in adolescence.
Table 5  Multiple Regression Analyses for Predictors of Children’s Health and Wellbeing

<table>
<thead>
<tr>
<th>Child’s Characteristics</th>
<th>Predictors</th>
<th>Parents PGSI</th>
<th>Child Gender*</th>
<th>Parents Age</th>
<th>Household Income</th>
<th>IRSD^</th>
<th>Parents Education</th>
<th>Model Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>R²</td>
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<td>COHORT B—12 years</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health (CHU9D)</td>
<td></td>
<td>-0.06</td>
<td>-0.12***</td>
<td>-0.01</td>
<td>0.05</td>
<td>-0.04</td>
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<td>0.02</td>
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<tr>
<td>Happiness</td>
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<td>0.04</td>
<td>0.01</td>
<td>0.03</td>
<td>0.00</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Short Mood &amp; Feelings Questionnaire</td>
<td>0.04</td>
<td>0.06**</td>
<td>0.00</td>
<td>-0.07**</td>
<td>-0.03</td>
<td>-0.01</td>
<td>-0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Spence Anxiety Scale</td>
<td></td>
<td>0.05</td>
<td>0.17***</td>
<td>0.00</td>
<td>-0.04</td>
<td>-0.01</td>
<td>-0.02</td>
<td>0.04</td>
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<tr>
<td>Strength and Difficulties Total Score</td>
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<td>-0.04</td>
<td>-0.09***</td>
<td>-0.05</td>
<td>0.05</td>
<td>0.03</td>
<td>0.03</td>
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<td>Strength and Difficulties Domains</td>
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<td>Prosociality</td>
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<td>-0.22***</td>
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<td>-0.01</td>
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<tr>
<td>Hyperactivity</td>
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<td>-0.02</td>
<td>-0.09***</td>
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<td>-0.06</td>
<td>-0.05</td>
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<td>0.02</td>
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<td>Emotional Symptoms</td>
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<td>0.16***</td>
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<td>-0.05</td>
<td>0.00</td>
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<td>0.04</td>
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<tr>
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<td>-0.11***</td>
<td>-0.09***</td>
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<td>0.05</td>
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<tr>
<td>Conduct problems</td>
<td></td>
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<td>-0.17***</td>
<td>-0.06</td>
<td>-0.07**</td>
<td>-0.06</td>
<td>0.05</td>
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<tr>
<td>Sports Participation (0=no, 1=yes)</td>
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<td>-0.07**</td>
<td>-0.02</td>
<td>0.12***</td>
<td>0.06</td>
<td>-0.10***</td>
<td>0.05</td>
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<td>COHORT K—16 Years</td>
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<td>0.00</td>
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<td>0.01</td>
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<tr>
<td></td>
<td>Parents PGSI</td>
<td>Child Gender*</td>
<td>Parents Age</td>
<td>Household Income</td>
<td>IRSD^</td>
<td>Parents Education</td>
<td>Model Statistics</td>
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<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>R²</td>
<td>F</td>
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<tr>
<td>Hyperactivity</td>
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<td>0.00</td>
<td>-0.05</td>
<td>0.01</td>
<td>0.05</td>
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<td>-0.03</td>
<td>0.03</td>
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<td>0.09***</td>
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<td>-0.03</td>
<td>-0.15***</td>
<td>0.02</td>
<td>0.04</td>
<td>11.11</td>
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<tr>
<td>Conduct problems</td>
<td>0.07</td>
<td>-0.10***</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.05</td>
<td>0.11***</td>
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<td>7.73</td>
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<td>Sports Participation (0=no, 1=yes)</td>
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<td>0.02</td>
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<td>0.12***</td>
<td>-0.06</td>
<td>0.05</td>
<td>12.71</td>
</tr>
</tbody>
</table>

^ Index of Relative Socioeconomic Disadvantage; *gender coded 1=male, 2=female; correlations are significant at the Bonferroni adjusted **p < .005 and ***p < .001 levels
Author Contribution CT was responsible for study conception and CT, NH, MB and MR all contributed to study design. Material preparation and analysis was performed by CT. The first draft of the manuscript was written by CT and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Declarations

Ethics Ethics approval for secondary analysis was granted by CQUniversity Human Research Ethics Committee (#22878).

Conflict of Interest The authors declare no conflict of interest for this study.

The 3-year declaration of interest for each author follows:

- CT was supported by a Central Queensland University Research Stipend Scholarship and a New South Wales Office of Responsible Gambling part-PHD scholarship. CT has contributed to research projects funded by Gambling Research Australia, New South Wales Office of Responsible Gambling, and the Victorian Responsible Gambling Foundation.
- NH has received research funds from the Victorian Responsible Gambling Foundation, New South Wales Office of Responsible Gambling, the South Australian Department of Human Services, Queensland Justice and Attorney-General, Gambling Research Australia, New Zealand Ministry of Health, Australian Communications and Media Authority, the Alberta Gambling Research Institute, Australian Government Department of Social Services, New Zealand Ministry of Health, and Australia’s National Research Organisation for Women’s Safety.
- MB has received funding from the New South Wales Office of Liquor and Gaming, the Victorian Responsible Gambling Foundation, the Queensland Government Department of Health, the Tasmanian Department of Treasury and Finance, the South Australian Department of Human Services, the Alberta Gambling Research Institute, Gambling Research Australia, the New Zealand Ministry of Health, the Department of Families, Housing, Community Services and Indigenous Affairs, the Australian Department of Innovation, Industry, Science and Research, and the Department of Foreign Affairs and Trade.
- MR has received research grants from the Queensland Treasury, the Victorian Treasury, the Victorian Responsible Gambling Foundation, the New Zealand Ministry of Health, the NSW Dept of Industry and Trade, the Department of Social Services, the Tasmanian Department of Treasury and Finance, the Alberta Gambling Research Institute, the South Australian Department of Human Services, the Alberta Gambling Research Institute and Gambling Research Australia.
- MH has received funding from the Alberta Gambling Research Institute (AGRI) for conference travel.

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**Authors and Affiliations**

**Catherine Tulloch**¹ · **Nerilee Hing**² · **Matthew Browne**² · **Matthew Rockloff**² · **Margo Hilbrecht**³

Nerilee Hing  
*n.hing@cqu.edu.au*

Matthew Browne  
*m.browne@cqu.edu.au*

Matthew Rockloff  
*m.rockloff@cqu.edu.au*

Margo Hilbrecht  
*MHilbrecht@vanierinstitute.ca*

¹ School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, NSW, Australia

² School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, QLD, Australia

³ The Vanier Institute of the Family, Ontario, Canada and the Dept. of Recreation & Leisure Studies, University of Waterloo, Waterloo, Ontario, Canada
Chapter 6 - CSO Health and Wellbeing Across a Range of Gambling

Problem Severity (Study 3)

“(I’ve been impacted in) no real way, he has just started gambling

and I am hoping it won’t continue”

[Friend, Male, 49 years]

“It was a real big let down. We share a son together and it would absolutely infuriate me

that he could spend money gambling and putting money in the pokies while I worked and

studied and paid for 100% of our son’s needs…I don’t know why I let it go on for so long”

[Former Spouse/Partner, Female, 22 years] 7

7 These quotes were offered by participants as part of the data collection utilised in Chapter 8.
6.1 Introduction

Study 3 makes an important contribution to knowledge by being the first to quantitatively examine the health and wellbeing of CSOs with known exposure to the entire spectrum of gambling risk levels. A key element of a public health approach to gambling is that gambling harms can occur to people along a range of gambling behaviours (Korn & Shaffer, 1999). In Australia, gamblers categorised as “at-risk” (PGSI 1–7) account for approximately 85% of the population-level burden of gambling harm (Browne et al., 2017). However, the literature review (Chapter 2) identifies the wide variety of identifying CSOs. In the studies that rely on self-identification, the gambling problem’s severity is unknown. Other research identifies CSOs based on treatment-seeking samples, who are likely to represent people exposed to more severe problems. Consequently, there is little knowledge about CSOs known to be exposed to less severe problems. Study 3 addresses this gap by exploring the health and wellbeing of CSOs across the entire spectrum of gambling risk levels. It investigates whether the health and wellbeing decrements associated with being a CSO are confined to those exposed to severe gambling problems (PGSI 8+) or extend to those exposed to people categorised as being at moderate-risk (PGSI 3–7) or low-risk (PGSI 1–2) of gambling harm. This study broadens our knowledge about which CSOs are likely to be harmed by examining how the severity of the gambling problem impacts reported CSO health and wellbeing.

6.2 Manuscript

This chapter contains a copy of a published manuscript. See Appendix D for the Declaration of Co-Authorship and Copyright.
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How gambling problems relate to health and wellbeing in Australian households: Evidence from the Household Income and Labour Dynamics of Australia Survey

Catherine Tulloch a,*, Nerilee Hing b, Matthew Browne b, Matthew Rockloff b

a School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, NSW, Australia
b School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, QLD, Australia

Abstract

Gambling harms can impact the health and wellbeing of both individuals who gamble and those close to them. They occur across a spectrum of gambling risk levels, most research is conducted on people close to those gamblers who have severe problems. This study examined the health and wellbeing of people living with gamblers across the entire spectrum of gambling risk levels, via secondary analysis of the nationally-representative Household Income and Labour Dynamics in Australia Survey (HILDA). The subsample of interest comprised 13,698 respondents without a gambling problem of their own, aged between 15 and 84, and who lived in households where all residents completed the Problem Gambling Severity Index (PGSI). Health and wellbeing were measured via the SF-6D, the SF-36, and subjective wellbeing measures. Compared to those living in non-problem gambling households, participants living in problem-gambling households reported significantly lower mean SF-6D scores, lower scores on the SF-36 mental health domain, and significantly less satisfaction with both their financial situation and with feeling part of their local community. Participants living in moderate-risk gambling households also reported less satisfaction with their financial situation than those in non-problem gambling households. Conclusions: The results indicate that measurable impacts to the health and wellbeing of those living with gamblers occur predominantly at the more severe end of the risk level spectrum, except for financial dissatisfaction, which is also evident in those residing with gamblers categorised as moderate-risk.

Keywords:
Gambling harm
Concerned significant others
HILDA
Health
Wellbeing

1. Introduction

A current focus of gambling research is exploring gambling-related harms and identifying their range of impact (Brown et al., 2021; Langham et al., 2016; Lind et al., 2022). Gambling-related harms can be experienced when excessive time or money is spent on gambling and are described as ‘adverse consequence due to an engagement with gambling that leads to a decrement in the health and wellbeing of an individual, family unit, community or population’ (Langham et al., 2016, p. 4). Harms occur across multiple domains, including financial and relationship problems, emotional impacts, impacts to health, work and study, and involvement in criminal activity (Langham et al., 2016). Financial harms are often the first consequence of excessive gambling losses and can have an immediate impact, as well as having a cascading effect on other harms such as relational and emotional problems (Langham et al., 2016; Mathews & Volberg, 2013). These harms can affect individuals who gamble and those close to them; often termed “concerned significant others” (CSOs; Castren et al., 2021; Dowling et al., 2014; Lind et al., 2022; Riley et al., 2018).

Gambling-related harms, by definition, are associated with decrements to the health and wellbeing of CSOs. Commonly reported impacts on health and wellbeing are emotional or psychological distress (Castren et al., 2021; Chan et al., 2016; Dowling et al., 2016; A. Salonen et al., 2016; Svensson et al., 2013), symptoms of depression or mood disorders (Dannon et al., 2006; Wenzel et al., 2008), feelings of anger and guilt (Lorenz & Yaffee, 1988), alcohol or substance abuse (Svensson et al., 2013; Wenzel et al., 2008), poor self-assessed health (Chan et al., 2016), physical symptoms associated with anxiety (Lorenz & Yaffee, 1988) and reduced subjective wellbeing (Tulloch, Hing, et al., 2021). However, research on CSO health and wellbeing is primarily conducted with

* Corresponding author.

E-mail addresses: cathe.tulloch@cqumail.com (C. Tulloch), n.hing@cqu.edu.au (N. Hing), m.browne@cqu.edu.au (M. Browne), m.rockloff@cqu.edu.au (M. Rockloff).

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treatment-related populations, or populations who identify as being harmed by another person’s problem gambling (Tulloch, Browne, et al., 2021). The study populations used in the aforementioned papers are generally associated with respondents who are close to people with more severe gambling problems. Thus, it is currently unclear if these harms are also experienced by those close to gamblers experiencing a less severe gambling problem.

A public health approach stresses the importance of measuring the harms associated with gambling across the entire spectrum of gamblers (Korn et al., 2003). Researchers such as Canale et al. (2016) and Browne and Rockloff (2018) found that, in those who gamble, harms are not limited to those with a severe problem. Approximately 6.8% of the Australian adult population are categorised as at-risk (i.e. categorised as low- or moderate-risk gamblers by the PGSI [Ferris & Wynne, 2001]), compared to around 1.1% categorised as problem gamblers (Armstrong & Carroll, 2017). If only 1 in 5 of the at-risk individuals experienced harm, then this group would account for a larger proportion of harmed gamblers in the population than problem gamblers. Indeed, Browne and Rockloff (2018) found that, except for some very severe and rare harms, a greater proportion of the population aggregate harms could be attributed to at-risk gamblers than to problem gamblers. The harms experienced by people with less severe gambling problems are also associated with a variety of health, wellbeing and quality of life decrements; although these tend to be less severe than those experienced by problem gamblers (Blackman et al., 2019; Hilbrecht & Mock, 2019; Moayeri, 2020). For example, using disability weights, Browne et al. (2017) calculated the aggregate impact of gambling-related harms on quality of life, finding that while the severity of impact was greatest in those categorised as problem gamblers, at-risk gamblers also experienced some significant quality of life decrements. Overall, while the health and wellbeing impacts associated with at-risk gamblers are more clearly understood, little is known about CSOs outside those associated with more severe gambling problems. It is possible that wellbeing impacts might also be found in people who have close relationships with at-risk gamblers.

The number of CSOs impacted by each problem gambler has been estimated at around six, and at-risk gamblers at about three (Goodwin et al., 2017). Despite the lower number of CSOs impacted by at-risk gamblers, the higher prevalence of at-risk (6.8%) relative to problem gamblers (1.1%) implies a greater number of people potentially exposed. These people may be experiencing health and wellbeing decrements caused, or aggravated by, gambling-related harms occurring at subclinical levels. Increasing our knowledge of the impacts on CSOs across the spectrum of gambling risk levels will inform and assist policymakers and researchers in understanding the severity of gambling problems associated with the measurable impact on CSOs’ health and wellbeing at the population level. In addition, this would allow for better targeting of policy for the greatest harm reduction benefits for both the person who gambles and those close to them.

1.1. Aims and objectives

The current study uses secondary analysis of a population-representative Australian survey. It examines the health and wellbeing of people living in households with others experiencing different severities of gambling problems. That is, people living in the same household as others categorised by the PGSI as ‘non-problem’, ‘low-risk’, ‘moderate-risk’ and ‘problem’ gamblers. Specifically, the paper will extend existing research by aiming to understand if measurable health and wellbeing impacts are limited to only people living in the same households as gamblers with more severe problems (i.e., categorised as problem gamblers), or if they extend to those living in at-risk gamblers’ households (i.e., others categorised as low- or moderate-risk gamblers).

2. Methods

2.1. Study design and participants

The study analyses data from Wave 18 of the Household Income and Labour Dynamics in Australia Survey (HILDA; Department of Social Services & Melbourne Institute of Applied Economic and Social Research, 2019), the most recent wave to include a problem gambling screen. HILDA began in 2001 and is an ongoing Australian longitudinal survey collecting social and economic information. Full details are presented elsewhere (Summerfield et al., 2019; Watson & Wooden, 2012). In summary, Wave 1 began with a large national probability sample of 7,682 Australian households, collecting data from all individuals within the household. Sample selection was via a stratified three-stage cluster design, covering all Australian households (except very remote; 0.8%; Australian Institute of Health and Welfare, 2019). The original sample was extended to include new household members as household compositions changed, and in Wave 11, it was topped up with an extra 2,153 households. In most cases, interviews were conducted face-to-face, except for gambling-related questions, which participants completed privately via a paper-based questionnaire. The 2018 HILDA sample comprised 23,237 participants. Of these, participants did not fit eligibility for the current study if they were under 15 years of age (N = 4,831), they or their other household members had not completed the gambling-related questions (N = 3,679), or they had a gambling problem themselves (N = 1,029). Of those who did not complete the gambling related questions, approximately 34% did not participate in the survey that year (non-responding person), 53% did not complete the Self Completion Questionnaire (containing, amongst others, gambling questions), and 13% refused or did not respond to the gambling questions. The final sample of interest comprised 13,698 participants, who resided across 7,852 households (54.1% female, ages ranged between 15 and 84, mean age 46.3 years). Excluding children, respondents excluded due to lack of gambling variables were significantly younger (m = 42.2 years; f(2,18403) = 68.97, p < .001) than either those excluded due to their own gambling problems (m = 46.6 years) or the included group (m = 46.3 years), however, there was no significant gender difference (X^2(2) = 6.032, p = .51).

2.2. Measures

HILDA collects a broad range of measures; those relevant to this study are briefly described. A range of socio-demographic characteristics were assessed with questions probing age, gender, marital status, education, employment, and household income and debt. Problem gambling severity was assessed via the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). The PGSI is well-validated (Cronbach’s alpha = 0.84; Ferris & Wynne, 2001) and consists of nine questions used to measure gambling problems and identify symptoms of potentially harmful gambling behaviours. Total summed scores range between 0 and 27, and from these respondents are classified as either ‘non-problem gamblers’ (total score of 0), ‘low-risk gamblers’ (scores of 1 or 2), ‘moderate-risk gamblers’ (scores of 3 to 7), or ‘problem gamblers’ (scores 8+).

Household categorisation was derived from the PGSI category of the person with the most severe gambling problem in the household, with each household classified as either a ‘non-problem gambling household’, a ‘low-risk gambling household’, a ‘moderate-risk gambling household’ or a ‘problem gambling household’. For example, if a household included a person categorised as a ‘problem gambler’ and one classified as a ‘moderate-risk gambler’, that household was categorised as a ‘problem gambling household’. Similarly, if a ‘moderate risk gambler’ and two ‘non-problem gamblers’ lived in the same household, this was categorised as a ‘moderate-risk gambling household’. Within these households, the study looked exclusively at people who did not have any level of gambling problem themselves (i.e., only those who
scored ‘0’ on the PGSI). This enabled the comparison of only people who did not have personal gambling problems across different levels of gambling-risk households. All participants were asked to complete the PGSI, as such, scores of ‘0’ reflect both non-gamblers and non-problem gamblers, as we were not able to distinguish between the two.

HRQoL was assessed via the SF-36 (Ware & Sherbourne, 1992), a 36-item measure of functional health and wellbeing, validated for use in Australian populations (Butterworth & Crosier, 2004). All items (except for one asking respondents about health changes over the past year) are aggregated into eight multi-item scales and then transformed into a 0–100 scale with 0 representing the worst health status and 100 the best. The scales measure physical functioning, role-physical (interference with work or other daily activities due to physical health), bodily pain, general health, vitality, social functioning (interference with normal social activity), role-emotion (interference with work or other daily activities due to emotional problems), and mental health (symptoms associated with anxiety and depression and, conversely, measures of positive affect). Australian norms are provided by the Australian Bureau of Statistics (1995). Health state utility was measured by the SF-6D. This health index health state score is derived from the SF-36 and ranges from 0 (worst health state) to 1 (best health state). The SF-6D has been shown to have good psychometric characteristics (Baxter et al., 2015; Norman et al., 2013). HILDA calculates these utility values using both the UK and Australian weights (Norman et al., 2013; Walters & Brazier, 2003).

Life satisfaction was assessed using a single-item question that asked respondents, “All things considered, how satisfied are you with your life?” to gauge their global wellbeing. Responses are rated on an 11-point scale from 0 (totally dissatisfied) to 10 (totally satisfied). Domains of wellbeing were assessed via questions that asked people to rate how “satisfied or dissatisfied you are with some of the things happening in your life”. Participants were then shown a list which covered “Your employment opportunities”, “Your financial situation”, “The amount of free time you have”, “The home in which you live”, “Feeling part of your local community”, “The neighbourhood in which you live”, “How safe you feel” and “Your health”. Satisfaction with a partner was assessed via the question, “How satisfied are you with your relationship with your partner?”. Participants responded on an 11-point scale from 0 (totally dissatisfied) to 10 (totally satisfied). Most respondents reported within the “satisfied” range of the scale, which is typical of these measures (OECD, 2013).

2.3. Statistical analysis

The initial analyses use bi-variate statistical techniques to describe and explore the population utilised in the study (individuals with no gambling problem of their own) by the level of gambling risk experienced by others in their household. The SF-36 and life satisfaction scores are not normally distributed, having moderate negative skews ranging from −1.69 to −0.50. However, previous analysis suggests that, particularly in larger samples, the use of parametric statistical techniques with a standard normal error distribution are relatively robust and yield accurate results (Terrance et al., 2009; Walters & Campbell, 2005). These techniques have previously been used with HILDA data (e.g., Livingston, 2009; Renzaho et al., 2010). Accordingly, ANOVA was used to assess group differences between participants across each gambling household category for all SF-36 and life satisfaction domains. Welch was used where noted where the assumption of variance was violated, and Turkey’s HSD was used to assess differences between more than two groups. Following the bi-variate analyses, a series of multiple regressions were used to further examine the relationship between health and wellbeing and gambling problems in the household. The regressions continued to use the same population of interest; participants with no gambling problem of their own (i.e., a PGSI score of 0). The level of ‘gambling household risk’ was included as a predictor in the regressions, as were some socio-demographic control variables commonly associated with health and wellbeing (gender, age, health, income, employment, and marital status). This model enabled a greater understanding of the unique impact the level of gambling problems in the household had on the health and wellbeing of the participant. Linearity was assessed via plots of studentized residuals against the predicted values. There was independence of residuals, as assessed by the Durbin-Watson statistic and no evidence of multicollinearity, assessed by tolerance values greater than 0.1. Missing data were removed listwise. Given the use of multiple tests in the study, we applied a Bonferroni correction and used adjusted alpha levels for our interpretations.

2.4. Ethics

The HILDA study was approved by the Human Research Ethics Committee of The University of Melbourne, and informed consent was obtained for all participants. In addition, approval for secondary analysis was granted by Central Queensland University Human Research Ethics Committee (#22878).

3. Results

Participants in this study comprise only those categorised as non-problem gamblers (including non-gamblers) by the PGSI. Of the 13,698 participants in this study, 93.7% resided in a non-problem gambling household, 3.5% in low-risk gambling households, 1.9% in moderate-risk gambling households, and 0.9% in problem gambling households. Some demographic characteristics of these groups are shown in Table 1. Those living in problem gambling households tend to be significantly younger than in other groups, and those in low-risk and problem gambling households were more likely to be female. Those in non-problem gambling households were less likely to have never married and more likely to be widowed. They were more likely to have completed further education but had lower household incomes.

Fig. 1 illustrates HRQoL across each level of household gambling. There was a significant difference across gambling risk groups, F(3,13124) = 7.40, p < .001. Post-hoc tests revealed participants living in problem gambling households reported significantly lower SF-6D health states than those in non-problem gambling households.

Table 2 details the domains of SF-36 HRQoL measures, for participants across each of the household gambling risk levels, and Fig. 2 displays clustered means and error bars for these variables. There was a significant difference across gambling risk groups in the mental health domain. Post-hoc tests indicated that mental health was significantly poorer for people in problem gambling households than those in non-problem gambling households. No statistically significant differences were found across the remaining domains.

Table 3 outlines domains of satisfaction across each level of household gambling risk and clustered means and errors bars are displayed in Fig. 3. There were significant differences across gambling risk groups in satisfaction with financial situation and feeling part of your local community. Post-hoc tests showed participants living in problem gambling households reported significantly lower mean satisfaction scores than those in non-problem gambling households in two domains: their financial situation and feeling part of their local community. Significantly lower satisfaction levels with their financial situation were also found in participants in moderate-risk gambling households compared to those in non-problem gambling households. No other significant differences were found.

Multiple regressions were conducted to control for non-gambling factors commonly associated with HRQoL (gender, age, health conditions, marital status, income, education, and employment). As shown in Table 4, compared to living in a non-problem gambling household, living in problem gambling households significantly predicted SF-6D and satisfaction with feeling part of the local community, but not the SF-36 mental health scale. After controlling for demographic variables, living in any at-risk or problem gambling household all significantly
Table 1

<table>
<thead>
<tr>
<th>Household gambling risk</th>
<th>Non-problem gambling household</th>
<th>Low-risk gambling household</th>
<th>Moderate-risk gambling household</th>
<th>Problem gambling household</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>12,838</td>
<td>475</td>
<td>264</td>
<td>121</td>
</tr>
<tr>
<td>Age - Mean (SD)</td>
<td>46.6 (19.1)</td>
<td>43.0 (18.7)</td>
<td>42.9 (18.4)</td>
<td>39.3 (16.9)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>53.5%***</td>
<td>62.3%***</td>
<td>60.60%</td>
<td>66.1%***</td>
</tr>
<tr>
<td>Male</td>
<td>44.50%</td>
<td>37.70%</td>
<td>39.40%</td>
<td>33.90%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>22.0%**</td>
<td>26.20%</td>
<td>27.10%</td>
<td>28.90%</td>
</tr>
<tr>
<td>Married</td>
<td>60.00%</td>
<td>62.50%</td>
<td>59.40%</td>
<td>57.00%</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>12.70%</td>
<td>8.20%</td>
<td>11.60%</td>
<td>11.60%</td>
</tr>
<tr>
<td>Separated</td>
<td>5.2%**</td>
<td>3.00%</td>
<td>2.00%</td>
<td>2.50%</td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not complete high school</td>
<td>23.3%***</td>
<td>28.00%</td>
<td>33.10%</td>
<td>25.60%</td>
</tr>
<tr>
<td>Completed high school</td>
<td>14.90%</td>
<td>17.40%</td>
<td>13.90%</td>
<td>21.50%</td>
</tr>
<tr>
<td>Completed further education</td>
<td>61.8%***</td>
<td>54.70%</td>
<td>53.00%</td>
<td>52.50%</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part time employment</td>
<td>21.0%***</td>
<td>26.30%</td>
<td>29.20%</td>
<td>19.80%</td>
</tr>
<tr>
<td>Full-time employment</td>
<td>42.70%</td>
<td>40.20%</td>
<td>41.60%</td>
<td>44.60%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3.00%</td>
<td>4.10%</td>
<td>3.20%</td>
<td>5.00%</td>
</tr>
<tr>
<td>Retired</td>
<td>21.40%</td>
<td>15.90%</td>
<td>14.00%</td>
<td>9.90%</td>
</tr>
<tr>
<td>Other</td>
<td>12.0%***</td>
<td>13.50%</td>
<td>12.00%</td>
<td>20.70%</td>
</tr>
<tr>
<td>Household</td>
<td>$133,806</td>
<td>$166,791</td>
<td>$164,563</td>
<td>$145,438</td>
</tr>
<tr>
<td>Income - Mean (SD)</td>
<td>($137,593)</td>
<td>($174,473)</td>
<td>($161,621)</td>
<td>($95,101)</td>
</tr>
<tr>
<td>Household Debt - Mean</td>
<td>$216,325</td>
<td>$252,432</td>
<td>$290,646</td>
<td>$269,416</td>
</tr>
<tr>
<td>(SD)</td>
<td>($406,426)</td>
<td>($436,982)</td>
<td>($495,246)</td>
<td>($493,599)</td>
</tr>
</tbody>
</table>

Note: Participants in the sample are all classified as ‘non-problem gamblers’. ***p < 0.001, **p < 0.1, *p < 0.05.

predicted lower satisfaction with their financial situation, with the financial effects greater in those living in problem gambling households.

4. Discussion

To our knowledge, this is the first article to explore the relationships between the severity of gambling problems and the health and wellbeing of others within the household. We aimed to understand if measurable health and wellbeing impacts were limited only to people living in the same households as gamblers with severe problems or if they extended to those living in at-risk gamblers’ households. This enabled us to extend existing research by exploring the impacts of gambling-related harms outside treatment-seeking or problem gambling populations. Additionally, by examining the health and wellbeing of only people who were either non-problem gamblers or non-gamblers, the study effectively controlled for own-gambling problems, which are relatively common in CSOs (Mazar et al., 2018; Meisel et al., 2013).

The study found a consistent linear trend for lower health and wellbeing associated with increased gambling problems in the household. With HRQoL, living in a problem gambling household was associated with significantly worse health states than living in non-problem gambling households. Participants living in a problem gambling household also reported significantly worse mental health functioning in the SF-36, a sub-scale that measures feelings of nervousness and/or depression. These mean differences were within the range to be considered clinically and socially meaningful (Ware et al. 1994; cited in Butterworth & Crosier, 2004; Walters & Brazier, 2003). Unlike results that have been found in people with their own gambling problems (Blackman et al., 2019; Browne et al., 2017; Hilbrecht & Mock, 2019; Moayeri, 2020), there were no significant differences in mean HRQoL scores in participants living in low- or moderate-risk gambling households compared to non-problem households. However, further analysis indicated that after controlling for other contributors to HRQoL, associations with living in problem gambling households remained significant for health state (SF-6D), but not the mental health sub-scale of the SF-36. Living in low-risk gambling households was a significant predictor of health state scores after controlling for other variables. As illustrated by the error bars in Fig. 1, it may be that some differences are not detectable given the available sample size, and within-group variability caused by the number of other contributors to health and wellbeing. The magnitude of the effect of living in problem gambling households on HRQoL is approximately two to three times greater than low-risk or moderate \-risk households. This ratio is similar to that found in people who gamble (Browne et al., 2017). Overall, these findings may reflect that living in households with severe, but not necessarily low to moderate gambling problems, contributes to ill-health via factors identified in previous research. These include increased stress and guilt, in turn leading to poorer sleep (Landou et al., 2018) and headache, bowel and stomach issues (Lorenz & Yaffee, 1988). Serious gambling problems may be specifically associated with unhealthy lifestyles, such as alcohol and tobacco use by both gamblers and CSOs (Morisano et al., 2009; A. H. Salonen et al., 2015; Svensson et al., 2013).

Concerning subjective feelings of wellbeing, the study found significantly lower satisfaction with their financial situation in moderate-risk and problem gambling households, with a larger effect in problem-gambling households. This is despite these groups having significantly higher household incomes than non-problem gambling households, and no significant difference in household debt. This finding supports the understanding around gambling harms as detailed in Langham et al.’s conceptual framework (2016), with financial problems most directly related to gambling and often appearing in people experiencing less severe gambling problems. A CSO’s dissatisfaction with their financial situation can then contribute to increased stress as well as relational and psychological health issues (e.g., Järvinen-Tassopoulos, 2020). Browne and Rockloff (2018), found relatively serious financial harms are commonly experienced by low- and moderate-risk gamblers, but that more severe health and social impacts were largely limited to problem gamblers. Finally, financial harms can have a long-term impact on those experiencing them (‘legacy’ harms; Langham et al., 2016). As such, this problem may continue to affect the CSOs long after the gambling problem is resolved or they have left the household, and thus may have a long-term impact on a CSO’s wellbeing.

Living in a problem gambling household was also significantly associated with lower satisfaction with feeling part of the local community. The scores and mean differences reported in ‘feeling part of the community’ are similar to those reported between people experiencing very high psychological distress compared to those who are not (Reeve et al., 2016) and those currently experiencing material deprivation versus not (The Melbourne Institute, 2020). High levels of preoccupation with gambling, or dealing with the issues caused by another’s gambling, may act to supplant other activity, and dissolve bonds with one’s community/neighbourhood. Feelings of shame, stigma and guilt, often experienced by CSOs (Järvinen-Tassopoulos, 2020), may also be causing a barrier between themselves and those around them. The combined findings of dissatisfaction with finances and dissatisfaction with feeling part of the local community have been associated with a transition into loneliness (Baker, 2012), which has its own serious health and wellbeing implications (Leigh-Hunt et al., 2017).
SF-6D Health State Classification by Household PGSI status

![Fig. 1. Mean SF-6D Health State Classification by Household PGSI status.](image)

Table 2
Domains of SF-36 across household gambling risk.

<table>
<thead>
<tr>
<th>Household Gambling Risk</th>
<th>Non problem gambling household</th>
<th>Low-risk gambling household</th>
<th>Moderate-risk gambling household</th>
<th>Problem gambling household</th>
<th>ANOVA P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF-36 Domain</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Mental health</td>
<td>12,206</td>
<td>73.17a</td>
<td>17.57</td>
<td>460</td>
<td>72.70a</td>
</tr>
<tr>
<td>Social functioning</td>
<td>12,242</td>
<td>81.72a</td>
<td>23.98</td>
<td>460</td>
<td>80.71a</td>
</tr>
<tr>
<td>Physical functioning</td>
<td>12,018</td>
<td>83.21a</td>
<td>23.96</td>
<td>450</td>
<td>81.29a</td>
</tr>
<tr>
<td>Role-emotion</td>
<td>12,000</td>
<td>81.29a</td>
<td>34.30</td>
<td>450</td>
<td>83.15a</td>
</tr>
<tr>
<td>Bodily pain</td>
<td>12,046</td>
<td>71.96a</td>
<td>23.90</td>
<td>452</td>
<td>69.25</td>
</tr>
<tr>
<td>General health</td>
<td>12,152</td>
<td>66.78a</td>
<td>21.09</td>
<td>455</td>
<td>65.07a</td>
</tr>
<tr>
<td>Vitality</td>
<td>12,202</td>
<td>58.15a</td>
<td>20.31</td>
<td>460</td>
<td>57.44</td>
</tr>
<tr>
<td>Role physical</td>
<td>12,004</td>
<td>78.57a</td>
<td>36.57</td>
<td>452</td>
<td>78.28</td>
</tr>
</tbody>
</table>

Note: Participants in the sample are all classified as ‘non-problem gamblers’. ANOVAs were run for each domain. Statistically significant in bold, significance based on Bonferroni adjusted alpha levels of 0.00625 per test. Groups that have the same subscripts across a row are not significantly different from each other. If a group has two subscripts, then it is not statistically significantly different to either of the other groups; * Welch.

4.1. Limitations

The results of this study should be interpreted in light of several limitations. First, caution must be taken in the overall interpretation of these results due to the limitations regarding power. Serious gambling problems are relatively uncommon in general population samples; therefore, the study may lack the statistical power necessary to detect some small effects. Health and wellbeing are impacted by a wide range of factors including societal and personal characteristics, genetic and demographic variables (Dolan et al., 2008; Geerling & Diener, 2020), so any single contributor tends to exert a small impact, relative to total variation. For this reason, future work would benefit from using non-population representative stratified samples and attempting to control for as many other influences on HRQoL as possible, to reduce unexplained variance. No significant differences were identified between either category of at-risk households (low- or moderate-risk) and non-problem gambling households but this may be (again) due to issues of low power. Bias may have been introduced into the study, due to the using particular sub-sample of HILDA respondents (whose household completed the PGSI and who didn’t have a gambling problem themselves). However, there were no gender differences and only a small age difference between the included and excluded groups, and it was unfeasible to include participants where the entire household’s gambling risk levels were unknown. Finally, the bi-directional nature of the relationship between gambling problems and health and wellbeing means that while associations were found, both causal directions are possible.

4.2. Conclusions

The overall results seem to indicate a step-change in the health and wellbeing impacts of harm to CSOs, between moderate-risk and problem gambling households. At the population level, it appears that it is at the more severe end of the gambling-risk spectrum that a CSO (and not experiencing gambling problems of their own) starts to experience measurable negative impacts on their wellbeing. As an exception, some financial impacts on wellbeing appear to be associated with less severe problems. CSOs are often unaware of gambling problems until they are
Table 3
Domains of subjective wellbeing across household gambling risk.

<table>
<thead>
<tr>
<th>Household Gambling Risk</th>
<th>Non problem gambling household</th>
<th>Low-risk gambling household</th>
<th>Moderate-risk gambling household</th>
<th>Problem gambling household</th>
<th>ANOVA P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>How satisfied are you with…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>your financial situation</td>
<td>12,828</td>
<td>6.83a</td>
<td>475</td>
<td>6.63ab</td>
<td>2.23</td>
</tr>
<tr>
<td>feeling part of your local community</td>
<td>12,807</td>
<td>6.85a</td>
<td>475</td>
<td>6.80a</td>
<td>2.08</td>
</tr>
<tr>
<td>the amount of free time you have</td>
<td>12,829</td>
<td>6.87a</td>
<td>475</td>
<td>6.82a</td>
<td>2.25</td>
</tr>
<tr>
<td>the neighbourhood in which you live</td>
<td>12,821</td>
<td>7.89a</td>
<td>475</td>
<td>7.84a</td>
<td>1.70</td>
</tr>
<tr>
<td>your partner</td>
<td>9130</td>
<td>8.37</td>
<td>1.93</td>
<td>353</td>
<td>8.15</td>
</tr>
<tr>
<td>your life</td>
<td>12,833</td>
<td>8.00a</td>
<td>1.38</td>
<td>474</td>
<td>7.96ab</td>
</tr>
<tr>
<td>your health</td>
<td>12,837</td>
<td>7.18</td>
<td>1.91</td>
<td>475</td>
<td>7.22</td>
</tr>
<tr>
<td>how safe you feel</td>
<td>12,832</td>
<td>8.38</td>
<td>1.43</td>
<td>475</td>
<td>8.37</td>
</tr>
<tr>
<td>the home in which you live</td>
<td>12,828</td>
<td>8.13</td>
<td>1.63</td>
<td>475</td>
<td>8.17</td>
</tr>
<tr>
<td>your employment opportunities</td>
<td>10,271</td>
<td>7.22</td>
<td>2.24</td>
<td>402</td>
<td>7.22</td>
</tr>
</tbody>
</table>

Note: Participants in the sample are all classified as ‘non-problem gamblers’. ANOVAs were run for each domain of satisfaction. Statistically significant in bold, significance based on Bonferroni adjusted alpha levels of 0.005 per test. Groups that have the same subscripts across a row are not significantly different from each other. If a group has two subscripts, then it is not statistically significantly different to either of the other groups; * Welch.
Table 4
Multiple regression analysis for predictors of SF-6D, SF-36 mental health subscale, satisfaction with financial situation and satisfaction with feeling part of the local community.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>SF-6D</th>
<th>SF-36 Mental Health Subscale</th>
<th>Satisfaction with financial situation</th>
<th>Satisfaction with feeling part of local community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>BEB beta</td>
<td>B</td>
<td>BEB beta</td>
</tr>
<tr>
<td>Gender (Male = 1, female = 2)</td>
<td>-0.03</td>
<td>0.00 -0.06**</td>
<td>-2.39</td>
<td>0.30 -0.07***</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.00 -0.03*</td>
<td>0.20</td>
<td>0.01 0.02**</td>
</tr>
<tr>
<td>Health - long term health condition (No = 0, Yes = 1)</td>
<td>0.24</td>
<td>0.01 0.43***</td>
<td>10.21</td>
<td>0.35 0.26***</td>
</tr>
<tr>
<td>Household Income</td>
<td>0.01</td>
<td>0.00 0.12***</td>
<td>0.65</td>
<td>0.07 0.09***</td>
</tr>
<tr>
<td>Marital Status (reference category: married/cohabiting)</td>
<td>never married</td>
<td>-0.01</td>
<td>0.01 -0.02</td>
<td>-2.27</td>
</tr>
<tr>
<td></td>
<td>separated/divorced</td>
<td>-0.02</td>
<td>0.01 -0.03**</td>
<td>-1.07</td>
</tr>
<tr>
<td></td>
<td>widowed</td>
<td>-0.02</td>
<td>0.01 -0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Education (reference category: completed high school)</td>
<td>Did not complete high school</td>
<td>-0.03</td>
<td>0.01 -0.05***</td>
<td>-1.04</td>
</tr>
<tr>
<td></td>
<td>Completed further education</td>
<td>-0.01</td>
<td>0.01 -0.01</td>
<td>-0.13</td>
</tr>
<tr>
<td>Employment (reference category: full-time employment)</td>
<td>part-time employment</td>
<td>0.02</td>
<td>0.01 0.03***</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>unemployed</td>
<td>-0.04</td>
<td>0.01 -0.02**</td>
<td>-5.77</td>
</tr>
<tr>
<td></td>
<td>retired</td>
<td>-0.01</td>
<td>0.01 -0.01</td>
<td>2.24</td>
</tr>
<tr>
<td>Gambling household risk (reference category: no problem)</td>
<td>Low risk gambling household</td>
<td>-0.03</td>
<td>0.01 -0.02**</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>Moderate risk gambling household</td>
<td>-0.03</td>
<td>0.01 -0.02</td>
<td>-1.95</td>
</tr>
<tr>
<td></td>
<td>Problem gambling household</td>
<td>-0.07</td>
<td>0.02 -0.03***</td>
<td>-3.60</td>
</tr>
<tr>
<td>Model Statistics</td>
<td>R² = 0.272</td>
<td>R² = 0.125</td>
<td>R² = 0.161</td>
<td>R² = 0.056</td>
</tr>
<tr>
<td></td>
<td>F = 307.66</td>
<td>F = 122.05</td>
<td>F = 164.11</td>
<td>F = 50.93</td>
</tr>
<tr>
<td></td>
<td>P &lt; .001</td>
<td>P &lt; .001</td>
<td>P &lt; .001</td>
<td>P &lt; .001</td>
</tr>
</tbody>
</table>

Note: Participants analysed in the sample are all classified as ‘non-problem gamblers’. Significance based on Bonferroni adjusted alpha levels of 0.01 per test, ** Correlation is significant at the 0.001 level (2-tailed), *** Correlation is significant at < 0.001.

quite serious (Kourgiantakis et al., 2013; Riley et al., 2018), so CSOs may experience dissatisfaction with their financial situation before they are aware that gambling may be causing those financial issues within the household. Dissatisfaction in this area could be explored as a way to identify CSOs associated with less severe gambling problems in order to offer support. Additionally, financial counselling might be useful for both moderate risk and problem gamblers to support both them and their families.

Without limiting the impact of the harms experienced by CSOs of at-risk gamblers, it does appear that the bulk of the measurable effects on health and wellbeing found in this study was experienced by people living in households where others are suffering from more severe gambling problems. Policy considerations and investments should focus on strategies that prevent gambling harms in order to reduce the health and wellbeing burden across the entire community, while also targeting help and assistance to those close to people with severe gambling problems.

CRediT authorship contribution statement

Catherine Tulloch: Conceptualization, Data curation, Formal analysis, Writing – original draft. Nerilee Hing: Supervision, Writing – review & editing. Matthew Brownie: Supervision, Writing – review & editing. Matthew Rockloff: Supervision, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

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References


“(I feel) frustrated when they play they don't seem to want to socialise just concentrate on gambling”

[Friend, Female, 61 years]

“I am concerned about the impact on my financial wellbeing”

[Former Spouse/Partner, Male, 24 years]⁸

⁸ These quotes were offered by participants as part of the data collection utilised in Chapter 8.
7.1 Introduction

The literate review (Chapter 2) identified a lack of large-scale population-based longitudinal studies examining CSO health and wellbeing. Study 4 is the first in the literature to use longitudinal data to explore the long-term health and wellbeing of CSOs, prior to the likely exposure to the gambling problem. It uses 18 years of HILDA data to examine CSO health and wellbeing trajectories leading up to their known exposure to a gambling problem. Prior research has highlighted decrements in health and wellbeing among CSOs. However, these relationships are complex due to the bi-directional nature of the relationships and the variety of other factors that can impact health and wellbeing. The use of longitudinal data enhances our understanding by building upon the predominantly cross-sectional nature of these existing studies, providing a more comprehensive insight. A methodological limitation inherent in all research on gambling harms is that researchers are restricted to observational studies. Consequently, they cannot draw definitive causal conclusions. The most that can be achieved is inferring causality based on available findings, and using longitudinal data enhances the ability to make these inferences. This study investigates which aspects are likely to be directly related to exposure to the gambling problem and which predate exposure to it. It provides a more rigorous method to understanding the direct health and wellbeing impacts of gambling harms on CSOs.

7.2 Manuscript

This chapter contains a copy of a published manuscript. See Appendix E for the Declaration of Co-Authorship and Copyright.

longitudinal analysis of the Household, Income and Labour Dynamics in Australia (HILDA) survey. *PloS One, 18*(1), e0281099. [https://doi.org/10.1371/journal.pone.0281099](https://doi.org/10.1371/journal.pone.0281099)
RESEARCH ARTICLE

Trajectories of wellbeing in people who live with gamblers experiencing a gambling problem: An 18-year longitudinal analysis of the Household, Income and Labour Dynamics in Australia (HILDA) survey

Catherine Tulloch, Matthew Browne, Nerilee Hing, Matthew Rockloff, Margo Hilbrecht

1 Experimental Gambling Research Laboratory, School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, New South Wales, Australia. 2 Experimental Gambling Research Laboratory, School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, Queensland, Australia. 3 The Vanier Institute of the Family, Ontario, Canada. 4 The Department of Recreation & Leisure Studies, University of Waterloo, Ontario, Canada

* c.tulloch@cqu.edu.au

Abstract

In cross-sectional gambling studies, friends, family, and others close to those experiencing gambling problems (concerned significant others ‘CSOs’) tend to report detriments to their quality of life. To date, however, there have been no large, population-based longitudinal studies examining the health and wellbeing of CSOs. We analyse longitudinal data from the Household, Income and Labour Dynamics in Australia (HILDA) survey to examine the 18-year trajectories of general, social, health and financial wellbeing of household CSOs (n = 477) and compare these to those without a gambling problem in the household (n = 13,661). CSOs reported significantly worse long-term wellbeing than non-CSOs in their satisfaction with life, number of life stressors, and social, health and financial wellbeing. However, both social and financial wellbeing showed a temporal effect, declining significantly for CSOs at times closer to the exposure to the gambling problem. This finding suggests a causal link between living in a household with a person with a gambling problem and decreased CSO social and financial wellbeing. Policy responses, such as additional social and financial support, could be considered to assist CSOs impacted by another person’s gambling problem.

Introduction

The impacts of gambling-related harm on the health and wellbeing of close family and friends of people who gamble (‘close significant others’, CSO’s) contribute to the public health burden associated with gambling problems [1]. Harm attributable to gambling can extend to CSOs across multiple areas of their lives, with the most commonly experienced being impacts to their psychological, social/relational, and financial wellbeing [2–4]. Because an ongoing gambling problem requires substantial financial outlay, financial impacts are the most commonly
experienced issue [2, 3, 5, 6]. Financial stress is not only associated with a lack of money for bills and essential needs and a reduction in spending money, but also leads to increased stress and conflict within relationships [6]. Relationship harms can range from reduced time spent together [6] through to increased conflict [7–9] and domestic and family violence [10]. The CSO’s relationships with others can also be impacted. For example, they can experience a reduced social life [11, 12], become estranged or distanced from family and friends [13], and experience social rejection [14] and isolation [12]. Impacts to psychological wellbeing are commonly associated with CSOs and include emotional or psychological distress [e.g., 3, 15–17], anger and feelings of guilt [18], symptoms of anxiety and depression [18–20] and lower wellbeing and satisfaction with life [21]. These can then lead to physical health problems such as headaches [18, 22, 23] and reduced sleep [24, 25].

However, many of these relationships are bi-directional. For example, gambling can be used to try to improve finances [26]; where a household is struggling financially, a household member may attempt to solve this problem by gambling. For other people, gambling may have begun as a social activity; for instance couples might have started visiting gambling venues together as a response to feeling socially isolated [27]. Alternatively, gambling may be used as an escape, as a way to cope with or avoid negative emotions, including those associated with problems or stresses being experienced by others close to the gambler [28]. Therefore, a fundamental limitation to many CSO studies is their cross-sectional nature, as these wellbeing decrements may have predated exposure to the gambling problem. Furthermore, most of the studies mentioned above deal with self-nominated symptoms as described by CSOs. Thus, any reported harms might be over-attributed to the gambling rather than other causes, be exaggerated due to negative attitudes towards gambling, and/or conceivably not result in a significant impact to a CSO’s overall health and wellbeing. Overall, rather than a friend or family member’s gambling directly leading to health and wellbeing decrements in CSOs, the gambling problems may be a feature of those groups vulnerable to both poorer health and wellbeing outcomes and gambling problems, such as those experiencing economic deprivation [29–31]. Thus, the gambling may to some degree be a symptom rather than an underlying cause of such health or wellbeing deficits. If this alternative explanation is true, then one would expect that any observed decrement to wellbeing in CSOs should precede the reported gambling problems.

There are very few quantitative studies exploring the impact of gambling on CSOs longitudinally. One short-term study examined health and wellbeing factors associated with being close to someone with a gambling problem, following up a year later [15]. At the initial assessment, CSOs reported financial impacts, relationship problems, poor mental health, risky alcohol use, and a lack of social support (someone to talk to or help with practical issues). A year later, participants who were still defined as CSOs were compared to those who were not (ex-CSOs). Ex-CSOs reported fewer arguments and separations, improved mental health and fewer financial problems than in the first assessment; however, there were no differences in self-reported health or alcohol use. Another study followed children of parent/s experiencing a gambling problem [32], and found depressive symptoms increasing between mid-adolescence and early adulthood. Both these studies explored CSOs’ wellbeing after they had been exposed to problem gambling, so conclusions cannot be made about whether the ongoing problems were legacy harms attributable to gambling [6, 33], or ongoing longer-term co-morbid issues.

The present study seeks to understand whether gambling is a direct causal factor in wellbeing outcomes for household members of individuals experiencing a gambling problem. People who co-habit with a person experiencing a gambling problem are a key subset of the broader group of CSOs. They tend to have a very close relationship with the gambler, sharing household and financial responsibilities, and therefore tend to be the most acutely affected. We
analyse longitudinal data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, a large-scale population study, to explore the trajectory of wellbeing factors in CSOs. Using data from 2018, the most recent to assess gambling problems, the present study identifies household CSOs, that is, those people living with another person experiencing moderate or severe gambling problems at that time (i.e., 2018). We then examine the trajectory of the CSOs’ overall, social, health and financial wellbeing variables over the preceding 17 years and compare these to respondents who were identified as non-CSOs in 2018 as a non-experimental control group. Unfortunately, data on household gambling problems are not available for every year; however, gamblers are known to transition in and out of experiencing problems [34] and, as such, the probability of negative impacts from gambling should, on average, progressively reduce over the preceding years. In contrast, we would expect stable socio-economic factors that drive both exposure to gambling problems and CSO wellbeing outcomes to be relatively constant, and not to be time-synchronised to the observed gambling problems. Since these effects should not show a time-dependent gradient, analysis of the retrospective time-course of CSOs’ wellbeing can help distinguish consequences that are a direct outcome of the gambling, as opposed to being due to shared risk factors.

A key assumption is that the CSOs in this study were unlikely to have been exposed to gambling problems for the preceding 17 years. Their level of exposure involves two factors: how long the gambler has experienced a gambling problem, and how long the CSO has had an active relationship with that person. Overall, the bulk of evidence supports that more serious gambling problems may fluctuate over reasonably short periods of time [34]. While, Billi et al. [35] found severe gambling problems to be relatively stable over a 4-year period, more recent longitudinal studies have found episodes of problem gambling to last around 1 year, and unrelated problems across 4 or 5 years to be relatively uncommon [36–39]. In looking specifically at CSOs, the evidence is more limited. In Riley et al.’s [40] qualitative study of partners of non-treatment-seeking gamblers, the mean length of the relationship between the couples was close to 10 years. Almost all participants recalled a time in their relationship when their partner’s gambling was not a problem. Another study of 50 family members of gamblers found that around 30% of the participants had been CSOs for less than three years [13]. Svensson et al. [15]’s population-based study found that just over half (54.7%) continued to be impacted a year later. While in some cases the gambling problem itself resolves, in other instances, CSOs may remove or distance themselves from the person with the gambling problem. This ‘withdrawal’ commonly occurs and is potentially a helpful coping method [41]. Separation and divorce rates are also high for individuals experiencing gambling problems, with those experiencing a severe problem being over twice as likely to be divorced than the general population [42]. Given this evidence, the current study is based on the relatively safe assumption that a household CSO is most likely to be experiencing negative impacts at the time gambling problems are identified in their household, and that, to the extent gambling is causing impacts to wellbeing, the expected impacts should decrease at increasingly distal times. Alternatively, if mean decrements to wellbeing are due to pre-existing long-term factors (e.g., economic deprivation), there should be no significant differences between the gradients (compared to households without a gambling problem) with respect to increasing time from the gambling problem.

In sum, this study examines a range of social, health and financial wellbeing factors up to and including the time at which the CSO is known to be exposed to another person’s gambling problem. We examine retrospective trajectories of wellbeing in CSOs impacted by gambling problems in 2018 compared to people without a gambling problem in the household. We expect that social, health and financial wellbeing are primarily outcomes of exposure to the gambling problem (rather than other causes or confounds that were measured), and
accordingly hypothesise that CSO wellbeing should decline closer to a known time when they are impacted by the gambling problem. Since data on CSO status was also available in the 2015 wave, we also check assumptions against this data, examining the proportion of affected respondents who were also household CSOs three years prior.

Methods

Data source

The Household Income and Labour Dynamics in Australia Survey [HILDA; 43] is a longitudinal Australian survey that collects economic, social, health and demographic information. The study began in 2001 with an initial sample of 7,682 Australian households selected via a stratified three-stage cluster design, expanding to include new household members as household configurations changed. The sample was topped up with an extra 2,153 households in 2011, and by 2018, there were 9,639 responding households, comprising 23,237 people. Further details are available in Summerfield et al. [44], and Watson and Wooden [45]. Participants aged 15 and over were asked to annually participate in a face-to-face interview that included questions about subjective wellbeing. They also privately completed a paper-based questionnaire, which consisted of gambling-related questions and questions probing health, social support, community participation, financial stressors, and life events.

Design and participants

The current study is a prospective cohort study. We used linear mixed models to examine 18-year trajectories of general, health, social and financial wellbeing outcome variables associated with those identified as CSOs or non-CSOs in 2018. The sample of interest for this study was participants aged 15 years or over (adults) who lived in households where all individuals completed the Problem Gambling Severity Index [PGSI; 46] in 2018. This enabled them to be categorised as CSOs or non-CSOs (as described in measures).

Measures

Identifying CSOs. First, gambling problems were identified using the Problem Gambling Severity Index [PGSI; 46] as measured in the 2018 HILDA wave. The PGSI is a well-validated and commonly used measure of problematic gambling behaviour and its consequences over the past 12 months [47]. All household members were asked to complete the PGSI in relation to their own gambling. The 9-item questionnaire includes questions such as “How often have you bet more than you could really afford to lose?” which are rated on a four-point scale from 0 (never) to 3 (almost always). The total summed scores range between 0 and 27, by which respondents are classified as non-problem gamblers or non-gamblers (total score of 0), low-risk gamblers (1 to 2), moderate-risk gamblers (3 to 7), or problem gamblers (8+).

The study then identified all the household members of participants who had been classified by their completed PGSI as either a ‘moderate-risk’ or ‘problem’ gambler. These participants were classified as CSOs as they lived with someone experiencing a gambling problem. Fig 1 describes the sample selection process used to identify CSOs and non-CSOs.

There were no significant sex differences between the excluded (missing household PGSI) group and the analytic sample. However, the mean age was significantly lower (M = 41.7 years, SD = 19.9) compared to the analytic sample (M = 46.6 years, SD = 18.9); Welch (5884.70) = 190.40, p < .01).

HILDA collected data on gambling behaviours only in 2015 and 2018. For CSOs identified in 2018, a similar categorisation was conducted in 2015 to assess the proportion of CSOs who
were also household CSOs three years prior. Around one-quarter of the sample (25.2%) could not be categorised in 2015 as they, or their other household members, did not complete the PGSI in that wave.

**Outcome variables.** Health. Health state utility was measured by the SF-6D. This health index health state score is derived from the SF-36 [48], a measure of functional health and well-being which has been validated for use in Australian populations [49]. Scores range from 0 (worst health state) to 1 (best health state). HILDA calculates these utility values using Australian weights [50, 51]. The SF-36 was available across all 18 years.

Social support. The HILDA social support scale is used to assess an individual’s perceived social support [52–54]. The 10 questions include “I often need help from other people but can’t get it”, “I don’t have anyone that I can confide in”, and “When I need someone to help me out, I can usually find someone”. Responses are rated on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). Negatively worded items were reverse-scored, and responses were summed to create a scale. Higher scores represent a higher level of perceived social support. Cronbach’s Alpha for the scale was $\alpha = .85$, indicating adequate internal reliability. HILDA included this scale in its current form from 2003 onwards.

Community participation. Community participation was assessed using a 12-item measure adapted for use in HILDA from the Australian Community Participation Questionnaire [55]. Questions include “Attend events that bring people together such as fetes, shows, festivals or other community events”, “Get involved in activities for a union, political party, or groups that is for or against something” and “Chat with your neighbours” and cover three broad categories of participation: civic engagement, political participation, and informal social connectedness. Responses are rated on a six-point scale from 1 (never) to 6 (very often). Higher scores represent greater community participation. Scale reliability for this study was Cronbach’s Alpha, $\alpha = .80$. HILDA measured community participation in 2006, 2010, 2014 and 2018.

Financial stressors. Indicators of financial stress were assessed via seven yes/no questions. These were “could not pay electricity, gas or telephone bills on time”, “could not pay the mortgage or rent on time”, “pawned or sold something”, “went without meals”, “was unable to heat

---

**Fig 1.** Primary sample selection, HILDA 2018.

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home”, “asked for financial help from friends and family” and “asked for help from welfare/community organisation”. The number of positive responses was summed with a higher number indicative of more financial stressors. Financial stressors were measured across all years except 2010.

**Personal stressors.** HILDA assesses various life events, both positive and negative. Personal stressors were assessed from the following 14 life events “separated from spouse”, “serious personal injury/illness”, “serious injury/illness to family member”, “death of a spouse or child”, “death of a close relative/family member”, “death of a close friend”, “victim of physical violence”, “victim of a property crime”, “detained in jail”, “close family member detained in jail”, “retired from the workforce”, “fired or made redundant”, “changed jobs” and “major worsening in finances”. Participants indicated yes or no to these events occurring in the previous 12-months, and the number of positive responses was summed. Personal stressors were measured across all years except 2001. Deviant personal stressors were those associated with violence and crime. They included “victim of physical violence”, “victim of a property crime”, “detained in jail”, and “close family member detained in jail”.

**Subjective wellbeing (SWB).** A single item life satisfaction question probed global wellbeing: “All things considered, how satisfied are you with your life?”. Specific wellbeing domains were assessed via questions that asked people to rate how “satisfied or dissatisfied you are with some of the things happening in your life”. Participants were then shown a list which included “Your financial situation”, “Feeling part of your local community”, “The neighbourhood in which you live” and “Your health”. All responses were rated on an 11-point scale from 0 (totally dissatisfied) to 10 (totally satisfied). SWB was measured across all years.

**Covariates**

A range of socio-demographic variables associated with gambling problems [56] were included in the study. These included age, sex, education, and household income.

**Statistical analysis**

Participants’ characteristics in 2018 were analysed using descriptive analyses in IBM SPSS Statistics for Windows, Version 27 [57]. These analyses detailed the total sample, CSOs and non-CSO groups, with differences assessed using chi-square tests and t-tests. Longitudinal data (2001–2018) was then analysed utilising the R statistical programming environment [58]. This analysis was used to examine the preceding years’ responses, allowing the identification of any CSO trajectories different from non-CSOs. To maximise sample size and power, the study did not exclude participants who were missing from some of the previous waves (e.g., did not complete the questionnaire that year, or began participation in a later year due to joining a ‘HILDA household’ or being associated with the 2011 top up sample). A linear mixed model was fit using the REML criterion. Repeated measures were included within-subjects, across years of assessment. Each model included fixed effects predicting each outcome from CSO status, demographic control variables (sex, age, education, and income), plus a linear effect for the year relative to 2018: the year in which the assessment of CSO status occurred, and an interaction term between year and CSO status. Thus, a significant beta coefficient for CSO indicates an overall difference in the outcome over all years that is not dependent on recency with respect to observed CSO status. A significant main effect for year indicates a systematic change in the outcome over time that is not moderated by CSO status, likely due to age or cohort effects. However, a significant interaction between year and CSO status indicates that the difference in the outcomes between CSOs and non-CSOs was moderated by recency to the time of positive CSO identification in 2018. Our original analysis intention was to include not
only a random intercept for each participant but also a random slope for year. However, this model presented numerical convergence issues for several outcome variables. Therefore, we were obliged not to include this effect. From informal comparison of models that did converge, our opinion is that this slight model misspecification should not present major issues for inference regarding the main analysis goals. The linear mixed model design considers the clustering of observations within persons; however, in some cases, multiple CSOs reside in a single household and, as such, are linked to the same gambler. Therefore, there may be some potential clustering of outcomes within households, technically violating the assumption of independence. Convergence issues associated with introducing a further random factor prevented this inclusion to account for this co-variance. To increase beta comparability, all numeric and ordinal variables (both IVs and DVs) were scaled (mean = 0, SD = 1). Natural binary variables like sex were not scaled. A p-value of <.05 was considered significant.

Ethics

The HILDA Study has been conducted annually since 2001, following the University of Melbourne’s ethics guidelines. Ethics approval for data collection was granted by the Human Research Ethics Committee of the University of Melbourne Ethics (#1955879) and updated annually. This paper uses de-identified unit record data, so consent was not required for this study, and approval for secondary analysis was granted by Central Queensland University Human Research Ethics Committee (#22878).

Results

Characteristics of participants in 2018 are described in Table 1. Of the total sample, 3.5% were identified as CSOs (i.e., they lived in a household where the PGSI has classified another member as a moderate-risk or problem gambler). CSOs were significantly more likely to be female, be low or moderate risk or problem gamblers themselves, and be younger and less well-educated than non-CSOs. Of the CSOs in 2018 who could be categorised in 2015, around half (49.9%) were also CSOs three years previously (50.1% were not CSOs).

The trajectories of overall wellbeing, the average number of personal stressors, deviant personal stressors, and mean life satisfaction scores for CSO and non-CSOs are illustrated in Fig 2 (panels a—c). Fig 3 shows the trajectories associated with social (panels a—d), health (panels e—f) and financial (panels g—h) wellbeing. These figures identify the means for CSOs and non-CSOs for each year of data and the trendlines for each group.

General wellbeing

The analyses shown in Table 2 indicate that overall, CSOs tend to have a significantly greater number of personal and deviant personal stressors, and lower satisfaction with life than non-CSOs across the previous years. There were no significant differences found between CSOs and non-CSOs in the slope of the trajectories over that time.

Social wellbeing

CSOs reported significantly worse social wellbeing across all social DVs than non-CSOs (Table 3). The trajectories are similar for CSOs and non-CSOs for community participation and satisfaction with their neighbourhood. However, the trajectory of their satisfaction with the community and their perceived social support significantly declines with recency for CSOs compared to non-CSOs. That is, their social wellbeing in these areas becomes worse closer to the point at which the CSOs were identified as being close to someone with a gambling problem (2018).
Table 1. Participant characteristics in 2018 by total sample and CSO status.

<table>
<thead>
<tr>
<th></th>
<th>Total Sample</th>
<th>CSO</th>
<th>Non-CSO</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6686</td>
<td>47.3</td>
<td>199</td>
<td>41.7</td>
</tr>
<tr>
<td>Female</td>
<td>7452</td>
<td>52.7</td>
<td>278</td>
<td>58.3</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>3051</td>
<td>21.6</td>
<td>115</td>
<td>24.1</td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>6582</td>
<td>60.7</td>
<td>298</td>
<td>62.5</td>
</tr>
<tr>
<td>Separated/divorced</td>
<td>1776</td>
<td>12.6</td>
<td>55</td>
<td>11.5</td>
</tr>
<tr>
<td>Widowed</td>
<td>727</td>
<td>5.1</td>
<td>9</td>
<td>1.9</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>did not complete high school</td>
<td>3278</td>
<td>23.2</td>
<td>146</td>
<td>30.6</td>
</tr>
<tr>
<td>completed high school</td>
<td>2154</td>
<td>15.2</td>
<td>80</td>
<td>16.8</td>
</tr>
<tr>
<td>completed further education</td>
<td>8700</td>
<td>61.6</td>
<td>251</td>
<td>52.6</td>
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<tr>
<td>Employment</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>part time employment</td>
<td>2944</td>
<td>20.8</td>
<td>102</td>
<td>21.4</td>
</tr>
<tr>
<td>full time employment</td>
<td>6117</td>
<td>43.3</td>
<td>211</td>
<td>44.3</td>
</tr>
<tr>
<td>unemployed</td>
<td>452</td>
<td>3.2</td>
<td>23</td>
<td>4.8</td>
</tr>
<tr>
<td>retired</td>
<td>2982</td>
<td>21.1</td>
<td>78</td>
<td>16.4</td>
</tr>
<tr>
<td>other</td>
<td>1631</td>
<td>11.5</td>
<td>62</td>
<td>13</td>
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<td>Income Band</td>
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<td></td>
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<td>Under $20,000</td>
<td>469</td>
<td>3.4</td>
<td>7</td>
<td>1.5</td>
</tr>
<tr>
<td>$20,000–$39,999</td>
<td>2053</td>
<td>14.7</td>
<td>44</td>
<td>9.4</td>
</tr>
<tr>
<td>$40,000–$59,999</td>
<td>1881</td>
<td>13.5</td>
<td>54</td>
<td>11.5</td>
</tr>
<tr>
<td>$60,000–$79,999</td>
<td>1487</td>
<td>10.7</td>
<td>56</td>
<td>12</td>
</tr>
<tr>
<td>$80,000–$99,999</td>
<td>144</td>
<td>10.3</td>
<td>55</td>
<td>11.8</td>
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<td>$100,000–$124,999</td>
<td>1700</td>
<td>12.2</td>
<td>83</td>
<td>17.7</td>
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<tr>
<td>$125,000–$149,999</td>
<td>1366</td>
<td>9.8</td>
<td>46</td>
<td>9.8</td>
</tr>
<tr>
<td>$150,000–$199,999</td>
<td>1818</td>
<td>13</td>
<td>61</td>
<td>13</td>
</tr>
<tr>
<td>$200,000 or more</td>
<td>1736</td>
<td>12.4</td>
<td>62</td>
<td>13.2</td>
</tr>
<tr>
<td>PGSI Category*</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-problem gambler</td>
<td>13142</td>
<td>95.6</td>
<td>355</td>
<td>76.7</td>
</tr>
<tr>
<td>low risk gambler</td>
<td>538</td>
<td>3.9</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>moderate risk gambler</td>
<td>63</td>
<td>0.5</td>
<td>63</td>
<td>13.6</td>
</tr>
<tr>
<td>problem gambler</td>
<td>8</td>
<td>0.1</td>
<td>8</td>
<td>1.7</td>
</tr>
<tr>
<td>Mean SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>N</td>
<td>= 14138</td>
<td>n</td>
<td>= 477</td>
</tr>
<tr>
<td>Age</td>
<td>46.6</td>
<td>18.9</td>
<td>43.5</td>
<td>18.5</td>
</tr>
<tr>
<td>Household debt</td>
<td>$420,405</td>
<td>$221,180</td>
<td>$249,728</td>
<td>$468,019</td>
</tr>
</tbody>
</table>

* Problem- and moderate-risk gamblers were excluded unless they resided with another problem- and moderate-risk gambler and were therefore categorised as a CSO.

https://doi.org/10.1371/journal.pone.0281099.t001

**Health wellbeing**

Health-related quality of life and satisfaction with health for CSOs are consistently lower than for non-CSOs. However, the trajectory of both is similar to that experienced by non-CSOs (Table 4).
Financial wellbeing

Table 5 indicates that over the 18 years, CSOs have consistently had more financial stressors and lower satisfaction with their finances than non-CSOs. While there was no significant difference in the trajectory of financial stressors between CSOs and non-CSOs, as illustrated in Fig 3 (panel h), the CSOs’ satisfaction with their financial situation does not increase over the years as much as non-CSOs.

Discussion

We examined the health and wellbeing trajectories of a group of household CSOs in 2018, for the 17 years prior to when it was known from the survey that they were living with someone experiencing a gambling problem. This CSO group was compared to people without a gambling problem in the household at that time. As expected, some social and financial wellbeing outcomes showed a clear temporal effect, declining closer to the time they were known to be impacted by the gambling problem. However, while all measured health and wellbeing outcomes were worse for CSOs, no temporal effects were found with any measured general wellbeing or health variables. We also found around half (49.9%) of the CSO group had also been CSOs three years prior. This is relatively consistent with previous findings [13, 15] and provides further support for our assumption that the likelihood of experiencing impact from another person’s gambling declined with decreasing proximity to the time household gambling problems were measured.

The study identified clear temporal effects associated with social and financial wellbeing. That is, there were significantly different trajectories for CSOs and non-CSOs as proximity to known exposure to household gambling problems decreased. For those without a gambling problem in the household, satisfaction with their financial situation improved as they aged; however, this was not the case in CSOs, whose satisfaction remained reasonably stable over...
time and lacked improvement. One of the most common gambling-related harms, financial problems can be the first consequence of excessive gambling (Langham et al., 2016; Mathews & Volberg, 2013). Consequently, gambling-related financial problems might offset any normal improvements expected in a person’s financial wellbeing over time. Social wellbeing also appeared to be influenced by gambling problems. For participants not associated with a household gambling problem, social wellbeing appeared relatively stable over time. However, CSOs perceived that social support and their satisfaction with their community deteriorated closer to the point at which it was known they were living with someone with a gambling problem.
Table 2. Generalised linear mixed-effects model results for overall wellbeing variables.

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.01</td>
<td>0.01</td>
<td>1.18</td>
<td>.239</td>
<td>0.02</td>
<td>0.01</td>
<td>1.98</td>
<td>.048</td>
<td>0.07</td>
<td>0.01</td>
<td>11.79</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Year</td>
<td>0.03</td>
<td>0.00</td>
<td>8.30</td>
<td>&lt;.001</td>
<td>0.01</td>
<td>0.00</td>
<td>3.47</td>
<td>.001</td>
<td>0.05</td>
<td>0.00</td>
<td>14.99</td>
<td>&lt;.001</td>
</tr>
<tr>
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<td>0.09</td>
<td>0.03</td>
<td>3.20</td>
<td>.001</td>
<td>-0.11</td>
<td>0.04</td>
<td>-3.02</td>
<td>.003</td>
<td>0.07</td>
<td>0.03</td>
<td>2.67</td>
<td>.008</td>
</tr>
<tr>
<td>Female</td>
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<td>0.01</td>
<td>2.25</td>
<td>.025</td>
<td>0.02</td>
<td>0.01</td>
<td>1.67</td>
<td>.095</td>
<td>-0.05</td>
<td>0.01</td>
<td>-6.45</td>
<td>&lt;.001</td>
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<td>Age</td>
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<td>0.01</td>
<td>-4.63</td>
<td>&lt;.001</td>
<td>0.05</td>
<td>0.01</td>
<td>7.06</td>
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<td>-0.11</td>
<td>0.00</td>
<td>-25.20</td>
<td>&lt;.001</td>
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<td>Education</td>
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<td>-7.92</td>
<td>&lt;.001</td>
<td>0.01</td>
<td>0.00</td>
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<td>.006</td>
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<td>Household Income</td>
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<td>-22.52</td>
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<td>0.10</td>
<td>0.01</td>
<td>14.45</td>
<td>&lt;.001</td>
<td>-0.07</td>
<td>0.00</td>
<td>-16.35</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Year x CSO</td>
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<td>0.02</td>
<td>-1.44</td>
<td>.150</td>
<td>0.01</td>
<td>0.02</td>
<td>0.42</td>
<td>.671</td>
<td>0.01</td>
<td>0.02</td>
<td>0.26</td>
<td>.795</td>
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<tr>
<td>Random Effects</td>
<td>St. Dev</td>
<td>Correlation</td>
<td>St. Dev</td>
<td>Correlation</td>
<td>St. Dev</td>
<td>Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Intercept)</td>
<td>0.42</td>
<td>0.07</td>
<td>0.68</td>
<td>0.05</td>
<td>0.34</td>
<td>0.24</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Year</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Residual</td>
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<td>0.69</td>
<td></td>
<td>0.93</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Parameter estimates (phi)</td>
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<td></td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
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<td>Observations</td>
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<td></td>
<td>152754</td>
<td></td>
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<td>13910</td>
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</tr>
</tbody>
</table>

Note: all numeric and ordinal variables, both IVs and DVs (except those already binary) were scaled (m = 0, SD = 1). Correlation structure AR (1).

https://doi.org/10.1371/journal.pone.0281099.t002

While both groups reported similar levels of social wellbeing early in the study, the social well-being of CSOs had decreased by 2018. This finding supports previous research on social impacts associated with CSOs. CSOs can feel excluded from friends and family and limit social activities due to the fear of being stigmatised because of the gambling behaviour [59], feel

Table 3. Generalised linear mixed-effects model results for social wellbeing variables.

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Estimate</th>
<th>SE</th>
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<th>Estimate</th>
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<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
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<td>-16.75</td>
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<td>-7.09</td>
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<td>-0.09</td>
<td>0.01</td>
<td>-9.30</td>
<td>&lt;.001</td>
<td>-0.02</td>
<td>0.01</td>
<td>-2.48</td>
<td>.013</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
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<td>0.00</td>
<td>-7.59</td>
<td>&lt;.001</td>
<td>0.02</td>
<td>0.00</td>
<td>4.92</td>
<td>&lt;.001</td>
<td>0.01</td>
<td>0.00</td>
<td>1.89</td>
<td>.059</td>
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<td></td>
</tr>
<tr>
<td>CSO—Yes</td>
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<td>-2.75</td>
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<td>-0.08</td>
<td>0.04</td>
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<td>.021</td>
<td>-0.14</td>
<td>0.04</td>
<td>-3.60</td>
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Note: all numeric and ordinal variables, both IVs and DVs (except those already binary) were scaled (m = 0, SD = 1). Correlation structure AR (1).

https://doi.org/10.1371/journal.pone.0281099.t003
Table 4. Generalised linear mixed-effects model results for health variables.

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Note: all numeric and ordinal variables, both IVs and DVs (except those already binary) were scaled (m = 0, SD = 1). Correlation structure AR (1).

https://doi.org/10.1371/journal.pone.0281099.t004

shame about staying with the person, or have a fear of being judged [40]. They may be embarrassed because the person who gambles does not attend social events due to time spent gambling, and the CSOs have to attend alone or explain the absence [12]. CSOs might not want to socialise in places with an opportunity to gamble [59]. It might be expected that the social

Table 5. Generalised linear mixed-effects model results for financial wellbeing variables.

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<td>.000</td>
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Note: all numeric and ordinal variables, both IVs and DVs (except those already binary) were scaled (m = 0, SD = 1). Correlation structure AR (1).

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impact is stronger in partners or household CSOs (such as examined in this study) as their social lives may be more interlinked than non-household CSOs such as friends and work colleagues.

Contrary to expectations, in other areas of health and wellbeing, no temporal effects were found. Trajectories of health-related quality of life and satisfaction with health were similar for both CSOs and non-CSOs. However, CSOs reported lower mean values, reporting consistently lower health-related quality of life and satisfaction with health than non-CSOs. These lower means are consistent with cross-sectional studies that tend to find CSOs report impaired physical and mental health [e.g. 17, 20, 60]. Over the period of the study, CSOs reported a higher number of personal, deviant, and financial stressors than non CSOs, however these trajectories did not measurably differ with proximity to the known gambling problem. Life satisfaction stayed relatively steady over time for all participants. This findings fits the theory that people have their own personal level of satisfaction with life [61]. Over time, notwithstanding a few bumps along the way, this will usually return to that person’s ‘normal’ level. Again, the trajectory of CSOs’ satisfaction with life was similar to non-CSOs, while CSOs reported lower mean satisfaction overall. Paterson and colleagues [62] found similar results when they explored the trajectory of life satisfaction in those experiencing a first-hand gambling problem. Their study found those with a serious gambling problem reported consistently lower levels of life satisfaction across 15 years compared to non-problem and at-risk gamblers.

Our findings suggest that some of the lower health and life satisfaction factors commonly associated with CSO’s may not be directly or solely attributable to the gambling problem. While CSOs were found to experience long-standing decrements to their health and reported life satisfaction, these did not change with proximity to exposure to the gambling problem. Instead, it may be that these issues are related to some risk factors for having a gambling problem in the household, or some factor unrelated to gambling. For example, CSOs tend to be younger, less educated, and more likely to have a gambling problem themselves [4, 15, 20, 21, 60]. Additionally, gambling problems are associated with renting in low socioeconomic areas, other addictions, and other mental health challenges [56, 63, 64]. All these factors have their own complex relationships with health and wellbeing [65–67], and may affect the health and life satisfaction of household CSOs.

**Limitations and further research**

The principal limitation of the study was that CSO status was only measured in 2018, meaning that full longitudinal modelling of this impact to consequences could not be done. The retrospective analysis undertaken rests on the uncontroversial assumption that proximity to gambling problems is not permanent: given a positive case in 2018, the probability of being a CSO in a prior year tends to decline with increasing time. Nevertheless, the unmeasured variable and the stochastic nature of the temporal relationship inject significant noise into the analysis. Additionally, the sample size and variability within the data may not have provided enough power to identify some smaller effects over-time, while clustering may have yielded anti-conservative tests of significance. Further purpose-designed longitudinal studies will be needed to make firmer conclusions, for example by measuring CSO status across all years and larger samples that enable comparative analyses of CSOs living with gamblers in the problem and at-risk categories of the PGSI. Finally, the analytic sample consisted of CSOs living in the same household as a person with a gambling problem. While an important sub-sample, those impacted by another person’s gambling comprise a much wider group [2, 4, 59]. Ex-partners, for example, comprise a significantly sizeable proportion of people harmed by another’s gambling problem [4] and can experience long-term financial and relational harm [6, 59, 68].


Conclusions

Overall, the study found a temporal effect between exposure to another person’s gambling problem and negative social and financial wellbeing outcomes for CSOs. This indicates that a gambling problem in the household is likely to directly contribute to decreases in the social and financial wellbeing of other people living in that household. On the other hand, no clear temporal link was found with health, life satisfaction, or the number of stressors experienced by CSOs; that is, there were no significant changes with respect to proximity to the gambling problem. Instead, CSOs reported long-term health and overall wellbeing decrements, which likely preceded exposure to the gambling problem. This might indicate that these decrements may not necessarily be a direct outcome of problem gambling exposure. Instead, they may be related to other risk factors associated with having a gambling problem in the household. However, regardless of what is causing or contributing to health and wellbeing decrements, they should continue to be considered by policy and practice that aims to support CSOs.

Acknowledgments

This paper uses unit record data from Household, Income and Labour Dynamics in Australia Survey [HILDA] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS’ contractors or partners. DOI:10.26193/IYBXHM.

Author Contributions

Conceptualization: Catherine Tulloch.

Data curation: Catherine Tulloch.

Formal analysis: Catherine Tulloch, Matthew Browne.

Supervision: Matthew Browne, Nerilee Hing, Matthew Rockloff, Margo Hilbrecht.

Writing – original draft: Catherine Tulloch.

Writing – review & editing: Catherine Tulloch, Matthew Browne, Nerilee Hing, Matthew Rockloff, Margo Hilbrecht.

References


57. IBM Corp. IBM SPSS Statistics for Windows, Version 27.0.


Chapter 8 - Who Experiences Harm
and How this Relates to Health and Wellbeing (Study 5)

“I feel that I am a failure as a mother
as my daughter has a gambling problem”

[Mother, Female, 63 years]

“He is always speaking about gambling
and trying to persuade me to play with him”

[Friend, Male, 29 years]9

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9 These quotes were offered by participants as part of the data collection utilised in Chapter 8.
8.1 Introduction

The final study uses a large sample of CSOs to understand which CSOs are most likely to be harmed by another person’s gambling and how this harm relates to a wide range of health and wellbeing areas. As discussed in Chapter 3, using population-based samples comes with some limitations. One limitation is that they tend to have a relatively low prevalence of CSOs, which may result in low statistical power. This study uses a large non-treatment-related sample of CSOs and a range of measures covering the conceptual model (Figure 1.10.1). These include the severity of the gambling problem, gambling harms experienced, and a broad range of subjective and objective wellbeing measures. While not representative, this method allows for a robust analysis of the relevant variables.

Additionally, the study’s design builds upon findings from the earlier studies that used population-representative data (Chapters 4 to 7). For example, the studies using HILDA data (Chapters 4, 6 and 7) were confined to household CSOs. However, ex-partners, who are less likely to cohabit with the person who gambles, comprise a large proportion of those harmed (Hing, Russell, et al., 2022). Therefore, it is important to understand health and wellbeing across a wide range of CSO relationships.

Additionally, an area of current research focus concerns identifying the differing harms experienced across a wide range of CSOs, with the expectation that CSOs closer to the person who gambles experience more harm. As explained by the Australian Productivity Commission (1999, sec. 7.34), “of course, the magnitude of (harmful) effects is likely to be weaker, of lesser duration and more under the control of the affected party, the more distant is their relationship to the problem gambler.” To date, researchers identify “distance” by the type of relationship with the person who gambles (e.g. partner or friend)
or whether or not they live in the same household. This study uses a novel approach by including a measure of relationship closeness alongside relationship types. A new scale, the Significant Other Closeness Scale (Appendix G), was developed for this purpose. The measure quantifies aspects of closeness in the relationship between the CSO and the person who gambles, which are not necessarily captured by the exclusive use of relationship types. This approach enables more robust conclusions about those most impacted by gambling-related harm.

8.2 Manuscript

This chapter contains a copy of a manuscript under consideration at Journal of Behavioral Addictions. See Appendix F for the Declaration of Co-Authorship.

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

Catherine Tulloch1, Matthew Browne2, Nerilee Hing2, Matthew Rockloff2 and Margo Hilbrecht3,4

1 Corresponding Author. Experimental Gambling Research Laboratory, School of Health, Medical and Applied Sciences, Central Queensland University, Sydney, NSW, Australia

2 Experimental Gambling Research Laboratory, School of Health, Medical and Applied Sciences, Central Queensland University, Bundaberg, QLD Australia

3 The Vanier Institute of the Family, Ontario, Canada

4 The Department of Recreation & Leisure Studies, University of Waterloo, Ontario, Canada

Submitted: 14 February 2023
How gambling harms others: The influence of relationship-type and closeness on harm, health, and wellbeing

Running head: gambling-related harm to others

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

Around 6% of Australian adults report being harmed by another person’s gambling (Hing et al., 2021). 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 et al., 2007; Wenzel et al., 2008), anxiety (Black et al., 2014), psychological or emotional distress (Chan et al., 2016; Dowling et al., 2014; Lind et al., 2022; A. Salonen et al., 2016; Svensson et al., 2013; Tulloch et al., 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; A. 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 et al., 2017). Similarly, in a recent qualitative study, Browne et al. (2022) 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 et al. (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., 2022; 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 et al., 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=1131). Respondents were recruited by survey aggregator, Qualtrics, through various panels. Each recruited respondent received a small incentive from their panel for participating. 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 G). 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 .831, showing good internal consistency.
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 et al., 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 et al., 2017). Summed scores range from 0 to 27, with higher scores representing more severe gambling problems. The Cronbach’s alpha for this study was .848.

Gambling harms

Gambling harms were measured via the 20-item Gambling Harms Scale for Affected Others (GHS-20-AO; Browne et al., 2022). 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 .905.
Wellbeing - Objective Health States

The SF-12v2 (Ware et al., 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 (QualityMetric, 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 .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 et al., 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 et al., 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 = .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 et al., 2010; A. H. Salonen et al., 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 et al., 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 (23491). 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 8.2.1.

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. The mean PGSI scores of the 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, \( F(3,1135) = 4.08, p = .007 \). 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 8.2.2. All differences between these relationship type groups were significant, \( F(3,1135) = 129.45, p < .001 \).
Table 8.2.1  Demographic characteristics of the participants

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/never married</td>
<td>342</td>
<td>30.0%</td>
</tr>
<tr>
<td>Living with partner / de facto</td>
<td>263</td>
<td>23.1%</td>
</tr>
<tr>
<td>Married</td>
<td>440</td>
<td>38.6%</td>
</tr>
<tr>
<td>Divorced or separated</td>
<td>76</td>
<td>6.7%</td>
</tr>
<tr>
<td>Widowed</td>
<td>18</td>
<td>1.6%</td>
</tr>
<tr>
<td><strong>Highest educational qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not complete year 10</td>
<td>27</td>
<td>2.4%</td>
</tr>
<tr>
<td>Completed year 10 or equivalent</td>
<td>84</td>
<td>7.4%</td>
</tr>
<tr>
<td>Year 12 or equivalent</td>
<td>184</td>
<td>16.2%</td>
</tr>
<tr>
<td>A trade, technical certificate or diploma</td>
<td>300</td>
<td>26.3%</td>
</tr>
<tr>
<td>A university or college degree</td>
<td>415</td>
<td>36.4%</td>
</tr>
<tr>
<td>Postgraduate qualification</td>
<td>129</td>
<td>11.3%</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full or part-time work (including self-employed)</td>
<td>867</td>
<td>78.4%</td>
</tr>
<tr>
<td>Unemployed and looking for work</td>
<td>36</td>
<td>3.2%</td>
</tr>
<tr>
<td>Full time student</td>
<td>46</td>
<td>4.0%</td>
</tr>
<tr>
<td>Full-time home duties</td>
<td>54</td>
<td>4.7%</td>
</tr>
<tr>
<td>Retired</td>
<td>74</td>
<td>6.5%</td>
</tr>
<tr>
<td>Sick, disability pension or other</td>
<td>45</td>
<td>3.1%</td>
</tr>
<tr>
<td><strong>Annual Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$0 to $39,999</td>
<td>161</td>
<td>14.1%</td>
</tr>
<tr>
<td>$40,000 to $79,999</td>
<td>288</td>
<td>25.3%</td>
</tr>
<tr>
<td>$80,000 to $119,999</td>
<td>257</td>
<td>22.6%</td>
</tr>
<tr>
<td>$120,000 to $159,999</td>
<td>212</td>
<td>18.6%</td>
</tr>
<tr>
<td>$160,000 or more</td>
<td>164</td>
<td>14.4%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>57</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>ATSI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Aboriginal or Torres Strait Islander</td>
<td>1024</td>
<td>89.9%</td>
</tr>
<tr>
<td>Yes, Aboriginal</td>
<td>91</td>
<td>8.0%</td>
</tr>
<tr>
<td>Yes, Torres Strait Islander</td>
<td>21</td>
<td>1.8%</td>
</tr>
<tr>
<td>Yes, both Aboriginal and Torres Strait Islander</td>
<td>3</td>
<td>0.3%</td>
</tr>
<tr>
<td><strong>Lie/Bet</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>696</td>
<td>61.1%</td>
</tr>
<tr>
<td>Possible gambling problems</td>
<td>443</td>
<td>38.9%</td>
</tr>
<tr>
<td><strong>Diagnosed Mental Health Condition</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>707</td>
<td>62.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>432</td>
<td>38.0%</td>
</tr>
</tbody>
</table>
### Table 8.2.2  Overall closeness and PGSI scores by relationship type

<table>
<thead>
<tr>
<th>Relationship Type</th>
<th>N</th>
<th>%</th>
<th>PGSI of Gambler</th>
<th>Closeness to Gamblers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Current spouse / partner</td>
<td>197</td>
<td>17.3%</td>
<td>14.13</td>
<td>6.36</td>
</tr>
<tr>
<td>Former spouse / partner</td>
<td>82</td>
<td>7.2%</td>
<td>15.16</td>
<td>5.65</td>
</tr>
<tr>
<td>Family member</td>
<td>411</td>
<td>36.1%</td>
<td>13.83</td>
<td>5.46</td>
</tr>
<tr>
<td>Mother / mother-in-law</td>
<td>52</td>
<td>4.6%</td>
<td>14.06</td>
<td>6.43</td>
</tr>
<tr>
<td>Father / father-in-law</td>
<td>82</td>
<td>7.2%</td>
<td>14.16</td>
<td>5.71</td>
</tr>
<tr>
<td>Sibling (sister / brother)</td>
<td>113</td>
<td>9.9%</td>
<td>13.77</td>
<td>5.39</td>
</tr>
<tr>
<td>Child / grandchild</td>
<td>43</td>
<td>3.8%</td>
<td>13.49</td>
<td>5.54</td>
</tr>
<tr>
<td>Grandparent</td>
<td>8</td>
<td>0.7%</td>
<td>11.75</td>
<td>4.86</td>
</tr>
<tr>
<td>Other family member / relative</td>
<td>113</td>
<td>9.9%</td>
<td>13.83</td>
<td>4.91</td>
</tr>
<tr>
<td>Non-family relationship</td>
<td>449</td>
<td>39.4%</td>
<td>13.12</td>
<td>5.01</td>
</tr>
<tr>
<td>Friend</td>
<td>368</td>
<td>32.3%</td>
<td>13.19</td>
<td>4.93</td>
</tr>
<tr>
<td>Flatmate / housemate</td>
<td>24</td>
<td>2.1%</td>
<td>13.29</td>
<td>5.14</td>
</tr>
<tr>
<td>Work colleague</td>
<td>57</td>
<td>5.0%</td>
<td>12.65</td>
<td>5.53</td>
</tr>
</tbody>
</table>

### Table 8.2.3  Intercorrelations between harm, domains of closeness, and combined closeness score by relationship type

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

** Correlation is significant at < 0.01 (2-tailed).
Figure 8.2.1 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, \( F(3,313.26 = 143.72, p < .001, \text{Welch}) \). 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, \( F(3,318.39 = 107.16, p < .001, \text{Welch}) \). Current partners reported the highest levels of emotional closeness, followed by family members and ex-partners, and then non-family relationships, \( F(3,318.61 = 75.10, p < .001, \text{Welch}) \). With shared time together, a current partner was again the closest relationship, which was significantly higher than all the other groups, \( F(3,305.70 = 64.15, p < .001, \text{Welch}) \).

**Figure 8.2.1 Clustered bar chart of domains of closeness by relationship type**

![Clustered bar chart of domains of closeness by relationship type](image-url)
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 (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(3,1135) = 64.15, p < .001. As shown in Table 8.2.3, 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 8.2.4. 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 8.2.5. Both current partners and ex-partners reported significantly higher levels of psychological distress and negative affect 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 8.2.6).
Table 8.2.4  Regression model predicting gambling-related harm from the severity of the gambling problem, relationship type, and domains of closeness to the gambler

<table>
<thead>
<tr>
<th>Dependent Variable: Harm</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
<th>95.0% CI for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>1.85</td>
<td>0.40</td>
<td></td>
<td>4.59</td>
<td>.000</td>
<td>1.06 - 2.64</td>
</tr>
<tr>
<td>PGSI</td>
<td>0.50</td>
<td>0.03</td>
<td>0.47</td>
<td>18.16</td>
<td>.000</td>
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<tr>
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<td>9.54</td>
<td>.000</td>
<td>3.71 - 5.63</td>
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<tr>
<td>Relationship (reference = Current Partner)</td>
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<tr>
<td>Family member</td>
<td>-1.75</td>
<td>0.41</td>
<td>-0.15</td>
<td>-4.32</td>
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<td>.115</td>
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<td>0.36</td>
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<tr>
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<td>0.95</td>
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<td>0.12</td>
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<td>.012</td>
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Note: p<.01 is considered significant
### Table 8.2.5  
**Mean and standard deviations of aspects of health and wellbeing by relationship type**

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</table>

* Welch. Letters denotes means which are significantly different (Student-Newman-Keuls)
Table 8.2.6  Mean and standard deviations of aspects of health and wellbeing by the level of closeness

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<tr>
<th>Aspects of Health and Wellbeing</th>
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<td>Medium Closeness</td>
<td>High Closeness</td>
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<td>N=379</td>
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<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
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<td>9.17b</td>
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<td>12.93b</td>
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<td>3.82</td>
<td>15.62b</td>
<td>3.45</td>
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<td>6.02</td>
<td>2.19</td>
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<td>60.40</td>
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<td>SF-12 Domains</td>
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<td>Bodily Pain Norm-Based Score</td>
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<td>44.95b</td>
<td>8.90</td>
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<td>9.91</td>
<td>42.90</td>
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<td>48.46b</td>
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<td>44.14a</td>
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<td>10.94</td>
<td>38.47b</td>
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<td>34.04a</td>
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<tr>
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<td>9.47</td>
<td>43.77b</td>
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<td>40.47a</td>
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<td>45.82a</td>
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</table>

* Welch. Letters denotes means which are significantly different (Student-Newman-Keuls)
Table 8.2.7 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 8.2.8, 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.

Table 8.2.7 Correlations between gambling-related harm and aspects of health and wellbeing

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<td>.48**</td>
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<tr>
<td>Panas - positive affect scale</td>
<td>.03</td>
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<tr>
<td>Life satisfaction</td>
<td>-.20**</td>
</tr>
<tr>
<td>PWI total score standardised</td>
<td>-.26**</td>
</tr>
<tr>
<td>Bodily Pain Norm-Based Score</td>
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<tr>
<td>Mental Health Norm-Based Score</td>
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<tr>
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<td>Role Physical Norm-Based Score</td>
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<td>Vitality Norm-Based Score</td>
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** Correlation is significant at the 0.01 level (2-tailed).
Table 8.2.8  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

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<tr>
<td>N</td>
<td>1131</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>p</td>
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<td>&lt;.001</td>
<td>.28</td>
<td>&lt;.001</td>
<td>0.11</td>
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<td>&lt;.001</td>
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<td>&lt;.001</td>
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<tr>
<td>N</td>
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<td>p</td>
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<td>&lt;.001</td>
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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.

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 et al., 2021). While CSOs tended to report lower subjective wellbeing than others, recent longitudinal findings by Tulloch et al. (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

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; A. 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 et al., 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.

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 et al.,
2012). Consequently, treatments aimed at reducing this distress may help to reduce the
harmful impacts of gambling on others. 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. 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.


https://doi.org/10.1007/s10899-021-10058-7


https://doi.org/10.1080/14459795.2017.1331252


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1162. https://doi.org/10.1007/s10899-020-09990-x

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Chapter 9 - Discussion

“It has affected everything and everyone”

[Current Spouse/Partner, Female, 49 years]

“She just ruined our entire life”

[Former Spouse/Partner, Male, 19 years]¹⁰

¹⁰ These quotes were offered by participants as part of the data collection utilised in Chapter 8.
9.1 Overview

Gambling-related harm can spread from the person who gambles to those close to them. Around 6% of Australians identify as being harmed by another’s gambling (Hing et al., 2021). This equates to approximately 1.5 million adult Australians. As this thesis discusses in Chapters 1 and 2, a number of studies have examined these harms, and a more limited number, the health and wellbeing impact on CSOs. However, little research has examined the impact of gambling-related harms on a broad range of health and wellbeing outcomes in community-based CSOs. Additionally, many studies have used small samples of partners of gamblers who have reached a crisis point and are seeking treatment. There has been a lack of longitudinal investigation, little knowledge about CSOs’ subjective wellbeing, and conflicting or limited evidence about which areas of wellbeing are impacted. These factors have made it unclear exactly which groups of CSOs are likely to experience health and wellbeing harms and in what way.

This thesis describes a series of studies that address these gaps. CSO health and wellbeing are explored from different perspectives: in adults and children in the community; by gambling problem severity; longitudinally; and by relationship and closeness to the person who gambles. The first two studies use large population-representative datasets to understand aspects of CSO (adults and children) health and wellbeing. Study three explores whether CSO health and wellbeing decrements are associated only with severe gambling problems (PGSI 8+) or whether they extend to CSOs of people who gamble across the gambling risk spectrum (PGSI 1–7). The fourth research study utilises longitudinal data spanning 18 years to examine whether decrements in health and wellbeing, often linked to CSOs, can be directly attributed to exposure to the gambling problem. The final study uses a large sample to examine who is likely to be harmed and the relationship between gambling-
related harm and CSO health and wellbeing outcomes. Overall, the series of studies described in this thesis contribute to the goal of understanding how and when gambling problems impact the health and wellbeing of CSOs.

This chapter summarises the key results of the individual research studies, and discusses the consolidated findings and their place in the literature. It then outlines limitations and strengths of the thesis, and the implications of the findings for policy, CSO support and education, and future research.

9.1.1 Overview of Key Findings

Below is a brief overview of the main findings of the individual studies in this thesis:

- Study 1 identifies that CSOs report lower subjective wellbeing than non-CSOs. However, there are no significant differences in wellbeing across the range of CSO relationships to the gambler or whether they are household members.

- The study of two cohorts of Australian children (aged 12 and 16) shows significant associations between parental gambling problems and decrements across a range of health and wellbeing aspects. However, most of these associations are no longer significant once other demographic and socioeconomic factors are considered.

- The third study identifies that the bulk of health and wellbeing decrements in CSOs are primarily associated with those exposed to severe gambling problems (PGSI 8+). However, financial wellbeing is negatively impacted for CSOs exposed to the entire range of gambling problem severity (PGSI 1+).

- The 18-year longitudinal analysis examining CSO’s health and wellbeing prior to exposure to the gambling problem (Study 4) indicates that social and financial wellbeing appear directly associated with this exposure. However, other health and
wellbeing variables show long-term decrements predating known exposure to the gambling problem.

– The final study finds that partners (current and ex) and family members who share finances and day-to-day responsibilities with the person who gambles are more likely than others to experience harm. The health and wellbeing outcomes most strongly associated with harm are high distress and negative emotions, impacting the CSO’s daily life.

9.2 Discussion of Combined Findings

Below is a consolidated view of the findings and their relationship to existing literature. First is a discussion about which CSOs are likely to report health and wellbeing decrements, followed by the nature of the relationship between gambling problems and CSO health and wellbeing.

9.2.1 When Do CSO Health and Wellbeing Decrements Occur?

9.2.1.1 Gambling Problem Severity

Financial wellbeing impacts are experienced by CSOs across the full range of gambling problem severity (PGSI 1–27; Study 3). This finding is unsurprising, considering financial losses are a primary driver of gambling harm. The prevalence and spread of financial harm to people who gamble across the risk spectrum are well-established (Browne et al., 2020; Volberg et al., 2022). Consistent with this observation, Study 3’s results reveal that the effects on financial wellbeing also extend to CSOs exposed to gambling across the risk spectrum.

However, the bulk of other health and wellbeing factors are more measurably associated with being impacted by someone experiencing severe gambling problems (Studies 2 and 3). In Study 2, as the severity of the parent’s gambling problem increased, so did the children’s anxiety and feelings of low mood. In Study 3, the strength of the association between gambling problem severity and decrements in CSO health and wellbeing is around
two to three times stronger in problem-gambling households (PGSI 8+) than in lower-risk level households (PGSI 1–7). This finding suggests a significant shift in CSO health and wellbeing decrements between those exposed to lower-level problems and those exposed to severe gambling problems. The strength of this association is consistent with research looking at people who gamble. Browne et al. (2017) found the quality of life impacts on gamblers are around one and half times greater for those with severe problems (PGSI 8+) than those with moderate problems (PGSI 3–7).

9.2.1.2 Relationship Type and Closeness

Gambling-related harms and the associated health and wellbeing decrements happen when the type of relationship is close, especially with partners (current and ex) and other family members when they have shared finances and day-to-day responsibilities (Study 5). It has been generally agreed that the risk of adverse effects due to another’s gambling is more likely to occur in close familial relationships, where there are strong emotional ties and shared financial responsibilities (Goodwin et al., 2017; Orford et al., 2017; Productivity Commission, 1999). The thesis’ findings support this observation, with partners (current and ex) reporting the most harm, followed by other family members and then non-family relationships. This pattern is consistent with other research (Hing, Russell, et al., 2022; Lind et al., 2022).

Study 5 uses a novel attempt to quantify and measure “closeness” using different domains of closeness rather than solely using relationship type. The study finds that a close financial connection is the strongest predictor of harm, followed by shared day-to-day responsibilities and time spent together. Unexpectedly, unlike the other domains of closeness, the results indicate that an emotional connection to the person who gambles is not independently predictive of experiencing harm. While children were not included in this study, non-adult children of people who gamble usually have close and highly dependent
relationships with their parents. Therefore, they would be expected to be very vulnerable to harm.

Ex-partners are an example of where the closeness of the relationship appears to make a strong difference concerning harm. According to the results from Study 5, being a partner of a person who gambles similarly predicts harm, regardless of whether the partner is current or ex. However, once the closeness of the relationship is considered, being an ex-partner more strongly predicts harm. That is, ex-partners who still have shared finances and responsibilities report experiencing greater harm than current partners or those who have been able to withdraw from any interdependence.

Overall, health and wellbeing decrements are more likely to be present when the gambling problem is severe (except for financial wellbeing that affects all CSOs) and where there is a close familial or partner connection, sharing responsibilities and finances.

9.2.2 The Impact of Gambling Problems on CSO Health and Wellbeing

The ultimate consequence of the adverse effects of gambling is the impact on health and wellbeing. Most research shows that CSOs often report health and wellbeing decrements (e.g. Kourgiantakis et al., 2013; Riley et al., 2018; Tulloch, Browne, et al., 2021). However, there has been little examination of whether these decrements are a direct outcome of exposure to another’s gambling problem or, alternatively, only associated with the gambling problem. This thesis makes a new contribution to knowledge by using more rigorous methods to understand this issue.

Studies in this thesis indicate that the health and wellbeing decrements most directly related to exposure to another’s gambling are the experience of psychological distress and negative emotions, impacts on financial wellbeing, and impacts on social wellbeing. However, other health and wellbeing factors (i.e. physical and mental health and general subjective
wellbeing) appear less directly related to the gambling problem. These observations will be discussed in turn.

**9.2.2.1 Psychological Distress and Negative Affect**

Clinically significant levels of psychological distress are reported by CSOs, and in particular, by partners and ex-partners with close relationships (Study 5). CSOs also report elevated levels of negative emotions and emotional problems. This finding is consistent across other research. For example, population studies have associated being a CSO with high levels of psychological distress (e.g. Lind et al., 2022; Tulloch et al., 2020), as have CSOs associated with gamblers in treatment (e.g. Chan et al., 2016). In non-adult children, a recent systematic review found strong evidence of a direct link between parental gambling problems and child distress (Suomi, Lucas, et al., 2022).

Negative affect is also strongly associated with harm in CSOs. The PANAS measure, used in this analysis, includes a list of adjectives that assess an individual’s experience of negative affect, representing different facets of negative emotions, such as “afraid” or “ashamed”. Prior research has found similar reports of negative affect by CSOs, including feelings of hopelessness and vulnerability (Jeffrey et al., 2019). Anger is also commonly associated with CSOs (Estévez et al., 2022; Lesieur & Rothschild, 1989; Suomi et al., 2013), sometimes leading to violence against the person who gambles (Suomi et al., 2013). This is another example of the complex relationship between gambling and harm. Research has indicated that CSOs have higher odds of being both victims and perpetrators of family violence (Dowling, Jackson, et al., 2014). However, violence towards the gambler can potentially lead to increased gambling behaviour. For instance, for some individuals who gamble, it may be used as a coping mechanism to deal with or escape the consequences of family violence or to attempt to fund leaving a violent relationship (Hing, Mainey, et al., 2022).
Study 5 uniquely contributes to the literature by comparing a broad range of possible health and wellbeing outcomes to CSOs. The results show psychological distress and negative emotions to be more strongly associated with the experience of gambling-related harm than any other measured aspects of health and wellbeing. This study also showed that distress and negative emotions are experienced to the point where they impact work and day-to-day functioning. Insufficient support for ongoing psychological distress can result in decreased productivity in the workplace (Gulliver et al., 2012), and thus Study 5’s findings indicate that the CSOs may not be receiving the level of support they require.

Psychological distress can also negatively impact physical and mental health via two main mechanisms: biological and behavioural. Firstly, when the body is under stress for a prolonged period, it can lead to an overproduction of stress hormones like cortisol and adrenaline, which can have a range of negative effects on the body (O’Connor et al., 2021). Secondly, it can lead to the adoption of damaging health behaviours such as overeating or smoking (Ng & Jeffery, 2003). Studies have shown that chronic stress and negative emotions can increase susceptibility to infectious illnesses, weaken immune function, make individuals more vulnerable to infections and other illnesses, and increase the risk of various physical and mental disorders (Seiler et al., 2020). Russ et al. (2012) identified that psychological distress is associated with elevated mortality risk from all causes, including cardiovascular disease and cancer. They found higher levels of distress to be associated with greater risk. These associations are present across different populations, distress measures used, and health outcomes examined (Barry et al., 2020).
9.2.2.2 Dissatisfaction with Financial Wellbeing

Studies in this thesis find strong links between exposure to another’s gambling problem and impacts on financial wellbeing (a subjective measure of a person’s perception of their financial situation). For example, Study 3 showed that reduced financial wellbeing is associated with gambling across the risk spectrum (PGSI 1–27), continuing to be statistically significant even once other demographic, health and socioeconomic factors are controlled for. Additionally, the longitudinal analysis of Study 4 indicates that these impacts have a temporal effect. There were clear differences in the 18-year trajectories of financial wellbeing between CSOs and non-CSOs, with CSO financial wellbeing declining closer to the known exposure to another person’s gambling problem.

While limited research exists, there are indications that financial wellbeing can impact work, with employees spending more time worrying about their financial wellbeing and being unable to concentrate on work (Ozyuksel, 2022). It has also been associated with more negative financial behaviours (Brüggen et al., 2017), lower financial literacy, and higher debt-taking behaviours (Tahir & Ahmed, 2021). Low financial wellbeing is also related to poorer overall wellbeing (Netemeyer et al., 2018) and has been implicated in directly impacting psychological health (Hassan et al., 2021).

Objective financial measures (such as income and debt) are commonly used in quantitative gambling research. However, while this thesis found CSOs reported lower financial wellbeing than non-CSOs, there was no significant difference in income or debt between the groups, indicating these may not always be reliable measures of harm. Financial wellbeing is an emerging area of research focus and is currently under-researched. In the only quantitative gambling-related study identified, Swanton et al. (2021) found evidence that lower financial wellbeing was associated with more severe gambling problems and increased
psychological distress in people who gamble. This current body of work appears to be the first to explore financial wellbeing in CSOs quantitatively. Aside from the impact of commonly discussed financial harms, such as reduced spending money and savings, financial or economic abuse is another likely contributor to lower financial wellbeing. Economic abuse is reported by CSOs (mainly partners) in qualitative studies, including the gambler diverting money from family funds to gamble, taking money without permission, and fraudulent use of credit cards or joint mortgages or loans to fund gambling (Hing et al., 2020). However, this is another under-researched area (for a detailed discussion, see Hing, O’Mullan, et al., 2022).

9.2.2.3 Dissatisfaction with Social Wellbeing

CSOs experience decrements in social wellbeing (Studies 3 and 4), reporting dissatisfaction with feeling part of their community and low perceived levels of social support. These decrements in social wellbeing show a temporal effect and appear to be influenced by exposure to the gambling problem (Study 4). These findings are in-line with reported impacts on CSO social wellbeing, such as a decreased social life (Dowling, Rodda, et al., 2014; Hodgins et al., 2007; Wood & Tirone, 2013), disconnection or distance from a social network (Mathews & Volberg, 2013), and feelings of social rejection (Hing et al., 2016) and isolation (Wood & Tirone, 2013). Adverse impacts on their social life were the most commonly reported harms in children, partners, and siblings seeking treatment due to harm caused by another person’s gambling (Dowling, Rodda, et al., 2014).

The shame, stigma, guilt and preoccupation with dealing with the gambling problem (Ferland et al., 2021; Järvinen-Tassopulos, 2020) can create a barrier between themselves and others. As a result, CSOs may feel excluded from social activities and limit their social interactions. They also may try to avoid places where gambling opportunities are present due to fear of judgement or embarrassment, for financial considerations, or worry about it.
encouraging gambling in the person who gambles (Ferland et al., 2021; Riley et al., 2020; Wood & Tirone, 2013).

There are strong links between social wellbeing and health, with two models that attempt to explain this relationship (Cohen, 2004). The main-effect model suggests that social connectedness is beneficial irrespective of stress levels. It purports that positive social wellbeing can provide positive and protective influences. For example, social ties can positively influence health behaviours such as diet, exercise, smoking and excessive alcohol consumption (Umberson & Montez, 2010). Additionally, having adequate social support can reduce the physiological impact of stress and enhance mental health (Umberson & Montez, 2010). In contrast, the stress-buffering model suggests that social connections provide resources to help cope with stress and moderate its influence on health (Cohen, 2004). That is, social relationships can provide the resources required to promote positive responses to life stressors, such as offering information, emotional support or practical assistance (Holt-Lunstad et al., 2010).

Poor social wellbeing is associated with various health conditions, including high blood pressure, cardiovascular disease, and cancer. Additionally, there is evidence that a lack of social ties is associated with inflammation and a weakened immune system, which can lead to slower wound healing and worsening health conditions (Umberson & Montez, 2010). A meta-analysis of 148 papers was conducted, comprising various measures covering functional support (such as perceived social support) and structural support (such as degree of integration into the community) (Holt-Lunstad et al., 2010). Social wellbeing positively affected life expectancy, with the results suggesting that having good social relationships can increase the chances of survival by 50%.
9.2.2.4 Summary

The most substantial impacts of gambling problems on CSO health and wellbeing are psychological distress, experiencing negative emotions, and social and financial wellbeing decrements. These outcomes are interconnected. For example, reduced financial wellbeing can lead to increased emotional and psychological distress, and a lack of people to turn to in times of distress can compound and grow those feelings. They also might lead to further issues. For example, experiencing both financial and social wellbeing decrements is associated with transitions into loneliness (Baker, 2012), which can have additional negative health impacts (Leigh-Hunt et al., 2017).

9.2.2.5 Other Aspects of CSO Health and Wellbeing

This thesis makes a significant and novel finding regarding other CSO health and wellbeing aspects. While CSOs often report decrements in areas such as physical and psychological health and general subjective wellbeing, they are not as strongly or directly (measurably) impacted by exposure to a gambling problem per se, but instead may be attributed to other co-occurring factors, such as living in a deprived environment.

Studies 1–5 in this thesis support existing research, with CSOs reporting health and wellbeing decrements compared to people without a gambling problem in their lives (e.g. Lind et al., 2022; Salonen et al., 2016, 2014; Svensson et al., 2013; Tulloch et al., 2020; Wenzel et al., 2008). However, further investigation and the use of longitudinal data indicate that the direct connection between the gambling problem and these other health and wellbeing outcomes is not particularly strong. The research studies in this thesis find weak correlations, effects that disappear once other factors are controlled for, and evidence that some health and wellbeing decrements predate the gambling problem. This evidence will be reviewed first, followed by some possible explanations.
Children with parents experiencing any level of harm associated with their gambling (PGSI 1+) report worse health, lower mood, higher levels of anxiety, and, in the 12-year-old cohort, lower levels of happiness than children without problems with gambling within the household (Study 2). However, after accounting for some other demographic and economic factors, the severity of the parental gambling problem was only significantly associated with (lower) mood in the older cohort (16 years). Another sizable community-based study of children of similar age (16 years), which controlled for potentially confounding factors such as socioeconomic status and parental personal characteristics, found comparable results in terms of low mood (Vitaro et al., 2008). Other studies using treatment-related samples found no difference between children with and without exposure to a gambling problem (Dowling et al., 2009; Lesieur & Rothschild, 1989). These null findings may be due to treatment responses, a wider range of ages in the children, or possibly power issues due to the smaller sample sizes in these studies. The null results may also indicate that negative effects of gambling on children occur through an indirect route of causing other types of deprivation.

In adults, across multiple studies in this thesis, CSOs reported worse health and general wellbeing than non-CSOs (Studies 1, 3, 4 and 5). Respondents report lower health-related quality of life, lower satisfaction with their health, lower mental health functioning, and lower general subjective wellbeing (life satisfaction, PWI, and happiness). These findings are consistent with those reported in other community or population-based studies of CSOs, with CSOs experiencing low mood (Dannon et al., 2006; Wenzel et al., 2008) or poor self-assessed health (Chan et al., 2016; e.g. Lind et al., 2022). In a new contribution to the field, Study 5 compares a broad range of health and wellbeing factors in CSOs. The results show that these factors have much weaker relationships with the experience of gambling-related harms than psychological distress and negative affect. The longitudinal analysis in Study 4 is the first to
use longitudinal data to examine these relationships in greater detail. The results suggest that some health and wellbeing concerns frequently reported by CSOs may be attributed to long-term deficits that predate their exposure to gambling-related harms. For instance, the health-related variables (objectively and subjectively measured) for CSOs are lower than non-CSOs across the 18 years, pre-dating known exposure to the gambling problem. There is no evidence to suggest that these health and wellbeing concerns significantly decline as individuals approach the time of exposure to a gambling problem. The study finds similar results with the overall subjective wellbeing measure: life satisfaction. These findings from both adults and children suggest that the health and wellbeing decrements in some CSOs may have a more complex cause than just exposure to gambling problems. This indicates a need to consider other factors that may contribute to these decrements.

However, the results of the studies suggest that the degree of closeness to, and the severity of, the gambling problem can impact specific dimensions of health and wellbeing. More severe psychological and physical health decrements are associated with CSOs who have a closer, more interdependent relationship with the person who gambles, and those exposed to more severe gambling problems. For example, lower health utility scores and lower mental health functioning are associated with CSOs living in households with more severe gambling problems (8+ PGSI; Study 3). In children, symptoms of low mood and anxiety increase with parental gambling problem severity (Study 2). Further, those in familial or very close (i.e. sharing finances and day-to-day responsibilities) relationships with the person who gambles report worse physical and mental health functioning than CSOs who are less close (Study 5). It is possible that the other potential factors contributing to these decrements, such as social and economic factors, may be more strongly associated with gamblers who experience severe problems. Additionally, it is also possible that the stress caused by gambling
problems may exacerbate pre-existing conditions, and the longitudinal analysis in Study 4 may not have had sufficient power to detect these smaller changes.

In contrast, neither the relationship with the person who gambles, nor the severity of the gambling problem, appears to impact areas of general subjective wellbeing (life satisfaction, happiness or PWI). For example, Study 1 finds that compared to non-CSOs, CSOs experience reduced subjective wellbeing. However, there are no differences in any measured aspect of general subjective wellbeing across relationships with the person with the gambling problem or whether they live in the same household. Similarly, results from Study 5 show that CSOs report lower general subjective wellbeing than the general population (Cummins et al., 2003; Reeve et al., 2016), yet no difference in subjective wellbeing measures (PWI and life satisfaction) across different relationship types (e.g. partner, other family member) or levels of closeness with the person who gambles was identified.

These combined results indicate that while some health and wellbeing decrements are reliably associated with being a CSO, they may not necessarily be a direct outcome of exposure to another’s gambling problem. There are several possible explanations for these findings, which will be discussed in turn.

According to the biopsychosocial model (Engel, 1977, 1980), there are multiple and interlinked determinants of health. Some of these determinants might be caused, or more directly impacted, by exposure to a gambling problem, while others will be unrelated to gambling. For example, certain biological and psychological determinants, such as genetics and physical and psychological health vulnerabilities, are most likely unrelated to gambling problems. On the other hand, increased psychological distress is closely related to being a CSO and an important determinant of overall health and wellbeing. There are also some general social and environmental contributors to health that are impacted by exposure to another’s
gambing problem. For example, CSOs are often exposed to relationship conflict (Jeffrey et al., 2019), family violence (Dowling et al., 2016), tense and chaotic environments (Darbyshire et al., 2001; Patford, 2009), and general “dysfunction” (Black et al., 2012) that tend to occur in conjunction with a gambling problem.

Moreover, some decrements experienced by CSOs may be related to a “third variable” effect, where factors common to health and wellbeing decrements and gambling problems come into play. Impaired health-related quality of life, reduced physical and psychological health functioning, and lower subjective wellbeing reported by CSOs may be associated with other factors. These include low socioeconomic status, co-morbid mental health and addiction problems, and/or other stressors. For example, gambling problems tend to occur in vulnerable populations. People with gambling problems are more likely to live in low socioeconomic areas (Armstrong & Carroll, 2017). These circumstances are associated with many health risk factors, including obesity, negative health behaviours such as smoking, and limited physical activity, which can lead to a greater risk of experiencing chronic health conditions (Australian Institute of Health and Welfare, 2023). CSOs have also been found to be dealing with a complex set of co-morbidities alongside the gambling problem. These include other mental health problems, other addictions (Lorains et al., 2011) and multiple other stressors (Tulloch et al., 2020). CSOs may be exposed to these stressors before exposure to the gambling problem, as mental health problems (Dussault et al., 2011; Hartmann & Blaszczynski, 2018) and other addictions (Kausch, 2003) can precede gambling problems in the person who gambles. Additionally, CSOs have an elevated likelihood of having problems with gambling themselves (Hing, Russell, et al., 2022), which will impact their health and wellbeing more directly. The effects observed regarding relationship closeness and gambling severity indicate
that exposure to a gambling problem may exacerbate some pre-existing health and wellbeing issues in certain individuals, even when caused by other factors.

In some cases, the CSOs’ physical and psychological health problems might contribute to excessive gambling behaviour in the person who gambles. For example, individuals who face stressors related to another person's health or have caregiver responsibilities have reported turning to gambling to find temporary relief from their situation (Corney & Davis, 2010; McCarthy, Thomas, Pitt, Marko, et al., 2022). However, research in this area appears to be predominantly conducted with females who gamble. Therefore, it remains unclear if those findings would also apply to males.

In more general areas of subjective wellbeing (life satisfaction, happiness or PWI), CSOs report long-term decrements, and there is no evidence of any impact of closeness or problem severity on these decrements. These findings indicate that, while lower than non-CSOs, these areas of wellbeing are not significantly impacted by exposure to a gambling problem. Instead, as suggested in the literature review, gambling appears to have specific areas of impact in terms of subjective wellbeing. CSOs are impacted in financial and social wellbeing but not in the more general aspects of wellbeing. This interpretation of the results is consistent with the adaptation theory of wellbeing (Diener et al., 2006). According to this theory, individuals typically have their own unique set points in aspects of wellbeing such as life satisfaction and happiness. Although their levels may fluctuate due to positive or negative circumstances, they tend to return to their set point after adapting to the new situation. These set points are thought to be primarily influenced by genetic factors, alongside personality and environmental factors, such as cultural influences (Lykken & Tellegen, 1996; Nes et al., 2006).
9.2.2.6 Summary

A wide variety of factors (biological, psychological, and social) can impact health. This body of work identifies some factors more strongly or directly affected by the gambling problem, such as psychological distress, negative emotions, and low financial and social wellbeing. This work also identifies the health and wellbeing areas where CSOs experience decrements compared to non-CSOs, which are not necessarily directly related to exposure to a gambling problem. These include lower health-related quality of life, lower health satisfaction and lower mental health functioning. While not necessarily a direct outcome of gambling problem exposure, these decreases appear to be worsened by that exposure. Overall, gambling-related harms combine with other biological, psychological, and social factors to impact CSOs’ health – either by contributing to new health and wellbeing issues or exacerbating existing ones.

9.3 Limitations

The limitation sections in Chapters 2 and 4–8 describe the limitations of each study in detail. As discussed in Chapter 3, the thesis has attempted to overcome some of the limitations of the population-based studies (Studies 1–4) in the purposeful sample used in Study 5. Therefore, this section will not repeat each specific limitation in detail. Instead, it will provide a broader overview of the overarching limitations of this thesis.

Serious gambling problems are relatively uncommon in general population samples, which means it is statistically difficult to detect very small effects. Additionally, multiple factors and their interactions influence health and wellbeing, meaning that any single contributor (such as a gambling problem) exerts a small impact. This is an issue in the studies in this thesis using population-representative datasets. A large, purposefully recruited sample
of CSOs was used for the final study to ensure adequate statistical power to assess the relationship between variables. However, Study 5 tested different research questions than the other studies.

There exists a complex web of interactions between multiple stressors that affect CSOs. In addition to the bi-directional relationship between gambling and health and wellbeing, this complexity makes it even more challenging to isolate the effects of exposure to another individual's gambling problem. For example, as discussed, health and wellbeing can be impacted by a person’s gender, socioeconomic background, risk factors for ill health, social circumstances, and coping abilities. Where possible, the studies described in this thesis attempt to statistically isolate the gambling problem's impact from some other key determinants of health, but it is not feasible to control for all conceivable confounding variables.

There is considerable heterogeneity in the CSO population. Studies in this thesis aimed to use broad population-representative samples. Consequently, the total samples were around 50% female, and the ages of participants identified as CSOs ranged from 12 years to 91 years old. Additionally, the studies examined a wide range of relationships and levels of closeness with the person who gambles. This strategy is appropriate to the aim of the thesis – to capture the population-level health and wellbeing impacts that CSOs experience. However, these results may need to be replicated in studies of specific cultural, age and gender groups. For example, all participants lived in Australia or Canada, so further research is needed to test the generalisability of the finding to different cultural populations. Similarly, there may be differences in health and wellbeing outcomes across CSO age groups, which were not examined in these studies. Additionally, the HILDA and LSAC studies focused exclusively on household CSOs. This sub-group of CSOs has arguably the closest and most interdependent
relationship with the person who gambles. Consequently, they are likely to be the most affected. However, it is not fully representative of all CSOs. Therefore, it is important to examine whether the findings from these studies can be generalised to a broader group of CSOs.

Overall, this thesis attempts to better understand the causal link between exposure to another’s gambling problem and health and wellbeing by using a large, longitudinal dataset. However, fundamentally, any assurance of causality is limited by the constraint of only using observational research, the heterogeneity of the CSO population, and the complex number of interrelated factors that impact a person’s health and wellbeing. Therefore, more complex community-based longitudinal studies that follow both the gambler and those close to them (including children) may help provide further clarity.

9.4 Strengths

Despite these limitations, this thesis greatly extends and clarifies knowledge about CSOs. It offers a more comprehensive understanding of the relationship between gambling and the health and wellbeing of CSOs at a population level, examining this relationship from various perspectives. Furthermore, the studies uniquely contribute to the gambling-CSO literature through their methodological strengths and examination of known knowledge gaps.

The studies use rigorous and unique methodological approaches to understand CSO health and wellbeing, including:

– the use of large population-representative datasets
– the first use of longitudinal data to understand CSO health and wellbeing prior to exposure to another’s gambling
the development of a unique scale, The Significant Other Closeness Scale (SOCS; Tulloch, Hing, et al., 2023), to allow a more nuanced understanding of which CSOs may be harmed.

The research deepens existing knowledge by filling identified knowledge gaps in the gambling research field. Published papers in this thesis:

– are the first to examine the impact on CSO health and wellbeing across different levels of gambling problem severity
– are the first to quantitatively explore a wide range of subjective wellbeing measures (such as happiness, life satisfaction and financial wellbeing) in CSOs
– are the first to examine a wide range of health and wellbeing impacts on children exposed to a parental gambling problem
– provide more reliable data by measuring and comparing a wide range of health and wellbeing outcomes and their relationship to gambling-related harm.

Overall, the work contained in this thesis provides a valuable contribution to the field by extending existing research and offering more clarity and understanding of the topic.

9.5 Implications

This thesis highlights and presents compelling new evidence of the detrimental effects of gambling on CSOs. The findings within this thesis have practical implications for policy, support/education, and future research, identifying which areas and to whom it may be beneficial to focus policy, strategies, education, and funding.

9.5.1 Implications for Public Health Policy and Practice

The research outlined in this thesis can inform policymaking by providing information that can be useful in understanding the scope of gambling problems and who is harmed. The findings can be used in designing and implementing public health policies to reduce the
burden of gambling harm in the community. From a social ecological lens, policy and legislation plays a key part in addressing the wider societal influences (Centers for Disease Control and Prevention 2022) and have direct impacts on the other levels in the model. For example, legislation about access to gambling products, or stronger advertising restrictions will directly influence the behaviour of companies within organisational level of influence.

In the Australian community, almost a quarter of a million people gamble at a problematic level (PGSI 8+) (Hing et al., 2021). If they each impact around six others (Goodwin et al., 2017), then well over a million CSOs are potentially impacted by a serious gambling problem. At this level of problematic gambling, the findings in this thesis indicate strong links between gambling harms and CSO health and wellbeing decrements. The current body of work shows that CSOs exposed to severe gambling problems experience significant distress and emotional problems, negative social wellbeing impacts, and worsening of existing psychological or physical health issues. These adverse outcomes are likely to be associated with a significant cost burden (Browne, Greer, Armstrong, et al., 2017; Lucchini & Comi, 2022). As will be discussed, relevant and effective education and support need to be provided to those impacted. In addition, when developing policies to reduce the impact on those CSOs experiencing the greatest health and wellbeing burden (particularly partners and children), a focus should be reducing the prevalence of people in the community experiencing severe gambling problems. In Australia, for example, this might include limiting the number of EGMs, which are products strongly associated with gambling problems (Browne et al., 2023; Jeannot et al., 2023). Evidence suggests that EGM profits have increased beyond pre-COVID-19 levels (Smith & Gladstone, 2023). However, a broad public-health response is needed. A recent Delphi consensus and implementation rating study (Regan et al., 2022) identified 40 targeted measures to reduce harmful gambling. These measures were across five key domains: price
and taxation; availability; accessibility; marketing, advertising, promotion, and sponsorship; and treatment and support. They concluded a “far-reaching, well resourced, and coordinated public health approach is needed to protect vulnerable people, reduce exposure to gambling products, and provide help to those who experience harms associated with gambling” (Regan et al., 2022, p.715).

This thesis also provides compelling evidence that the health and wellbeing harms experienced by CSOs are not limited to those associated with serious gambling problems. For people who gamble, most population-level harm comes from those experiencing low- or moderate-risk problems with gambling (Browne et al., 2016). From a public health perspective, it is important to understand the impacts of this level of gambling on their associated CSOs. In an original contribution to the field, this thesis finds that harm to financial wellbeing occurs to CSOs across the gambling risk spectrum. Approximately 10% of the adult Australian population experiences some level of gambling-related harm from their own gambling (Hing et al., 2021). If, on average, each of these people only affects the financial wellbeing of one other person, this still equates to two million CSOs impacted. Accordingly, the evidence in this thesis suggests that instead of a narrow focus on reducing the prevalence of severe gambling problems in the community, a policy priority should be prevention and harm reduction across the spectrum of gambling risk.

9.5.2 Implications for CSO Support and Education

While public health policy influences the broader environmental factors associated with gambling, support and education is more focussed on the individuals and their interpersonal relationships. This thesis recommends focusing on several key areas. First, at the individual level, is to provide CSOs with assistance with distress and negative emotions, financial education, and social support, and then guide them on how best to support the person who
gambles. Any support to increase health and wellbeing should be primarily targeted at CSOs exposed to more severe problems, while financial education should be targeted at all CSOs. This assistance should focus on partners and other family members, particularly those with close financial connections and shared responsibilities. There is also an identified need to focus on ex-partners, especially where they have shared finances and commitments (such as shared parenting requirements) and cannot withdraw from the relationship.

This thesis identified distress and negative emotions as critical outcomes of exposure to another’s gambling problem. The distress reported was clinically significant, and this level of distress can interfere with daily life and lead to reductions in physical and psychological health. Providing support options to address these levels of psychological distress can positively impact various areas of CSOs' lives, including employment, health, and wellbeing. By reducing stress levels, such interventions can limit the damaging effects on physical and mental health (O'Connor et al., 2021). Moreover, these support options can help CSOs learn more effective coping mechanisms, which may replace maladaptive coping methods known to negatively impact health, such as overeating or alcohol use (Ng & Jeffery, 2003). By providing CSOs with the skills to manage their emotions and stressors, these support options can improve their overall resilience and promote positive health outcomes.

Bespoke financial education should be available or developed for CSOs. The results show a potentially sizeable proportion of Australians are having their financial wellbeing impacted by another’s gambling. Financial education is advisable for all CSOs, including those exposed to less severe problems because the results in this thesis suggest that CSOs of people who gamble at low- or moderate-risk still suffer from decrements to their financial wellbeing. Very few people who gamble at this level actively seek help for their gambling behaviour (less than 4%), and an even lower proportion of CSOs (Bijker et al., 2022). Therefore, there needs to be a
way to identify and assist this population of CSOs. Financial education, such as financial plans, can increase financial wellbeing (Tahir et al., 2021), as can improving financial literacy (Tahir et al., 2021). However, in the case of gambling problems in the household, this has added complexity. Financial losses are one of the first harms experienced by people who gamble (Langham et al., 2016) and are often out of the direct control of the CSO. There is a need for bespoke support for all CSOs, such as financial counselling, which can also involve helping a person manage their debts and protect their assets.

At the relationship level, CSOs also need support with improving their social wellbeing. The stress-buffering model explains that social ties promote good health by offering emotional and material assistance needed to confront stress (Cohen, 2004). It suggests that good social relationships can provide informational, emotional, or tangible help that encourages adaptive reactions to either short-term or long-term stressors, such as those experienced when exposed to another’s gambling problem. Fostering or restoring social ties with the CSO’s relatives, friends and their wider community may moderate or buffer the damaging effects of stress on health. Shame and stigma associated with gambling problems (Hing et al., 2017) are likely to be significant barriers to seeking social support, ultimately amplifying the negative consequences for all involved. Therefore, reducing this stigma may be critical to improving CSOs’ social wellbeing. However, reducing gambling-related stigma is an underexamined area, which led Brown and Russell (2020) to examine stigma reduction interventions in related conditions, such as mental health. Interventions include ‘contact interventions’ which involve the people facing stigma discussing their struggles and their recovery journeys with the wider community; education campaigns to correct misinterpretations and reduce negative perceptions and stereotypes; and advocacy, which involves reducing stigma by suppressing the negative stereotypes, reframing the issue and
combatting social inequalities. However, the authors concluded that gambling problems are a unique issue, and more work is required in this area.

While CSOs should be supported to reduce the impacts of the gambling problem on their own health and wellbeing, they should also be provided support and guidance on how to assist the gambler in addressing the gambling problem. Legacy harms are associated with gambling problems, which may continue even after the problem is reduced or resolved (Rockloff et al., 2022). However, addressing the gambling problem will significantly reduce further ongoing harm. For example, Rockloff et al. (2022) found that harms to social engagement and those associated with violence improved relatively quickly after the gambling problem was resolved.

Around 10–14% of Australian families with children are exposed to parental gambling problems (Suomi, Watson, et al., 2022; Tulloch et al., 2022). There is a need for those children, especially the ones exposed to severe gambling problems, to be identified and supported. A combination of direct support for children and the required support and education for adult CSOs is likely to positively impact their children’s wellbeing. For example, the health and wellbeing impacts experienced by adult CSOs may compound the harm caused to children. When one parent has a gambling problem, the other parent/adult in the household has to take up additional parental duties (Hodgins et al., 2007) while struggling with their own negative impacts of the gambling problems – such as a high level of distress. Additionally, the social impacts might limit the adult’s ability to ask for, or receive help from, their social network to assist with their parenting responsibilities.

Around a third of the callers to gambling helplines worldwide are CSOs; however, this proportion is much lower in Oceania (19%) and North America (16%) than in Asia (61%) or Europe (41%) (Bijker et al., 2022). The majority of these callers are given brief advice or
general counselling rather than evidence-based support methods (Bijker et al., 2022) that may be more useful in addressing the issues identified in this thesis. However, most CSOs do not seek professional help and instead use self-management strategies to cope with their situation (Booth et al., 2021). Dowling et al. (2021) found that the bulk of techniques used by CSOs were focused on reducing or stopping the gambling behaviour of the gambler rather than strategies to increase the CSO’s own wellbeing. Similarly, Booth et al. (2021) identified that only a relatively small proportion of the self-help strategies discussed by CSOs online involved stress management or increasing social support. Therefore, it is recommended that the above elements should be included by any websites or forums providing education on gambling problems, as well as included in more individual treatment options.

A final important aspect to consider for the support and education of CSOs is that CSOs are likely to have physical health problems, and be experiencing symptoms of anxiety, depression, and low subjective wellbeing. Regardless of whether these aspects of health and wellbeing are caused or exacerbated by the gambling problem, or co-exist, they need to be considered regarding treatment options. Therefore, there is a need for multifaceted and holistic support and treatment options that cover a wide range of issues, not necessarily narrowly focused on the gambling problem itself.

A range of support interventions are available to CSOs affected by addictions (see Merkouris et al., 2022 for review). However, due to limited studies and methodological issues, little is known about the best way to support CSOs (Merkouris et al., 2022). The issue warrants more attention, primarily on how to target interventions to a population who are not necessarily actively seeking them, and how best to address the areas of focus identified and discussed in this thesis.
There are several topic areas useful for future research focus. First, there is a need for continued focus on community-based, longitudinal studies of people who gamble and those close to them. Practical options might consist of including a range of relevant questions in existing or new long-term community studies. For example, HILDA has included a gambling module in two recent waves, 2015 and 2018, enquiring about gambling expenditure and assessing gambling problem severity. If this were extended, it could provide highly relevant information; for example, by including measures assessing whether another person’s gambling problems have impacted the participant and any harm received (to the person who gambles and the CSO). The results of this thesis indicate that psychological distress appears to be a good preliminary indicator of health and wellbeing harm to others. Accordingly, it is recommended that an appropriate psychological distress measure be included in population-representative studies alongside measures of gambling-related harm.

The closeness scale, SOCS (Tulloch et al., Submitted 13-2-2023), developed for this thesis, 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. In addition, the brevity of the scale makes its inclusion into research studies feasible without significantly increasing cost or participant burden.

Subjectively measuring financial wellbeing, as opposed to other more commonly examined areas such as financial distress, is relatively new (Brüggen et al., 2017). As discussed previously, there is very little quantitative research on the financial wellbeing of either people who gamble or CSOs. This study was the first to explore this aspect of CSO wellbeing, and the findings indicate that financial wellbeing declined compared to non-CSOs close to exposure to
the gambling problem. However, these trajectories have not yet been explored in those who gamble. Financial impacts are a key harm associated with gambling; therefore, a greater understanding of financial wellbeing will be helpful in understanding gambling harm and also may be useful for evaluating financial interventions. Economic abuse is another under-researched area in CSOs. It is often reported in qualitative studies of CSOs but has not been rigorously examined quantitatively or in the wider CSO population (Hing, O’Mullan, et al., 2022; Hing et al., 2020).

There is also value in further understanding of what makes people vulnerable to health and wellbeing impacts from gambling-related harms and what may be protective. For example, the stress-strain-coping-support model (Orford, Copello, Velleman, & Templeton, 2010) suggests that being CSOs of individuals with addiction can be stressful, which subsequently leads to health and wellbeing consequences (i.e. strain). They suggest that access to resources such as coping skills, social support, and education can help reduce this strain associated with living with someone else’s addiction. Some research has explored coping methods and health outcomes in gambling CSOs (Chan et al., 2016). However, the relationship between social support and health and wellbeing in gambling CSOs has yet to be thoroughly examined.

9.6 Conclusion

This thesis has provided important and timely evidence for the significant impact of gambling problems on the health and wellbeing of CSOs, including children. The findings confirm that gambling-related health and wellbeing impacts are not limited to the individual who is gambling but extend to those around them. The research presented here brings attention to this under-researched aspect of gambling harm and emphasises the need for greater recognition and support for CSOs.
Through the use of population-representative datasets, longitudinal studies, purposeful sampling and a novel measure, this thesis has provided valuable insights and deepened the understanding of the existing literature in this field. The evidence presented here shows that exposure to gambling problems can lead to a range of adverse outcomes, including psychological distress, negative affect, lower financial wellbeing, and negative impacts on social wellbeing. It demonstrates that other physical and mental health problems often predate exposure to a gambling problem but may worsen due to that exposure. Furthermore, it shows that the wellbeing impacts of gambling-related harm are not limited to CSOs exposed to severe problems but occur across the gambling risk spectrum. Although the health and wellbeing impacts experienced by CSOs may not be as severe as those experienced by people who gamble, the total number of CSOs significantly surpasses that of gamblers. Consequently, the cumulative burden in society is likely to be similar or greater.

This thesis provides information that policymakers, healthcare professionals, and support services can use to take appropriate action to mitigate the negative impact of gambling on the health and wellbeing of CSOs. Such measures should encompass comprehensive policies aimed at reducing all forms of gambling-related harm, thereby decreasing the overall burden to both individuals who gamble and their CSOs. In addition, for CSOs, this should include greater access to appropriate counselling services, specifically tailored financial support, social support and education.

The findings presented in this thesis hold important implications for public health and wellbeing, emphasising the need for a comprehensive strategy to address gambling harm that encompasses support for both individuals with gambling problems and their CSOs. By mitigating the detrimental effects of gambling problems and delivering tailored, holistic
support for CSOs, it is possible to improve the health and wellbeing of those affected, reduce the societal burden, and ultimately foster an improved quality of life for this vulnerable group.


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https://doi.org/10.1093/geronb/gbs068.


https://doi.org/10.1371/journal.pone.0281099


Appendix A

Declaration of Co-Authorship and Copyright – Chapter 2

*How gambling harms the wellbeing of family and others: A review*


*Status*

Published

*Nature of Candidate’s Contribution, Including Percentage of Total*

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 80%.

*Nature of Co-Authors’ Contributions, Including Percentages of Total*

My co-authors, Professor Nerilee Hing, Professor Matthew Browne, Professor Matthew Rockloff and Dr Margo Hilbrecht, contributed to the paper by providing supervision, review, feedback and editing the final manuscript (20%).

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Author: Catherine Tulliez, Matthew Browne, et al
Publication: International Gambling Studies
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Declaration of Co-Authorship and Copyright – Chapter 4

Study 1 – The subjective wellbeing of CSOs


Status

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Nature of Candidate’s Contribution, Including Percentage of Total

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 80%

Nature of Co-Authors’ Contributions, Including Percentages of Total

My co-authors, Professor Nerilee Hing, Professor Matthew Browne, Professor Matthew Rockloff and Dr Margo Hilbrecht, contributed to the paper by providing supervision, review, feedback and editing the final manuscript (20%).

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Appendix C

Declaration of Co-Authorship and Copyright – Chapter 5

Study 2 – The health and wellbeing of children exposed to gambling problems


https://doi.org/10.1007/s11482-022-10052-0

Status

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Nature of Candidate’s Contribution, Including Percentage of Total

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 80%.

Nature of Co-Authors’ Contributions, Including Percentages of Total

My co-authors, Professor Nerilee Hing, Professor Matthew Browne, Professor Matthew Rockloff and Dr Margo Hilbrecht, contributed to the paper by providing supervision, review, feedback and editing the final manuscript (20%).

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DOI
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Publication Date
2022-03-24

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Declaration of Co-Authorship and Copyright – Chapter 6

Study 3 – CSO health and wellbeing across a range of gambling problem severity


https://doi.org/10.1016/j.addbeh.2022.107538

Status

Published

Nature of Candidate’s Contribution, Including Percentage of Total

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 85%.

Nature of Co-Authors’ Contributions, Including Percentages of Total

My co-authors, Professor Nerilee Hing, Professor Matthew Browne and Professor Matthew Rockloff, contributed to the paper by providing supervision, review, feedback and editing the final manuscript (15%).

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Declaration of Co-Authorship and Copyright – Chapter 7

Study 4 – Longitudinal study of CSO health and wellbeing


Status

Published

Nature of Candidate’s Contribution, Including Percentage of Total

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 75%

Nature of Co-Authors’ Contributions, Including Percentages of Total

My co-authors, Professor Nerilee Hing, Professor Matthew Browne, Professor Matthew Rockloff and Dr Margo Hilbrecht, contributed to the paper by providing supervision, assisting with formal analysis (MB), and providing review, feedback and editing the final manuscript (25%).

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Appendix F

Declaration of Co-Authorship – Chapter 8

Study 5 – Who experiences harm and how this relates to health and wellbeing.


Status

Under peer review

Evidence of Submission

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<th>Title</th>
<th>Initial Date Submitted</th>
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<td>Action Links</td>
<td>J-BACD-00-000007</td>
<td>How gambling harms others: the influence of relationship-type and closeness on harm, health, and wellbeing.</td>
<td>Feb 13, 2023</td>
<td>May 01, 2023</td>
<td>Under Review</td>
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Nature of Candidate’s Contribution, Including Percentage of Total

In conducting the study, I was responsible for conceptualisation, data preparation and curation, formal analysis, writing original draft and review and editing. This publication was written by me, and my contribution was 75%.

Nature of Co-Authors’ Contributions, Including Percentages of Total

My co-authors, Professor Nerilee Hing, Professor Matthew Browne, Professor Matthew Rockloff and Dr Margo Hilbrecht, contributed to the paper by assisting with conceptualisation, aiding in measure development, reviewing data analysis (MB), providing supervision and review, feedback and editing the final manuscript (25%).
Use of Title Page Quotes

Data collected for use in this chapter included a response from a single optional, open answer question in the survey which asked about “any other ways you feel you have been impacted” by another person’s gambling. This question was included to identify any commonly experienced harms that did not appear to be adequately covered by the harms scale used in the study. There was no intention of there being any significant qualitative element to the study. Ethics and data collection details are included in Chapter 8 methodology. These responses have not been formally used in analysis in this thesis, but some responses relevant to chapters were included on the chapter title pages.
Appendix G

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?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>No emotional relationship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The closest emotional relationship I have</td>
</tr>
</tbody>
</table>

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?

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>No financial relationship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The closest shared or dependent financial relationship I have</td>
</tr>
</tbody>
</table>

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?

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<tr>
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<th>2</th>
<th>3</th>
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<td>No shared responsibilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The person I share the most daily responsibilities with</td>
</tr>
</tbody>
</table>
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?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No time spent together</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The person I spend the most time with</td>
</tr>
</tbody>
</table>

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