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ORIGINAL PAPER

Impact of Gambling Supply Reduction During COVID-19 Shutdowns on Gambling Problems and Gambling Behaviour in Australia: A National Longitudinal Study

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Abstract

Restricting access to gambling products is one possible harm reduction strategy. We examined whether land-based gambling product supply restrictions during the COVID-19 pandemic impacted gambling problems and gambling engagement. In a three-wave, online, longitudinal study, 462 Australian adults (M_{age} = 44.94; 87% male) who gambled completed survey measures of demographics, gambling engagement (land-based and online), gambling problems, and psychological distress. Analyses were pre-registered and examined the impacts of restrictions on gambling problems and engagement. During the period of restrictions, there were no significant differences in gambling problems (OR = 0.88 [95%CI 0.55–1.42], p = .610) nor online gambling (B = 4.48 [95%CI-0.40–9.35], p = .071) between states experiencing and not experiencing restrictions. There was a small overall reduction in gambling engagement at 2-(t = 2.03, p = .043) and 5-months (t = 2.37, p = .019) post-restrictions, but no change in gambling problems (t = 1.25, p = .211; t = 1.50, p = .134). Amongst those at moderate-to-high risk of problems at baseline, there were no significant reductions in gambling engagement (t = 0.58, p = .564; t = 1.20, p = .232) or problems (t = 0.92, p = .359; t = 1.53, p = .126) at 2- and 5-months post-restrictions. Findings show only a modest impact of COVID-related supply restrictions on gambling engagement and no impact on gambling problems up to 5 months follow-up. The wide-ranging psychosocial and financial impacts of the pandemic may have overshadowed any potential beneficial effects of the supply restrictions on problem gambling levels. Policies to promote and improve access to problem gambling treatment services are needed even following periods of reduced availability of gambling products.

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Keywords Gambling · Problem gambling · Supply reduction · Longitudinal · COVID-19

Abbreviations

CI	Confidence interval
IRSAD	Index of relative socioeconomic advantage and disadvantage
K6	Kessler 6
OR	Odds ratio
PGSI	Problem Gambling Severity Index

Introduction

Globally, about 1–2% of people will experience clinically significant gambling problems each year (Calado & Griffiths, 2016). A range of individual and family factors are associated with increased risk of gambling problems, such as impulsivity, anti-social behaviour, substance use, male gender, and parental involvement in and approval of gambling (Dowling et al., 2017; McComb & Sabiston, 2010). Research also points to features of the environment as playing an important role in the development of gambling problems; for example, a meta-analysis of over 180,000 people shows a dose–response relationship between the density of electronic gaming machines and the prevalence of problem gambling (Storer et al., 2009). An increase of one person experiencing gambling problems for every additional 1.25 electronic gaming machines available in the region was observed in this study (Storer et al., 2009).

One population level approach to reducing gambling problems is restricting access to gambling products. Available evidence is limited in both quantity and quality, but tends to suggest that restricted access is associated with reductions in gambling engagement and problems (McMahon et al., 2019; Meyer et al., 2018). However, some studies suggest a displacement effect, whereby restrictions to certain modes of gambling are associated with increases in engagement with other forms of gambling (Meyer et al., 2018). Notably, online modes of gambling can remain accessible to consumers through legal or illegal means. In this study, we sought to understand the impact of restricted access to gambling products during the COVID-19 pandemic on gambling behaviour and problems.

In Australia, all states initially underwent some degree of gambling venue shutdowns in response to the first wave of the pandemic in March 2020. During the lockdown periods, the only land-based gambling products available were instant scratch tickets and lottery tickets (which are available in newsagencies); however, access to these was also more limited than usual, as Australians were generally required to limit leaving the home to complete essential tasks only. Other land-based gambling products, such as electronic gaming machines, casino table games, poker, retail betting, and keno, were completely unavailable. Few national and international sporting events were held, reducing the available options for online sports betting. Racing continued albeit without spectators and at a reduced extent. By around June 2020 following 10 weeks of relatively strict lockdown, restrictions were eased. However, in July 2020, Victoria began to experience a second COVID-19 wave and hence restrictions were reinstated in Victoria.

Research out of Australia and Sweden to date using primarily cross-sectional designs shows an overall decrease in gambling engagement in the early months of the COVID-19 pandemic. This has been shown when measured by proportion of the population gambling (Biddle, 2020), frequency of gambling engagement (Gainsbury et al., 2020; Håkansson,

2020b; Lindner et al., 2020), and gambling taxation levels (Håkansson, 2020a). On the other hand, in Australia, the pandemic has also been associated with worsening of some mental health concerns such as anxiety (Kendrick & Isaac, 2020). This worsening of mental health could be associated with increases in gambling and gambling problems. Understanding of the impacts on gambling problems as well as the longer-term impacts of COVID-related restrictions on both gambling problems and engagement once restrictions eased remains limited.

The current study examined the impact of land-based gambling product supply restrictions on gambling behaviour and gambling problems in the context of the COVID-19 pandemic. The goals were two-fold: to examine whether restrictions led to (1) reduced problems and increased engagement with available products (online gambling products) while the restrictions were ongoing, and (2) sustained reductions in problems and overall gambling engagement in the 2 and 5 months after the restrictions were lifted. We were also interested to understand whether any sustained reductions in problems and overall gambling engagement once the restrictions were lifted occurred for the subset of participants who were at moderate-to-high risk of problems at baseline. We expected that the restrictions would lead to an increase in online gambling engagement but also to an overall decrease in the proportion of people classified as engaging in problem gambling while restrictions were ongoing. We made no specific hypotheses about the impact on gambling engagement and problems after restrictions were lifted.

Methods

Design

This was a pre-registered, three-wave longitudinal study conducted in May, August, and November of, 2020 (https://osf.io/vk8wh/). In May, all participants were experiencing restricted access to land-based gambling products due to the 10-week COVID-19 lockdowns. In August, only participants residing in Victoria were experiencing significant restrictions to land-based gambling products. In November, Victorian restrictions had just lifted, whereas restrictions in all other states had been lifted for about five months.

Participants and Procedure

This study was approved by the authors' institution's Human Research Ethics Committee (approval number 2019/213). Eligible participants were those who (1) were aged 18 years or older, (2) were residing in Australia, (3) had spent money on gambling in the previous 12 months, and (4) were fluent in English. Participants were recruited via advertisements (included in the Appendix) placed on social media and websites and sent to potentially eligible participants (including those on a mailing list from previous gambling-related research). Participants were also recruited via social media posts and e-newsletters from 26 organisations who agreed to support recruitment. These included gambling operators and gambling support services. Advertisements directed potential participants to the survey homepage (hosted by Qualtrics), where they were able to read the study information and provide informed consent. For each of Waves 1 and 2, participants who completed the survey had the opportunity to enter a prize draw to win one of five AU $50 shopping gift cards as an incentive for participation. All participants who completed Wave 3 received an

AU $10 shopping gift card as an incentive for participation. We switched to this guaranteed reimbursement for Wave 3 to try to increase the response rate. The Wave 1 survey was open for three weeks (May 1–22, 2020). Participants who provided consent and contact details to be contacted for the subsequent waves were emailed the Waves 2 and 3 surveys on August 11 and November 11, respectively. Participants had two weeks to complete each survey.

Measures

The dependent variables were problem gambling risk level, engagement in online gambling, and overall engagement in gambling, assessed at Waves 2 and 3. Problem gambling risk level was measured using the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001). This validated, nine-item screening measure assessed experience of gambling problems in the past 12 months on a four-point scale (0 = never, 3 = almost always). At Waves 2 and 3, the specified timeframe for reporting was modified from 12 months to three months, to capture the experience of problems between Waves 1 and 2 and between Waves 2 and 3. The resulting sum score can be interpreted as 0 = no problems, 1–2 = low risk gambling, 3–7 = moderate risk gambling, and 8–27 = problem gambling. Online gambling engagement was measured using a purpose-built questionnaire that allowed participants to report their frequency of participation in nine online gambling activities. At Wave 1, participants retrospectively reported gambling frequency during a typical month in the 12 months prior to restrictions implemented on March 26, 2020 (baseline). At Waves 2 and 3, participants reported their typical monthly participation in the past three months. Responses were recorded on a 5-point scale and then recoded and summed to compute the overall number of online gambling engagements in the preceding 30 days (*not at all* = 0; *1–3 times per month* = 2 [the midpoint of 1–3 times per month]; *once a week* = 4.29 [a 30-day month divided by seven]; *2–6 times per week* = 17.14 [a 30-day month divided by seven, multiplied by four (the midpoint of 2–6 times per week)]; *daily* = 30). Scores could range between 0 and 270. Given the lack of validated measures of gambling frequency, these measures were developed based on our earlier work (Gainsbury et al., 2020). Overall gambling engagement was collected and computed in a similar manner, summing the recoded responses to the nine online gambling activities with those from eight items assessing land-based gambling engagement. Scores could range between 0 and 510. Participants also completed measures of a range of demographic and other variables, including age, gender, relationship status, language spoken at home, education, and psychological distress. The full list of assessed variables by study wave is publicly available here: https://osf.io/t5hxd/.

Analyses

All analyses were pre-registered prior to looking at the Wave 2 data and prior to collecting the Wave 3 data (https://osf.io/d6jc4). Data processing and analysis were conducted in R using tidyverse, MASS, and mice R packages (Ripley et al., 2013; van Buuren & Groothuis-Oudshoom, 2011; Wickham et al., 2019).

The first part of the analyses was a cross-sectional, between-groups comparison of Victorians and non-Victorians at Wave 2 (August 2020), while controlling for key variables assessed at Wave 1 (May 2020). This is important as it increases confidence that any observed differences by land-based gambling availability might be caused by these

differences in availability, rather than by pre-existing group differences between the states. The covariates are presented in Supplemental Table A1. They were specified a priori based on existing literature (Dowling et al., 2017; Gainsbury et al., 2014; Howe et al., 2019; Slutske et al., 2019; Welte et al., 2017). The analyses were ordinal logistic regression and multiple linear regression to examine the relationship between land-based gambling product supply restrictions and problem gambling and online gambling engagement, respectively. The independent variable was the experience of supply restrictions on land-based gambling products at Wave 2 (1 = yes, 0 = no). Based on participants' self-reported post-codes, this was computed as 1 = yes for all those reporting residing in Victoria, and as 0 = no for all those reporting residing elsewhere in Australia. A power calculation setting the alpha to 0.05 and the required power to 80% indicated that 787 and 128 participants would be required to detect small and medium effects, respectively. Therefore, our sample of 241 completed Wave 2 participants should be powered to detect small-to-medium effects.

The second part of the analyses was a longitudinal, within-groups comparison of levels of gambling problems and overall gambling engagement across the study waves amongst those who experienced a period of restrictions to land-based gambling products followed by sustained reinstatement of these products (i.e., participants from all states except Victoria). Repeated measures ANOVAs with planned contrasts compared participants on levels of these two dependent variables at Waves 2 and 3 compared to pre-restriction levels (reported retrospectively at Wave 1). Analyses were first conducted amongst the full available sample and then again amongst the subsample who were at moderate-to-high risk of problems at baseline. A power calculation setting the alpha to 0.05, the required power to 80%, and the correlation between repeated measurements to 0.5 indicated that 163 and 28 participants would be required to detect small and medium effects, respectively. Therefore, our sample of 143 completed Wave 3 participants (excluding Victorians) and the subsample of 72 who were at moderate-to-high risk of problems at baseline should be powered to detect small to medium effects.

To reduce bias that can occur in complete-case analyses due to differential attrition, we used multiple imputation to handle non-response (Madley-Dowd et al., 2019). Per recommendations, we included in the imputation model all variables that would be entered into subsequent regression models, as well as variables associated with the attrition (White et al., 2011). This ensures that the imputed values are calculated based on the best available evidence (all relevant, measured variables). We imputed 55 datasets for the first analyses and 60 datasets for the second analyses to achieve the recommendation that the number of imputed datasets should exceed the percentage missingness (White et al., 2011). This means that results from analyses are synthesised across 55 and 60 different plausible responses for each missing value, thereby better capturing the variability in responses compared with that captured by fewer imputations.

Results

Participant Flow

The Wave 1 survey was completed by 769 eligible participants, of whom 465 agreed to be contacted to participate in Waves 2 and 3. Of these, 3 were removed following outlier and validity checks, leaving 462 participants who constituted the sample for the current longitudinal analyses. Of these 462, 241 (52%) and 193 (42%) completed the Waves

2 and 3 surveys, respectively. There were several statistically significant differences between those who did and did not complete the Waves 2 and 3 surveys (presented in Supplemental Tables A2-5).

Sample Characteristics

Participants tended to be male, aged in their mid-forties, and living in moderate-to-high socioeconomic status neighbourhoods. Most spoke English at home, were tertiary educated, and were in a relationship. General psychological distress levels were at the subclinical level (< 6) on average; however, just over half of the sample were at moderate risk or problem levels of gambling. Table 1 presents the full descriptive statistics of the sample.

Prior to the COVID-19 shutdowns, on average, participants used 4.43 different gambling modalities in the past year and engaged in land-based and online gambling 11.31 and 22.19 times per month, respectively. The sample were predominantly regular gamblers, with 95% ($n = 440$) gambling at least weekly. Just over half (56%, $n = 258$) gambled in venues at least weekly and most (85%, $n = 392$) gambled online at least weekly. Half (50%, $n = 232$) had gambled at least weekly on the products that subsequently become unavailable during the shutdowns (land-based casino games, poker, electronic gaming machines, keno, sports betting, and race betting). Fewer Victorians (35%, $n = 38$) had been regularly using these products compared to the non-Victorians (55%, $n = 194$), $p < 0.001$.

Impact of Supply Restrictions on Gambling Engagement and Problems During Restrictions

The between-group analyses compared those experiencing the land-based gambling product restrictions (Victorians) and those not experiencing these restrictions (the rest of Australia) at Wave 2. The ordinal logistic regression analysis revealed that problem gambling levels did not differ significantly as a function of these land-based gambling restrictions (OR = 0.88 [95%CI 0.55–1.42], $p = 0.610$). As seen in Fig. 1, the proportion of participants experiencing problems was similar across groups. Full model statistics are presented in Supplemental Table A6.

Those with restricted access to land-based gambling products tended to engage in online gambling 4.48 occasions per month more than did those not under restrictions; however, this difference was not significant ($p = 0.071$). The linear regression model predicted that those under and not under restrictions engaged in online gambling 26.65 and 22.16 times per month, respectively (calculated at the modal and mean levels of the a priori specified categorical and continuous covariates). Full model statistics are presented in Supplemental Table A7.

Table 1 Baseline Sample Characteristics (N = 462)

Continuous variables	Possible range	M	SD
Age (years)	18 +	44.94	15.05
Neighbourhood advantage/disadvantage (IRSAD)	1–10	6.91	2.87
Psychological distress (Kessler 6)	0–24	4.59	4.74
Gambling breadth (number of activities)	1–17	4.43	2.59
Land-based gambling engagement (number per month)	0–240	11.31	16.57
Online gambling engagement (number per month)	0–270	22.19	19.67
Categorical variables	Levels	n	%
Gender	Female	61	13
	Male	401	87
Education	Lower secondary or below	40	9
	Upper secondary	93	20
	Post-secondary, non-tertiary	58	13
	Short-cycle tertiary	67	15
	Bachelors	155	34
	Masters or doctorate	49	11
State of residence[a]	ACT	10	2
	NSW	190	41
	NT	5	1
	QLD	83	18
	SA	27	6
	TAS	15	3
	VIC	108	23
	WA	23	5
Relationship status	Single	163	35
	In a relationship	299	65
Language at home	English	449	97
	Other	13	3
Gambling problems (Problem Gambling Severity Index)	None	113	24
	Low risk	110	24
	Moderate risk	123	27
	Problems	116	25

IRSAD = Index of Relative Advantage and Disadvantage (an indicator of neighbourhood advantage/disadvantage, where higher scores indicate higher advantage and lower disadvantage)

[a]One participant could not be matched to a state on the basis of their postcode, as the postcode they entered was invalid. The multiple imputation analysis matched them to 'Non-Victorian', which seems likely to be accurate as they entered a postcode beginning with '4', which corresponds to Queensland

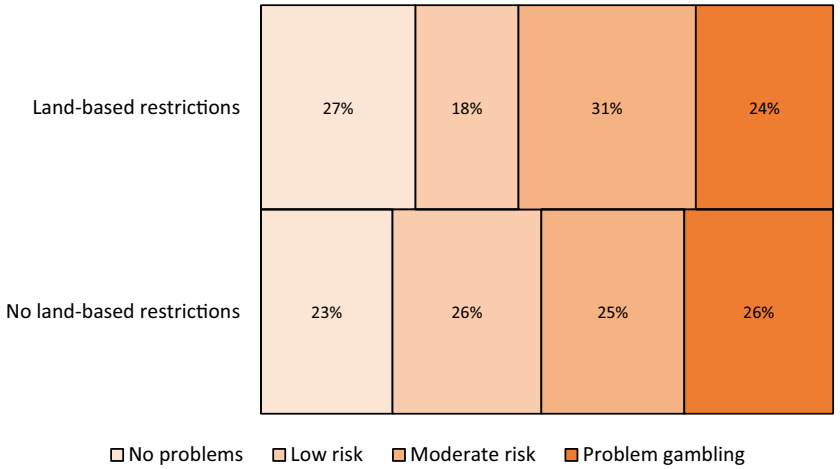

Fig. 1 Distribution of problem gambling risk status by presence of restrictions to land-based gambling products.

Impact of Supply Restrictions on Subsequent Gambling Engagement and Problems After Restrictions were Lifted

The within-group analyses examined whether there were any sustained reductions in gambling problems or gambling engagement. The repeated measures ANOVAs with planned contrasts showed no significant reduction in gambling problems at Wave 2 ($M=4.55$, $SD=5.38$, $t=1.25$, $p=0.211$) or 3 ($M=4.48$, $SD=5.28$, $t=1.50$, $p=0.134$), compared to pre-restriction baseline levels ($M=4.80$, $SD=5.74$; see Fig. 2). By contrast, frequency of gambling engagement was significantly reduced at both Waves 2 ($M=31.60$, $SD=29.98$, $t=2.03$, $p=0.043$) and 3 ($M=31.10$, $SD=25.83$, $t=2.37$, $p=0.019$), compared to pre-restriction baseline levels ($M=34.32$, $SD=31.55$; see Fig. 3).

Amongst the subsample who scored in the moderate (3–7) and problem (8+) range on the PGSI pre-COVID, there was similarly no significant reduction in gambling problems at Waves 2 ($M=5.06$, $SD=2.68$, $t=0.92$, $p=0.359$) or 3 ($M=4.92$, $SD=2.57$, $t=1.53$, $p=0.126$), compared to pre-restriction levels ($M=5.28$, $SD=1.88$). Amongst this subsample, there was also no significant reduction in frequency of gambling engagement at either Wave 2 ($M=35.26$, $SD=26.15$, $t=0.58$, $p=0.564$) or 3 ($M=34.28$, $SD=26.57$, $t=1.20$, $p=0.232$), compared to pre-restriction levels ($M=36.15$, $SD=26.44$).

Discussion

In a national convenience sample, there was no evidence that restricted access to most land-based gambling products for 10 weeks during the COVID-19 pandemic led to any reduction in gambling problems while restrictions were in place nor in the subsequent 2–5 months after restrictions were lifted. There was also no evidence that the implementation of these restrictions led to an increase in frequency of engagement with available gambling products (i.e., online gambling products). There was a small significant reduction in frequency of overall gambling engagement after restrictions were lifted, meaning that

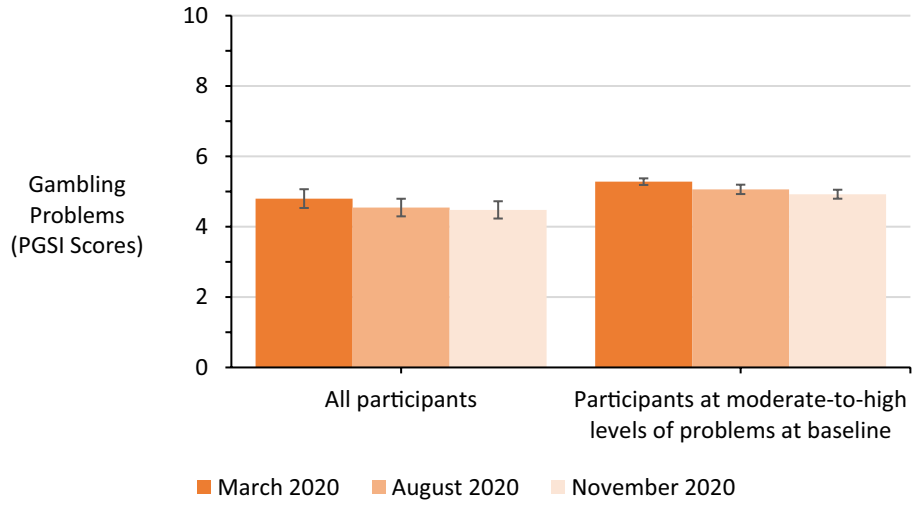

Fig. 2 Levels of gambling problems (Problem Gambling Severity Index) as a function of time and gambling problem risk status at baseline. Baseline (March 2020) values represent past-year gambling problems retrospectively reported at Wave 1 (May 2020). August and November 2020 represent levels post restrictions to land-based gambling products

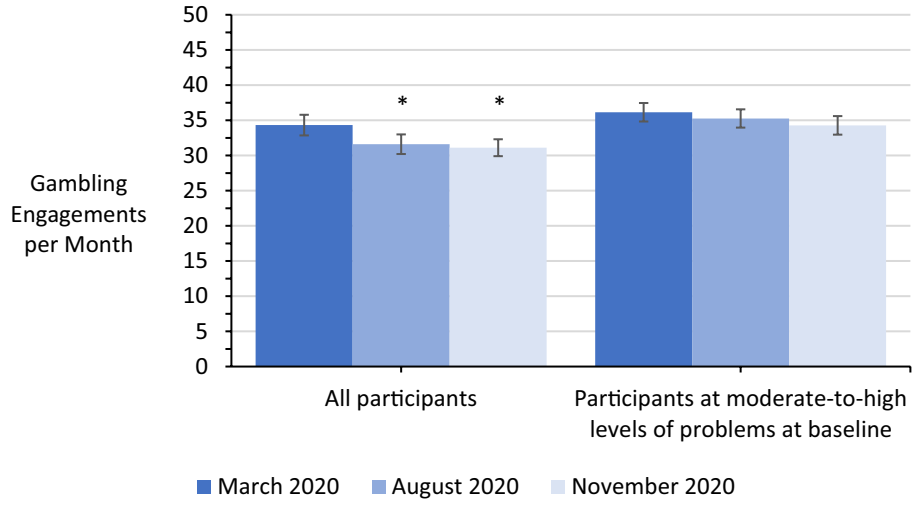

Fig. 3 Frequency of engagement in gambling (times per month) as a function of time and gambling problem risk status at baseline. Baseline (March 2020) values represent levels prior to restrictions to land-based gambling products (i.e., typical monthly gambling participation in the 12 months prior to restrictions implemented on March 26, 2020) that were retrospectively reported at Wave 1 (May 2020). August and November 2020 represent levels post restrictions to land-based gambling products. * indicates a significant reduction at both August and November, relative to March

participants were gambling less often two and five months after restrictions than they were pre-restrictions. This reduction was observed only for the full sample; no significant reduction in frequency of gambling engagement was observed amongst the subset of participants who were at moderate-to-high risk of problems at baseline.

It seems that in the context of the COVID-19 pandemic, restricted access did not result in any noticeable improvement in gambling problems. For those who experience problems related to their gambling, it might be that direct, more intensive psychological or pharmacological approaches are necessary in order to reduce problems (Bartley & Bloch, 2013; Choi et al., 2017), that longer follow-up periods are needed to observe substantial reductions in problems that might have been ongoing for years (Kushnir et al., 2018), or that the 10-week duration of restrictions was not long enough for behaviour change to occur. Further, the unique context of the pandemic and its wide-ranging impacts on people's psychosocial and financial wellbeing may have overshadowed any potential benefits of the reduced availability on gambling problems.

In contrast to previous literature (Meyer et al., 2018), we found no evidence of a displacement effect to other (online) forms of gambling when the land-based products were restricted. Given that most of our sample were regularly gambling online at baseline, it is useful to know that this engagement does not seem to increase significantly when land-based products are removed. It is necessary to also understand the impact on online gambling engagement amongst those who are not already regular online gamblers. While we tried to increase the representation of this group in our current sample, we were limited in our ability to do so as our usual methods of recruiting such gamblers (e.g., in venues) were unavailable due to the COVID-19 pandemic.

There was a significant reduction in frequency of overall gambling engagement at two and five months; however, the size of the reduction was small (a reduction of 0.6–0.7 engagements per week). Further, there was no significant reduction amongst the subsample who were at moderate-to-high risk of problems at baseline. These trajectories reflect naturally-occurring changes in behaviour among a sample of regular gamblers after restrictions precipitated by the pandemic were lifted. These reductions in frequency of overall gambling engagement are in line with observed patterns of substance use during the early stages of the pandemic in Australia; a number of studies have found reductions in the frequency and quantity of alcohol consumption in Australia over this period (Bade et al., 2021; Callinan et al., 2021; Clare et al., 2021). Together, these changes in engagement in substance use and gambling behaviour might both reflect changes in habits associated with periods of restricted access to typical venues for these activities.

Strengths and Limitations

This was a longitudinal study with a controlled element comparing a group who were experiencing land-based gambling product restrictions with a group who were not experiencing these restrictions. While the groups were not randomly allocated, the nature of the allocation to the conditions was not caused by any gambling-related factors (it was caused by differential COVID-19 outbreaks). This strengthens the findings and assuages concerns about allocation bias. It extends existing literature that examines the impact of restrictions, which has primarily consisted of uncontrolled studies (Meyer et al., 2018). Further, we incorporated key a priori identified covariates that we expected to be associated with the dependent variables. In this way we attempted to account for any factors that might differ between groups and impact outcomes. Finally, the longitudinal design allowed us to identify any impacts over a five-month timeframe

and the multiple imputation employed likely reduced bias that can occur due to differential attrition in longitudinal studies.

The key limitations to consider when interpreting the current findings are the use of a non-representative sample who were primarily engaged in online gambling, the non-random allocation, the potential for confounding due to the coinciding COVID-19 pandemic, and the measurement of (changes in) gambling problems. Only half of the sample regularly used the land-based gambling products that became unavailable during the restrictions. As such, the sample is not representative of the population who would most stand to be impacted by restrictions. Participants who did regularly use these products disproportionately resided in non-Victorian states, which would limit capacity to see a change amongst the Victorians who experienced the restrictions. On this point, we included frequency of engagement in online and land-based gambling as two covariates in the models, which should go some way to reducing bias introduced by these baseline between-state differences. Given the opportunistic nature of the current study in the context of the COVID-19 pandemic, it cannot provide a 'pure' test of the impact solely of the gambling restrictions as many other COVID-19-related changes were ongoing. Finally, the PGSI has been validated as a screening measure but not as an outcome measure. Its sensitivity to change is therefore unknown, meaning it is not clear how well it would detect changes in problems should they have occurred.

Conclusions

We found that the 10-week period of COVID-related restrictions on access to most land-based gambling products did not appear to have any beneficial effect in terms of reducing gambling problems at the population level either while restrictions were ongoing or at two and five-months after restrictions were lifted. The relatively short duration of the restrictions and the wide-ranging psychosocial and financial impacts of the pandemic may have reduced the potential for the restrictions to have a beneficial effect on problem gambling levels. Our findings highlight the need for easy access to and promotion of problem gambling treatment services even following periods of reduced availability.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10899-021-10067-6.

Author Contributions NB: Conceptualisation—Paper; Methodology—Analysis Plan; Data Cleaning and Preparation; Formal Analysis; Writing—Original Draft, Review & Editing; TBS: Conceptualisation—Study and Paper; Methodology—Study Design and Analysis Plan; Data Cleaning and Preparation; Formal Analysis; Writing—Original Draft, Review & Editing; Project Administration; MTB: Conceptualisation—Paper; Methodology –Analysis Plan; Data Cleaning and Preparation; Formal Analysis; Writing—Review & Editing; Visualisation; SMG: Conceptualisation—Study and Paper; Methodology—Study Design; Writing—Review & Editing; Supervision.

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Declarations

Conflict of interest NB: None; TBS: Thomas Swanton has received a PhD scholarship and research grant through the NSW Government's Gambling Research Capacity Grants program, funded by the NSW Responsible Gambling Fund, and supported by the NSW Office of Responsible Gambling. He has received honoraria for research advisory services from GambleAware, an independent UK charity that seeks to minimise gam-

bling harms and which receives voluntary donations from the gambling industry.; MTB: None.; SMG: Over the last three years (2018–2021), Dr. Gainsbury has worked on projects that have been received funding and in-kind support through her institution from Australian Research Council, NSW Liquor and Gaming, Svenska Spel Research Council, Responsible Wagering Australia, Australian Communication and Media Authority, Commonwealth Bank of Australia, GameCo, ClubsNSW, Wymac Gaming. Dr. Gainsbury is currently a member of the National Council on Problem Gambling International Advisory Board (Singapore) and receives an honorarium for this. She is a member of the Steering Committee for Remote Gambling Research and the Independent Research Oversight Panel both run by GambleAware, which provide an honorarium for reviewing research reports and proposals. Dr. Gainsbury has received honorarium directly and indirectly for research, presentations and advisory services from RSL Services Clubs, ClubsNSW, Centrecare WA, Gambling Research Exchange Ontario, Department of Social Services, Community Clubs Victoria, Financial and Consumer Rights Council, Generation Next, KPMG.

Ethical Approval This study was approved by the University of Sydney's Human Research Ethics Committee (approval number: 2019/213). All participants completed informed consent.

Preregistration Statement The protocol and hypotheses relating to this study were preregistered on Open Science Framework prior to looking at the Wave 2 data and prior to collecting the Wave 3 data: https://osf.io/d6jc4.

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