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Sex and age differences in clinically significant symptoms of depression and anxiety among people in Australia in the first month of COVID-19 restrictions: A national survey

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Competing interests

The authors have no completing interests to declare.

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Abstract

Objectives: To identify sex and age differences in clinically significant symptoms of depression and anxiety and the factors associated with these differences among adults in Australia during the first month of COVID-19 related restrictions.

Design: An anonymous online survey.

Setting: Australia.

Participants: Adults aged over 18 years living in Australia were eligible and 13,829 contributed complete data. Of these, 13,762 identified as either female (10,434) or male (3,328) and were included in analyses.

Interventions: None

Outcome measures: Clinically significant symptoms of depression or anxiety as indicated by a score of ≥10 on the Patient Health Questionnaire 9 (PHQ-9) (depression) or the Generalised Anxiety Disorder Scale 7 (GAD-7), and experiences of irritability (GAD-7 Item 6).

Results: Women were more likely than men to have clinically significant symptoms of depression (26.3% versus 20.1%, p <0.001) and anxiety (21.8% versus 14.2%, p <0.001) and to have experienced irritability at least several days in the previous fortnight (63.1% versus 51.4%, p<0.001). They were also more likely than men to be doing unpaid work caring for children (22.8% versus 8.6%, p <0.001) and dependent relatives (9.8% versus 5.7%, p <0.001) which made significant contributions to the mental health outcomes of interest. Loss of employment, fear of contracting COVID-19, and feeling a severe impact of the restrictions were associated with poorer mental health in both women and men of all ages.

Conclusions: Rates of clinically significant symptoms of depression and anxiety were high overall and higher among women than men. Rather than being intrinsically more vulnerable to mental health problems during the COVID-19 pandemic, the higher risk of clinically significant symptoms of anxiety

and depression among women may in part be explained by their disproportionate burden of unpaid caregiving.

Strengths and limitations of this study

- This national survey was launched four days after significant restrictions to limit the spread of COVID-19 were mandated in Australia.
- More than 13,800 people from all states and territories completed the survey.
- Almost 75% of respondents were women.
- We ascertained sex and age differences in factors contributing to poorer mental health.
- As this was a cross-sectional study, causal relationships cannot be established with certainty.

Introduction

As the World Health Organization declared the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2, resulting in COVID-19) outbreak a pandemic, many countries adopted restrictions on people's movements and activities to limit its spread. In Australia, the first confirmed case of COVID-19 was identified in late January 2020.[1, 2] The spread of the virus was initially slow but upward trends in infection rates and the seriousness of this threat to public health led to the establishment of the National Cabinet, an intergovernmental decision-making forum, to coordinate the national response to the COVID-19 pandemic in Australia.[3] In late March, national lockdown measures were mandated to limit the spread of the virus. They included requirements to stay at home except for a few specified reasons, work from home wherever possible, limit physical proximity, meet online and not in person, avoid visits to residential aged care facilities, limit attendance at weddings to five and at funerals to ten people, cancel interstate and international travel, and close schools and other educational institutions and move to learning from home.

As a result of the restrictions, economic activity stalled and unemployment soared. Concerns about the mental health consequences of being confined to home, loss of employment, financial strain, loss of freedom to move, and uncertainty about the future have been expressed by health professionals and widely reported in the media.[4-6] The media and health professionals have focused on the likelihood of the pandemic and its associated restrictions increasing the risk of severe mental illness and rates of suicide. However, the possible implications of the COVID-19 restrictions for psychological wellbeing at a population level have received less attention.

Studies in Australia, the United States, and the United Kingdom have reported that COVID-19-related restrictions have adversely affected women's mental health more than men's but the potential underlying reasons for this have not been described.[7-10]

Experts call for high-quality population-level data on the mental health effects of the COVID-19 pandemic to inform government responses, to mitigate adverse effects, and to prepare for future national crises.[11] This should include identifying factors that increase the risk of poor mental health in subgroups of the population.

The aim of this component of a larger project was to identify sex and age differences in clinically significant symptoms of depression and anxiety and the factors associated with these among adults in Australia during the first month of COVID-19-related restrictions.

Method

The research was approved by Monash University Human Research Ethics Committee (2020-24080-42716).

Patient and Public Involvement

No patient involved.

Design

A short, anonymous online survey of people living in Australia aged at least 18 years was launched four days after the COVID-19 restrictions were implemented. It included demographic questions; study-specific, fixed-response-option questions about experiences of COVID-19 and the associated restrictions; and two widely used standardised psychometric instruments measuring symptoms of depression and anxiety.

A sample size of 3,074 people is required to estimate the prevalence of people (20%) with a mental health problem (at the precision of 2% taking into account design effect = 2).

Detailed information about the design, data source, and procedure have been published.[12]

Socio-demographic questions

Study-specific questions were used to ascertain age, area of residence, gender, and living and work circumstances.

Socioeconomic Indices for Areas (SEIFA) were derived from each respondent's postcode using the most recent Australian Bureau of Statistics data.[13] SEIFA provides measures of socio-economic conditions by geographic area.

Experience of COVID 19 and the associated restrictions

Study-specific questions assessed:

i. Direct experience of COVID-19: whether the respondent had been diagnosed with or tested for COVID-19, or lived with or knew someone with COVID-19: yes / no.

ii. Whether a job had been lost because of COVID-19 restrictions: yes / no.

iii. Worry about contracting COVID-19: a visual analogue scale with scores from 0 (not at all worried) to 10 (extremely worried).

iv. How badly COVID-19 restrictions had affected daily life: a visual analogue scale with scores from 0 (not at all badly) to 10 (very badly).

Psychological wellbeing

Two standardised psychometric instruments were used to assess symptoms of depression and generalised anxiety experienced over the previous two weeks.

Patient Health Questionnaire 9 (PHQ-9)

The PHQ-9[14] is a 9-item scale asking respondents to state how often they have experienced each depressive symptom in the last fortnight on a four-point scale: 0=Not at all, 1=Several days, 2=More than half the days, and 3=Nearly every day. Aggregated responses yield a scale indicative of symptom severity. Formally validated against diagnostic psychiatric interviews, a PHQ-9 score ≥10 has sensitivity

of 88% and specificity of 88% for Major Depression. PHQ-9 scores of 5-9 represent mild, 10-14 moderate, 15-19 moderately severe, and ≥20 severe depressive symptoms.

Generalised Anxiety Disorder Scale (GAD-7)

The GAD-7[15] is a 7-item scale assessing common symptoms of anxiety that uses the same response options as PHQ-9. In formal validation against psychiatric interviews, a GAD-7 score ≥10 has sensitivity of 89% and specificity of 82% to detect Generalised Anxiety Disorder. Scores of 5-9 represent mild, 10-14 moderate, and 15-21 severe anxiety. Higher scores are strongly associated with functional impairment. GAD-7 Item 6 asks whether the respondent is 'Becoming irritable or easily annoyed'.

Procedure

The survey was built in Qualtrics Insight Platform (Qualtrics, Provo, UT). It was available from April 3 to May 2, 2020. A link to the survey was hosted on the Monash University website and information about it was distributed widely on news and social media and through organisational and personal networks.

Data management and statistical analysis

The outcomes were whether, in the last fortnight, the respondent had experienced:

1. Clinically significant symptoms of depression: PHQ-9 scores ≥ 10.
2. Clinically significant symptoms of anxiety: GAD-7 scores ≥ 10.
3. Becoming easily annoyed or irritable: GAD 7 item 7 score > 0

The visual analogue scales were categorised into two groups: not at all or none to moderate (0-7) and high (≥ 8).

Data were analysed in two stages.

1. Social-demographic characteristics, experience of COVID 19 and the associated restrictions, and psychological wellbeing were described separately by women and men. Tests of statistical significance (chi-square) were conducted to compare characteristics by gender.

2. Sex and age differences in the factors associated with clinically significant symptoms of depression and anxiety and becoming easily annoyed or irritable were examined using multiple logistic regression analyses for each of the four sub-groups (women 18-49 years, women 50 years and older, men 18-49 years, and men 50 years and older). Multiple logistic regression analyses were performed for each of the outcomes and included as potential explanatory factors social-demographic characteristics and experiences of COVID-19.

Only complete data were included in analyses, which were conducted using STATA Version 16 (StataCorp., College Station, TX).

Results

Of the 15,121 respondents who began the questionnaire, 13,829 (91.5%) contributed complete data. Of these, 13,762 identified as either female or male and were included in analyses. We excluded people from the analyses reported in this paper who did not identify as either female or male because the size of the group (N= 67) was relatively small and, in our opinion, the needs of this group warrant distinct consideration.

Respondent characteristics

Respondents' characteristics are in Table 1. Three quarters of the respondents were women. All age groups and socioeconomic positions were represented. About one in five respondents were living on their own. Women were more likely than men to have clinically significant symptoms of depression and anxiety and to report irritability. They were also more likely to do unpaid work caring for children

and dependent relatives. Almost one in ten had lost their job as a result of COVID-19. About one in seven were highly worried about contracting COVID-19 and one in four perceived that the restrictions had a highly adverse effect on their lives.

[TABLE 1 ABOUT HERE]

Factors associated with mental health outcomes

The factors associated with clinically significant symptoms of depression and anxiety and experiencing irritability for women and men in two age groups are shown in Tables 2, 3, and 4, respectively. Being highly worried about contracting COVID-19 and perceiving that the restrictions affected personal life very badly were associated with all outcomes for both women and men of all ages.

Sex and age differences in factors influencing risk of clinically significant symptoms of depression

For women and men in both age groups, living with family rather than living on their own or with non-family members reduced the risk of clinically significant symptoms of depression, and the loss of a job as a result of COVID-19 increased the risk. Occupying a higher socioeconomic position was protective for all groups, but this reached statistical significance only for women. Unpaid work caring for children increased the risk for women aged >50 years and decreased the risk for younger women. The effect on men of caring for children was not significant. Caring for dependent relatives increased risk for all except men aged >50 years.

[TABLE 2 ABOUT HERE]

Sex and age differences in factors influencing risk of clinically significant symptoms of anxiety

Living with family was protective for all except for women aged >50 years, for whom it increased the risk of clinically significant symptoms of anxiety. Unpaid work caring for children also increased the risk for women aged >50 years but not for younger women or men. Caring for dependent relatives increased risk for all but men aged <50 years. The loss of a job increased risk for women aged >50 years.

[TABLE 3 ABOUT HERE]

Sex and age differences in factors influencing risk of irritability

Living with family increased the risk of reported irritability in women of all ages but not in men. Caring for children increased risk of irritability in women of all ages and men aged <50 years but not in older men. Caring for dependent relatives increased risk of irritability in women and men aged >50 years but not in younger men. The loss of a job increased risk for all but women aged <50 years.

[TABLE 4 ABOUT HERE]

Discussion

This population-based study identified sex and age differences in the mental health consequences of COVID-19 restrictions and associated factors. While the loss of a job, being very fearful of contracting COVID-19, and experiencing the restrictions as highly adverse for daily life increased the risk of clinically significant symptoms of anxiety and depression and of reported irritability in almost all groups, other factors were more likely to affect the mental health of sub-groups.

Strengths of this study include the large sample. Validated measures of symptoms of anxiety and depression were used and the survey included questions about respondents' experiences of COVID-19, level of concern about contracting COVID-19, loss of a job due to COVID-19, and how badly COVID-19 restrictions had affected daily life. However, limitations are also acknowledged including the much higher proportion of women than men completing the survey. As a result, while we are confident that the findings accurately reflect the impact of the restrictions on women's mental health, it is possible that we can be less confident about our understanding of their impact on the mental health of men. Also, because the proportion of respondents occupying the lowest socioeconomic position (whose experiences are likely to have been more difficult) was low, it is possible that the findings might be

underestimates of the mental health impacts of the restrictions on the population. Lastly, the cross-sectional design does not allow causal relationships to be established.

The mental health effects of living with family members rather than alone or with non-family members varied by group. While living with family members was protective against symptoms of depression for all groups, it increased the risk of anxiety in women >50. Furthermore, it increased the risk of reported irritability for women of all ages but not for men. A possible explanation for these findings is that, as a consequence of COVID-19 and its associated restrictions on the economy and labour market, many young people lost employment and became unable to pay rent and other living expenses and therefore had to move back to their family home. A recent survey revealed that 26% of households in Australia have an adult child living at home. Of those households, 21% have an adult child who has returned home because of COVID-19.[16] The work of re-establishing expectations of how to live together, negotiating contributions to household tasks, and dealing with adult children's feelings of frustration may have been largely carried by women which may have contributed to their higher risk of anxiety and irritability.

The unpaid work of caring for children and dependent relatives is disproportionately carried by women. In 2015 women in Australia did 11.5 hours per week more unpaid labour than men.[17] This study found that caring for dependent relatives contributed significantly to the risk of symptoms of depression and anxiety and reported irritability in all groups. In response to the pandemic, many services accessed by people with dependent relatives such as special schools, allied health, and disability services became restricted or unavailable. This may have increased the burden of caring and contributed to the poorer mental health of people caring for dependent relatives. Findings were less consistent on the impact on mental health of caring for children. Whereas this contributed significantly to symptoms of depression and anxiety in women aged >50, in younger women it reduced the risk of symptoms of depression and it had no effect on the mental health of men. Younger women are likely to have younger children than older women and they may be easier to manage at home than

adolescents and young adults. Furthermore, the restriction related changes in the caring responsibilities of women with young dependent children may have been less dramatic than for those with adolescents or young adult children. The strain of being largely confined to home and managing the needs and frustrations of adolescents or young adults who have to learn from home rather than together with peers at school or university might explain the increased risk of symptoms of depression and anxiety in women aged >50.

The findings of this study make a significant contribution to knowledge about the sex- and age-specific factors that contribute to poor mental health during government-imposed restrictions in response to the COVID-19 pandemic. They suggest that some factors increase the risk of poor mental health in women and men of all ages. Others, however, are more likely to affect the mental health of women and indicate that, rather than being intrinsically more vulnerable to mental health problems during the COVID-19 pandemic, their higher risk of poor mental health may in part be explained by their disproportionately large share of the burden of unpaid caring work which increased with the closure of usual services like schools and disability services. These findings can inform public health strategies to help at risk groups recover once the restrictions are lifted. As recommended in a recent policy brief issued by the United Nations, these should include rapid implementation of 'a whole-of-society approach to promote, protect, and care for mental health; ensuring widespread availability of mental health and psychosocial support; and supporting recovery from COVID-19 by building mental health services for the future'.[18]

Authors' contributions

The survey was developed and implemented by the members of the Monash COVID -19 Restrictions Research Group: Jane Fisher, Thach Tran, Karin Hammarberg, Jayagowri Sastry, Hau Nguyen, Heather Rowe, Sally Popplestone, Ruby Stocker, Claire Stubber, and Maggie Kirkman.

KH, TT, MK and JF contributed to the conceptualisation of the research question and interpretation of the data. TT analysed the data. KH lead the manuscript writing. TT, MK and JF provided constructive feedback and approved of the final version.

Table 1 Respondent characteristics (n=13,762)

	Total n (%)	Females n (%)	Males n (%)	p-value
Total	**13762**	**10434 (75.8)**	**3328 (24.2)**	
Age group				< 0.001
18-29	1323 (9.6)	1033 (9.9)	290 (8.7)	
30-39	2275 (16.5)	1860 (17.8)	415 (12.5)	
40-49	2842 (20.7)	2334 (22.4)	508 (15.3)	
50-59	3055 (22.2)	2309 (22.1)	746 (22.4)	
60-69	2825 (20.5)	2016 (19.3)	809 (24.3)	
70 +	1442 (10.5)	882 (8.5)	560 (16.8)	
SEIFA quintiles				< 0.001
Quintile 1 (Lowest socio-economic position)	1086 (7.9)	760 (7.3)	326 (9.8)	
Quintile 2	1534 (11.2)	1127 (10.8)	407 (12.2)	
Quintile 3	2222 (16.2)	1670 (16.0)	552 (16.6)	
Quintile 4	3024 (22.0)	2313 (22.2)	711 (21.4)	
Quintile 5 (Highest socio-economic position	5896 (42.8)	4564 (43.7)	1332 (40)	
Living situation				< 0.001
On your own	2646 (19.2)	2033 (19.5)	613 (18.4)	
With only your partner / your partner and children / adult family members	9594 (69.7)	7190 (68.9)	2404 (72.2)	
With children and without a partner	576 (4.2)	527 (5.1)	49 (1.5)	
In a shared house with non-family members / Other	946 (6.9)	684 (6.6)	262 (7.9)	
Doing unpaid work caring for children	2664 (19.4)	2377 (22.8)	287 (8.6)	< 0.001
Doing unpaid work caring for dependent relatives	1205 (8.8)	1017 (9.8)	188 (5.7)	< 0.001
Lost job because of COVID-19	1241 (9.0)	964 (9.2)	277 (8.3)	0.108
Highly worried about contracting COVID-19 (scale score ≥ 8)	2167 (15.8)	1730 (16.6)	437 (13.1)	< 0.001
High adverse impact of restrictions (scale score ≥ 8)	3414 (24.8)	2661 (25.5)	753 (22.6)	0.001
Clinically significant symptoms of depression, PHQ-9 score ≥ 10	3408 (24.8)	2740 (26.3)	668 (20.1)	< 0.001
Clinically significant symptoms of anxiety, GAD-7 score ≥ 10	2747 (20.0)	2275 (21.8)	472 (14.2)	< 0.001
Becoming easily annoyed or irritable GAD 7 Item 6 > 0	8291 (60.2)	6579 (63.1)	1712 (51.4)	< 0.001

Table 2 Factors associated with clinically significant symptoms of depression (PHQ-9 scores ≥10)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**0.63 [0.54; 0.74]**	**0.71 [0.6; 0.83]**	**0.6 [0.45; 0.8]**	**0.4 [0.3; 0.53]**
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.8 [0.58; 1.08]	0.85 [0.63; 1.16]	0.75 [0.39; 1.45]	0.82 [0.5; 1.34]
Quintile 3	**0.66 [0.49; 0.87]**	0.88 [0.66; 1.17]	0.96 [0.54; 1.7]	0.95 [0.59; 1.52]
Quintile 4	0.78 [0.6; 1.01]	0.78 [0.58; 1.03]	0.95 [0.55; 1.64]	0.85 [0.54; 1.33]
Quintile 5 (Highest SEP)	**0.62 [0.48; 0.8]**	**0.71 [0.55; 0.93]**	0.87 [0.52; 1.45]	0.7 [0.46; 1.07]
Doing unpaid work caring for children	**0.83 [0.72; 0.95]**	**1.33 [1.05; 1.67]**	1.21 [0.82; 1.78]	1.15 [0.66; 2.03]
Doing unpaid work caring for dependent relatives	**1.52 [1.21; 1.91]**	**1.55 [1.26; 1.91]**	**1.8 [1.02; 3.19]**	1.47 [0.89; 2.44]
Lost job because of COVID-19	**1.51 [1.25; 1.82]**	**1.81 [1.43; 2.28]**	**1.65 [1.13; 2.41]**	**1.69 [1.09; 2.62]**
Highly worried about contracting COVID-19 (scale score ≥ 8)	**1.77 [1.5; 2.09]**	**1.62 [1.37; 1.92]**	**2.02 [1.34; 3.04]**	**1.57 [1.14; 2.17]**
High adverse impact of restrictions (scale score ≥ 8)	**3.34 [2.93; 3.81]**	**2.81 [2.41; 3.28]**	**2.91 [2.2; 3.84]**	**4.36 [3.32; 5.72]**

Table 3 Factors associated with clinically significant symptoms of anxiety (GAD-7 score ≥10)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**0.83 [0.7; 0.99]**	**1.27 [1.05; 1.53]**	**0.61 [0.44; 0.85]**	**0.6 [0.43; 0.83]**
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.82 [0.6; 1.14]	1.18 [0.82; 1.69]	0.81 [0.39; 1.71]	0.9 [0.49; 1.67]
Quintile 3	**0.73 [0.54; 0.97]**	1.13 [0.81; 1.59]	1.16 [0.61; 2.19]	1.34 [0.76; 2.35]
Quintile 4	0.8 [0.61; 1.05]	1.1 [0.79; 1.54]	0.99 [0.54; 1.82]	1.33 [0.78; 2.27]
Quintile 5 (Highest SEP)	**0.72 [0.56; 0.94]**	1.01 [0.74; 1.38]	0.82 [0.46; 1.46]	0.92 [0.55; 1.54]
Doing unpaid work caring for children	0.99 [0.86; 1.14]	**1.34 [1.05; 1.73]**	1.13 [0.73; 1.75]	1.07 [0.57; 2.01]
Doing unpaid work caring for dependent relatives	**1.34 [1.06; 1.69]**	**1.49 [1.19; 1.87]**	1.5 [0.8; 2.8]	**2.32 [1.38; 3.9]**
Lost job because of COVID-19	1.18 [0.97; 1.44]	**1.56 [1.2; 2.02]**	1.48 [0.98; 2.24]	1.38 [0.83; 2.29]
Highly worried about contracting COVID-19 (scale score ≥ 8)	**2.49 [2.12; 2.93]**	**2.44 [2.04; 2.91]**	**2.91 [1.9; 4.43]**	**2.05 [1.45; 2.9]**
High adverse impact of restrictions (scale score ≥ 8)	**3.03 [2.65; 3.47]**	**3.13 [2.64; 3.7]**	**3.17 [2.34; 4.29]**	**4.52 [3.31; 6.16]**

Table 4 Factors associated with irritability (GAD-7 item 6 score >0)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**1.24 [1.05; 1.47]**	**1.57 [1.39; 1.78]**	1.2 [0.91; 1.59]	1.07 [0.86; 1.32]
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.99 [0.7; 1.41]	1 [0.78; 1.28]	0.59 [0.32; 1.11]	0.91 [0.64; 1.29]
Quintile 3	0.83 [0.61; 1.14]	0.95 [0.75; 1.2]	0.76 [0.43; 1.33]	1.06 [0.76; 1.5]
Quintile 4	0.95 [0.71; 1.28]	1.08 [0.86; 1.36]	0.81 [0.47; 1.39]	1.05 [0.76; 1.46]
Quintile 5 (Highest SEP)	0.97 [0.73; 1.29]	0.99 [0.81; 1.23]	0.84 [0.51; 1.4]	1.09 [0.81; 1.48]
Doing unpaid work caring for children	**1.84 [1.58; 2.14]**	**1.37 [1.13; 1.67]**	**1.81 [1.21; 2.7]**	1.05 [0.71; 1.55]
Doing unpaid work caring for dependent relatives	**1.42 [1.07; 1.89]**	**1.44 [1.21; 1.72]**	0.99 [0.54; 1.82]	**1.69 [1.16; 2.47]**
Lost job because of COVID-19	1.18 [0.94; 1.47]	**1.28 [1.04; 1.59]**	**1.63 [1.07; 2.49]**	**1.52 [1.05; 2.19]**
Highly worried about contracting COVID-19 (scale score ≥ 8)	**1.44 [1.18; 1.77]**	**1.43 [1.23; 1.65]**	**2.39 [1.45; 3.94]**	**1.49 [1.16; 1.91]**
High adverse impact of restrictions (scale score ≥ 8)	**2.33 [1.96; 2.77]**	**1.84 [1.6; 2.1]**	**2.35 [1.72; 3.22]**	**2.74 [2.19; 3.43]**

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	p 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	p 2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	p 4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	p 5
Methods			
Study design	4	Present key elements of study design early in the paper	p 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	p 5-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	p 5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	p 5-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	p 5-7
Bias	9	Describe any efforts to address potential sources of bias	p 5
Study size	10	Explain how the study size was arrived at	p 5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	p 7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding 7-8	
		(*b*) Describe any methods used to examine subgroups and interactions	p 7-8
		(*c*) Explain how missing data were addressed	p 8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	p 8
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	p 8 and Table 1
		(b) Indicate number of participants with missing data for each variable of interest *Only surveys with complete data were included in analysis*	
Outcome data	15*	Report numbers of outcome events or summary measures	p 9-10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 2-4

		(*b*) Report category boundaries when continuous variables were categorized	Table 2-4
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	p 10-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	p 10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	p 10-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	p 11-12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	p 1

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Sex and age differences in clinically significant symptoms of depression and anxiety among people in Australia in the first month of COVID-19 restrictions: A national survey

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Sex and age differences in clinically significant symptoms of depression and anxiety among people in Australia in the first month of COVID-19 restrictions: A national survey

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Competing interests

The authors have no competing interests to declare.

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Abstract

Objectives: To identify sex and age differences in clinically significant symptoms of depression and anxiety and the factors associated with these differences among adults in Australia during COVID-19 related restrictions.

Design: Anonymous online survey.

Setting: Australia.

Participants: Adults aged over 18 years living in Australia were eligible and 13,829 contributed complete data. Of these, 13,762 identified as female (10,434) or male (3,328) and were included in analyses.

Interventions: None

Outcome measures: Clinically significant symptoms of depression (≥10 on Patient Health Questionnaire 9. PHQ-9) or anxiety (≥10 on Generalised Anxiety Disorder Scale 7, GAD-7), and experiences of irritability (GAD-7 Item 6).

Results: Women were more likely than men to have clinically significant symptoms of depression (26.3% [95% CI 25.4; 27.1] versus 20.1% [95% CI 18.7; 21.5], p <0.001) and anxiety (21.8% [95% CI 21.0; 22.6] versus 14.2% [95% CI 13.0; 15.4], p <0.001) and to have experienced irritability in the previous fortnight (63.1% [95% CI 62.1; 64.0] versus 51.4% [95% CI 49.7; 53.2], p<0.001). They were also more likely than men to be doing unpaid work caring for children (22.8% [95% CI 22.0; 23.6] versus 8.6% [95% CI 7.7; 9.6], p <0.001) and dependent relatives (9.8% [95% CI 9.2; 10.3] versus 5.7% [95% CI 4.9; 6.5], p <0.001) which made significant contributions to the mental health outcomes of interest. Loss of employment, fear of contracting COVID-19, and feeling a severe impact of the restrictions were associated with poorer mental health in women and men of all ages.

Conclusions: Rates of clinically significant symptoms of depression and anxiety were higher among women than men. Rather than being intrinsically more vulnerable to mental health problems during

the COVID-19 pandemic, the higher risk of symptoms of anxiety and depression among women may in part be explained by their disproportionate burden of unpaid caregiving.

Strengths and limitations of this study

- The first to quantify population prevalence of clinically significant symptoms of depression and anxiety among adults in Australia in month one of COVID-19 restrictions.
- Standardised measures of depression and anxiety were used to permit comparisons with equivalent COVID-19 and non-COVID-19 affected populations.
- We ascertained sex and age differences in factors contributing to poorer mental health.
- Almost 75% of respondents were women.
- As this was a cross-sectional study, causal relationships cannot be established with certainty.

Introduction

As the World Health Organization declared the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2, resulting in COVID-19) outbreak a pandemic, many countries adopted restrictions on people's movements and activities to limit its spread. In Australia, the first confirmed case of COVID-19 was identified in late January 2020.[1] The spread of the virus was initially slow but upward trends in infection rates and the seriousness of this threat to public health led to the establishment of the National Cabinet, an intergovernmental decision-making forum, to coordinate the national response to the COVID-19 pandemic in Australia.[2] In late March, national lockdown measures were mandated to limit the spread of the virus. They included requirements to stay at home except for a few specified reasons, work from home wherever possible, limit physical proximity, meet online and not in person, avoid visits to residential aged care facilities, limit attendance at weddings to five and at funerals to ten people, cancel interstate and international travel, and close schools and other educational institutions and move to learning from home.

As a result of the restrictions, economic activity stalled and unemployment soared. Concerns expressed by health professionals about the mental health consequences of being confined to home, loss of employment, financial strain, loss of freedom to move, and uncertainty about the future have been widely reported in the media.[3-5] These media reports have focused on the likelihood of the pandemic and its associated restrictions increasing the risk of severe mental illness and rates of suicide. However, the possible implications of the COVID-19 restrictions for psychological wellbeing at a population level have received less attention.

Studies in Australia, the United States, China and the United Kingdom have reported that COVID-19-related restrictions have adversely affected women's mental health more than men's but the potential underlying reasons for this have not been described.[6-10]

Experts call for high-quality population-level data on the mental health effects of the COVID-19 pandemic to inform government responses, to mitigate adverse effects, and to prepare for future national crises.[11] This should include identifying factors that increase the risk of poor mental health in subgroups of the population.

The aim of this component of a larger project was to identify sex and age differences in clinically significant symptoms of depression and anxiety and the factors associated with these among adults in Australia during the first month of COVID-19-related restrictions.

Method

The research was approved by Monash University Human Research Ethics Committee (2020-24080-42716).

Patient and Public Involvement

No patient involved.

Design

A short, anonymous online survey of people living in Australia aged at least 18 years was launched four days after the COVID-19 restrictions were implemented. It included demographic questions; study-specific, fixed-response-option questions about experiences of COVID-19 and the associated restrictions; and two widely used standardised psychometric instruments measuring symptoms of depression and anxiety.

A sample size of 3,074 people is required to estimate the prevalence of people (20%) with a mental health problem (at the precision of 2% taking into account design effect = 2). [12]

Detailed information about the design, data source, and procedure have been published.[13]

Socio-demographic questions

Study-specific questions were used to ascertain age, area of residence, gender, and living and work circumstances.

Socioeconomic Indices for Areas (SEIFA) were derived from each respondent's postcode using the most recent Australian Bureau of Statistics data.[14] SEIFA provides measures of socio-economic conditions by geographic area.

Experience of COVID 19 and the associated restrictions

Study-specific questions assessed:

i. Direct experience of COVID-19: whether the respondent had been diagnosed with or tested for COVID-19, or lived with or knew someone with COVID-19: yes / no.

ii. Whether a job had been lost because of COVID-19 restrictions: yes / no.

iii. Worry about contracting COVID-19: a visual analogue scale with scores from 0 (not at all worried) to 10 (extremely worried).

iv. How badly COVID-19 restrictions had affected daily life: a visual analogue scale with scores from 0 (not at all badly) to 10 (very badly).

Psychological wellbeing

Two standardised psychometric instruments were used to assess symptoms of depression and generalised anxiety experienced over the previous two weeks.

Patient Health Questionnaire 9 (PHQ-9)

The PHQ-9 [15] is a 9-item scale asking respondents to state how often they have experienced each depressive symptom in the last fortnight on a four-point scale: 0=Not at all, 1=Several days, 2=More than half the days, and 3=Nearly every day. Aggregated responses yield a scale indicative of symptom severity. Formally validated against diagnostic psychiatric interviews, a PHQ-9 score ≥10 has sensitivity

of 88% and specificity of 88% for Major Depression. PHQ-9 scores of 5-9 represent mild, 10-14 moderate, 15-19 moderately severe, and ≥20 severe depressive symptoms.

Generalised Anxiety Disorder Scale (GAD-7)

The GAD-7[16] is a 7-item scale assessing common symptoms of anxiety that uses the same response options as PHQ-9. In formal validation against psychiatric interviews, a GAD-7 score ≥10 has sensitivity of 89% and specificity of 82% to detect Generalised Anxiety Disorder. Scores of 5-9 represent mild, 10-14 moderate, and 15-21 severe anxiety. Higher scores are strongly associated with functional impairment. GAD-7 Item 6 asks whether the respondent is 'Becoming irritable or easily annoyed'.

Procedure

The survey was built in Qualtrics Insight Platform (Qualtrics, Provo, UT). It was available from April 3 to May 2, 2020. A link to the survey was hosted on the Monash University website (https://www.monash.edu/medicine/living-with-covid-19-restrictions-survey) and information about it was distributed widely on news and social media platforms including the national broadcaster ABC and Facebook and through organisational and personal networks.

Data management and statistical analysis

The outcomes were whether, in the last fortnight, the respondent had experienced:

1. Clinically significant symptoms of depression: PHQ-9 scores ≥ 10.
2. Clinically significant symptoms of anxiety: GAD-7 scores ≥ 10.
3. Becoming easily annoyed or irritable: GAD 7 item 7 score > 0

The visual analogue scales were categorised into two groups: not at all or none to moderate (0-7) and high (≥ 8).

Data were analysed in two stages.

1. Social-demographic characteristics, experience of COVID 19 and the associated restrictions, and psychological wellbeing were described separately by women and men. Tests of statistical significance (chi-square) were conducted to compare characteristics by sex.

2. Sex and age differences in the factors associated with clinically significant symptoms of depression and anxiety and becoming easily annoyed or irritable were examined using multiple logistic regression analyses for each of the four sub-groups (women 18-49 years, women 50 years and older, men 18-49 years, and men 50 years and older). Multiple logistic regression analyses were performed for each of the outcomes and included as potential explanatory factors social-demographic characteristics and experiences of COVID-19.

Only complete data were included in analyses, which were conducted using STATA Version 16 (StataCorp., College Station, TX).

Results

Of the 15,121 respondents who began the questionnaire, 13,829 (91.5%) contributed complete data. Of these, 13,762 identified as either female or male and were included in analyses. We excluded people from the analyses reported in this paper who did not identify as either female or male because the size of the group (N= 67) was relatively small and, in our opinion, the needs of this group warrant distinct consideration.

Respondent characteristics

Respondents' characteristics are in Table 1. Three quarters of the respondents were women. All age groups and socioeconomic positions were represented. About one in five respondents were living on their own. Women were more likely than men to have clinically significant symptoms of depression and anxiety and to report irritability. They were also more likely to do unpaid work caring for children

and dependent relatives. Almost one in ten had lost their job as a result of COVID-19. About one in seven were highly worried about contracting COVID-19 and one in four perceived that the restrictions had a highly adverse effect on their lives.

[TABLE 1 ABOUT HERE]

Factors associated with mental health outcomes

The factors associated with clinically significant symptoms of depression and anxiety and experiencing irritability for women and men in two age groups are shown in Tables 2, 3, and 4, respectively. Being highly worried about contracting COVID-19 and perceiving that the restrictions affected personal life very badly were associated with all outcomes for both women and men of all ages.

Sex and age differences in factors influencing risk of clinically significant symptoms of depression

For women and men in both age groups, living with family rather than living on their own or with non-family members reduced the risk of clinically significant symptoms of depression, and the loss of a job as a result of COVID-19 increased the risk. Occupying a higher socioeconomic position was protective for all groups, but this reached statistical significance only for women. Unpaid work caring for children increased the risk for women aged >50 years and decreased the risk for younger women. The effect on men of caring for children was not significant. Caring for dependent relatives increased risk for all except men aged >50 years.

[TABLE 2 ABOUT HERE]

Sex and age differences in factors influencing risk of clinically significant symptoms of anxiety

Living with family was protective for all except for women aged >50 years, for whom it increased the risk of clinically significant symptoms of anxiety. Unpaid work caring for children also increased the risk for women aged >50 years but not for younger women or men. Caring for dependent relatives increased risk for all but men aged <50 years. The loss of a job increased risk for women aged >50 years.

[TABLE 3 ABOUT HERE]

Sex and age differences in factors influencing risk of irritability

Living with family increased the risk of reported irritability in women of all ages but not in men. Caring for children increased risk of irritability in women of all ages and men aged <50 years but not in older men. Caring for dependent relatives increased risk of irritability in women and men aged >50 years but not in younger men. The loss of a job increased risk for all but women aged <50 years.

[TABLE 4 ABOUT HERE]

Discussion

To date most COVID-19 related research has focused on the physical effects of COVID-19. There is now growing evidence about the far-reaching mental health consequences of COVID-19 and its associated government-imposed restrictions. Population-based studies and studies of health care workers and people with pre-existing mental illness demonstrate the significant impact of COVID-19 on people's mental health and wellbeing.[17-22] This population-based study adds to existing evidence by identifying sex and age differences in the mental health consequences of COVID-19 restrictions and associated factors. While the loss of a job, being very fearful of contracting COVID-19, and experiencing the restrictions as highly adverse for daily life increased the risk of clinically significant symptoms of anxiety and depression and of reported irritability in almost all groups, other factors were more likely to affect the mental health of sub-groups.

Strengths of this study include the large sample. Validated measures of symptoms of anxiety and depression were used and the survey included questions about respondents' experiences of COVID-19, level of concern about contracting COVID-19, loss of a job due to COVID-19, and how badly COVID-19 restrictions had affected daily life. However, limitations are also acknowledged. There is clear evidence that women are more likely than men to participate in research, as they did in this study

where a much higher proportion of respondents were women than men.[23] As a result, while we are confident that the findings accurately reflect the impact of the restrictions on women's mental health, it is possible that we can be less confident about our understanding of their impact on the mental health of men. Also, because the proportion of respondents occupying the lowest socioeconomic position (whose experiences are likely to have been more difficult) was low, it is possible that the findings might be underestimates of the mental health impacts of the restrictions on the population. Lastly, the cross-sectional design does not allow causal relationships to be established.

The mental health effects of living with family members rather than alone or with non-family members varied by group. While living with family members was protective against symptoms of depression for all groups, it increased the risk of anxiety in women >50. Furthermore, it increased the risk of reported irritability for women of all ages but not for men. A possible explanation for these findings is that, as a consequence of COVID-19 and its associated restrictions on the economy and labour market, many young people lost employment and became unable to pay rent and other living expenses and therefore had to move back to their family home. A recent survey revealed that 26% of households in Australia have an adult child living at home. Of those households, 21% have an adult child who has returned home because of COVID-19.[24] The work of re-establishing expectations of how to live together, negotiating contributions to household tasks, and dealing with adult children's feelings of frustration may have been largely carried by women which may have contributed to their higher risk of anxiety and irritability.

The unpaid work of caring for children and dependent relatives is disproportionately carried by women. In 2015 women in Australia did 11.5 hours per week more unpaid labour than men.[25] This pre-existing gender inequality may have been exacerbated by the COVID-19-related restrictions during which women reported being much more likely than men to do unpaid work caring for children and dependent relatives. This study found that caring for dependent relatives contributed significantly to the risk of symptoms of depression and anxiety and reported irritability in all groups. In response

to the pandemic, many services accessed by people with dependent relatives such as special schools, allied health, and disability services became restricted or unavailable. This may have increased the burden of caring and contributed to the poorer mental health of people caring for dependent relatives. Findings were less consistent on the impact on mental health of caring for children. Whereas this contributed significantly to symptoms of depression and anxiety in women aged >50, in younger women it reduced the risk of symptoms of depression and it had no effect on the mental health of men. Younger women are likely to have younger children than older women and they may be easier to manage at home than adolescents and young adults. Furthermore, the restriction related changes in the caring responsibilities of women with young dependent children may have been less dramatic than for those with adolescents or young adult children. The strain of being largely confined to home and managing the needs and frustrations of adolescents or young adults who have to learn from home rather than together with peers at school or university might explain the increased risk of symptoms of depression and anxiety in women aged >50.

The findings of this study make a significant contribution to knowledge about the sex- and age-specific factors that contribute to poor mental health during government-imposed restrictions in response to the COVID-19 pandemic. They suggest that some factors increase the risk of poor mental health in women and men of all ages. Others, however, are more likely to affect the mental health of women and indicate that, rather than being intrinsically more vulnerable to mental health problems during the COVID-19 pandemic, their higher risk of poor mental health may in part be explained by their disproportionately large share of the burden of unpaid caring work which increased with the closure of usual services like schools and disability services. These findings can inform public health strategies to help at risk groups recover once the restrictions are lifted. We agree with Ho et al. who argue that COVID-19-related mental health responses need to be coordinated and multi-sectorial and that 'Only by strengthening the psychological defence can nations continue to fight this long-drawn battle and secure success for the future.'[26] We also endorse a recent policy brief issued by the United Nations, which recommends that public health responses to assist in COVID-19 recovery should include rapid

implementation of 'a whole-of-society approach to promote, protect, and care for mental health; ensuring widespread availability of mental health and psychosocial support; and supporting recovery from COVID-19 by building mental health services for the future'.[27]

Data availability

Data are available from the first author (Karin.hammarberg@monash.edu) upon reasonable request.

Authors' contributions

The survey was developed and implemented by the members of the Monash COVID -19 Restrictions Research Group: Jane Fisher, Thach Tran, Karin Hammarberg, Jayagowri Sastry, Hau Nguyen, Heather Rowe, Sally Popplestone, Ruby Stocker, Claire Stubber, and Maggie Kirkman.

KH, TT, MK and JF contributed to the conceptualisation of the research question and interpretation of the data. TT analysed the data. KH lead the manuscript writing. TT, MK and JF provided constructive feedback and approved of the final version.

Table 1 Respondent characteristics (n=13,762)

	Total n (%)	Females n (%)	Males n (%)	p-value
Total	**13762**	**10434 (75.8)**	**3328 (24.2)**	
Age group				< 0.001
18-29	1323 (9.6)	1033 (9.9)	290 (8.7)	
30-39	2275 (16.5)	1860 (17.8)	415 (12.5)	
40-49	2842 (20.7)	2334 (22.4)	508 (15.3)	
50-59	3055 (22.2)	2309 (22.1)	746 (22.4)	
60-69	2825 (20.5)	2016 (19.3)	809 (24.3)	
70 +	1442 (10.5)	882 (8.5)	560 (16.8)	
SEIFA quintiles				< 0.001
Quintile 1 (Lowest socio-economic position)	1086 (7.9)	760 (7.3)	326 (9.8)	
Quintile 2	1534 (11.2)	1127 (10.8)	407 (12.2)	
Quintile 3	2222 (16.2)	1670 (16.0)	552 (16.6)	
Quintile 4	3024 (22.0)	2313 (22.2)	711 (21.4)	
Quintile 5 (Highest socio-economic position	5896 (42.8)	4564 (43.7)	1332 (40)	
Living situation				< 0.001
On your own	2646 (19.2)	2033 (19.5)	613 (18.4)	
With only your partner / your partner and children / adult family members	9594 (69.7)	7190 (68.9)	2404 (72.2)	
With children and without a partner	576 (4.2)	527 (5.1)	49 (1.5)	
In a shared house with non-family members / Other	946 (6.9)	684 (6.6)	262 (7.9)	
Doing unpaid work caring for children	2664 (19.4)	2377 (22.8)	287 (8.6)	< 0.001
Doing unpaid work caring for dependent relatives	1205 (8.8)	1017 (9.8)	188 (5.7)	< 0.001
Lost job because of COVID-19	1241 (9.0)	964 (9.2)	277 (8.3)	0.108
Highly worried about contracting COVID-19 (scale score ≥ 8)	2167 (15.8)	1730 (16.6)	437 (13.1)	< 0.001
High adverse impact of restrictions (scale score ≥ 8)	3414 (24.8)	2661 (25.5)	753 (22.6)	0.001
Clinically significant symptoms of depression, PHQ-9 score ≥ 10	3408 (24.8)	2740 (26.3)	668 (20.1)	< 0.001
Clinically significant symptoms of anxiety, GAD-7 score ≥ 10	2747 (20.0)	2275 (21.8)	472 (14.2)	< 0.001
Becoming easily annoyed or irritable GAD 7 Item 6 > 0	8291 (60.2)	6579 (63.1)	1712 (51.4)	< 0.001

Table 2 Factors associated with clinically significant symptoms of depression (PHQ-9 scores ≥10)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**0.63 [0.54; 0.74]**	**0.71 [0.6; 0.83]**	**0.6 [0.45; 0.8]**	**0.4 [0.3; 0.53]**
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.8 [0.58; 1.08]	0.85 [0.63; 1.16]	0.75 [0.39; 1.45]	0.82 [0.5; 1.34]
Quintile 3	**0.66 [0.49; 0.87]**	0.88 [0.66; 1.17]	0.96 [0.54; 1.7]	0.95 [0.59; 1.52]
Quintile 4	0.78 [0.6; 1.01]	0.78 [0.58; 1.03]	0.95 [0.55; 1.64]	0.85 [0.54; 1.33]
Quintile 5 (Highest SEP)	**0.62 [0.48; 0.8]**	**0.71 [0.55; 0.93]**	0.87 [0.52; 1.45]	0.7 [0.46; 1.07]
Doing unpaid work caring for children	**0.83 [0.72; 0.95]**	**1.33 [1.05; 1.67]**	1.21 [0.82; 1.78]	1.15 [0.66; 2.03]
Doing unpaid work caring for dependent relatives	**1.52 [1.21; 1.91]**	**1.55 [1.26; 1.91]**	**1.8 [1.02; 3.19]**	1.47 [0.89; 2.44]
Lost job because of COVID-19	**1.51 [1.25; 1.82]**	**1.81 [1.43; 2.28]**	**1.65 [1.13; 2.41]**	**1.69 [1.09; 2.62]**
Highly worried about contracting COVID-19 (scale score ≥ 8)	**1.77 [1.5; 2.09]**	**1.62 [1.37; 1.92]**	**2.02 [1.34; 3.04]**	**1.57 [1.14; 2.17]**
High adverse impact of restrictions (scale score ≥ 8)	**3.34 [2.93; 3.81]**	**2.81 [2.41; 3.28]**	**2.91 [2.2; 3.84]**	**4.36 [3.32; 5.72]**

Table 3 Factors associated with clinically significant symptoms of anxiety (GAD-7 score ≥10)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**0.83 [0.7; 0.99]**	**1.27 [1.05; 1.53]**	**0.61 [0.44; 0.85]**	**0.6 [0.43; 0.83]**
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.82 [0.6; 1.14]	1.18 [0.82; 1.69]	0.81 [0.39; 1.71]	0.9 [0.49; 1.67]
Quintile 3	**0.73 [0.54; 0.97]**	1.13 [0.81; 1.59]	1.16 [0.61; 2.19]	1.34 [0.76; 2.35]
Quintile 4	0.8 [0.61; 1.05]	1.1 [0.79; 1.54]	0.99 [0.54; 1.82]	1.33 [0.78; 2.27]
Quintile 5 (Highest SEP)	**0.72 [0.56; 0.94]**	1.01 [0.74; 1.38]	0.82 [0.46; 1.46]	0.92 [0.55; 1.54]
Doing unpaid work caring for children	0.99 [0.86; 1.14]	**1.34 [1.05; 1.73]**	1.13 [0.73; 1.75]	1.07 [0.57; 2.01]
Doing unpaid work caring for dependent relatives	**1.34 [1.06; 1.69]**	**1.49 [1.19; 1.87]**	1.5 [0.8; 2.8]	**2.32 [1.38; 3.9]**
Lost job because of COVID-19	1.18 [0.97; 1.44]	**1.56 [1.2; 2.02]**	1.48 [0.98; 2.24]	1.38 [0.83; 2.29]
Highly worried about contracting COVID-19 (scale score ≥ 8)	**2.49 [2.12; 2.93]**	**2.44 [2.04; 2.91]**	**2.91 [1.9; 4.43]**	**2.05 [1.45; 2.9]**
High adverse impact of restrictions (scale score ≥ 8)	**3.03 [2.65; 3.47]**	**3.13 [2.64; 3.7]**	**3.17 [2.34; 4.29]**	**4.52 [3.31; 6.16]**

Table 4 Factors associated with irritability (GAD-7 item 6 score >0)

	Females		Males	
	18-49 years old	**50 years old and above**	**18-49 years old**	**50 years old and above**
Living with family vs. not living with family	**1.24 [1.05; 1.47]**	**1.57 [1.39; 1.78]**	1.2 [0.91; 1.59]	1.07 [0.86; 1.32]
SEIFA quintiles				
Quintile 1 (Lowest SEP)				
Quintile 2	0.99 [0.7; 1.41]	1 [0.78; 1.28]	0.59 [0.32; 1.11]	0.91 [0.64; 1.29]
Quintile 3	0.83 [0.61; 1.14]	0.95 [0.75; 1.2]	0.76 [0.43; 1.33]	1.06 [0.76; 1.5]
Quintile 4	0.95 [0.71; 1.28]	1.08 [0.86; 1.36]	0.81 [0.47; 1.39]	1.05 [0.76; 1.46]
Quintile 5 (Highest SEP)	0.97 [0.73; 1.29]	0.99 [0.81; 1.23]	0.84 [0.51; 1.4]	1.09 [0.81; 1.48]
Doing unpaid work caring for children	**1.84 [1.58; 2.14]**	**1.37 [1.13; 1.67]**	**1.81 [1.21; 2.7]**	1.05 [0.71; 1.55]
Doing unpaid work caring for dependent relatives	**1.42 [1.07; 1.89]**	**1.44 [1.21; 1.72]**	0.99 [0.54; 1.82]	**1.69 [1.16; 2.47]**
Lost job because of COVID-19	1.18 [0.94; 1.47]	**1.28 [1.04; 1.59]**	**1.63 [1.07; 2.49]**	**1.52 [1.05; 2.19]**
Highly worried about contracting COVID-19 (scale score ≥ 8)	**1.44 [1.18; 1.77]**	**1.43 [1.23; 1.65]**	**2.39 [1.45; 3.94]**	**1.49 [1.16; 1.91]**
High adverse impact of restrictions (scale score ≥ 8)	**2.33 [1.96; 2.77]**	**1.84 [1.6; 2.1]**	**2.35 [1.72; 3.22]**	**2.74 [2.19; 3.43]**

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Default Question Block

HOW ARE YOU?

Living With COVID-19 Restrictions in Australia

***

To help our governments and the community to understand what life is like during the COVID-19 restrictions, we want as many people as possible to complete this snapshot survey.

This survey is anonymous. We can't know who you are.

We would like to hear from you if you are 18 or older and live in Australia!

It will take only about 10 minutes to answer the questions.

If you want to find out more about the survey before you begin, please click here for more information.

To begin the survey, please click "NEXT PAGE".

Are you living in Australia?

○ Yes

- [ ] No

Are you above 17 years of age?

- [ ] Yes
- [ ] No

The first group of questions asks about you and your situation

1. How old are you? (years)

▼

2. Do you live:

- [ ] On your own
- [ ] With only your partner
- [ ] With your partner and children
- [ ] With children and without a partner
- [ ] With adult family members
- [ ] In a shared house with non-family members
- [ ] Other (please specify)

3. What is your postcode?

4. Are you:

- [ ] Female
- [ ] Male
- [ ] Other

5. Were you born in Australia?

- ○ Yes
- ○ No

The next set of questions asks about your experience of COVID-19 infection

6. To what extent have you experienced COVID-19?

	Yes	No
I have been treated in hospital for COVID-19	○	○
I have had COVID-19 but did not have to go to hospital	○	○
I have been tested for COVID-19	○	○
Someone who lives with me has COVID-19	○	○
Someone I know who doesn't live with me has COVID-19	○	○

7. How worried are you that you will catch COVID-19?

Not at all worried — Extremely worried

0○ 1○ 2○ 3○ 4○ 5○ 6○ 7○ 8○ 9○ 10○

8. What is your situation at the moment?

	Yes	No
I have a job and am working from home	○	○
I have a job that I need to leave home to do	○	○
I am doing unpaid work caring for children	○	○

	Yes	No
I am doing unpaid work caring for dependent relatives	○	○
I have lost my job because of COVID-19	○	○
I was unemployed before COVID-19	○	○
I am retired	○	○
I am a student and my course is delivered online	○	○
I am a student but my course has been suspended	○	○
My main source of income is government benefits	○	○

9. Since COVID-19 I am drinking alcohol:

- ○ More than I used to
- ○ Less than I used to
- ○ About the same
- ○ I don't drink alcohol

The next set of questions is about your health in general

10. Have you been able to get the care you need for non-COVID-19 health conditions or a disability?

- ○ Yes; there's been no change in my health or disability care
- ○ Yes; my health or disability care has been better
- ○ No; my health or disability care has been worse
- ○ I haven't needed health or disability care

The next set of questions is about how you have felt in the last two weeks

11. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
a. Little interest or pleasure in doing things	○	○	○	○
b. Feeling down, depressed, or hopeless	○	○	○	○
c. Trouble falling or staying asleep, or sleeping too much	○	○	○	○
d. Feeling tired or having little energy	○	○	○	○
e. Poor appetite or overeating	○	○	○	○
f. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down	○	○	○	○
g. Trouble concentrating on things, such as reading the newspaper or watching television	○	○	○	○
h. Moving or speaking so slowly that other people could have noticed. Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual	○	○	○	○
i. Thoughts that you would be better off dead, or of hurting yourself in some way	○	○	○	○

12. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
a. Feeling nervous, anxious or on edge	○	○	○	○
b. Not being able to stop or control worrying	○	○	○	○
c. Worrying too much about different things	○	○	○	○
d. Trouble relaxing	○	○	○	○
e. Being so restless that it is hard to sit still	○	○	○	○
f. Becoming easily annoyed or irritable	○	○	○	○
g. Feeling afraid as if something awful might happen	○	○	○	○

The last set of questions is about the impact of COVID-19 on your life:

13. Please tell us up to three bad things that have happened to you because of the COVID-19 restrictions

Bad thing 1:

Bad thing 2:

Bad thing 3:

14. Please tell us up to three good things that have happened to you because of the COVID-19 restrictions

Good thing 1:

Good thing 2:

Good thing 3:

15. Please tell us in general how optimistic you feel about the future

Not at all optimistic Extremely optimistic

0 1 2 3 4 5 6 7 8 9 10

16. Please write anything else you would like us to know about your experience of COVID-19 (up to 250 characters)

Thank you for completing the survey. Please encourage other people to complete it by sending this link: **https://monash.az1.qualtrics.com/jfe/form/SV_dpqJqBdgFclvpyJ**

We will give the results to governments and other organisations to help them understand what people need now and to prepare for similar circumstances in the future.

You can see the survey results in a few weeks at [WEBSITE]

If you are feeling distressed, there are places you can contact for help:

Your GP

Beyond blue: beyondblue.org.au

For advice and information, go to: Government of Australia: www.australia.gov.au

Powered by Qualtrics

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	p 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	p 2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	p 4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	p 5
Methods			
Study design	4	Present key elements of study design early in the paper	p 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	p 5-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	p 5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	p 5-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	p 5-7
Bias	9	Describe any efforts to address potential sources of bias	p 5
Study size	10	Explain how the study size was arrived at	p 5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	p 7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding 7-8	
		(*b*) Describe any methods used to examine subgroups and interactions	p 7-8
		(*c*) Explain how missing data were addressed	p 8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	p 8
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	p 8 and Table 1
		(b) Indicate number of participants with missing data for each variable of interest *Only surveys with complete data were included in analysis*	
Outcome data	15*	Report numbers of outcome events or summary measures	p 9-10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables 2-4

		(*b*) Report category boundaries when continuous variables were categorized	Table 2-4
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	p 10-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	p 10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	p 10-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	p 11-12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	p 1

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.