

Research paper

Mental distress and subjective wellbeing in Australian parents: A pre-pandemic versus pandemic four-year national survey

Tanja Capic^{a,*}, George Youssef^a, Kate Lycett^{a,b}, Matthew Fuller-Tyszkiewicz^a, Sarah Khor^a, Georgie Frykberg^{a,b}, Mallery Crowe^a, Samantha Teague^{a,c}, Craig Olsson^{a,b}, Robert Cummins^a, Delyse Hutchinson^{a,d}

^a School of Psychology, SEEDLifespan Strategic Research Centre, Deakin University, Burwood, Australia

^b Murdoch Children's Research Institute, Parkville, Australia

^c Department of Psychology, College of Healthcare Sciences, James Cook University, Townsville, Australia

^d National Drug and Alcohol Research Centre, University New South Wales, Sydney, Australia

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ABSTRACT

Background: The COVID-19 pandemic has adversely impacted parents' mental health globally, yet few studies have examined long-term patterns in parents' mental health since the pandemic, and most lack pre-pandemic comparison data. This study addresses these gaps by examining mental distress and subjective wellbeing in Australian parents across four pandemic years, and relative to pre-pandemic.

Methods: Parents were adults living with children ($N = 3403$) from a repeated national cross-sectional survey, representative of Australian parents in age, gender, partner status and geographical location. Patterns of mental health were estimated by regressing mental distress (i.e., depression, anxiety, stress) and subjective wellbeing (i.e., Life satisfaction, Personal Wellbeing Index, and satisfaction with seven life domains) onto survey year (pre-pandemic: 2013, pandemic: 2020–2023).

Results: Parents' depression, anxiety and stress levels were consistently above pre-pandemic levels during the four years, with anxiety and depression levels being 32 % and 35 % higher than pre-pandemic in 2023, respectively. This coincided with a substantial drop in life satisfaction to below-normative levels in 2023. While satisfaction with personal safety was above pre-pandemic levels during 2021–23, satisfaction with health, standard of living, and future security was lower in 2022–23 compared to first two years. These effects were more pronounced and sustained for mothers, particularly on anxiety, stress and satisfaction with health.

Conclusion: Four years into the pandemic, many Australian parents faced challenges with chronic mental health issues. Access to wholistic mental health services, along with financial supports for struggling families, are essential to supporting parental mental health in the aftermath of the pandemic.

1. Introduction

Public health measures aimed at controlling the spread of the SARS-CoV-2 virus have inadvertently had negative consequences on the mental health of parents globally (Racine et al., 2022; Schurer et al., 2023; Panda et al., 2021). During the period of lockdowns in Australia, which were among the longest running in the world (Schurer et al., 2023), many parents had to manage multiple work and family responsibilities, with limited access to usual support structures, such as social supports, healthcare and educational services, and outdoor spaces. During the first six months of the pandemic, rates of mental

distress among parents were high (Panda et al., 2021; Racine et al., 2022), with some studies reporting that up to 63 % and 74 % of parents experienced anxiety and depression symptoms, respectively (Hwang et al., 2023). However, differences in sampling and measurement between studies have led to inconsistent estimates of the prevalence of mental distress in parents. Furthermore, studies with data on mental health both before and during the pandemic are limited, with even fewer studies having examined mental health trends over an extended period of the pandemic.

The limited number of longitudinal studies that have examined parental mental health over the first two years since the pandemic

* Corresponding author at: SEEDLifespan Strategic Research Centre, School of Psychology, Faculty of Health, Deakin University, Burwood, Victoria 3125, Australia.
E-mail address: tanja.capic@deakin.edu.au (T. Capic).

identified a sharp increase in anxiety and depression, relative to pre-pandemic data (Kwong et al., 2021; Racine et al., 2021; Schurer et al., 2023). The Household Income and Labour Dynamics in Australia Survey found that these effects were stronger for mothers, persisting until the end of Victoria's longest lockdown (Schurer et al., 2023). Another study of Australian caregivers, spanning 2020 to 2023, found that the high rates of mental distress in parents were specific to the first half of the pandemic, improving in the later part of the pandemic (Price et al., 2024). However, this study did not compare parents' mental distress to the pre-pandemic period, limiting understanding of whether the reductions observed in the later years indicate a return to pre-pandemic levels, or whether levels remained elevated.

From a resilience-based perspective (Cummins and Wooden, 2014), it is also important to understand trends in other areas of mental health, such as subjective wellbeing. Subjective wellbeing is defined as a person's perceived satisfaction with their life (OECD, 2013), and whilst it is associated with indicators of mental distress, such as depression, anxiety, and stress, it captures positive dimensions of mental health, such as an individual's satisfaction with their social relationships and health (OECD, 2013). Importantly, people with normative levels of subjective wellbeing have been shown to have a lower risk of disease, injury and illness, better immune functioning, greater longevity, and lower incidence of psychological distress (Diener et al., 2017). Thus, the World Health Organization and other international organisations have recognised subjective wellbeing as an important indicator for monitoring public health in the community (World Health Organization, 2013; OECD, 2020).

Despite increasing recognition of the importance of subjective wellbeing, research on subjective wellbeing in parents during the pandemic is scant, with existing studies yielding inconsistent findings (Westrupp et al., 2021c; Heers and Lipps, 2022; Huebener et al., 2021; Hudde et al., 2023; Vicari et al., 2022). For example, a Swiss longitudinal study found no change in parents' life satisfaction from before to after the first COVID lockdown (Heers and Lipps, 2022), while an Australian study reported a substantial decline in subjective wellbeing after the first lockdown in 2020, compared to pre-pandemic (Westrupp et al., 2021c). Similarly, three longitudinal studies in Germany reported small declines in subjective wellbeing during the pandemic, (Huebener et al., 2021; Hudde et al., 2023; Vicari et al., 2022), specifically among mothers, with declines being most evident later in the pandemic (i.e. 2021) (Hudde et al., 2023). Whilst there are likely to be country specific differences, these data suggest that subjective wellbeing may have declined in some countries over the pandemic. However, most of the existing studies only examined subjective wellbeing in the first two years of the pandemic, with many lacking pre-pandemic comparison data, making it difficult to ascertain the potential long-term impact of the pandemic on parents' subjective wellbeing.

Drawing on data from a long-running annual population survey in Australia, we aimed to address the aforementioned limitations in knowledge on parents' mental health over an extended pandemic period. Specifically, we used data spanning the pre-pandemic period, across four pandemic years, to address two aims. These were (1) to examine differences in parents' mental distress and subjective wellbeing during the pandemic, compared to pre-pandemic (i.e., 2013); and (2) to examine patterns of parental mental distress and subjective wellbeing over the four years since the pandemic (i.e., 2020–2023).

2. Methods

2.1. Study design

We analysed five years of repeated cross-sectional survey data from the Australian Unity Wellbeing Index, comprising four surveys during the pandemic (2020–2023), and one pre-pandemic survey conducted in 2013. We used data from 2013, as this was the most recent pre-pandemic year with complete data on the mental distress and subjective wellbeing

outcomes of interest, with no evidence of systematic deviations from other pre-pandemic survey years on subjective wellbeing outcomes measured annually (see Supplementary Table 2). Data collection was ethically approved by the Deakin University Human Research Ethics Committee (Reference: HEAG-H 45_2016).

2.2. Participants

Each year, a geographically representative sample of 2000 Australian English-speaking adults was interviewed via telephone about their subjective wellbeing and mental distress. Participants were recruited through random-digit dialling of phone numbers with pre-defined location-specific prefixes, allowing the sample to align within 5 % of Australian Bureau of Statistics (ABS) benchmarks for metropolitan and non-metropolitan populations in each state. More details on the sampling frame and recruitment methodology can be found here: https://www.acqol.com.au/uploads/surveys/survey-041-technical_report.pdf.

We note that between 2001 and 2013, recruitment was conducted via landline numbers only, followed by a mixed sampling approach from 2014 to 2017 (80 % landline, 20 % mobile), and a mobile only sample from 2018 onwards. Sample composition over this period was largely unchanged, except for a modest decrease in average participant age, from 50.7 years to 47.5 years (Khor et al., 2020).

Parents were defined as adults aged 18 years and over who reported living with children in their household at the time of survey completion. Adults not living with children were excluded from the analytic sample. Informed oral consent was obtained from all participants at the time of recruitment.

2.3. Procedure

The first positive COVID-19 case in Australia was identified on 25 January 2020, and the first death on 2 March 2020. The first two surveys (2020: 17/4–19/5; 2021: 20/5–17/6) were conducted during the initial national lockdown (16/03–17/05), and the 4th Victorian statewide lockdown (27/5–11/6), respectively (Fig. 1). The 2022 survey (23/5–27/6) was conducted six months after the longest lockdown in New South Wales (25/6–11/10) and the second longest lockdown in Victoria (15/7–21/10), and three months after a substantial surge in infections. A second large wave of infections occurred in the following summer of 2022/2023, approximately five months before the 2023 survey (7/6–27/6).

2.4. Measures

2.4.1. Mental distress

Mental distress was measured using single-item indicators of depression, anxiety, and stress, measured at all timepoints (except for depression in 2020). Participants were asked: "How depressed/anxious/stressed do you generally feel?", with responses rated on a scale from zero ("not at all") to 10 ("extremely"). Data were analysed continuously to reflect self-reported levels of mental distress, rather than clinical levels of mental distress. These brief, single-item measures are often used in large-scale surveys to reduce participant burden, and have demonstrated predictive utility in identifying individuals experiencing mental health symptoms (Ahmad et al., 2014; Turon et al., 2019; Skoogh et al., 2010).

2.4.2. Subjective wellbeing

We measured subjective wellbeing in two ways. First, we employed a commonly used single-item measure of life satisfaction, for comparability to other datasets globally. This item asked participants: "How satisfied are you with your life as a whole?", which was rated from zero ("no satisfaction at all") to 10 ("completely satisfied").

Second, we used a more comprehensive measure of subjective wellbeing, the Personal Wellbeing Index (PWI) – a composite measure of

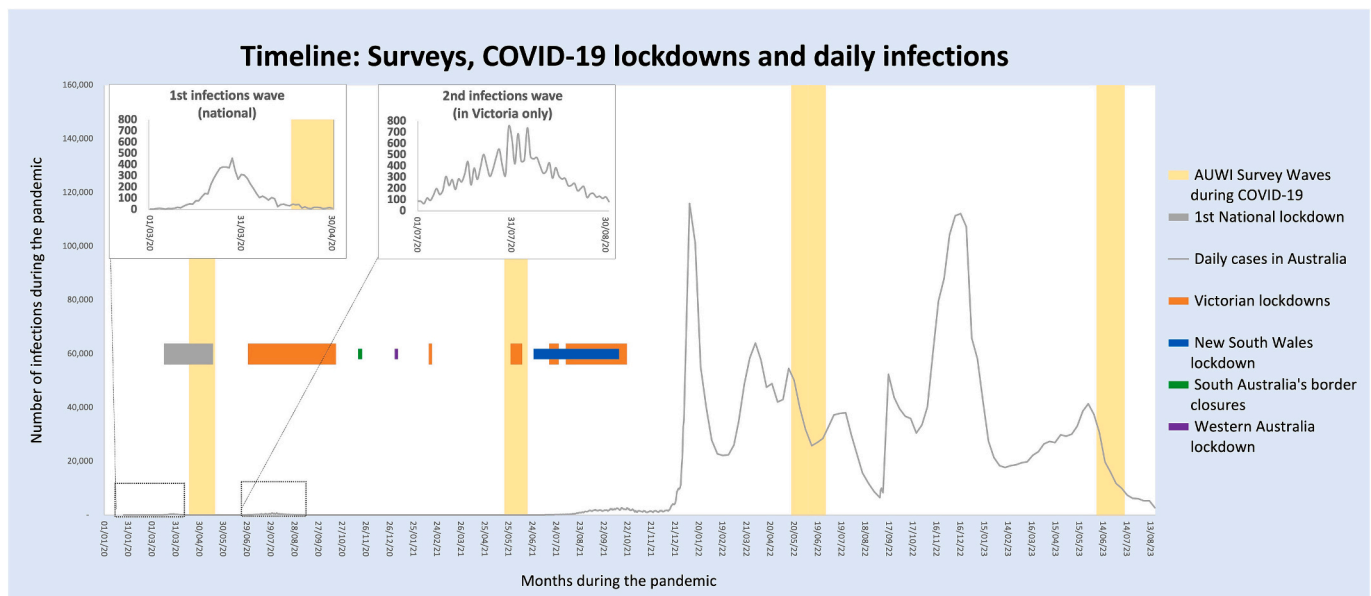


Fig. 1. Australian Unity Wellbeing Index (AUWI) surveys (vertical orange bars), lockdowns (horizontal multi-coloured bars) and daily COVID-19 cases in Australia (grey line).

seven life domains that together explain the majority of variance in life satisfaction (International Wellbeing Group, 2024). Domains assess satisfaction with Standard of Living, Health, Achieving in Life (or sense of purpose), Personal Relationships, Personal Safety, Community Connectedness and Future Security. Responses were rated on a scale from 0 (“no satisfaction at all”) to 10 (“completely satisfied”).

2.4.3. Demographic factors

Key demographic factors that have been associated with mental health in the literature (Whaley and Pfefferbaum, 2023; Westrup et al., 2021b) were used as covariates in our adjusted models. This included: age (<35, 36–45, 46–55, 56–65, 66+ years), gender, (male/female), household income (<\$30 k, \$30 k–\$60 k, \$61 k–\$100 k, \$101 k–\$150 k, \$151 k–\$250 k, >\$250 k), living with partner (yes/no), employment status (full-time employed, part-time or casually employed, not in labour force and unemployed) and state (Victoria, New South Wales, Queensland, Western Australia, South Australia and Other). The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) was used as a proxy measure for socio-economic status, collected as part of the 2021 Census of Population and Housing (Australian Bureau of Statistics, 2021) (Australian Bureau of Statistics, 2021). This measure has a national mean of 1000 (SD 100), where higher scores represent greater advantage.

2.5. Statistical analyses

Analyses were conducted in Stata (Version 15.1) and figures were produced in R Studio (Version 2023.12.1). Data cleaning and standardisation of all continuous measures to a percentage point scale (i.e., 0–100) were performed, as per the Personal Wellbeing Index (PWI) Manual (International Wellbeing Group, 2024). Missing data ranged from 0.6 % (gender) to 15.7 % (income). Multiple imputation by chained equations was conducted to address missingness. Specifically, 50 datasets were imputed, and all results were based on pooled estimates using Rubin’s rules (Rubin, 2004). Survey year was included in the multiple imputation model as an auxiliary variable to consider time specific patterns in the data and improve the accuracy of imputed values, ensuring that imputations reflected the distributional differences across waves. The impact of influential cases was tested in non-imputed data by comparing results using bootstrapped and non-bootstrapped estimates.

As only minor differences were observed, all cases were retained in the main analyses. Bonferroni correction was used to address the risk of type 1 error from multiple comparisons.

To test the two study aims, we conducted linear regression analyses for each outcome, to examine differences in mental distress (i.e., depression, anxiety, stress) and subjective wellbeing (i.e., life satisfaction, PWI composite and domains) across survey years (years: 2013–23). We estimated unadjusted and adjusted regression models, with adjusted models controlling for demographic factors (i.e., age, gender, partner status, employment status, socio-economic status, and state).

All primary results addressing the study aims were interpreted using adjusted models, with estimated means, standard deviations and 95 % confidence intervals from both unadjusted and adjusted models, presented in Supplementary Tables 3 and 4.

Multicollinearity among the factors included in the adjusted regression models (i.e., demographic factors and survey year) was assessed using variance inflation factors (VIFs) in the non-imputed dataset. The mean VIF was 1.87, and all individual VIFs were below 5, indicating no significant multicollinearity among the included variables.

As gender has been identified as a predictor of mental health in parents during the pandemic (Hudde et al., 2023; Schurer et al., 2023), we also conducted an additional series of analyses examining whether mental distress and subjective wellbeing outcomes differed as a function of parent gender, both over the pandemic period, and compared to pre-pandemic, by including interaction terms for gender in the adjusted regression models for each outcome (see Results - Supplementary Analyses).

Finally, to contextualise trends in subjective wellbeing among parents during the pandemic we reported annual means, 95 % confidence intervals, and established Australian norms for parents (International Wellbeing Group, 2024), for all subjective wellbeing outcomes across 31 annual surveys (2003–2023), presented in Supplementary Table 2.

3. Results

3.1. Descriptive statistics

Of 10,000 adults surveyed over the five waves, 3403 (34.6 %) were identified as parents (i.e., adults living with children) (Table 1). Parents in the surveys were similar to the Australian population of parents on

gender, age, partner status, age distribution, and state of residence. Parents were marginally more socio-economically advantaged (SEIFA mean: 1009.4–1020.2) compared to the national average (SEIFA mean: 1000). Likewise, more parents reported being in full-time employment (56.0 %–66.2 % vs. 49.2 %), with fewer parents in part-time roles (18.4 %–21.9 % vs. 24.6 %) or not in labour force (14.0 %–17.3 % vs. 23.5 %), compared to the national average.

Parents assessed during the pandemic were similar to parents pre-pandemic on gender, partner status, and socio-economic status. They were slightly younger (mean: 46.2 vs. 48.7 years) than pre-pandemic parents, likely due to changes in recruitment away from landlines to mobile phones from 2018 (Capic et al., 2024). A greater proportion of parents during the pandemic also reported incomes above \$100,000 (61.3–70.6 % vs. 49.5 %) and were in full-time employment (59.6–66.2 % vs. 56.0 %), compared to pre-pandemic.

3.2. Aim 1: Mental distress and subjective wellbeing during the pandemic compared to pre-pandemic

Average mental distress was higher in all pandemic years (Depression: 25.8–31.4 vs. 22.0; Anxiety: 39.2–47.2 vs. 29.7; Stress: 45.6–51.8 vs. 41.3), compared to pre-pandemic levels (Fig. 2).

Overall, the trend in subjective wellbeing was similar across the two measures of subjective wellbeing. Notably, average life satisfaction was lower in 2023 (74.6), compared to pre-pandemic (77.2). A similar but attenuated trend was observed on the PWI, where subjective wellbeing was marginally lower in 2023, compared to pre-pandemic (Fig. 3). On the PWI domains, average satisfaction with health was notably lower in 2022 (72.3) and 2023 (72.7), compared to pre-pandemic (75.8); while average satisfaction with personal safety was higher in 2021–2023

(2021: 85.2, 2022: 84.9, 2023: 84.5), compared to pre-pandemic (81.7).

3.3. Aim 2: Patterns of mental distress and subjective wellbeing through the pandemic

Average depression, anxiety and stress levels fluctuated during the pandemic (Fig. 2). Compared to 2021, average levels on all three indicators of mental distress were higher in 2022 (depression: 31.4 vs 25.8; anxiety: 47.2 vs 40.3; stress: 51.8 vs 45.6). Depression levels were also higher in 2023 (29.7), compared to 2021. Average stress levels in 2022 were also higher compared to all other pandemic years (2020: 46.5; 2023: 47.5). Anxiety fluctuated more, being higher in 2020 (46.3) and 2022, compared to 2021 and 2023 (39.2).

Average subjective wellbeing levels remained relatively stable over the early period of the pandemic, subsequently declining in 2022/2023 (Fig. 3). Specifically, compared to 2021 (77.8), average life satisfaction levels were lower in 2023 (74.6), falling below the normative range for parents, to the lowest point on record since 2001. Average PWI levels also declined in 2022 (75.4) and 2023 (75.3), compared to 2021 (77.2).

Differences were observed on three PWI domains: satisfaction with standard of living, future security, and health (Fig. 4). Specifically, parents' satisfaction with standard of living in 2020 (79.8) and 2021 (80.0), reached the highest levels in two decades (Supplementary Table 2), subsequently falling in 2023 (76.9). Similarly, satisfaction with future security peaked in 2021 (73.4), rising above the normative range for parents. This peak was followed by a substantial drop in 2022 (69.9) and 2023 (69.4). Finally, satisfaction with health in 2022 (72.3) fell below the 2020 level (75.2), and below the normal range for parents during 2021–2022, reaching its lowest point on record in two decades.

Table 1
Sample characteristics of parents at each timepoint.

	Pre-pandemic year (2013)	Pandemic year: 2020	Pandemic year: 2021	Pandemic year: 2022	Pandemic year: 2023	ABS 2021 Census Mean (SD) or %
Parents N (%)	662 (19.5 %)	718 (21.1 %)	692 (20.3 %)	669 (19.7 %)	662 (19.5)	NA
SEIFA-IRSAD, Mean (SD)	1018.1 (70.3)	1017.4 (75.1)	1018.9 (72.4)	1020.2 (73.8)	1009.4 (76.6)	1000.0 (100)
Age in years, Mean (SD)	48.7 (11.8)	46.5 (11.8)	45.8 (12.5)	46.1 (12.0)	46.5 (12.2)	45.9 (12.1)
Age groups (%)						
18–35 years	12.5	22.2	24.2	20.3	20.2	19.8
35–45 years	33.3	32.4	31.0	33.0	35.3	33.2
46–55 years	31.9	33	30.4	28.0	26.0	27.8
55–65 years	14.2	15.9	12.8	13.4	13.1	12.7
66+ years	8.2	5.5	6.0	5.1	6.2	6.6
Female (%)	50.6	52.3	54.7	49.5	56.2	55.4
Living with partner (%)	80.1	77.4	74.0	78.9	77.3	73.3
State (%)						
Tasmania	2.7	2.3	1.8	2.0	1.2	2.0
Victoria	24.3	26.4	31.3	27.9	25.2	26.6
New South Wales	36.3	35.2	30.7	30.5	30.2	31.3
Australian Capital Territory	2.1	2.0	3.2	2.0	1.8	2.3
Queensland	16.5	22.8	18.6	22.1	22.8	19.7
Northern Territory	1.1	1.1	1.8	0.5	1.1	0.8
Western Australia	10.0	11.0	10.4	10.0	11.0	10.6
South Australia	7.1	6.5	5.7	6.2	6.6	6.8
Household income (%)						
<\$30,000	11.1	7.2	7.3	5.1	6.4	NA
\$30,000–\$60,000	15.1	9.9	13.8	9.8	11.6	NA
\$61,000–\$100,000	24.3	21.3	17.6	14.6	17.0	NA
\$101,000–\$150,000	26.7	23.4	24.1	24.5	21.3	NA
\$151,000–\$250,000	17.4	28.7	25.1	27.6	30.5	NA
>\$251,000	5.4	9.5	12.1	18.5	13.2	NA
Employment status (%)						
Full-time employed	56.0	64.3	59.6	66.2	63.8	49.2
Part-time or casually employed ^a	19.3	19.9	21.9	18.4	19.5	24.6
Not in labour force	17.2	14.0	17.3	14.3	16.2	23.5

Note: Non-imputed and unadjusted data are used in this table; SD = standard deviation; N = number of observations; % = proportion in each demographic group; Socio-Economic Indexes of Areas-The Index of Relative Socio-Economic Advantage and Disadvantage (SEIFA-IRSAD) national mean 1000 (SD 100) - where higher scores represent less disadvantage; NA: data unavailable.

^a Australian Bureau of Statistics (ABS) 2021 Census data only included for part-time and not casual workforce.

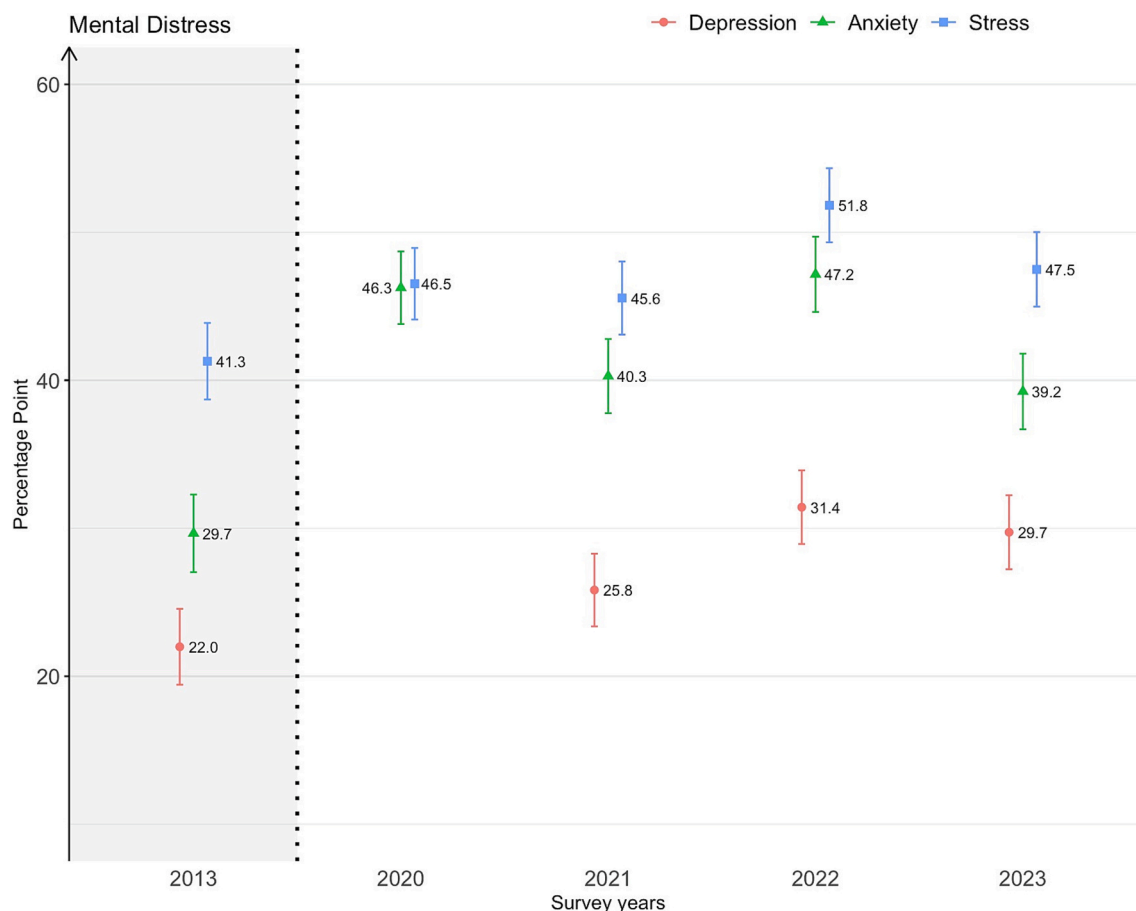


Fig. 2. Average Parents' Mental Distress (with 95 % Confidence Intervals) prior to pandemic and at each pandemic year.

3.4. Supplementary analyses

Models testing interactions between gender and survey year found no significant effects on most outcomes. However, significant interactions were found for anxiety ($F(4, 3352.8) = 5.43, p < .001$), stress ($F(4, 3352.3) = 3.19, p = .013$), and satisfaction with health ($F(4, 3352.3) = 2.91, p = .020$), indicating that the pattern of results over the pandemic on these outcomes differed as a function of parent gender. Specifically, mothers' anxiety and stress levels at each pandemic year were higher compared to pre-pandemic (anxiety: 43.9–48.2 vs. 28.6; stress: 50.9–52.6 vs. 42.3), with the exception of stress in 2021. Compared to pre-pandemic, fathers had higher anxiety levels in 2020–2022, and stress in 2022 (anxiety: 39.0–46.7 vs. 30.5; stress: 50.8 vs. 40.1). During the pandemic, mothers reported consistent levels on all outcomes, while fathers reported higher levels of stress in 2022 (50.8) compared to 2020 (41.7), and lower anxiety in 2023 (33.5) compared to 2020 (44.1) and 2022 (46.7). Gender comparisons within each survey year also showed that mothers reported higher anxiety levels in 2023 (43.9), and higher stress levels in both 2020 (50.9) and 2023 (51.3), compared to fathers (anxiety: 33.5; stress 41.7 and 43.1).

In terms of subjective wellbeing outcomes, mothers reported lower levels of satisfaction with health in 2023 (71.4) compared to pre-pandemic (77.5), while fathers' satisfaction with health remained unchanged. A similar pattern was observed for overall life satisfaction, with mothers reporting lower levels in 2023 (73.9) compared to pre-pandemic (78.7), however, the interaction effect for this outcome was not statistically significant. Full results of marginal means by gender and survey year for each outcome are presented in Supplementary Table 5.

4. Conclusions

Parents' mental distress levels were consistently higher in the four years since the COVID-19 pandemic was announced in Australia. Specifically, average anxiety and depression levels in 2022 were 59 % and 43 % higher than pre-pandemic, respectively, remaining 32 % and 35 % higher in 2023. High mental distress was also accompanied by lower levels of life satisfaction among parents in 2023, which fell to the lowest level ever recorded on our survey in the past 20 years (Frykberg et al., 2023). Our results suggest that the pandemic has had a chronic, adverse effect on parents' mental health in Australia.

It is notable that the elevated levels of mental distress reported among Australian parents in 2020 are consistent with global evidence of adverse mental health impacts during the early pandemic period (Racine et al., 2021; Pierce et al., 2020; Westrupp et al., 2021a), which was characterised by sudden disruptions in the everyday lives of billions of people around the world. For parents in many countries, the new norm involved prolonged periods of isolation, while juggling work and family responsibilities, with limited access to social and institutional supports. In some parts of Australia, these conditions persisted for nearly two years (Schurer et al., 2023), which was reflected in sustained elevated mental distress levels. Prolonged mental distress has been reported during the first 6–18 months in Australia (Westrupp et al., 2021b; Westrupp et al., 2021a) and New Zealand (Overall et al., 2022). One Australian study also reported declining rates of mental distress over the 2022/2023 period (Price et al., 2024). However, these changes were based on a cut-off indicating severe mental distress levels, and did not capture individuals experiencing more moderate, sub-clinical levels (Prochaska et al., 2012), which can also adversely impact people's functioning. Notably, when parents in this study retrospectively

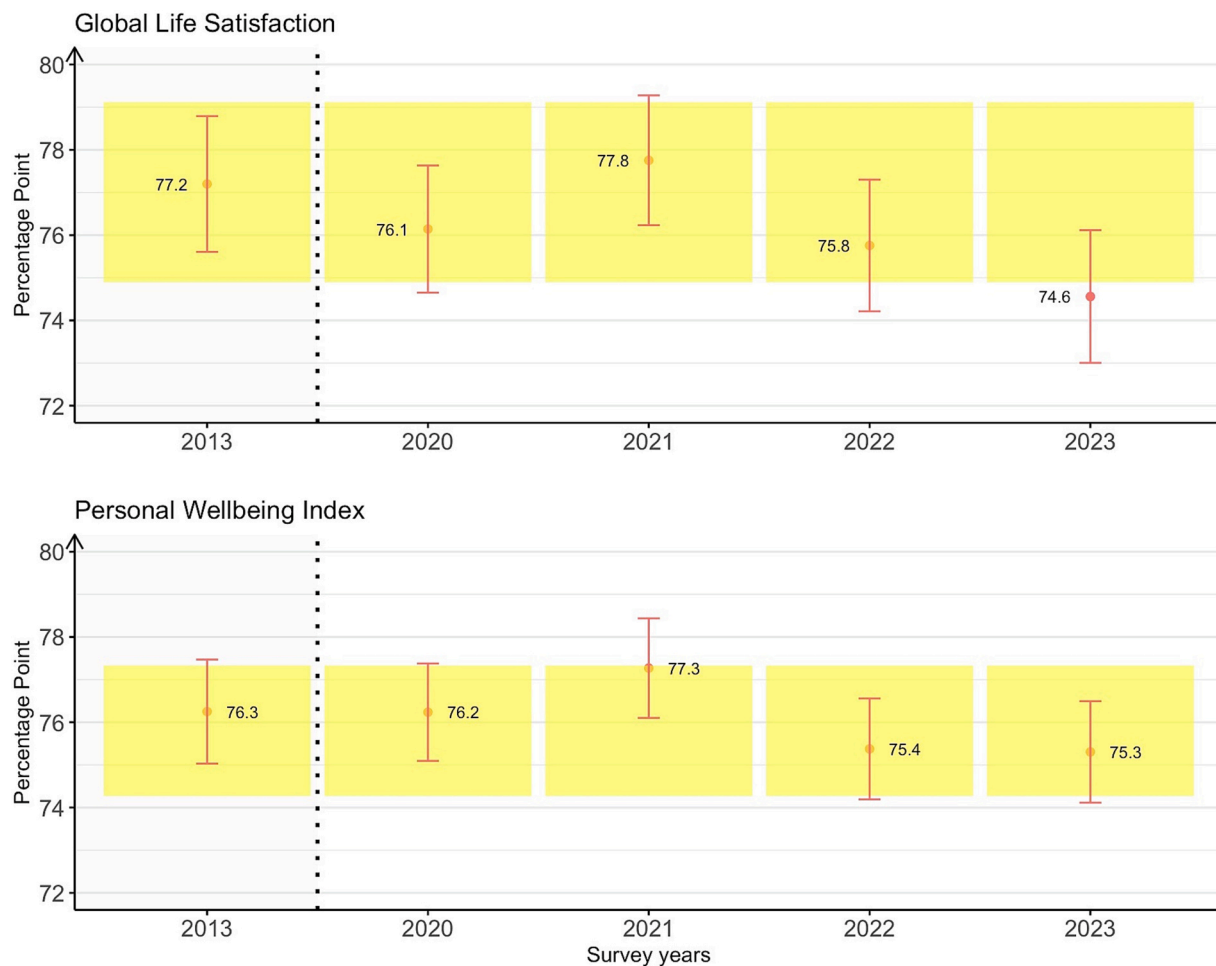


Fig. 3. Average Parents' Personal Wellbeing and Global Life Satisfaction (with 95 % Confidence Intervals) and normative ranges (yellow line) prior to pandemic and at each pandemic year. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

estimated changes in perceived mental health compared to pre-pandemic, findings were consistent, suggesting elevated rates of mental distress since the pandemic onset (Price et al., 2024).

Higher mental distress in 2020 compared to pre-pandemic, was followed by a brief period of respite in 2021, as virus transmission appeared to be under control and the government-supported financial safety nets remained available from April 2020 until March 2021 (Botha et al., 2022). Parents then experienced another peak in mental distress in 2022. Whilst this peak occurred six months after >80 % of Australians were immunised, and many social isolation restrictions had eased, it was a period of unprecedented infections and mortality rates in Australia, which may have increased feelings of uncertainty and fear surrounding health risks, and the future, for many families. Interestingly, in 2023, average anxiety and stress levels improved for fathers, but remained below pre-pandemic levels for mothers. This is consistent with global literature (Price et al., 2024; Whaley and Pfefferbaum, 2023; Schurer et al., 2023), pointing to greater mental strain experienced by mothers specifically. This may be due to challenges managing conflicting work and family roles (Racine et al., 2022), with some studies identifying higher levels of parental burnout among mothers (Johnson et al., 2022). Yet despite the improvements in anxiety and stress among fathers over this period, depression scores remained high for all parents in 2023. This poses a significant risk for parents, as depression is associated with a range of poorer health outcomes in both parents and their offspring (Moussavi et al., 2007; Le Bas et al., 2025; Rogers et al., 2020).

Our findings also show that four years into the pandemic, typically stable life satisfaction levels fell below the normative level for Australian

parents (see Supplementary Table 2). While international comparisons of subjective wellbeing are limited, evidence from the first two years of the pandemic in Germany similarly showed that, after an initial period of stability during the first lockdown, life satisfaction among mothers of young children declined in 2021 compared to 2020 (Hudde et al., 2023). These results support the 'accumulation hypothesis', which posits that repeated exposure to pandemic-related stressors gradually exhausted mothers' resilience, leading to a steady decline in life satisfaction over time. Such stressors likely included prolonged recurrent lockdowns (Hudde et al., 2023), periods of isolation (Schurer et al., 2023), increased housework and childcaring load, particularly for mothers (Del Boca et al., 2020), chronic mental distress (Price et al., 2024) and parent burnout (Johnson et al., 2022). In the Australian context, these challenges were likely exacerbated by broader pressures during this period, such as the rising cost of living, housing insecurity, global political unrest, and concerns about climate change. Although our results did not confirm a differential pattern in life satisfaction by gender, there was evidence of lower life satisfaction levels among mothers in 2023. Together, these findings lend further support for the 'accumulation hypothesis', beyond the first two years of the pandemic. Our findings also align with the Theory of Subjective Wellbeing Homeostasis, which posits that prolonged chronic distress can erode protective resources, leading to declines in typically stable levels of subjective wellbeing (Cummins and Wooden, 2014).

A more nuanced examination of the seven domains of the Personal Wellbeing Index revealed that in 2022/2023, parents reported lower satisfaction with health compared to any other year in the past two

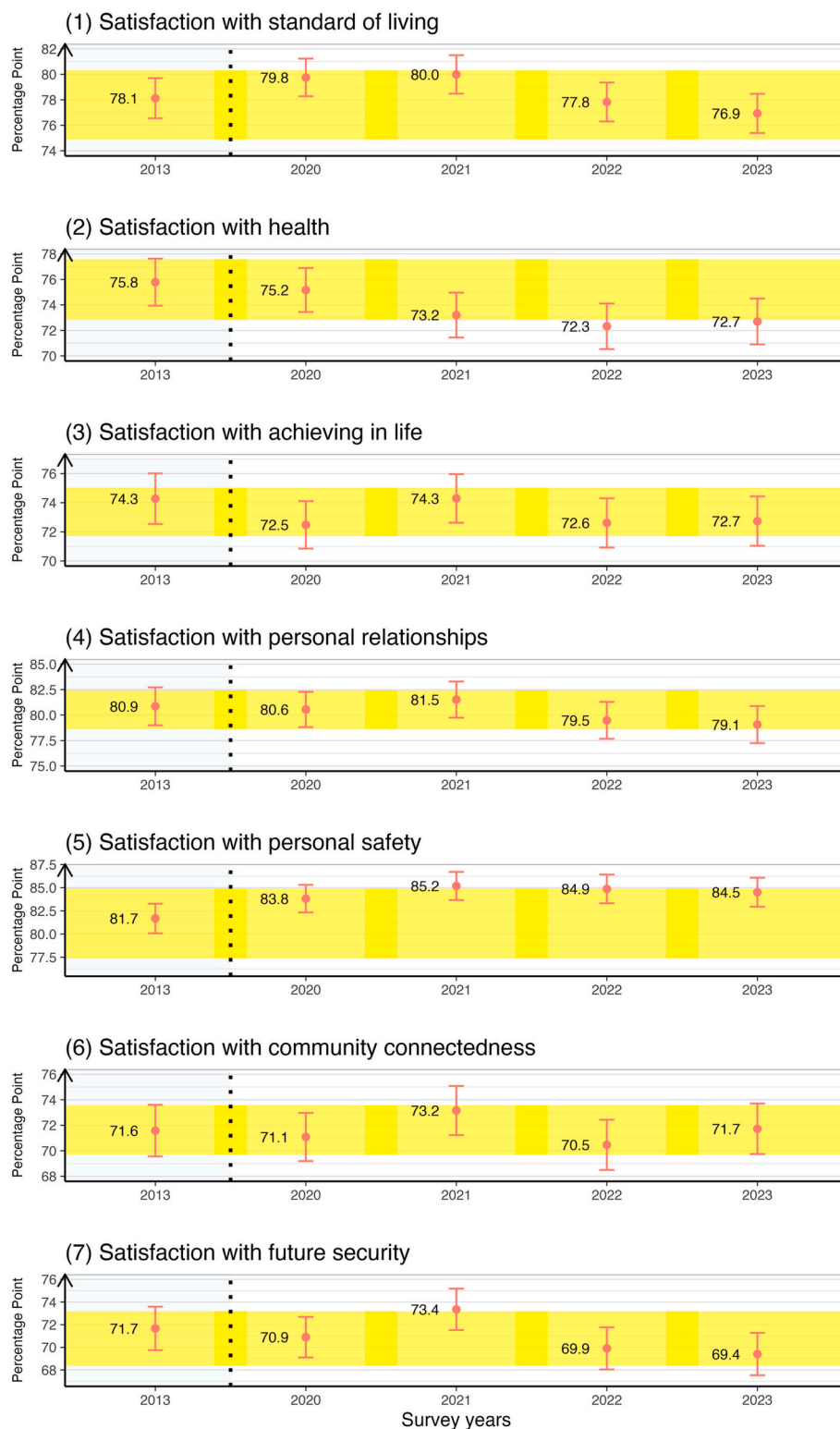


Fig. 4. Means and 95 % Confidence intervals for Personal Wellbeing Index domains during pre-pandemic (i.e. 2013) and pandemic (i.e. 2020–2023) periods compared to normative ranges for parents.

decades. This is suggestive of ongoing health concerns due to COVID-19 infections on overall health and wellbeing in families, and is consistent with the declines in mental health previously reported (Price et al., 2024). While both mothers and fathers reported lower levels of health satisfaction over time, the pattern appeared more pronounced and sustained for mothers. By 2023, mothers' health satisfaction was lower than

fathers', despite being higher pre-pandemic, suggesting a possible cumulative impact, and a slower post-pandemic recovery among mothers.

In contrast, during the pandemic (i.e., 2021–2023), parents reported feeling more satisfied with personal safety. Similar effects were reported in the Household Income and Labour Dynamics in Australia Survey during 2020/2021 (Schurer et al., 2023). This points to the likely

positive effect of transparent communication by the government regarding the public health interventions during the pandemic (Westrupp et al., 2021c). Despite this, feeling safe during the pandemic did not offset the decline in life satisfaction over multiple pandemic years. It is also notable that satisfaction with future security and standard of living declined in 2022 from their highest recorded levels in 2021, suggesting that government fiscal support, made available early in the pandemic, may have temporarily boosted wellbeing, while the removal of this support, at the peak of the ongoing health crisis, may have had negative consequences for families (Botha et al., 2022). This likely left parents under increased strain and apprehensive about their financial circumstances (Botha et al., 2022; Cummins and Wooden, 2014).

This study provides valuable insights on the mental health of Australian parents during the COVID-19 pandemic, with a number of notable strengths, including four waves of data during the pandemic, pre-pandemic comparison data, and robust sample representativeness across gender, age, partner status and state of residence in Australia. There are however some limitations to note. First, our data was cross-sectional, limiting the examination of within-person change over time and capacity for causal inferences. Second, we acknowledge that the pre-pandemic wave occurred seven years prior to the pandemic onset, which introduces the possibility that broader social, economic, or policy factors, unrelated to the pandemic, may have influenced mental distress and subjective wellbeing outcomes over time. We do however note: (1) that 2013 was the most recent pre-pandemic year with complete data on all mental health outcomes of interest in this study; and (2) that average subjective wellbeing levels in parents from 2013 to 2019 were relatively stable (see Supplementary Table 2), suggesting that 2013 was not anomalous to other pre-pandemic survey years. Third, a shift in recruitment mode from landline to mobile phone sampling (2014–2018) resulted in small demographic differences in the sample composition (e. g., marginally lower average age). Whilst we adjusted for these factors in our analyses, we cannot fully rule out the potential influence of residual mode-related confounding, such as unmeasured differences in respondent characteristics or response patterns, which may have affected estimates beyond the current adjustments. Fourth, parents were defined as adults (aged 18 years and over) living with children in the same household, which may have included a small proportion of adults who were not parents, but were living with children. Fifth, we note that whilst the single-item measures of mental distress may not have the psychometric rigor of multi-item measures such as the Patient Health Questionnaire (PHQ-9) or Depression, Anxiety and Stress Scale (DASS-21), they were used to reduce participant burden associated with longer questionnaires, and have been demonstrated to have acceptable predictive utility in detecting mental health symptoms (Ahmad et al., 2014; Turon et al., 2019; Skoogh et al., 2010). Finally, depression was not measured in 2020, limiting the comparability across all four pandemic years.

Whilst these findings should be interpreted in light of the aforementioned limitations, they nevertheless highlight important public health priorities, particularly the need to address the sustained mental health impacts observed in parents during the post-pandemic period. Given the persistently elevated levels of mental distress we identified, coupled with a notable drop in life satisfaction, our results support several policy directions. First, governments should expand access to affordable, flexible mental health services tailored to parents, with targeted initiatives to support maternal mental health and prevent burnout. Preventative, family-centred mental health services, such as parent support programs targeting parenting stress and family mental health, online evidence based therapeutic interventions, and guided self-help services, could be made available through telehealth and digital delivery platforms, to ensure access to care and reduce the risk of overburdening the healthcare system in periods of significant crisis. The protective role of financial security further underscores the need to strengthen income support and financial relief payments to support

families experiencing economic hardship during public health emergencies. Finally, ongoing investment in mental health surveillance is critical to monitoring mental health and wellbeing over time, enabling timely, data-informed responses to safeguard family health and resilience in future national and global crises.

CRediT authorship contribution statement

Tanja Capic: Conceptualization, Methodology, Access to data and verification, Formal analysis, Writing - original draft, Writing - review and editing. **George Youssef:** Conceptualization, Methodology, Formal analysis, Supervision, Writing - original draft, Writing - review and editing. **Kate Lycett:** Conceptualization, Funding acquisition, Methodology, Writing - original draft, Writing - review and editing. **Matthew Fuller-Tyszkiewicz:** Funding acquisition, Writing - review and editing. **Sarah Khor:** Writing - review and editing. **Georgie Frykberg:** Funding acquisition, Access to data and verification, Writing - review and editing. **Mallery Crowe:** Access to data and verification. **Samantha Teague:** Supervision. **Craig Olsson:** Funding acquisition, Supervision, Writing - review and editing. **Robert Cummins:** Funding acquisition, Supervision, Writing - review and editing. **Delyse Hutchinson:** Conceptualization, Funding acquisition, Methodology, Supervision, Writing - original draft, Writing - review and editing.

Ethics approval

Ethics approval was granted for the data collection by the Deakin University Human Research Ethics Committee (Reference: HEAG-H 45 2016). Informed oral consent was obtained from all participants at the time of recruitment.

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Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jad.2025.120088>.

Data availability

Anonymised, de-identified data from the Australian Unity Wellbeing Index surveys used and/or analysed in the current study are publicly available on the Australian Centre on Quality of Life website.

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