

BMJ Open Ethnicity matters in perceived impacts and information sources of COVID-19 among mothers with young children in Australia: a cross-sectional study

Li Ming Wen ,^{1,2,3,4,5} Huilan Xu,² Danielle Jawad,² Limin Buchanan,^{1,2,3,5} Chris Rissel,¹ Philayrath Phongsavan,^{1,4} Louise A Baur,^{1,4,5,6} Sarah Taki^{1,2,3,5}

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For numbered affiliations see end of article.

Correspondence to

Professor Li Ming Wen;
Liming.Wen@health.nsw.gov.au

ABSTRACT

Objectives This study aimed to investigate perceived impacts, ways of communication with professionals and information sources related to COVID-19, and explore whether these impacts or information sources were associated with ethnicity that is, language spoken at home.

Design A cross-sectional study.

Setting Sydney, Australia during the period from March to October 2020.

Participants Mothers of young children participating in an existing trial.

Outcome measures Mothers were asked to respond to a set of survey questions related to COVID-19 via telephone. The questions included a mental health scale, and how they communicated with health professionals and their information sources related to COVID-19 during the COVID-19 pandemic.

Results Of 537 mothers who completed the survey (81% response rate), 45% reported they spoke a language other than English at home. Overall, 136 (26%) reported experiencing mental distress. 234 (44%) reported that COVID-19 affected the way they receive and communicate health-related information with health professionals, especially for those from non-English speaking backgrounds with an adjusted odds ratio (AOR) 1.58 (95% CI 1.10 to 2.27). They were less likely to use a face-to-face service (AOR 0.55, 95% CI 0.37 to 0.80) and more likely to use social media (AOR 2.11, 95% CI 1.40 to 3.17) for health-related information. Regarding sources of COVID-19-related information, mothers from non-English-speaking backgrounds were more likely to rely on family members (AOR 1.49, 95% CI 1.01 to 2.19) and social media (AOR 3.34, 95% CI 2.05 to 5.43).

Conclusions COVID-19 has significantly impacted mothers with young children in regard to their mental health, means of communication with health professionals and sources of health information. Mothers from non-English-speaking communities were less likely to use a face-to-face service, and more likely to seek information from family members and social media. Appropriate health support for non-English-speaking community needs to take these factors into account.

Trial registration number ANZCTR:12618001571268. they

Strengths and limitations of this study

- This is the first study to report on the role of ethnicity in perceived impacts and information sources of COVID-19 among mothers with young children in Australia.
- The study highlights the importance of taking ethnicity into account in providing appropriate health support for mothers with young child from various backgrounds during the COVID-19 pandemic.
- The study could be limited by potential sample selection bias as a result of survey participants from an existing trial.
- Further qualitative research is required to understand why there were differences in sources used for information on COVID-19 and healthy lifestyle behaviours.

INTRODUCTION

The COVID-19 pandemic has had profound effects on communities globally.¹ Since February 2021, this SARS-CoV-2 has engulfed the world with approximately 105 million confirmed cases and 2.2 million deaths.¹ In Australia, by January 2021, over 28 000 confirmed cases and 908 deaths have been reported.² As a result, containment measures have included closure of or limited access to government and private offices, schools, shops, parks and non-essential workplaces.³ This has directly and indirectly impacted people's daily activities, social events, food availability, dietary quality, sleep cycle, screen time, employment, access to recreational locations and financial security.⁴⁻⁸

Recent studies have identified multiple aspects of life that have been influenced by the pandemic. For instance, a study of Canadian families with young children found that COVID-19 restrictions adversely affected daily routines, with reduced physical activity and increased screen time as well as an overall

increased consumption of food and snacks.⁹ Such changes, triggered by stress eating, working from home, online home schooling and limited access to outdoor play areas, are likely to lead to lower quality of life which in turn may lead to long lasting health problems.^{5 10} In addition to the impact on health behaviours, COVID-19 restrictions also present unique stressors that have placed a burden on mental health.^{11–15} In examining the impacts of social restrictions and distancing measures, a recent meta-analysis of 19 studies with 93 569 participants reported a higher prevalence of stress (8.1%–81.9%), psychological distress (34.43%–38%), depression (14.6%–48.3%), anxiety (6.33%–50.9%) and post-traumatic stress disorder (7%–53.8%) during the pandemic when compared with previously estimated 1-year prevalence rates prior to the pandemic.¹¹ That review highlighted that more adverse psychological symptoms were exhibited among women, people under 40 years and those with existing mental health illnesses, unemployment and students.¹¹

Despite the rapid escalation and repercussions of the COVID-19 pandemic across all populations, it has disproportionately affected disadvantaged and culturally and linguistically diverse (CALD) communities. According to recent provisional analyses, COVID-19-related death is significantly higher among CALD communities than those of white ethnicity.^{16 17} This finding indicates that the influence of COVID-19 on CALD communities can potentially exacerbate health inequalities in already vulnerable populations.¹⁸ The higher death rates from COVID-19 among CALD populations may be partly due to factors such as lower education, difficulty finding up to date information from trustworthy sources, lack of accessibility of translated materials and language barriers to access health services.^{19–21}

Further, within Australia, CALD communities have lower levels of health literacy.²² It is therefore possible that these previously mentioned factors may influence the quality of health information CALD communities receive about COVID-19 and their ability to respond appropriately. An Australian study also showed that people with inadequate health literacy and those who spoke a language other than English at home, struggled to find and understand information on COVID-19 from government sources compared with those with adequate health literacy and who spoke English at home.²³ In contrast, a recent study highlighted government websites as one of the most used and trusted sources of COVID-19-related information among people of white ethnicity.²⁴ Moreover, the trust and choice of selected sources of information are influenced by several demographic factors such as ethnicity, age, religion, education and political affiliation.^{24 25}

To date, there has been limited research examining the role of ethnicity related to the impacts of COVID-19 and accessing health information. The aims of this study were to investigate perceived impacts, means of communication with professionals and information sources related to COVID-19 among mothers with young children; and

further explore whether these impacts or information sources were associated with ethnicity.

METHODS

Study design

We conducted a cross-sectional survey of mothers with young children participating in an existing study²⁶ in Sydney, Australia from March to October 2020. The mothers had participated in a longitudinal study since 2017, and the study protocol was published prior to the commencement of this trial.²⁶ The recruitment process and first year outcomes of the original trial have been reported elsewhere.^{27 28} Briefly, the trial aimed to investigate effectiveness of an early childhood obesity prevention using telephone support or text messages. This current study was part of the 3-year follow-up survey.

Patient and public involvement

The survey participants were originally recruited to a longitudinal study^{27 28} from antenatal clinics in eight hospitals of four local health districts in Sydney. For this current study the development of the research questions and outcome measures was partially informed by the intervention nurses through their telephone support consultations with the study participants as part of the original trial.²⁸ The study participants played no role in the design of this study, but their informed consent was sought. Not participating in this current study had no effect on their participation in the original study. The summary results of this study will be disseminated to all the participants through mailouts or the website. The study participants and project team members are acknowledged in the acknowledgements section.

Inclusion and exclusion criteria

For the original study, women were eligible to participate if they were aged 16 years and over, able to communicate in English, had a mobile phone and lived in the recruitment areas of a local hospital. Women were excluded from the study if they had a severe medical condition or known major fetal anomalies based on medical advice.

Survey respondents and data collection

A total of 662 mothers remained in the existing trial when their children reached 3 years. The survey was conducted by a marketing survey company using computer-assisted telephone interviewing.

Perceived COVID-19 impacts

We measured the impacts that COVID-19 has had on families from four aspects including (1) changes in eating, physical activity and screen time behaviours, (2) mental health, (3) participating in research and (4) whether the pandemic influenced their ways of receiving health-related information. The mothers were asked to respond to five statements on whether their family: (1) ate more snacks, fruit and vegetables, (2) had more screen time, (3) had more physical activity and (4) were

more likely to follow mealtime or bedtime routines during the COVID-19 pandemic. We used a 5-level Likert scale, 'Strongly disagree', 'Disagree', 'Neither agree nor disagree', 'Agree' and 'Strongly agree'. The responses to each of the statements were further dichotomised into 'having more' if they 'Strongly agree' or 'Agree' to the statement, or 'no changes' (see online supplemental document about questionnaire and coding frame).

The Patient Health Questionnaire-4 (PHQ-4) was used to assess mothers' mental health.²⁹ The mothers were asked how often they were bothered by the following over the last 2 weeks: (1) nervous and anxious, (2) worrying, (3) depressed or hopeless, (4) little interest or pleasure in doing things. Mothers responded to each of the questions on a 4-point scale, '0' for 'Not at all' to '3' for 'Nearly every day'. The PHQ-4 total score ranges from 0 to 12, with categories of psychological distress being normal (0–2), mild (3–5), moderate (6–8) and severe (9–12). It was further dichotomised into 'psychological distress' (mild to severe) and 'none'. Mothers were also asked how often they worried about family members and close friends on a 4-point scale. Responses were dichotomised into 'worrying about family' (for several days to nearly every day), or 'no worry' (online supplemental document).

Assessing the impact COVID-19 had on their research participation, mothers were asked whether COVID-19 negatively affected their desire to participate in research. Mothers responded to the question on a 5-level Likert scale, 'Not at all', 'A little bit', 'Moderately', 'Quite a bit' and 'Extremely'. We also dichotomised the responses into 'Affecting research participation' (Moderately to Extremely) and 'No affect' (Not at all or A little bit). The mothers were asked whether the COVID-19 pandemic affected the way they receive and communicate health-related information with health professionals. They were also asked how likely they would use the following modes to receive and communicate health-related information with health professionals: face to face, telephone, short message service, videoconference, website, social media and booklets or pamphlets. Mothers responded to each of the modes on a 5-level Likert scale, 'Unlikely', 'Possibly', 'Likely', 'Almost certain' and 'Certain'. The responses were categorised into 'Yes' and 'No', with 'Yes' referring to 'Likely', 'Almost certain' or 'Certain'.

Sources of health information for changing behaviours during COVID-19 pandemic

We asked about sources of health information related to three areas specific to COVID-19: (1) COVID-19-related information, (2) changing food and beverage behaviour and (3) changing physical activity from government officials, health professionals, family members, social media or educators respectively. The question allowed multiple responses (see online supplemental document).

Mothers' demographics

Mothers' demographic information, including their language spoken at home, was collected at baseline using

standard questions from the New South Wales (NSW) Adult Population Health Survey.³⁰ All mothers' demographic and socioeconomic information were categorised into groups.

Statistical analysis

Statistical analyses were carried out using Stata V.13 (StataCorp). All p values are two sided and statistical significance was set at the 5% level. Descriptive analysis was conducted to describe mothers' baseline demographic characteristics for those who completed 3-year survey. Pearson's χ^2 tests were conducted to examine the associations between mothers' demographic characteristics and COVID-19 impact and sources of health information during COVID-19 pandemic. Number and percentage were reported.

Multiple logistic regression models were built to investigate the associations between mothers' language spoken at home and COVID-19 impact and sources of health information during COVID-19 pandemic. To identify potential confounding factors, mothers' demographic variables that were significant in Pearson's χ^2 tests with $p < 0.25$ were entered in the multiple logistic regression models. The least significant variables were progressively dropped until only those with $p < 0.05$ remained. Variables dropped from the model were then entered into the model individually to assess confounding. Since the survey respondents were involved in an intervention trial, their group allocation was also adjusted in the final model. Adjusted ORs (AORs) with 95% CIs were then calculated as a measure of the association.

RESULTS

Of 662 mothers remaining in the follow-up study, 537 completed the COVID-19 survey questions with a response rate of 81%. **Table 1** shows demographic characteristics of the survey respondents with 45% of the mothers speaking a language other than English at home.

Table 2 shows that the impacts on mental health were observed across the survey respondents, with 26% reporting psychological distress (including 18% with mild symptoms of mental distress, 6% moderate symptoms and 2% severe mental distress) and 59% worrying about their family. There was no significant difference in psychological distress between mothers from English-speaking or non-English-speaking backgrounds. Substantial proportions of mothers reported having more snacks (46%) and no increase in fruit and vegetable consumption (55%), in particular among English-speaking mothers. Overall, 77% of the mothers reported having more screen time while 60% reported no increase in physical activity, with no significant differences found between English-speaking and non-English-speaking mothers. Significantly higher proportions of English-speaking mothers reported impacts of the COVID-19 restrictions on their mealtime (71%) or bedtime (76%) routines.

Table 1 Demographics of the survey respondents in Sydney, Australia, March and October 2020

Mothers' demographics	3-year survey
	Completed n (%)
Age (years)	
<30	143 (27)
≥30	394 (73)
Country of birth	
Australia	211 (39)
Overseas	326 (61)
Language spoken at home	
English	296 (55)
Other	241 (45)
Annual household income	
<AUS\$80 000	316 (64)
≥AUS\$80 000	175 (45)
Employment status	
Employed	365 (68)
Other	172 (32)
Marital status	
Married/de-facto partner	508 (95)
Other	28 (5)
Education level	
University	381 (71)
Up to HSC/TAFE	155 (29)
First time mother	
Yes	303 (56)
No	234 (44)

HSC, High School Certificate; TAFE, Technical and Further Education.

Table 2 also shows 44% reported that COVID-19 affected the way they receive and communicate health-related information with health professionals, especially those who spoke a language other than English, with an AOR (AOR 1.58, 95% CI 1.10 to 2.27). They were less likely to use a face-to-face service (AOR 0.55, 95% CI 0.37 to 0.80) and more likely to use social media (AOR 2.11, 95% CI 1.40 to 3.17) for health-related information.

Table 3 shows the sources of COVID-19-related information and information for changes in food and beverage consumption and physical activity behaviours during the COVID-19 pandemic. For the COVID-19-related information almost all of mothers (97%) relied on government officials, followed by health professionals (77%), family members (67%), educators (52%) and social media (26%). However, mothers who spoke a language other than English were more likely to rely on family members (AOR 1.49, 95% CI 1.01 to 2.19) and social media (AOR 3.34, 95% CI 2.05 to 5.43).

Less than half of the survey respondents (48%) reported accessing sources of information for changing physical activity from government officials and 27% reported accessing such information from health professionals (table 3). However, non-English-speaking mothers were more likely to rely on government officials (AOR 2.23, 95% CI 1.49 to 3.32) or health professionals (AOR 3.58, 95% CI 2.34 to 5.50) compared with English-speaking mothers. Regarding information for changing food and beverages only, about 20% reported accessing information from government officials or health professionals. Non-English-speaking mothers were more likely to rely on government officials (AOR 6.68, 95% CI 3.56 to 12.55) or health professionals (AOR 5.26, 95% CI 3.11 to 8.89), compared with English-speaking mothers.

DISCUSSION

This cross-sectional survey conducted with mothers during the pandemic found that one in four reported having psychological distress, with more than half of the respondents being worried about their family regardless of ethnicity. The COVID-19 pandemic resulted in more snack consumption and more screen time. It also affected the way mothers receive and communicate health-related information with health professionals, especially those who spoke a language other than English. Non-English-speaking mothers were less likely to use a face-to-face service and more likely to use family and social media for health-related information. The survey also found that the majority of mothers relied on government officials and health professionals for COVID-19-related information regardless of ethnicity.

Impact of COVID-19 on mental health

On average, general mental distress among mothers with young child was moderate. Most reported feeling normal (74%), or having a mild (18%) degree of mental distress. Similar patterns were found among English-speaking and non-English-speaking mothers. The mental health status of our survey respondents appeared to be better than that of respondents of a survey that examined mental health status of the general Australian population during the pandemic with responses from 5158 Australian adults.³¹ A possible explanation could be due to the difference in data collection period. That study collected data from 1 April 2020 to 4 April 2020 while lockdown restrictions were occurring in Australia.³² Our survey collected data from March till October 2020 which covered periods from lockdown to easing of restrictions in Australia. The varying results also could be explained by the different tools used for assessing mental health and the age range and gender of our study participants.

Our findings are complementary to a previous study conducted in Germany, which showed similar psychological effects of the pandemic using the same PHQ4 tool. Analysis of the survey data collected from (27 March–6 April) reported that the majority (78.3%) of respondents

Table 2 Perceived impacts of COVID on mothers and associations with mothers' language spoken at home

Covid-19 impacts	Total n (%)	Language spoken at home		P value	Other vs English AOR (95% CI)
		English n (%)	Other n (%)		
Perceived behavioural changes					
Having more snacks	244 (46)	154 (52)	90 (38)	0.001	0.52 (0.36 to 0.75)
No increase in fruit and vegetable consumption	293 (55)	200 (68)	93 (39)	<0.0001	0.31 (0.21 to 0.45)
Having more screen time	412 (77)	235 (80)	177 (74)	0.107	0.71 (0.46 to 1.08)
No increase in physical activity	319 (60)	174 (59)	145 (61)	0.728	1.07 (0.75 to 1.55)
Did not follow mealtime routine	304 (57)	210 (71)	94 (39)	<0.0001	0.27 (0.18 to 0.39)
Did not follow bedtime routine	347 (65)	224 (76)	123 (51)	<0.0001	0.34 (0.23 to 0.49)
Mental health					
Psychological distress	136 (26)	72 (24)	64 (27)	0.547	1.03 (0.68 to 1.55)
Worry about their family	321 (59)	164 (56)	148 (62)	0.152	1.27 (0.88 to 1.82)
Participating research	91 (18)	26 (9)	65 (28)	<0.0001	2.20 (1.25 to 3.88)*
The way of receiving health info	234 (44)	115 (39)	119 (50)	0.014	1.58 (1.10 to 2.27)
The way of communicating with health professionals (multiple responses allowed)					
Face to face	344 (65)	207 (71)	137 (57)	0.001	0.55 (0.37 to 0.80)
Telephone	406 (76)	237 (81)	169 (71)	0.006	0.70 (0.44 to 1.11)*
SMS	274 (52)	152 (52)	122 (51)	0.849	0.94 (0.66 to 1.35)
Video conference	313 (59)	200 (68)	113 (47)	<0.0001	0.45 (0.31 to 0.66)
Website	277 (52)	158 (54)	119 (50)	0.342	0.79 (0.55 to 1.13)
Social media	146 (27)	58 (20)	88 (37)	<0.0001	2.11 (1.40 to 3.17)
Booklets	288 (43)	131 (45)	97 (41)	0.322	0.82 (0.57 to 1.19)

All models were adjusted for intervention allocations and employment status.

*Adjusted for intervention allocations, employment status and annual household income.

AOR, adjusted OR; SMS, short message service.

were concerned of the health consequences for their relatives. The average depressive and anxiety PHQ4 score was mild among participants, similar to our study. Additionally, the study highlighted that women had a significantly higher PHQ-4 score than men, highlighting the susceptibility of women to mental illness.³³

Despite the low prevalence of mothers reporting mental distress in our current study, it is intuitive that COVID-19 pandemic restrictions would increase mental distress as evidenced by previous literature on the negative influences of public health crises on mental health.^{11–15} More than half of our study participants reported worrying about their family members. While government efforts to manage and eradicate COVID-19 continue, our society will also need to continue maintaining physical distancing, some social isolation and dealing with disruptions to life. Thus, it is imperative to intervene to protect communities, in particular those in high-risk groups such as women with young children,³¹ and other vulnerable communities such as non-English-speaking people, where a greater effort to communicate well is needed. Specifically, research needs to focus on better understanding, from a cultural lens, the cultural

differences to help CALD communities deal with the changing contexts related to COVID-19, and how they see the role of governments and health professionals to help CALD communities interact with health systems (health literacy).²³ Addressing this will increase the effectiveness of the COVID-19 response such as testing, following physical isolation restrictions and the uptake of vaccinations to effectively and successfully manage subsequent waves of the pandemic.

Sources used for health information

Our study findings echo some previous studies in which it was also found that vulnerable populations are less likely to use face-to-face services and more likely to turn to other sources for health information such as religious leaders or family members and community leaders who may be important in many cultures.^{22–24} Social media is an additional platform that has been used substantially by many people including CALD communities for health-related information.²¹ Using social media from non-medical or non-government sources may be of concern, given the proliferation of readily available misinformation obtained via unreliable and unverified online social

Table 3 Sources of COVID-19-related information and health information for changing food and beverage and physical activity behaviours during the Covid-19 pandemic and their associations with mothers' language spoken at home

	Total n (%)	Language spoken at home		P value	Other vs English AOR (95% CI)
		English n (%)	Other n (%)		
Sources of COVID-19-related information					
Government officials	517 (97)	288 (98)	229 (96)	0.149	0.74 (0.25 to 2.21)
Health professionals	410 (77)	229 (78)	181 (76)	0.556	0.87 (0.57 to 1.33)
Family members	355 (67)	182 (62)	173 (72)	0.011	1.49 (1.01 to 2.19)
Social media	136 (26)	35 (12)	101 (42)	<0.0001	3.34 (2.05 to 5.43)*
Educators	278 (52)	141 (48)	137 (57)	0.031	1.31 (0.91 to 1.88)
Sources of health information for changing food and beverage behaviour					
Government officials	95 (18)	15 (5)	80 (34)	<0.0001	6.68 (3.56 to 12.55)*
Health professionals	99 (19)	23 (8)	76 (32)	<0.0001	5.26 (3.11 to 8.89)
Family members	102 (19)	18 (6)	84 (35)	<0.0001	8.19 (4.65 to 14.43)
Social media	47 (9)	6 (2)	41 (17)	<0.0001	5.46 (2.13 to 14.04)*
Educators	71 (13)	14 (5)	57 (24)	<0.0001	4.01 (2.05 to 7.86)*
Sources of health information for changing physical activity					
Government officials	258 (48)	114 (39)	144 (60)	<0.0001	2.23 (1.49 to 3.32)*
Health professionals	145 (27)	48 (16)	97 (41)	<0.0001	3.58 (2.34 to 5.50)†
Family members	134 (25)	45 (15)	89 (37)	<0.0001	3.13 (2.03 to 4.81)
Social media	60 (11)	12 (4)	48 (20)	<0.0001	5.73 (2.91 to 11.31)
Educators	96 (18)	30 (10)	66 (28)	<0.0001	3.15 (1.93 to 5.16)

All models were adjusted for intervention allocations and employment status.

*Adjusted for intervention allocations, employment status and annual household income.

†Adjusted for interventions allocations, employment status and marital status.

AOR, adjusted OR.

applications.^{34 35} Recent evidence showed that two-thirds (66%) of individuals encountered misinformation about COVID-19 on social media,³⁶ an additional one-third (36%) mentioned obtaining false information from news media coverage.³⁶ For instance, in the USA, misleading claims of a national lockdown fuelled panic buying of paper products and groceries resulting in food insecurity among vulnerable populations giving rise to mass hysteria and panic.³⁷ While social media is highly used by populations of various backgrounds and can be a beneficial platform to share information, there is a need to improve social media literacy skills. More research needs to be conducted to identify relevant approaches to support CALD communities and improve navigating through credible information on digital or social media platforms.

Adverse psychosomatic outcomes are expected to increase especially among CALD communities due to social isolation, access barriers to health services, discrimination and racism, limited support networks, low English proficiency and poor digital literacy.³⁸ These circumstances can potentially exacerbate existing health inequities for these vulnerable groups, thus perpetuating suboptimal health-seeking behaviours and poor engagement with healthcare professionals and the broader health system. As identified in our study, there

is a cultural tendency to seek information from families, religious leaders and media, which highlights the importance of mitigating harm from digital 'infodemics' and tailoring messages to community values.³⁸ There is a clear case for government agencies to take a leadership role in communicating with CALD communities using culturally appropriate methods, in particular to increase the uptake of COVID-19 vaccinations. In addition, a cross-sectional survey of Pennsylvania adults found that COVID-19 knowledge correlates with using trusted news sources (ie, government health websites). The study called for the use of government health websites, as well as monitoring and correcting misinformation presented by other sources (eg, Facebook) in order to maximise information dissemination and compliance with COVID-19-related public health recommendations.³⁹

This study found that during the pandemic, the majority of people obtained COVID-19-related information from government officials and health professionals, but a much smaller proportion of mothers obtained health information for changing health behaviours from these sources. This does not necessarily mean that mothers did not receive diet and physical activity information or advice from government officials or health professionals. Rather, it may indicate that changing lifestyle

behaviours was considered to be a low priority during the pandemic compared with navigating the various responses to COVID-19. Another reason might be that the majority of the population in Australia are less likely to have ever lived through a pandemic, and therefore, there is a sense of unfamiliarity in how to respond and react. Thus, the government played a major role in the response including constant changes in social restriction laws requiring the population to follow information from government officials.

Despite this, good nutrition and regular physical activity contribute to improving immunity. As such, WHO released guidelines on diet during the COVID-19 pandemic stating that 'good nutrition is crucial for health, particularly in times when the immune system might need to fight back'.⁴⁰ However, there are currently very few culturally-appropriate programmes and resources that promote healthy eating and physical activity targeted at children aged under 5 years.⁴¹ Government and various health agencies will need to continue developing culturally appropriate resources and health-related behavioural change support material to mitigate the likelihood of long-term impacts of COVID-19 on chronic disease status.

Strength and limitations

Our survey is timely and specific to the impacts of COVID-19 during the pandemic. Mental health outcomes were measured with the PHQ-4 which is a psychometrically valid instrument and has been demonstrated as a valid screening tool in general populations.²⁹ With regard to the limitations, our cross-sectional survey design hindered causal inference. The survey questions for perceived behaviour change, and information sources as impacted by COVID-19 were newly developed for the current study given that no validated instruments were available at the time we initiated this study. Additionally, our collection period ranged from March to October 2020 and within this period, Australia experienced a range of COVID-19 restrictions, from full lockdown to eased restrictions, to having varying levels of restrictions in place and in different states.³² We acknowledge that respondents' behavioural data only represent their state on the date they completed the survey with limited generalisability. Further qualitative research is required to understand why there were differences in sources used for information on COVID-19 and healthy lifestyle behaviours.

CONCLUSION

The response to COVID-19 has impacted on mothers with young children in regard to their mental health, means of communicating with health professionals and sources of health information. Mothers from CALD communities were less likely to use a face-to-face service, and more likely to seek information from family members and social media. Appropriate health support for CALD community needs to take these factors into account.

Author affiliations

¹Sydney School of Public Health, The University of Sydney, Sydney, New South Wales, Australia

²Population Health Research & Evaluation Hub, Sydney Local Health District, Camperdown, New South Wales, Australia

³Sydney Institute for Women, Children and Their Families, Sydney Local Health District, Sydney, New South Wales, Australia

⁴Charles Perkins Centre, The University of Sydney, Sydney, New South Wales, Australia

⁵NHMRC Centre of Research Excellence in the Early Prevention of Obesity in Childhood (EPOCH), The University of Sydney, Sydney, New South Wales, Australia

⁶The Children's Hospital at Westmead Clinical School, The University of Sydney, Sydney, New South Wales, Australia

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ORCID iD

Li Ming Wen <http://orcid.org/0000-0003-1381-4022>

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