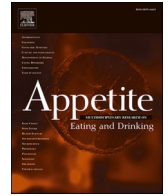




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COVID-19 & culinary behaviours of Australian household food gatekeepers: A qualitative study

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ABSTRACT

The COVID-19 pandemic and associated lockdowns had a significant impact on Australian food supply, with potential implications for food purchasing, preparation and consumption behaviours. Therefore, we explored Australian primary food gatekeepers' perceptions and responses towards their culinary behaviours during COVID-19 pandemic and associated lockdowns. We conducted online semi-structured interviews with 25 Australian primary food gatekeepers. Interviews were audio-recorded, transcribed verbatim and analysed using inductive thematic analysis. We found that the majority of food gatekeepers during the lockdown reported increased home cooking and experimentation in the kitchen, enhanced their food literacy such as cooking skills and confidence, meal planning and purchasing skills, and increased consumption of family meals. However, they also reported less positive outcomes such as increases in snacking and alcohol intake, baking less healthy foods and overall increases in food intake. There is a need to develop comprehensive nutritional programs for Australian primary food gatekeepers to increase their food literacy and confidence in food preparation and cooking. Future research could explore if these newly adopted behaviours positively impact primary food gatekeepers' dietary behaviours and if these behaviours sustain over time.

1. Introduction

Many countries around the world imposed strict regulatory measures to control the spread of COVID-19 virus. With the outbreak of this virus in Australia, since March 2020 each state government imposed various public health measures to stop the spread including travel restrictions, closure and or limited functioning of non-essential business activities, social distancing rules and lockdowns and associated curfews (Department of Health, 2020). These measures have had significant impacts on people lives including their culinary behaviours (Baker, Farrokhnia, Meyer, Pagel, & Yannelis, 2020; Bracale & Vaccaro, 2020; Cohen, 2020; Phillipou et al., 2020b).

Food planning and shopping are two aspects of culinary behaviour that could have been influenced by these regulatory measures. Along with them, food shortages and fear of being infected have been reported to reduce the frequency of shopping trips and increase the use of online food delivery services in other countries (Bracale & Vaccaro, 2020; Laguna, Fiszman, Puerta, Chaya, & Tárrega, 2020). In Australia, food

shortages and long queues associated with panic buying were reported in retail food establishments with the announcement of restrictive measures (Maiden, 2020; Prentice, Chen, & Stantic, 2020). Moreover, state governments imposed different limitations over dining premises capacities in food service establishments. For example, in Victoria these services were only allowed to offer take-away food or delivery services (Victorian Department of Health and Human Services, 2020). It is likely that Australians have adopted various coping strategies to deal with these changes in the foodscape. COVID-19 restrictions appear to have caused havoc in many businesses leading to job cuts and reductions in working hours for many workers. Many people relied on their savings or government support schemes (Kent et al., 2020a). The resulting financial scarcities may have led people to change their food habits in terms of reliance on cheaper meals and food products and reductions in the quantity and quality of food being consumed (Kent et al., 2020a).

With these changes, food preparation skills and cooking became more important and the dynamics of home cooking and eating appears to have changed during this period (i.e. more family meals, more time

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for cooking and trying new recipes) (Bracale & Vaccaro, 2020; Di Renzo, Gualtieri, Pivari, et al., 2020; Evans, 2020). This is also evidenced by people posting pictures of home cooking on social media (e.g. Instagram using #covidcooking) (MICHELIN, 2021; Torres-Romay & Garcia-Miron, 2020, pp. 77–88). Before the pandemic, out of home food (i.e. fast food, take away food) and ready-to-eat/ready-to-heat, pre-cooked meals had a significant place on Australians' diet (Future Food, 2019; Rangan, Schindeler, Hector, Gill, & Webb, 2009; Savige, Ball, Worsley, & Crawford, 2007) and cooking skills had been declining (Burns, Jackson, Gibbons, & Stoney, 2002; Machado et al., 2019). Thus, the pandemic with its associated restrictions on people's lifestyles may have created an opportunity to reinvigorate home cooking and experimentation with food.

Food appears to have been used as a key way of connecting with others during pandemic associated lockdown periods; examples include sharing cooking responsibilities among family members, greater enjoyment of family mealtimes, celebration of special events through home-made food, experimenting with new recipes, and posting success and failures on social media for others to try (Aureus, 2020; Evans, 2020; Wilson, 2020). Moreover, the stress associated with social isolation led people to make homemade treats such as different desserts, sweets and savoury snacks as comfort food (Bracale & Vaccaro, 2020; Di Renzo, Gualtieri, Pivari, et al., 2020). It is important to explore how Australians used food to connect with others and to comfort themselves under the social and physical restrictions associated with this pandemic.

Prolonged restrictions of people's living conditions and associated economic turmoil in supply chains may have long-term effects on people's behaviour including their dietary patterns. Therefore, there is a need to explore food planning and preparation behaviours in order to develop strategies to ensure the health and safety of people during and beyond the pandemic. Household food gatekeepers are the individuals who hold the main responsibility for household food-related activities including meal planning, shopping, and preparation (Burton, Reid, Worsley, & Mavondo, 2017; Reid, Worsley, & Mavondo, 2015). In a pandemic situation like this, the household food gatekeepers' roles have become more important than ever as they undergo many challenges in sourcing and supplying food for themselves and their family. Moreover, food gatekeepers faced additional challenges during the pandemic due to increased responsibilities associated with 'learning from home' (children undertaking online studies from home) and 'working from home' (gatekeepers and partners engage in work using online platforms at their home). Since mid-2020, Australian researchers had started to explore the influence of pandemic on people's lifestyle, food security, dietary patterns, mental wellbeing, etc (Fisher et al., 2020; Kent et al., 2020b; Phillipou et al., 2020a). However, according to the best of authors' knowledge, no studies have employed a qualitative research approach to explore detailed aspects of food gatekeepers' food-related practices and experiences during pandemic associated lockdown periods. Thus, this study aimed to explore Australian household food gatekeepers' perceptions and responses towards their culinary behaviours during the COVID-19 pandemic and associated lockdowns. The study provides detailed insights into Australian household food gatekeepers' perceptions of the challenges and opportunities they faced in planning and cooking food during this unprecedented period. This study will shed light on their responses and mitigation strategies in meeting their daily food needs.

2. Methods

The social constructivism was used as a theoretical framework to inform the present qualitative inquiry (Denzin & Lincoln, 2008; Sandelowski, 2000). It serves as a useful framework for this qualitative study to reveal insights on how people interact with the world through sharing social experiences and how these experiences and knowledge are socially and culturally constructed. This interpretive paradigm allowed the investigators to explore the primary food gatekeepers'

experiences regarding culinary behaviours during COVID-19 pandemic (Creswell, 2014). These viewpoints are typically underpinned by the community in which the respondents live and are cultivated through their experiences and interactions with the community members (Creswell, 2014). Semi-structured interviews were used as a data collection method to collect information on food planning, purchasing, and preparation behaviours during the COVID-19 lockdown in Australia. Ethical approval was granted by Medicine and Health Sciences Subcommittee of Macquarie University (Project ID: 6692; Reference No. 52020669215870) for this study in May 2020.

Australian primary household food gatekeepers formed the study sample. Family food gatekeepers were chosen as potential informants for this inquiry because they are the ones who typically make food purchasing and preparation decisions in the households (Burton et al., 2017; Wijayaratne, Reid, Westberg, Worsley, & Mavondo, 2018). The gatekeepers were invited to take part in the inquiry through placing advertisements on social media (e.g. Facebook, Instagram, Twitter) and through personal networks. The primary food gatekeepers interested in taking part in the semi-structured interviews expressed their interest to the investigators (RR & JN) via email or phone. Subsequently, an informed consent form, which provided a broad description of the proposed study, was sent to all participants via email. The participants were asked to return signed consent forms if they agreed to participate in this research and indicate their preferred time and day for the interview. In addition, prior to the interview, the participants were instructed to take three photographs of their dinner which they either prepared or purchased. These photographs were used to facilitate discussion.

All semi-structured interviews were conducted by two researchers (RR & JN) via using digital platform Zoom between June and October 2020. The lockdown in Australia was relatively short in comparison to other countries, therefore two interviewers were conducting the interviews to make sure they were available for the interviewees at all times. At the beginning of each interview, the interviewees were notified that the interactions would be recorded and that all information would be treated as confidential (King, 2004a). They were further informed that their participation was voluntary and they were free to withdraw from the study at any time prior to data analysis. Two interviewers met on a regular basis to discuss the collected data and determine data saturation (Liamputtong & Ezzy, 2009; Patton, 1990). Data saturation was reached at the 20th interview where no new subthemes/themes emerged as we analysed our data concurrently with data collection. Nevertheless, five more interviews were conducted to confirm data saturation. The interviewees did not receive any incentive payment for their participation. The online interview sessions lasted between 14 and 43 min.

Based on the research aim and a review of the culinary behaviour literature, a series of open-ended questions were developed to form the interview guide (see Table 1). Each participant was asked these key questions and some probing questions that arose from each interview. In

Table 1
Open-ended questions posed to the interviewees.

- | |
|--|
| Q1. Could you tell me more about your three dinner meals (Photographs of the three dinner meals were shared by the primary food gatekeepers prior to the interviews)?
Was it prepared by you? What were the factors which impact your meal choices? |
| Q2. Could you tell me about your social eating dynamics before and during lockdown? |
| Q3. Could you tell me about your food planning behaviour before and during lockdown? |
| Q4. Could you tell me about your cooking experience before & during lockdown? |
| Q5. From which sources do you usually obtain food on a daily basis (before and during lockdown)? |
| Q6. Where did you look for information or get inspiration what to cook/prepare meals before and during lockdown? |
| Q7. Could you tell me if you experienced any food availability/accessibility issues during the lockdown? |
| Q8. Could you tell me about your intentions of cooking after the lockdown? |
| Q9. Is there anything else would you like to add? |

addition, some basic socio-demographic questions (i.e. age, employment status, type of occupation, ethnicity) were asked.

Data analyses were carried out concurrently with the online interviews to maintain a balance between the two processes (Sandelowski, 2000). All audio recordings were transcribed verbatim through a digital transcription service via Zoom (Zoom Video Communications Inc., 2016) and checked for accuracy by two interviewers to ensure uniformity (Riessman, 2002). Minor modifications were made to ensure the accuracy of the transcripts. Transcripts were returned to the interviewees for their feedback and/or further information. However, none of the interviewees provided any extra information. Manual coding was employed to execute thematic analysis. The transcribed data were subjected to thematic analysis by the Template Analysis technique (King, 2004b). This technique involves the development of a coding template which is a representation of the themes as defined by the researchers. Three investigators (RR, JN & NR) designed the template on the basis of a subset of data (20% of transcripts), which was further revised, refined and applied to the full data set. Then, one investigator (NR) coded the rest of transcripts. In order to ensure the trustworthiness of the coding, all investigators reviewed the codes and templates for each interview on a regular basis. In case of difference in opinions, modifications were made in the template until a consensus was reached (Creswell, 2014). Finally, all investigators were involved in drawing the subthemes and themes from the coded templates. A comprehensive analysis of the transcribed data characterising the main themes and direct narratives from the participants is presented in the Results section.

3. Results

3.1. Socio-demographic characteristics of the sample

Twenty-five gatekeepers participated in the online interviews; 84% were females and 84% had attained a university degree. Three-fifths of the sample (N = 15; 60%) were aged between 31 and 40 years and around two-fifths of the interviewees were of Caucasian origin (N = 11; 44%). Except for one gatekeeper, all the other gatekeepers were employed prior to the pandemic restrictions and four of them reported loss of their jobs during the pandemic. Nearly three quarters of the households did not have children (N = 18; 72%). The socio-demographic characteristics of the gatekeepers are presented in Table 2.

3.2. Themes and sub-themes

Four major themes were identified through analyses of the 25

Table 2
Socio-demographic characteristics of the primary food gatekeepers.

Socio-demographic items		N = 25 (%)
Gender	Male	4 (16)
	Female	21 (84)
Age	21–30 years	8 (32)
	31–40 years	15 (60)
	41–50 years	2 (8)
		2 (8)
Ethnicity	Caucasian	11 (44)
	South Asian	12 (48)
	East Asian	2 (8)
Education	High school/Diploma	4 (16)
	Bachelors	5 (20)
	Masters	12 (48)
	Doctorate	4 (16)
Employment status before lockdown	Yes	24 (96)
	No	1 (4)
Employment status during lockdown	Yes	20 (80)
	No	5 (20)
Children <16 years living in the household	0	18 (72)
	1–2	5 (20)
	≥3	2 (8)

interviews associated with food preparation behaviours, meal planning and food shopping behaviours, dietary behaviour, and social eating dynamics: i) Transformation in culinary behaviours; ii) Changes in food purchasing and meal planning behaviours; iii) Modified dietary choices and behaviours; and iv) Novel social eating norms. These themes and sub-themes are described below and illustrative quotations are presented in Table 3.

3.2.1. Theme 1 – Transformation in culinary behaviours

3.2.1.1. Increased home cooking. Sixteen gatekeepers (64%) reported that cooking at home increased substantially during the pandemic restrictions compared to pre-pandemic times. These augmented cooking episodes were attributed mainly to increased time availability as most of the gatekeepers and their family members were confined to their homes during the lockdown. Half of the gatekeepers stated that they prepared traditional time-consuming dishes during the pandemic as they reported having more time available.

“[...] So, I had time during lockdown to cook food like a slow roasted meat or some legumes or like, you know, grains, and stuff like that, which takes a bit longer time to cook like barley, you know.” P21

3.2.1.2. Increased experimentation in the kitchen. The majority of participants said that the pandemic restriction on social movements offered them an exciting opportunity to carry out culinary experiments at home. These experiments varied from baking bread, cakes, and cookies to trying to cook different cuisines such as Thai and Chinese and making jams, jellies, and pickles. In addition, three participants reported that they increased their confidence in cooking and food preparation skills during the pandemic restrictions.

“I’ve definitely been a lot more adventurous in my cooking. Normally it would be the same things that I just cook all the time, but I feel like that’s changed. I feel like I am more open to try new things.” P8

Some participants said that, besides enhancing cooking confidence, these culinary experiments helped them in broadening their recipe repertoire. This enriched recipe repertoire was informed by multiple sources including recipe books, Facebook, Instagram, YouTube, Google, television, and mother’s recipe repertoire.

“Usually I follow this blogger on Instagram and most of the recipes I just learnt from my Mom ... I have a recipe book. And if there’s anything new. I just like look it up through YouTube or something. And just to let you know, change it according to my taste.” P25

3.2.1.3. Cooking responsibilities. The majority of participants reported no major changes in cooking responsibilities during the pandemic compared to pre-pandemic times. Nearly all participants from Caucasian households indicated that cooking duties were often shared between partners and during the pandemic two Caucasian gatekeepers also involved their children in meal preparation. However, nearly all participants from Asian households indicated that females/wives were predominantly responsible for all food-related activities.

“... I pretty much do all the cooking. If he’s (husband) home, he will just look after kids while I do the cooking.” P17

Nevertheless, three gatekeepers out of 14 Asian origin gatekeepers stated that their male partners would help them in some kitchen chores like cutting and chopping of fruits and vegetables and food purchasing.

“... so, my partner would help me with meal preparation by cutting and chopping ...” P22

Table 3

Themes associated with culinary and dietary behaviours during the COVID-19 pandemic and associated lockdowns.

Theme and subthemes	Illustrative quotes
Transformation in culinary behaviours	
Increased home cooking	<p>“Yeah, because you have more time now because you’re working from home, you’re not tired of traveling. Um, so you just have more time to prepare your dinner” P7</p> <p>“I think we cook more definitely and ...” P6</p> <p>“[...] So, a lot of more greens, because have time to cook all the Sri Lankan things. Because it consumes time, I had more chance to cook all these kind of traditional Sri Lankan dishes.” P3</p>
Increased experimentation in the kitchen	<p>“Yeah, because I think I baked after like 10 years because I never do that. So that’s something like something very new, I did because of the lockdown ...” P4</p> <p>“I do enjoy and what I like is homemade sort of pickles and jams ... And with the lockdown, it gave you a little bit more time at home ... I am making sourdough at the moment ... I’ve made my own sauerkraut, the other day ...” P5</p> <p>“I think for more than 3 years I haven’t baked sourdough bread. So, it came up pretty good ... I made a sweet-meat called ‘Kiriya’ It’s a Sri Lankan sweet-meat something really hard to get right ... And made Kung Pao chicken, like few Chinese dishes ...” P15</p> <p>“It is a great opportunity for me to learn cooking skills, because I’m not good in cooking” P9</p> <p>“[...] I’ll think, okay, I want a recipe for sourdough bread. And so, I’ll just Google that or look on tastes.com.au. I do have lots of recipe books. I’ve got recipe books from my grandmother ...” P5</p>
Cooking responsibilities	<p>“Yeah, I mean my daughter is really into making cookies. And so, we did make more cookies than we normally would. Just because you know she was a bit bored and needed an activity. So, yeah we would bake ...” P5</p> <p>“The second one, which was the fish. I did it with my partner.” P1</p> <p>“... we cook together. I will cook a dessert and [Partner’s name] will cook dinner.” P8</p> <p>“Oh, typically one person cooks and one cleans up. He is more of a cleaning person. But as I got pregnant (during COVID), he did more cooking ...” P6</p> <p>“Yes, I do all the cooking at my place, very rarely my husband cooks.” P3</p>
Changes in food purchasing and meal planning behaviours	
Reduced visits to shopping centres and restaurants	<p>“Well, I tried to reduce shopping trips during lockdown ... Just to be sure like to reduce the risk of getting any disease [COVID-19]” P21</p> <p>“Yeah, I think the main change is how many times we go to the supermarket. Now we go only once a week or every 10 days maybe.” P2</p> <p>“[...] That had the announcement in Coles. They had the announcement on, you know, wash your hand, sanitizer. Don’t touch anything. They took away baskets. They took away trolleys ... Oh yeah, absolutely reduced going shopping ...” P11</p> <p>“[...] we used to go to a restaurant at least once a fortnight, but this has all stopped since the COVID.” P3</p> <p>“Ever since the stage 4 lockdown, we did not shop by ourselves, we usually do the online ordering and we get the food delivered ... We are ordering the food, the groceries. So yes, it was the stage four lockdown, we didn’t go out for groceries.” P19</p> <p>“Maybe not. No, no, I haven’t used any delivery services before the lockdown. I found out that they [supermarket such as Coles, Woolworths] can deliver in lockdown. So now I use delivery services.” P14</p>
Increased purchasing of takeaways	<p>“I ate more takeaways during lockdown because it’s like a reward for getting through the hard week, you don’t get to see your friends, you don’t have</p>

Table 3 (continued)

Theme and subthemes	Illustrative quotes
Unavailability of staple foods	<p>anything to look forward to ... Oh, I’m so excited. I get to pick the place, and I’m going to take pizza on Friday and like in lockdown it became my form of entertainment” P1</p> <p>“I would say we have ordered less during the COVID and basically because of money ...” P11</p> <p>“I think we would almost always go out to eat, but because of the lockdown, restaurants were closed so had to rely on takeaways and delivery apps solely and yeah that’s a massive change. Yeah.” P12</p> <p>“Yeah, there was some time. I remember that I went to the supermarket. There was no pasta left and no more flour, egg. So yeah, it was pretty annoying” P21</p> <p>“Yeah, I think during like the peak time, [early phase of lockdown], we actually didn’t get much of fresh veggies, because we couldn’t find them ...” P4</p> <p>“In terms of animal sources, we prefer to have chicken over other meat items, but most of the time when we were ordering, the chicken was not available for purchasing ...” P19</p> <p>“So, I just replan on what to eat or replace it, find a substitution for it. You can instead of pasta use couscous, which was left on the shelf, it is pretty much the same as pasta, but it seems people don’t know that” P21</p>
Hoarding of food items	<p>“I was doing some bulk shopping during COVID ... It was panic buying I would accept!” P13</p>
Changes in shopping venue	<p>“So, normally when we go shopping, we would go to Aldi because that’s a bit cheaper than Coles and Woolworths ... I remember there was like maybe one or two weeks when it was really hard to get milk ... So, there was no milk in Aldi and then we had to buy it from Woolworths ...” P12</p> <p>“Now [Starting of Stage 4 lockdown in Melbourne] we can’t go to Clayton [8-10 kms from participant’s home] because we cannot go anywhere ... I will visit the small Asian store first ...” P16</p> <p>“[...] because we wanted to support the small businesses around us ...” P6</p>
Improvement in meal planning skills	<p>“[...] we make sure that there is everything in the list (food shopping) that is bought at once, we don’t want to keep going in between ... again, I’m saving more time ... I think at this point of time we started to buy things that is only needed. Something that is not needed was not bought ...” P18</p>
Modified dietary choices and behaviours	
Quality of meals	<p>“I cook. I tried to cook healthy. So, always have some greens in the dish. Some carbs and proteins. And then some fruits ...” P22</p> <p>“So, basically, pre-lockdown I used to work. I was working in the café. I pretty much used to grab something while working. Pretty much like for 5 days a week I don’t cook at home. Even for dinner at least I will bring something from there [café] like burger ... Whenever we were hungry, we just go to a kebab shop and had HSP [Halal Snack Pack]. HSP was a big thing in the meal. I tried all the Chinese takeout. I used to eat out a lot. I have a lot of spare time now ... so, that’s why I decided to cook these ...” P15</p>
Rise in snacking episodes	<p>“Yeah, I think, I think it was boredom. So I am at home and I’m trying to work with my computer. I’m like, oh, I know its like I could just go have an apple...” P1</p> <p>“If I don’t feel that good or stressed, it turns to make comfort food. After COVID, my consumption of comfort food or discretionary food increased” P14</p> <p>“I’m working from home all the time. So, I’m just like, I want that chocolate. I want that chips, whatever it is. There were so many moments where I just went, I don’t care anymore. So, I think I was less strict on myself ...” P1</p> <p>“[...] but the other thing I think also changed as well is I’ve been drinking a lot more alcohol. It’s the end of the day, you want to have wine” P1</p>

(continued on next page)

Table 3 (continued)

Theme and subthemes	Illustrative quotes
Increased intake of food	<p>“I am not worried about snacking, because I snack on a celery stick.” P13</p> <p>[...] About food intake. Yes, definitely increased, this snacking and in general food intake increased.” P21</p> <p>[...] I am the fattest ever in my life at the moment ... After COVID because I baked a lot ... Also lack of exercise, you know. So, I put lots of weight on. I think it is an outcome of the COVID, if there was no COVID, I wouldn't put weight on, and it is because I think I started to bake ...” P13</p>
Factors affecting meal choices	<p>“So, every day we usually have rice and we usually have a protein source and also vegetables.” P16</p> <p>“Okay, to be honest, what happened was I had lots of stress during that period. So, it was about convenience.” P13</p> <p>[...] secondly, it should be nutritious.” P13</p> <p>[...] and then some fruits. So, I would usually have fruits five days of the week ...” P22</p> <p>[...] I get veggies from the garden ... It was like the things we are growing in the garden. Basically, so it's all greens. The choices are pretty easy, because we don't want to get it from outside because of the fear of COVID ... Yeah, it's a big garden. So, we have like mustard leaves, herbs, eggplant, guava, and jackfruit.” P9</p> <p>[...] the main driving factor is convenience. So, we usually go for dinners which doesn't take much time to prepare ... Simple, convenient, but still nutritious ...” P19</p> <p>“Well the biggest factor is easy. It has to be easy. Pumpkin soup, it's quite easy the way I prepare it. And I tried to make it every now and then.” P20</p> <p>Oh, it's all been like to do a variety ...” P3</p> <p>“So, a lot of time, I have to factor in the fact that my kids probably you know won't eat this spicy food. So, I have to think about something else for them as well ...” P17</p> <p>“I think sometimes also it depends on the weather, whether you want something warm or cold ...” P2</p> <p>“It's mainly the weather and hence the last couple of dinners were something warm. Also, something in bulk (preparing in large quantities) so saving on money so we can use it again ...” P11</p> <p>[...] Also, my husband has gout as well. So, he had to sort of avoid certain foods like seafood or beef so that also we factored into our decision as well ...” P12</p> <p>“And then if my husband wants to eat something. So, his preference is another criteria ... also sometimes I just want to have some comfort food ...” P14</p>
Novel social eating norms	
Increase in family meals	<p>“So, now we [gatekeeper and her partner] eat breakfast and lunch together, which we never did before, never, ever ... and we have dinner now every night together. Whereas in the past, if he [partner] was late from work, we used to eat separately.” P6</p>
Lack of social outings induced disappointment	<p>“So basically, before the lockdown I would eat lunch and dinner out. It was like a chance to catch up with friends ... So now, I mean, there's no more socializing. When this lockdown ends, I want to try different food, different restaurants. So, catch up with friends. That will make me to dine out.” P15</p>

3.2.2. Theme 2 – Changes in food purchasing and meal planning behaviours

3.2.2.1. Reduced visits to shopping centres and restaurants. All the food gatekeepers claimed that they reduced the number of supermarket visits for purchasing groceries and fresh produce during the pandemic due to the fear of contamination as well as adopting stringent norms related to sanitation and physical distancing. Food shopping was often restricted to once a week or fortnight. Similarly, nearly half of participants expressed their disappointment over not being able to visit restaurants

since they were closed for dining while the lockdown restrictions were in place.

“I think we would almost always go out to eat, but because of the lockdown restaurants were closed ...” P12

Some participants (N = 7; 28%) reported that they increased or switched to online supermarket purchasing only, as they found it was challenging to venture outdoors during the pandemic restrictions. They ordered food including groceries, fruits and vegetables, cooked meals, and meal kits (e.g. Marley Spoon, Hello Fresh) online. A few participants also admitted that they had never purchased groceries online prior to the pandemic.

“The first one [picture of a dinner meal shared by the participant] is from Hello Fresh box [meal kit delivery service]. It was like a trial. Because it was delivered. So, it was different ... I have been trying it for few weeks.” P20

3.2.2.2. Increased purchasing of takeaways. One third of participants stated that they increased purchasing of takeaway food during the restriction time due to two main reasons: they missed dining out in restaurants, and they were looking for variety because they were bored eating their own cooked food for weeks. In contrast, one fifth of gatekeepers reported that they had reduced their consumption of takeaway food during the pandemic. This was because they reported being more conscious about hygiene, trying to save money, and had more time to cook their own food.

“So, may be from January to March, I can say every weekend we had a takeaway ... But then (April - in lockdown) onwards, it came down a bit, order once in two weeks and lately it has just been may be less than once a month or may be twice but not more than that. One, because I have time by my side, I can cook more I can invest more time in cooking and I think it's more so with my husband than me because he was afraid about the safety issue ...” P18

3.2.2.3. Unavailability of staple foods. Eighteen interviewees (72%) expressed their frustration over the lack of availability of certain staple food items like pasta, flour, rice, eggs, milk, chicken, fresh fruits and vegetables in supermarkets as well as local markets during the early phase of the COVID-19 crisis. Some interviewees said they made some adjustments to their recipes by either replacing the missing ingredient with an available ingredient or starting to prepare pre-mixes/batters from scratch as they experienced challenges in procuring certain staples.

“What we realized during this pandemic, especially that dosa batter [a fermented mixture of rice and pulse is used to prepare pancakes called dosa; Dosa is widely consumed in Southern India] was unavailable. The only choice was to prepare it from scratch. You want to have it, so we landed up soaking the rice and pulse and grinding it and then fermenting it ...” P18

3.2.2.4. Hoarding of food items. Some gatekeepers expressed their worries about the shortage of food staples at the onset of the pandemic, and they said as a result they resorted to hoarding of certain food items like rice, pasta, and frozen items. One of the gatekeepers explained how she stocked up her freezer with frozen food items as follows:

[...] and when the COVID hit and everything was going under lockdown, I actually went crazy and went out and bought a whole bunch of supplies. And it was quite interesting. Because at first, I went to Aldi and got a whole bunch of frozen gozleme [Turkish type of food] and foods that we wouldn't normally eat. I got frozen fish. I just have heaps of frozen things that we can just stick in the freezer.” P11

3.2.2.5. Changes in shopping venue. One third of participants reported they felt compelled to make changes in their shopping venues. Three reasons were given for these alternate shopping arrangements including lack of availability of certain food ingredients in their preferred supermarkets, inability to travel to the desired stores because of the travel restrictions as well as the desire to support local small-scale businesses in such challenging times.

"[...] I would normally catch the train to go to supermarket but during lockdown I actually discovered we have a greengrocer across the road from us, which I have never gone to before ..." P1

3.2.2.6. Improvement in meal planning skills. In the light of the challenges identified by participants that linked with food shopping and food availability, one third of participants noted an improvement in their meal planning skills over the course of the pandemic. They stated that before the pandemic, preparation of food shopping lists based on the meals to be prepared over the week was rare but after the onset of the pandemic, the participants started planning their meals and subsequently, preparing shopping lists to minimise shopping trips, save money and time.

"Before the lockdown we used to go like two or three times a week to the supermarket. We didn't have a very good organization ... So, now that we are trying to be at home as much as possible and avoid busy places and so we organise what we're going to eat in advance. So, we prepare like a little menu for the week ..." P2

3.2.3. Theme 3 – Modified dietary choices and behaviours

3.2.3.1. Quality of meals. More than half participants reported consuming meals comprised of major food groups like cereals, vegetables, lean meats, and alternatives. Moreover, these meals were mostly prepared at home (See Supplementary file). However, some participants further reported that consumption of these meals was not so common before COVID-19 because they had very limited time to prepare such meals; they either dined out more or relied on takeaway foods.

"When I was working, I usually would go with my colleagues and have lunch. Sometimes I would pack. But most of the time we would go out and have different foods ..." P10

3.2.3.2. Rise in snacking episodes. Nearly half of the participants stated that there was an increase in their snacking behaviour due to either stress, anxiety or boredom. Most of them mentioned that they indulged in unhealthy snacking (N = 10; 40%) like snacking on chips, chocolates and only a handful said they consumed healthy snacks (N = 2; 8%) such as yoghurt or celery. In addition to increased snacking of energy-dense, nutrient-poor foods, a few participants stated that they increased their alcohol intake while being restricted to their homes.

"Because you know it's kind of boring and we can't eat out. So, we started drinking ... Yes, we started consuming some wine which is unusual for us. We're just social drinkers. We usually drink with friends. But we started drinking at home right now I have to confess." P14

3.2.3.3. Increased intake of food. Some participants (N = 6; 24%) noted that they consumed more food including increase in portion size of meals, sweets, and snacks in the lockdown and they stated that this resulted in them gaining weight. These participants said that they were eagerly waiting for the termination of the lockdown to resume healthier eating practices as well as physical activity.

"[...] Also, I think we ate more than usual and maybe not as healthy food because of the anxiety because when you don't know what's waiting in the

future. You are kind of more anxious and at least I am none of these people when I'm anxious I eat more ... we need to control, watch more what we eat and go back to the gym ..." P10

3.2.3.4. Factors affecting meal choices. Participants mentioned a variety of factors that impacted their meal choices. Half of the participants indicated that they tried to consume nutritious meals by incorporating at least some fruits and vegetables in their meals. Nearly half of participants reported the availability of food items in their home such as their pantry and vegetable garden as another factor impacting on their meal choices. A few participants stated that availability of foods in their garden reduced the challenges associated with food shortages and reduced trips to supermarkets.

"How did I decide depends on what I have in my pantry and in my freezer, also in my refrigerator. It's my first criteria." P14

One third of gatekeepers reported that the convenience was the most vital determinant of meal choices during the pandemic. Some interviewees (N = 8; 32%) expressed the desire for having a variety of food in their meals and said they did not enjoy eating same meals every day.

"During COVID-19 I had plenty of time. So, I will usually have a sandwich with salmon for breakfast ... next day I may have something with ham and cheese or next day fried eggs. So, I don't like eating the same food everyday ..." P10

One third of participants stated that their meal choices were often determined by the preferences of family members such as children, partners or gatekeeper preferences. Besides the above factors, weather (N = 2; 8%), financial difficulties (N = 4; 16%) due to loss of employment, and prevailing life conditions like pregnancy and gout were also mentioned by some participants (N = 2; 8%).

3.2.4. Theme 4 – Novel social eating norms

3.2.4.1. Increase in family meals. The pandemic led to several favourable outcomes with regards to family meals. Nearly half of the participants noted that they enjoyed having all three meals i.e. breakfast, lunch, and dinner with their immediate family members both on weekdays and weekends. They stated that this eating context was rarely experienced prior to the COVID-19 pandemic since breakfast and lunch were usually consumed outside the home, for example:

"So you know we have time to sit down and have breakfast together ... and you know, sit down, eat a meal, watch a movie ... which is good because then you know we get to have a lot more family time ..." P17

Some participants (N = 3; 12%), staying in shared accommodation, said they shared their meals with their housemates in this crisis period.

"[...] before lockdown, I wouldn't usually eat together but I think during lockdown I noticed that we (housemates) would have most meals together, even though we're not having the same thing." P7

3.2.4.2. Lack of social outings induced disappointment. Half of the participants (n = 12) said they were disappointed when COVID-19 and associated restrictions prevented them from socializing and sharing food with friends, colleagues, and extended family. Some of them (N = 7; 28%) mentioned that after the cessation of the restrictions, they would like to dine out with their friends and family.

"We miss going out, we miss you know spending time with family because I have got my parents here, my in-laws are here. So, you know, on weekends we would get together for barbeques. Yeah, so its [lockdown] had a huge impact on us because we do a lot of family gatherings. Food is like the main thing on our table. Yeah. So yeah, we miss it a lot. Waiting

for the restriction to be over so that we can get food sharing back to normal." P17

4. Discussion

This qualitative study explored Australian primary household food gatekeepers' perceptions and responses towards their culinary behaviours during the COVID-19 pandemic. The findings indicated that this pandemic and its associated lockdowns had a significant and transformative impact on Australian food gatekeepers' culinary and dietary behaviours. In sum, the majority of food gatekeepers during the lockdown reported increases in home cooking and experimentation in the kitchen; increases in food literacy such as cooking skills and confidence, meal planning and purchasing skills; and increases in family meals. However, they also reported less positive impacts such as increased snacking and alcohol intake, increased baking of less healthy foods and an overall increase in food intake. These findings are discussed in more detail below alongside recommendations for future research and practice to support primary household food gatekeepers' culinary and dietary behaviours.

The majority of our participants indicated that they increased the number of home cooked meals and time for cooking. This is a positive change as higher food preparation and level of cooking skills have been linked with better diet quality (Caraher, Wu, & Seeley, 2010; Lavelle et al., 2020). In the last quarter century, the prevalence of food and cooking skills has declined which has been associated with increased intake of take-away food (Hartmann, Dohle, & Siegrist, 2013). Often take-away or ready-to-eat meals are high in energy particularly from saturated fat and refined sugars and low in dietary fibre and micro-nutrients (e.g. vegetables) which compromises diet quality (Monteiro, Levy, Claro, de Castro, & Cannon, 2010; Moubarac et al., 2013). The major barriers associated with the reduction of home cooking from scratch appear to be time limitations, the demand for convenience, and greater availability and accessibility of takeaway/ready-to-eat foods (Brunner, Van der Horst, & Siegrist, 2010). During the COVID-19 pandemic the majority of Australians switched to working from home or had flexible working hours which most likely reduced the time many spent in commuting (Beck & Hensher, 2020) and hence they had more time for home cooking.

Although many of our participants increased their cooking skills, they also reported less healthy diet related behaviours, for example, increasing their use of unhealthy snack foods and beverages and consumption of more alcohol. Some participants reported that these behaviours were induced by distress and anxiety which aligns with other studies investigating COVID-19's impact on dietary behaviours (Antunes et al., 2020; Di Renzo, Gualtieri, Cinelli, et al., 2020). In addition, although participants reported increased experimentation in the kitchen, it often involved baking cakes, biscuits and savory pastries. Perhaps as a consequence, several participants reported increased weight gain. This finding is similar to those of other studies conducted during COVID-19 lockdown (Laguna et al., 2020; Pellegrini et al., 2020; Reyes-Olavarría et al., 2020).

Poor diet quality has an impact on physical and mental health (Naja & Hamadeh, 2020). Therefore, it would be beneficial to develop comprehensive strategies and interventions to increase food literacy including food preparation and cooking skills among food gatekeepers in order to improve their diet quality and behaviour. Food literacy is a broad concept which encompasses food and nutrition knowledge, food preparation and cooking skills, budgeting, motivation and ability to use this knowledge and skills to maintain good health and food security (Cullen, Hatch, Martin, Higgins, & Sheppard, 2015; Vidgen & Gallegos, 2014). Food literacy has been associated with healthier dietary behaviours (Vaitkeviciute, Ball, & Harris, 2015). The interventions could include community-based nutritional programs, web-based nutritional programs, TV cooking shows or YouTube channels to provide credible

nutritional information.

The majority of participants reported the changes in their food purchasing behaviours during the lockdown, for example reducing the number of trips to the shops or using online services due to the fear of infection with some admitting being panic buyers and stock-piling foods, and some reported trying to support local businesses so they increased purchases of take away food or used home deliveries. Some of these behavioural changes have been observed in other countries such as New Zealand, the United Kingdom, Ireland and the United States of America (Bentall et al., 2020; Loxton et al., 2020; Martin-Neuninger & Ruby, 2020). Although there were no significant restrictions placed on Australian food supply working hours, people experienced food shortages of some staple foods at the early stages of lockdown. However, most of our participants met this challenge by modifying their recipes, improvising or using home deliveries and takeaways. Furthermore, some participants reduced the purchase of unpacked foods such as vegetables and time spent on reading nutritional information due to fear of contamination, similar behaviours was observed in New Zealand (Martin-Neuninger & Ruby, 2020). This also increased the demand for and use of online shopping (Mitchel, 2020). The continuity of these COVID induced behaviours after the pandemic requires further investigation.

Finally, the majority of the participants reported changes in their social/family eating dynamics. Most participants increased the number of family meals not only during dinner but also breakfast and lunch times which they found to be a positive experience. Several studies have shown the importance of family meals for strengthening family connectedness, forming positive social eating experiences and healthier dietary intake (Fulkerson et al., 2011; Hammons & Fiese, 2011; Neumark-Sztainer, Story, Ackard, Moe, & Perry, 2000). However, some participants reported 'feeling down' at not being able to go to eat out at restaurants and cafes with their friends and family during the lockdown. Social eating culture in Australia has changed dramatically in the last decades, in particular among younger generations who are the highest consumers of away from home foods rather than cooking from scratch at home. Future research is needed to explore the impact of increased family meals and home cooking during the lockdown to diet quality and if these behaviours sustained after the COVID-19 pandemic.

To our knowledge, this is the first qualitative study that was conducted with primary household food gatekeepers in Australia which explored the impact of the COVID-19 related restrictions on their culinary and dietary behaviours. Another strength of the study is that we used online platform (Zoom) to collect our data which enabled us to include geographically diverse participants across Australia. However, only participants with the Internet access were able to participate in this study which may excluded participants from rural/remote areas of Australia. This may partly account for the fact that the majority of our participants were highly educated (84% of participants had a university degree) and three quarters of them did not have children. Also, the ethnicity of our respondents does not reflect the distribution of the ethnicity of the whole Australian population. Therefore, there is a need for a longitudinal study to assess the prevalence of the reported themes and the relationship between them among a variety of demographic groups. Taking into account the limitations of our sample demographics, the generalisability may be limited. Therefore, our findings should be interpreted with care and cannot be considered to be representative of all Australian population.

Declaration of competing interest

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

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.appet.2021.105598>.

Authors contributions

R.R., J.N., and N.R. conceived the study and its original design. R.R., J.N., and N.R. drafted the initial form and all revisions of this paper. R.R. and J.N. collected the data. R.R., J.N., and N.R. analysed the data. R.R., J.N., A.W., and N.R. reviewed and approved the final manuscript.

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Ethical statement

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Medicine and Health Sciences Subcommittee of Macquarie University (Project ID: 6692; Reference No. 52020669215870; Date of ethical approval: 20/05/2020). The procedures performed were in accordance with the ethical standards of the committee. Written informed consent was obtained from all respondents before commencement of the study.

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