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Understanding food choices and promoting healthier food options among online food delivery service users in Australia: a qualitative study

Adyya Gupta^{1*}, Kathryn Backholer¹, Catherine E. Huggins¹, Rebecca Bennett¹, Gloria K.W. Leung¹ and Anna Peeters¹

Abstract

Background Online food delivery services (OFDS) are increasingly used to acquire food prepared out-of-home. Evidence suggests that OFDS commonly promote energy dense and nutrient poor foods, and their regular use may contribute to adverse health outcomes. To inform public health efforts to promote healthy choices on OFDS in Australia, we aimed to explore factors influencing adults' food choices on OFDS and gauge their perceptions towards actions that could support healthier food choices on OFDS.

Methods This is a qualitative study. In-depth, semi-structured interviews were conducted with English speaking adults living in Victoria, Australia, aged 18 to 45 years who reported using OFDS at least once a month. The interview guide was developed to elicit information on factors that prompted participants' food choices on OFDS and gather insights on if and how they could be supported to make healthier food choices on OFDS. Transcripts were deductively coded, guided by the socio-ecological model, using thematic analysis.

Results Thirty Australian adults participated in the study. Participants were mostly women (80%) with a mean age of 28 years and living in metropolitan Melbourne. 85% had completed higher education, 20% lived with children < 18 years of age and > 80% used OFDS 2–5 times per week. A range of individual factors (motivation to seek comfort food, time and cost considerations), social factor (family influence) and environmental level factors related to navigating OFDS (limited availability and accessibility to healthy food outlets and healthy food options; price promotions, low delivery fee and appealing food images) influenced consumers food choice decisions on OFDS. All participants expressed positive attitudes towards potential actions to help them make healthier food choice decisions on OFDS (such as making healthier foods as default or on promotions).

Conclusion Individual and social circumstances, together with online marketing techniques, drive consumers' food purchasing decisions on OFDS. Actions are needed to enhance the accessibility, availability and desirability (through increased visibility and price promotions) of healthy food options on OFDS to promote healthy food choices.

*Correspondence:
Adyya Gupta
adyya.gupta@deakin.edu.au

Full list of author information is available at the end of the article



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Keywords Online food delivery, Meal delivery applications, Qualitative interview, Online food choices, Public health, Health policy

Introduction

Overweight and obesity are major risk factors for death and disease in Australia, with the latest national estimates indicating that almost two thirds (65.8%) of adults are currently overweight or obese [1]. There is well-established evidence on the association between overweight and obesity and multiple co-morbidities including type-2 diabetes, cancer and cardiovascular diseases [2]. Frequent consumption of food prepared out-of-home, often high in sugar, salt and fat (termed 'discretionary foods'), is associated with overweight and obesity [3, 4]. The prevalence of acquiring meals prepared out-of-home is on the rise, due to new formats of selling and purchasing foods such as online food delivery services (OFDS) [5].

OFDS are third-party platforms that connect customers with food outlets, enabling consumers to quickly and easily place food orders online at their convenience [6]. The use of OFDS is rapidly increasing both globally and in Australia [7]. These platforms employ various marketing techniques, such as price promotions and exclusive member deals targeting young adults, to maintain and expand their consumer base [6, 8]. In Australia, the OFDS industry has grown at an average rate of 26.6% per year between 2018 and 2023 [9]. Emerging evidence from Australia indicates that foods available and promoted on OFDS are mostly discretionary foods [10, 11]. Initial evidence also suggests that OFDS are commonly used by adults, those with higher education and parents with children under 18 years [7, 12], making them a key target for unhealthy food marketing on OFDS [13].

Food choice is a complex behaviour, with a substantial body of literature outlining conceptual models of food choice [14]. Food environments (including food retail environments) have been identified as a major driver of food choice together with other socio-ecological factors affecting health, namely, individual factors (biological, psychological, socio-demographic), interpersonal factors (knowledge, attitudes, family, and peers) and societal factors (culture, food features) [15]. While research on the reasons for using OFDS to purchase out-of-home food is limited, studies from the United Kingdom indicate that convenience, such as easy access and time-saving, may be key reasons, especially during COVID-19 related travel restrictions [16]. In the current post-COVID-19 context, no research has explored reasons for food choices on the OFDS in Australia. Understanding why consumers make certain food choices on OFDS can help inform public health actions that may improve the healthiness of food offered on OFDS. For example, changes to the choice architecture of food retail environments such as

increasing the range or number of healthy food options at point-of sale, checkouts or end-of-aisle has been shown to improve the food choice decisions among consumers [17, 18]. As the popularity of OFDS is on rise worldwide and in the absence of any regulatory framework to tackle the easy accessibility and availability of unhealthy food promoted on OFDS, it is likely that OFDS are increasing the overall unhealthy food consumption, resulting in adverse health outcomes at a population-level. Our previous study has demonstrated public support for national-level policy initiatives tackling unhealthy foods such as prohibiting advertising and promotion of unhealthy food, taxing sugar-containing food and beverages among others in Australia [19]. However, whether similar support exists for policy initiatives to tackle unhealthy foods sold on OFDS remains unknown. Thus, seeking public opinion is a critical first step towards increasing the likelihood of intervention success and drive meaningful change.

We aimed to explore factors influencing adults' food choices on OFDS and gauge their perceptions towards actions that could support healthier food choices on OFDS.

Methods

Using semi-structured in-depth interviews, a qualitative study was undertaken between July and September 2023, to explore the factors influencing adults' food choices when using OFDS and to understand their perceptions of actions that could support healthier food choices on OFDS. We used a constructivist approach [20] to facilitate a rich description of individuals perceptions and experience related to their food choice decision making process on the OFDS. The Standards for Reporting Qualitative Research were used to guide the reporting process of the study (Supplementary Table 1) [21]. The study was approved by Deakin University Human Research Ethics Committee (HEAG-H 37_2023).

Study design

Theoretical perspective

A socio-ecological model is a theoretical framework that examines the interrelationships between individual, interpersonal (including social and community networks) and environmental (including organisation and policy) level factors in any given context [22–24]. The socio-ecological model was therefore used in our study to inform the development of the interview guide and data analysis and interpretation. Applying a constructivist approach [20] to the socio-ecological model enabled us to explore and examine the multiple factors embedded

in individual's social, and environmental contexts that determine their food choices on OFDS.

Sampling and recruitment

We used convenience sampling to recruit participants for this study. The eligibility criteria for inclusion were limited to English speaking adults, aged 18 to 45 years, who reported regular use of OFDS (at least once per month), living in Victoria, Australia. Emerging evidence identifies adults between 18 and 45 years as high users of OFDS and hence this age range was selected for this study [7, 12]. The definition of 'regular' of OFDS use was informed by prior studies investigating takeaway food purchasing practices [16, 25, 26]. The study was advertised via university social media accounts (including X, Facebook and LinkedIn). Participants who expressed interest in participating were assessed for eligibility by the primary author, and those meeting the eligibility requirements received a plain language statement. Written informed consent was obtained prior to commencing the study. Following completion of the interview, participants were given a 50 Australian Dollars (AUD) supermarket voucher as a thank-you for their participation.

Data collection procedure

As food choice decisions are both personal and complex, in-depth interviews was considered an appropriate approach to explore individuals' perspectives and reasons for making food choice decisions on OFDS. Prior to study commencement, the interview guide was pilot tested with two eligible individuals to assess the appropriateness of the questions in addressing the research question, and amendments were made as necessary. The primary author conducted 30–45-minute in-depth semi-structured interviews virtually using the Zoom platform (Supplementary Table 2: Interview topic guide). In the interviews, we first gathered the participants basic demographic and OFDS related information. Basic demographic details included age, sex, household income, highest education completed, postcode, and the number of children less than 18 years of age living in their household. OFDS related information included frequency of using OFDS, choice of OFDS used and if participants held a membership for OFDS. We then asked the participants to share their experience of ordering food from start to finish using OFDS. Throughout the exploration, we asked participants to reflect on the factors that influence their food choices on the OFDS. Lastly, we asked participants if and how they could be enabled to make healthy food choices on OFDS. To explore this, we prompted participants to reflect about the healthy food retail approaches they may have observed when purchasing food at the supermarket and encouraged them to think of potential ways to apply them to the OFDS. This allowed us to

gauge their perceptions and potential actions towards supporting healthier food choices on OFDS.

We used a paid professional transcription service based in Australia, to transcribe verbatim audio-recorded interviews. 15% of the transcripts were verified by the primary author for their accuracy and reliability. The primary author reflected on her position as an ethnically, culturally and linguistically diverse, female, public health academic with a young family and a previous user of OFDS. For maintaining rigor in our research process, through best practice verification strategies [27] such as continuous self-reflection through keeping notes and maintaining transparency (reflexivity), discussing preliminary research findings and interpretations with two co-authors (AP and KB) (peer debriefing) and corroborating findings with previously published literature, the primary author minimised bias in the data collection and analysis process.

Data analysis

Transcripts were imported into QSR-NVivo 12 to manage the data, facilitate coding and analysis. To get an in depth understanding of consumers drivers of food choices on OFDS, a thematic analysis approach was undertaken. Identifying patterns in consumers perspective at every step of their food purchase journey on the OFDS generated in-depth insights into the topic. Using Braun and Clark's six-step thematic analysis process [28], the coding process including a combination of inductive and deductive reasoning. Following the familiarisation with the data, the transcripts were coded inductively to identify words, phrases and patterns describing the multiple factors that influenced Australian adult's food choices on OFDS and participants' perceptions towards actions that could support healthier food choices on OFDS. Next, all the recurring and distinctive codes were reviewed and organised into sub-themes to reflect the participants motivations to food choice decisions on OFDS. The sub-themes were then deductively and axially coded into themes aligned to the individual, social and environmental factors, guided by the socio-ecological model to identify relationships between the themes and sub-themes, and contextualise the findings. AG, AP and KB discussed the themes throughout the process to ensure that consumers reasons and motivations for their food choices on OFDS were accurately summarised within the themes.

Results

Participant characteristics

A total of 30 Australian adults participated in the study and over 80% participants ($n=25$) used OFDS for food purchases 2 to 5 times per week. The study sample was mostly women (80%) ($n=24$), with a mean age of 28

Table 1 Participant characteristics (n = 30)

Participant characteristics	
Age (mean, range)	28 years (18–45 years)
Sex	
Male % (n) (%)	20 (n = 6)
Female % (n)	80 (n = 24)
Education level % (n)	
High school	13 (n = 4)
Bachelor's degree or higher	37 (n = 11)
Postgraduate degree	50 (n = 15)
Household income per annum % (n)	
<19,000 \$AUD*	4 (n = 1)
20,000 to < 49,000 \$AUD	10 (n = 3)
50,000 to < 79,000 \$AUD	13 (n = 4)
>=80,000 \$AUD	73 (n = 22)
Household status % (n)	
Households with children < 18 years of age	20 (n = 6)
Households with no children < 18 years of age	80 (n = 24)

*\$AUD: Australian Dollars; %= percentage; n = sample size

years (age range: 18–45 years), and the majority (90%) lived in metropolitan suburbs classified as having a high socioeconomic status within Melbourne, Victoria, based on the Australian Bureau of Statistics Socioeconomic Indices for Areas. Most (73%, n = 22) participants had a household income over 80,000 Australian Dollars (\$AUD) (after tax), over 85% (n = 26) held bachelor's or post-graduate degrees and 20% lived in a household with one or more children less than 18 years of age (n = 6).

Three leading OFDS in Australia were used by the participants, namely, Uber Eats (n = 21), DoorDash (n = 5) and Menulog (n = 4). Most participants (n = 25) placed dinner orders over the weekdays only. The total \$AUD spent for one online food delivery order ranged from \$AUD35 to \$AUD60. Eleven participants held memberships with OFDS which enabled them to receive discounted delivery fees and other 'member only' promotional discounts. Table 1 shows the characteristic of the study participants.

Factors influencing food choices on OFDS

According to the socio-ecological model, we identified four themes describing the factors that influenced participants' food choices when using OFDS namely, (a) motivation to seek comfort food; (b) time and cost consideration; (c) family influence; and (d) navigating OFDS (Table 2). A description of the themes, and illustrative quotes, are discussed below.

Individual factors: motivation to seek comfort food

All participants reflected that their emotional status including feelings of stress, boredom and tiredness were important factors driving food cravings that resulted in purchasing out-of-home foods using OFDS. These emotions were largely linked to day-to-day work and life stresses and often led participants to seek comfort food options (typically less healthy food) on OFDS as they perceived less healthy food as a "treat or reward" to alleviate their mood.

"I think it's the mood that I associate with online food. It's usually, as I said, at the end of a week, at a moment of tiredness or stress. And so it's usually comfort food that is like treat and reward. I want it to be good and not so expensive". (26 years)

"So, it really just depends on the day and how we're feeling. After a tiring day, all you want is food comes that comes to your home door". (27 years).

For some participants, initial motivation for purchasing food using OFDS was often due to feelings of "hunger", but it soon elevated to "cravings" or "indulgence" particularly when viewing the appealing prompts, leading to purchasing comfort foods using OFDS.

"It's when I'm super hungry, and when I see food options on the app, I really, really start craving for that thing". (28 years)

"Obviously if I'm craving something – like if I'm craving junk food I'm not going to think twice. I'm not too hard on myself. I would order it. (29 years)

Table 2 Themes describing factors influence food choices using OFDS

Socio-ecological model	Themes	Description of factors influencing food choices using OFDS
Individual factors	Motivation to seek comfort food	Emotional status (stress, boredom, tiredness), food as a treat, hunger, appetite, palatability, craving, good/ satisfying experience, food/ taste preference (e.g. highly desirable)
	Time and cost consideration	Time and effort saving compared to food preparation at home High value for money (due to low cost of less healthy food)
Social factors	Family influence	Eating with others (partner or children)
Environmental factors	Navigating OFDS	Difficulty in finding healthy food options; price promotions, ratings, reviews, low delivery fee and appealing food images on OFDS

Participants described their motivation to purchase comfort food on OFDS was because the foods offered were not what they typically cooked and consumed at home. Food ordered using OFDS was regarded as highly desirable to satisfy hunger and achieve satiety, and appetite. Most participants felt the overall experience of purchasing less healthy food on OFDS was a way of feeling good.

"Comfort food for me is food that makes me feel good. That's tasty and that makes me happy, I guess. That's in the terms of burgers and pizza and those kinds of things". (33 years)

"I am attracted towards the appeal of the food itself. So, is it looking like it's going to be tasty? Is it something that I cannot easily make at home?" (26 years).

Individual factors: time and cost consideration

All participants perceived purchasing food using OFDS as time and cost-saving. For example, after a long day at work or during exam times, purchasing low-cost convenient food was considered a preferred alternative to spending time and effort to preparing a home cooked meal.

"So, after a tiring day, it's just convenience for me, and you are just paying a small amount of money, so why not." (27 years).

"I think at the time, it was the quickest and probably one of the cheaper options in terms of what I was craving that night, which was pasta." (22 years).

Most participants perceived themselves as having average cooking skills resulting in meals they perceived as less enjoyable. They reported that time, effort and money spent in preparing and cooking meals and cleaning afterwards was not worth the effort, especially if the home cooked meals were not enjoyed by themselves and their family. This prompted these participants to seek comfort food options on OFDS, the cost of which was regarded as comparable if not cheaper to home cooked food in some cases.

"So, I think generally I'm just not a fan of cooking. That means when I am cooking, it's usually basic meals which aren't fun. I think it is more kind of a time saving and convenient way to get food." (31 years).

"I don't cook very often. So, I don't have the practice. And, it's so easy to just go on the app, and order for the food that would taste good in less time and money. So yeah, why not." (22 years).

Social factors: family influence

Many participants reported that eating food in presence of others (partner or children) influenced their food choices on OFDS. Participants living with partners expressed that online ordering of comfort food was an easy way to finish a busy day and spend quality time with their partner.

"I live with my partner. So like he would say, 'Oh, I want this food.' And I'm like, 'Oh, like, good idea.' I guess he influences me as well in the choices. Sometimes I do the same to him, because I'm like, 'I want this.' Yeah, I guess we kind of do that to each other" (28 years).

"My husband has the major role. Like I will say 50% of him and 50% of me. He has been living in Australia for such a long time and he knows the taste, like what we will like to eat." (34 years)

Some participants, particularly parents with younger children, expressed their preference to select comfort food options that were enjoyed by their children. This was expressed to avoid their children disliking the meal and overcome the struggle to feed them home cooked meals.

"If we were to order food, we definitely order what we'll have as a family and consider my son's preferences and his tastes. We'll never cut him out of that. This way everyone enjoys what they want." (31 years).

"Having a child and particularly a toddler or a very young child, it takes even more of your time in terms of anything. So, getting the food they love is so much less struggle." (35 years).

One participant shared how having a baby in the family changed their method of food purchasing behaviour, but not food choice. The participant shared that before having their baby, the couple consumed comfort foods using dine-in services at food outlets. After the baby, they continue to choose the same comfort food from same food outlets as before, using OFDS.

"Before the baby it was more flexible. You can go whenever you want, a late-night drive to McDonalds and it's not a problem. But having a baby, because we try to prioritise sleep for the baby, whenever she needs to sleep, so we now order from Maccas using online food delivery." (31 years).

Environmental factors: navigating OFDS

All participants recalled a strong presence of food marketing techniques, including on the homepage, food outlet page and at the checkout page, leading to difficulty in finding healthy food options and influencing their food choices. As perceived by the participants, these food marketing techniques were mostly for less healthy food options and included default placements, price promotions, high rating and reviews, low delivery fees and appealing food images. While all participants stated that they were familiar with the 'search' function on the OFDS and used it to search for 'healthy' food options on the OFDS, the limited options to choose from, low appeal, and high cost of healthy food, often deterred them from purchasing healthy food on the OFDS.

"There's not really one outstanding healthy food chain. So, I ignore that and just pick something that I like." (19 years)

"I don't see the healthy foods as being tasty. Also they tend to be a bit more expensive in general so we don't go for those kind of foods." (33 years)

Participants referred to receiving push notifications or promotional emails from OFDS. They clearly stated that while these techniques did not always trigger their immediate use of OFDS, they perceived that the pervasive nature of the promotion influenced their food purchasing decisions on OFDS.

"So, a lot of times I do get the push notifications and the ones that I look out for, even screenshot, is the one with the coupon code. So, they would say, feeling hungry? Get \$5 off if you purchase local businesses before this time." (31 years)

"When I get push notifications, I kind of go through, skim it, and have that email or the push notification in my mind. So when I am on the app, I always think about the offer I saw on the notification because I want to get the best offer- I'm always looking for that, all the time." (34 years)

Many participants reflected that they looked for cost-related promotions on food items through the entire food purchase process. Participants mentioned that availability of loyalty rewards and discount offers on food items were important factors that influenced their food choices, commonly for less healthy foods.

"I just look at the promotions in the front of my phone and then I can kind of just gauge whether the offer is worth my money or not. If it just matches the

price of the restaurant and if I'm feeling particularly hungry, I will get it." (27 years)

"I'll order from pretty much the cheapest place that I can find, and that's why I'm usually looking for the promo codes to see how I can have the price reduced." (27 years)

Participants also asserted that ratings and reviews of food and food outlets, the appealing high-resolution images of the foods and low delivery fees, were among the other influential marketing techniques that influenced participants food purchase decisions on OFDS.

"So the first thing I do is usually sort it by rating and then once I've done that, I just browse through each restaurant and I just check for their ranking, their menu." (31 years)

"They must have good ranking, which are close by – I also take the time into consideration – if it is taking too long to arrive, or if there's too much of a delivery fee." (35 years)

Actions supporting healthier food choices on OFDS

On asking participants if and how they could be enabled to make healthy food choices on OFDS, participants expressed that, although they mostly seek comfort foods on OFDS, they would prefer the ability to choose between healthy and less healthy options. Participants suggested various actions to potentially improve the accessibility and availability of healthy food option.

"The more the better. Anything they could put in there just to remind people to make healthier choices would be so helpful." (34 years)

"Because I'm very visually influenced. So having like a healthy toggle that is appealing would be helpful for me to think." (28 years)

Participants suggested increasing the visibility of healthy food options by positioning them as the default when opening the OFDS app and within food outlet menus, followed by less healthy options.

"It would be great if the algorithm prioritised healthier food choices, and so that was at the top as opposed to like having to dig for it." (24 years)

"Just rearranging the menu items in a way that you see the most authentic items first and then you move on to the fast food." (22 years)

One participant suggested that healthy food options could be made more prominent if third-party apps partnered more with healthy restaurants that prioritised health over profit.

"I guess a basic one would just be partnering with more restaurants and food groups that are healthy. And maybe they could make that a priority for the company, just to look into where the healthiest food groups are and, yeah, prioritise it a little bit more." (19 years).

Participants stated that cost-related promotions such as discounts, deals, rewards, and free delivery on healthier food options would encourage them to make healthier food choices when ordering from OFDS.

"Definitely make the healthier options cheaper. If I, yeah, just because, again, as I said, price is an important consideration for me. And then, yeah, the very first things you see should be like a popular healthy item, maybe, because that kind of influences your thinking a little bit." (27 years)

"Buy one, get one free for a healthy food option or let's say it's rewarding you for your healthy choice." (30 years)

On prompting participants to reflect on existing the food retail strategies observed at Australian supermarkets, some suggested potentially implementing similar strategies for OFDS. This centred mainly on front-of-pack labels which could be applied to the digital image of a food pack and included traffic light labels or health star rating (HSR). While a few participants expressed mixed feelings on the potential effectiveness of a HSR front-of-pack labelling scheme on their food purchase decision-making on OFDS, as participants reflected on their current limited engagement with the labelling strategies at supermarkets.

"Think of the Health Star Rating kind of thing and if that sort of thing could be applied. But I don't really pay attention to the Health Star ratings, so it's sort of tricky to say if it will work or not." (26 years)

"Probably if it's colour coded, like how they have the stars in the shopping centres like, four star health rating, one star health rating. If it's a red would be a junk food type option. If it's a vegan super healthy stuff, it might be green, a dot next to it or something, that would be handy. That would inform my decision." (34 years)

Discussion

In this study, we aimed to gain an in-depth understanding of the factors influencing adults' food choices on OFDS and gauge their perceptions towards actions that could support healthier food choices on OFDS. We found that food choice on OFDS is a complex decision and is driven by a range of factors at multiple levels of socio-ecological model. This includes individual-level factors (motivation to seek comfort food, time and cost consideration), social-level factors (family influence) and environment-level factors related to navigating OFDS (limited availability and accessibility to healthy food outlets and healthy food options; price promotions, low delivery fee and appealing food images on OFDS platforms). Participants recommended potential actions to support healthier food choices on OFDS. Actions included positioning of healthier foods as defaults, having healthier options on price promotions and front-of-pack food labelling, similar to that found in supermarkets.

Participants in our study reported ordering of comfort food (typically less healthy food items) more than any other available food options. This is unsurprising as emerging evidence indicates food sold on OFDS are mostly energy-dense and nutrient-poor [4, 8, 10, 11]. A recent study conducted in Australia and New Zealand reported 75% of the most popular fast-food outlets on OFDS were less healthy food outlets and 9 out of 10 most popular menu items on OFDS were discretionary foods [11]. Our participants described how they perceived less healthy foods on OFDS as highly desirable, enjoyable and a treat to relieve daily stresses. Time constraints, convenience, food-related attitudes and seeking value for money have also been consistently described as key individual-level factors that drive consumers to choose less healthy food options across settings and contexts [16, 29, 30]. Selection of less healthy food by families was a result of time constraints and to ease the efforts involved in the planning, preparation, consumption and clean-up after preparing food at home. Ordering of less healthy food on OFDS was considered a way to manage stressful mealtimes arising from fussy eating. Parents shopping for food with children at supermarkets have reported that they agree to their children's request for purchasing less healthy foods for similar reasons [31, 32]. With a disproportionately large number of less healthy food options on the OFDS, there is a risk that food ordered using OFDS may lead to an increased consumption of less healthy foods [13, 30, 33]. In line with the results from a qualitative study exploring factors influencing Australian's high sugar consumption [34], our findings indicate that together with individual and social circumstances, environmental stimuli (in our study, the overwhelming presence of the less healthy food options on OFDS) are critical factors driving food choice decisions on OFDS.

Participants in our study reported exposure to a range of marketing techniques used by OFDS to promote less healthy food options at point-of-sale. They unanimously recalled the prevalence of price promotions on less healthy foods as an important factor influencing their food choice on OFDS. This aligns with existing evidence showing that most food marketing techniques on OFDS promote less healthy food [4, 10, 11, 13, 35] and that marketing strategies such as discounts and rewards influence consumers purchase behaviour [36]. These practices raise concerns as promotion of less healthy foods may contribute to their over consumption, potentially negatively impacting diet quality and health [33]. Moreover, limited availability, low appeal, and high cost of healthy food options were reported as influential factors that prompted participants to choose less healthy foods on OFDS in our study. Participants recalled that healthy food options on OFDS were often difficult to find and when they were found, they were often perceived as expensive and not considered 'value for money'. Similar challenges were reported by consumers purchasing food on the online grocery platforms [37]. This underscores the need to redirect marketing techniques on all forms of online food platforms towards healthier food options to support consumers in making healthier food choices.

Our participants emphasised that changes at the OFD sector and government level (environment- level factors) may promote healthier food choices on OFDS. This aligns with the ongoing advocacy for the need for policy actions directed towards increasing the healthiness of the online food environment [19, 38, 39]. Participants emphasised that reducing the cost of, and increasing the availability and visibility of, healthier foods by OFDS may nudge them towards healthier food choices. Other potential actions suggested for OFDS included positioning of healthy food options within restaurant menus as a first option or as a default option, increasing the ratio of available healthier options relative to unhealthier options, including healthy options on promotion, offering suggestions for healthier food item swaps within restaurant menus and at the checkout, and providing food labelling (in line with existing Government approved systems or dietary guidelines, such as Australia's Health Star Rating system [40]) on the food items. Whilst there is promising evidence to suggest that some these actions when implemented within simulated online food environments (mostly grocery platforms) can promote healthier food choices [41–45], these need to be adopted by the OFDS for a real-world impact. To hold the OFDS industry accountable for their impacts on population diets, strong government-led policy measures are pivotal to create a 'level playing field' for OFD sector and promote a health-enabling online food environment [46, 47]. Advocating for the extension of existing policies that are

applicable in the real-world (for example energy labelling on menu boards in fast food restaurants [48, 49]) to their digital equivalents may be the first step towards creating a level playing field for the OFDS sector. Further research is required to better understand the acceptability and feasibility of the various actions suggested above and assess their effectiveness and equity considerations, on food choices, diets and health. Given the convenience and the popularity of OFDS, consistent implementation of these approaches across OFDS is required in order to drive healthier food choices on OFDS [50].

Strengths and limitations

Our study has several strengths. Using qualitative methods, our study is one of the first to describe participants' experience of ordering food using OFDS in Australia. Our study provides rich insights into the factors influencing food choices on OFDS and from the consumer's perspective, ways to support healthier food choice decisions on OFDS. We employed multiple verification strategies including reflexivity, peer debriefing, and corroboration with published literature, at multiple stages in the research process to increase reliability of our results. Our study also has some limitations. First, most of the participants in our study had similar sociodemographic characteristics (i.e., mostly women, living in metropolitan Victoria, highly educated, of high socioeconomic status; frequent users of OFDS). While this allowed us to construct clear themes from the data that may be transferable to similar populations, their perceptions may not represent perceptions of other consumer groups such as younger adults, men, those of low socio-economic status or non-frequent users of OFDS. Future studies could replicate our study in different population groups using OFDS to validate our study findings. Next, there may be some social desirability bias in the participants' responses, as individuals were frequent users and asked to share their food purchasing experiences when using OFDS. However, despite this, our participants provided insights into their reasons for purchasing of (mostly less healthy) foods on the OFDS.

Conclusion

In conclusion, our study found that food choice on OFDS was a complex decision, driven by multiple considerations. Using the socio-ecological model, we found that factors at individual, social and environmental-levels influenced consumers' food choice decisions on the OFDS. Participants in our study acknowledged the overwhelming availability and marketing of less healthy food options compared to healthy food options on OFDS, a key driver of their food choices on OFDS. Our participants expressed a desire to find healthy food options more easily on OFDS to help them to make an informed

food choice. Robust actions are needed to enhance the accessibility, availability and desirability of healthy food options on OFDS to enable consumers make healthier food choices on OFDS.

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Author contributions

AG was responsible for leading the study including research inception, study design, data analysis, manuscript writing and revisions. KB, CEH and AP contributed to the research inception, study design, and provided detailed feedback on the manuscript. RB and GL provided feedback on multiple drafts of the manuscript. All authors critically revised drafts of the manuscript and approved the final version.

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Data availability

Data is provided within the manuscript.

Declarations

Ethics approval and consent to participate

The study followed the ethical guidelines for research on human subjects as outlined in Declaration of Helsinki. The study was approved by Deakin University Human Research Ethics Committee (HEAG-H 37_2023) and all participants willingly provided written informed consent.

Consent for publication

All authors critically revised drafts of the manuscript and approved the final version.

Competing interests

The authors declare no competing interests.

Author details

¹Deakin University, Geelong, Australia, Institute for Health Transformation, Global Centre for Preventive Health and Nutrition, School of Health and Social Development, Faculty of Health, Geelong, VIC 3220, Australia

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