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Conceptualisation, experiences and suggestions for improvement of food security amongst Aboriginal and Torres Strait Islander parents and carers in remote Australian communities

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ABSTRACT

This study aimed to determine perceptions of the lived experience of food insecurity and suggestions to improve food security in four remote Aboriginal communities in the Northern Territory, and Queensland. Participants were Aboriginal and/or Torres Strait Islander pregnant and breastfeeding women, and parents/carers of children aged six months to five years. Semi-structured interviews (n=17) were conducted between June–July 2021 and the data thematically analysed using a four stage process. No specific term was used by participants to describe being either food secure or insecure. Descriptions of food security were centred in food sharing, food sufficiency, and family activities. Elements describing food insecurity were physical pain and emotional stress, adults going without food, seeking family help and managing without food until payday. Factors contributing to food insecurity were reported to be: (i) Low income and unemployment, (ii) Cost of living remotely, (iii) Resource sharing, and (iv) Impact of spending on harmful commodities and activities. Three themes were conceptualised: (1) Cultural practices buffer food insecurity, (2) Coping with food insecurity, (3) People accept a degree of food insecurity as normal. Findings suggest Aboriginal and Torres Strait Islander cultural practices such as sharing food buffer episodic food insecurity and constitute 'cultural food security'. Despite use of cultural practices (e.g., procuring traditional food) and generic coping strategies, regular episodes of food insecurity often aligned with the off week of social assistance payments. Household energy (electricity) security was coupled to food security. Suggestions for improving food security included better transport and food access, extending electricity rebates, increases in the regularity of social assistance payments, and computer access and training in budgeting. Policies to advance food security should embody deeper Aboriginal and Torres Strait Islander descriptions and experiences. Community-derived policy suggestions which aim to increase access to adequate, regular, stable household income are likely to succeed.

1. Introduction

Traditional food procurement, including hunting, fishing, gathering, and family sharing networks provided food security and were central to Aboriginal and Torres Strait Islander Australian's culture, health and wellbeing prior to colonisation in Australia (Bourke et al., 2018). In the late 19th and early 20th century, colonisation was accompanied by the introduction of food rations such as tea, flour and sugar as part of the Aboriginal Protection Act of 1909 (Government of New South Wales, 1909) and were issued to Aboriginal workers and people living on government settlements and missions in an inequitable exchange for work on pastoral leases (Foster, 2000; Huggins, 2022). The legacy of

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European colonisation in Australia is widespread structural violence (Australian Human Rights Commission, 2020; Galtung, 1969; Moreton-Robinson, 2015) evidenced by ingrained inequity, racism, trauma, the disconnection for some Aboriginal peoples from their lands and subsequent poor health, including food insecurity (Fredericks and Bradfield, 2021; Moreton-Robinson, 2020; Paradies, 2016). The impacts of structural violence and racism on food security persist today and are evidenced by the continued failure of governments to undertake systemic and structural reforms to ensure that Aboriginal people have access to affordable, nutritious quality food. In later years the introduction of and reliance on community stores and government welfare payments serve to entrench food insecurity and remains a part of contemporary life in some remote communities (Bryce et al., 2020; Pearson, 2021).

Nearly one in five (19%) Aboriginal and Torres Strait Islander people live in 'remote' or 'very remote' communities; defined as having "very restricted/little access to goods, [and] services …" (Australian Bureau of Statistics, 2007). Income inequality increases with remoteness (Markham and Biddle, 2018) and prices in remote communities are higher for goods and services including food (Lee et al., 2002; Lee et al., 2021; Northern Territory Government, 2020). Food insecurity, the inability to access (both physical and economic) a safe and affordable food supply, is a deeply concerning public health issue in developed countries (Pollard and Booth, 2019) with serious physical, social and mental health consequences across the life course (Gundersen and Ziliak, 2015, Thomas et al., 2019). Structural violence and racism impacts on food insecurity (Odoms-Young, 2018). Food insecurity prevalence is higher in remote Aboriginal and Torres Strait Islanders communities (31%) compared to the Australian population (4%) (Australian Bureau of Statistics, 2015) with research indicating the remote prevalence to be a fifty percent underestimate (Brimblecombe et al., 2018).

The determinants of food insecurity in remote Australian communities include poverty, and economic insecurity, unemployment, a reliance on inadequate government social assistance payments and the high cost of living remotely including a lack of food affordability (Brimblecombe et al., 2014; Bryce et al., 2020; Lee and Ride, 2018; Spurway and Soldatic, 2016). Inadequate social assistance payments mean that food purchased does not last until the next payment, leading to episodic food insecurity (Brimblecombe et al., 2014; Bryce et al., 2020). Additional factors include a lack of adequate food storage, preparation and cooking facilities and household overcrowding (Bryce et al., 2020; Lee and Ride, 2018).

Aboriginal and Torres Strait Islander people who live remotely and experience food insecurity employ a variety of coping strategies including collecting traditional food (Ferguson et al., 2017; Spurway and Soldatic, 2016), sharing food or money among extended family members (Brimblecombe et al., 2014; Bryce et al., 2020; Ferguson et al., 2017), consuming foods that are cheaper and filling such as rice or pasta, concealing food, locking household food cupboards and consuming take-away food to minimise the impact of cultural sharing obligations (Brimblecombe et al., 2014; Bryce et al., 2020).

Aboriginal people's conceptualisation of food insecurity in the context of family life offers an important starting point in the development of tailored, culturally sensitive policies. Aboriginal researchers and participants in The Good Food System project defined food security as when '*the food of our ancestors is protected and always there for us and our children. It is also when we can easily access and afford the right non-traditional food for a collective healthy and active life. When we are food secure we can provide, share and fulfil our responsibilities, we can choose good food knowing how to make choices and how to prepare and use it.*' (Menzies School of Health Research, 2016). An ethnographic study on household food practices in the Anangu Pitjantjatjara Yankunytjatjara Lands in northern South Australia by Bryce et al. (2020) reported the term 'hungry days' was used by participants and occurred in the days leading up to when income was received. Research on the factors influencing food choice in an Australian Aboriginal community spoke of knowledge, health and resources being 'out of balance' (p.394) to support healthy food choices. Additionally, the term 'damper week' or 'nothing week' was used when money ran out and relatives were relied on to help with money or food (Brimblecombe et al., 2014). Building on the existing Australian literature is important to continue to understand Aboriginal people's conceptualisations of the term (Power, 2008).

This study aims to determine Aboriginal and Torres Strait Islander parents' and carers' experiences of food insecurity within the family context (conceptualisation, depth of the experience, influencing factors, coping strategies) and their suggestions for improvement in four remote communities.

2. Materials and methods

2.1. Procedure/study setting

This study is part of a larger study focussed on improving healthy food affordability and food security among Aboriginal and Torres Strait Islander women and children in remote Central Australia in the Northern Territory, and Cape York in Far North Queensland. Qualitative methods were employed as they bring the voices of the lived human experience to the forefront and provide insight for policymakers (Pine and deSouza, 2013). Ethical approval was granted by the University of Queensland and the Central Australian Human Research Ethics Committees (Project Numbers, 2022222636 and CA-203701).

2.2. Recruitment and data collection

Communities were selected based on: (i) previously expressed community commitment to support food and nutrition projects, and (ii) the presence of strong community groups, including maternal and child health groups. The community engagement process was led by two Aboriginal Community Controlled Health organisations who invited four communities (two control and two strategy) in each region to participate. Participants in the larger study were all Aboriginal and/or Torres Strait Islander pregnant women, women breastfeeding children up to five years, and parents/carers of children aged six months to five years, who identified as a resident and planned to reside in the community for the next eight months. Recruitment into the larger study was via local Aboriginal researcher assistants, clinic and childcare staff. Qualitative interviews occurred in the four strategy communities and involved the project team working with local Aboriginal researcher/s over five days in each community (two communities in Cape York, North Queensland and two in Central Australia, Northern Territory). After accepting the invitation for the larger study, participants were offered a subsequent qualitative interview. Interviews were conducted in English as planned with implementing partners and audio recorded. Each participant was given an AUD20 credit for their household electricity meter in acknowledgement of their contribution. In participating communities where household electricity is supplied through card-operated pre-payment meters, this method of reimbursement was chosen by Community Advisory Groups and project team members as a form of reimbursement that would be valued by participants and not directly impact food spending (related to the outcome of the larger study).

2.3. Interview instrument

The development, pilot testing and use of a semi-structured instrument was overseen by a Project Advisory Group. The instrument aimed to explore the lived experiences of food insecurity in remote Aboriginal and Torres Strait Islander communities. Questions were drafted from a brief review of the qualitative literature examining food insecurity in remote Indigenous communities globally (Bryce et al., 2020, Ferguson et al., 2017, Ford and Beaumier, 2011, Loring and Gerlach, 2015, McCarthy et al., 2018, Power, 2008, Skinner et al., 2013). Draft questions drew heavily on the work and experience of McCarthy et al. (2018), a member of the Project Advisory Group. The instrument

explored four main areas: (i) conceptualisation of food security/insecurity, (ii) the experience of food insecurity and coping strategies, (iii) factors contributing to food insecurity, and (iv) suggestions to improve food security. An adapted version of the Good Food Systems definition of the term food security (Menzies School of Health Research, 2016) was printed on a laminated A4 card and used as a participant visual prompt and discussion starter to clarify the interview purpose. Instrument pilots were conducted with Project Advisory Group members (n = 4) and Aboriginal and/or Torres Strait Islander staff working in Aboriginal Community Controlled Health Services (n = 4). Minor modifications included a reduction in the number of questions, changes in phraseology and question sequence, with further refinement to sequencing made in the field after interview one.

2.4. Data analysis

Data coding and interview analysis (n=17) was led by the first author, with input from six members of the research team, including Aboriginal, Torres Strait Islander and non-Indigenous members. Professionally transcribed interviews were checked against the audio files for accuracy with minor amendments. Green et al.'s (2007) four stage thematic analysis was undertaken (Green et al., 2007). Data immersion was achieved by transcribing a sub-sample, then reading and re-reading the transcripts to become familiar with the data (Stage 1). Data files were imported into NVivo (Version 12.6, QSR International) for management and coding (Stage 2). Data were coded and a sub-sample (n = 6) were blind cross coded. Deductive codes were developed from the transcripts and recorded in a code book. Comparison of nodes and code books was undertaken with team members until consensus was reached, with agreement on node definition, labelling and structure (Stage 3). Inductive codes were proposed via an iterative process and discussed with further code refinement into areas of commonality and agreement on the broader themes (Stage 4). In terms of theoretical sufficiency, saturation or the point at which issues were fully understood, occurred by the tenth interview, and no further apparent insights occurred by the thirteenth interview (Hennink et al., 2017). Participants data on improvements to household food security were categorised into levels according to the socioecological model (McLeroy et al., 1988).

3. Results

Seventeen women from four Aboriginal communities (eight women from Cape York, nine women from Central Australia) were interviewed in June–July 2021. The results are summarised (Fig. 1) and presented below. The upper part of the Figure presents the three main and corresponding sub-themes arising from the data. The lower part of the diagram presents the main thematic components described by interviewees which constituted their conceptual sense making of the specific concepts of food security, food insecurity and its drivers.

3.1. Terms and conceptual elements of food security/insecurity

No specific term or phrase was used by participants to describe the experiences of being food secure however, three conceptual elements were expressed. These were: 1) the ability to share food as an expression of family caring, 2) having sufficient food, variety and choice, and 3) food facilitating a relaxed family atmosphere (Fig. 1). Food security incorporated food sharing, the ability to invite family over to partake in '*a big cook up*' and spending time together knowing there was enough food. Sharing food with extended family was the cultural norm and this care was extended to families experiencing difficulties. Sufficient food, variety and choice to ensure children ate consistently was important '*to*

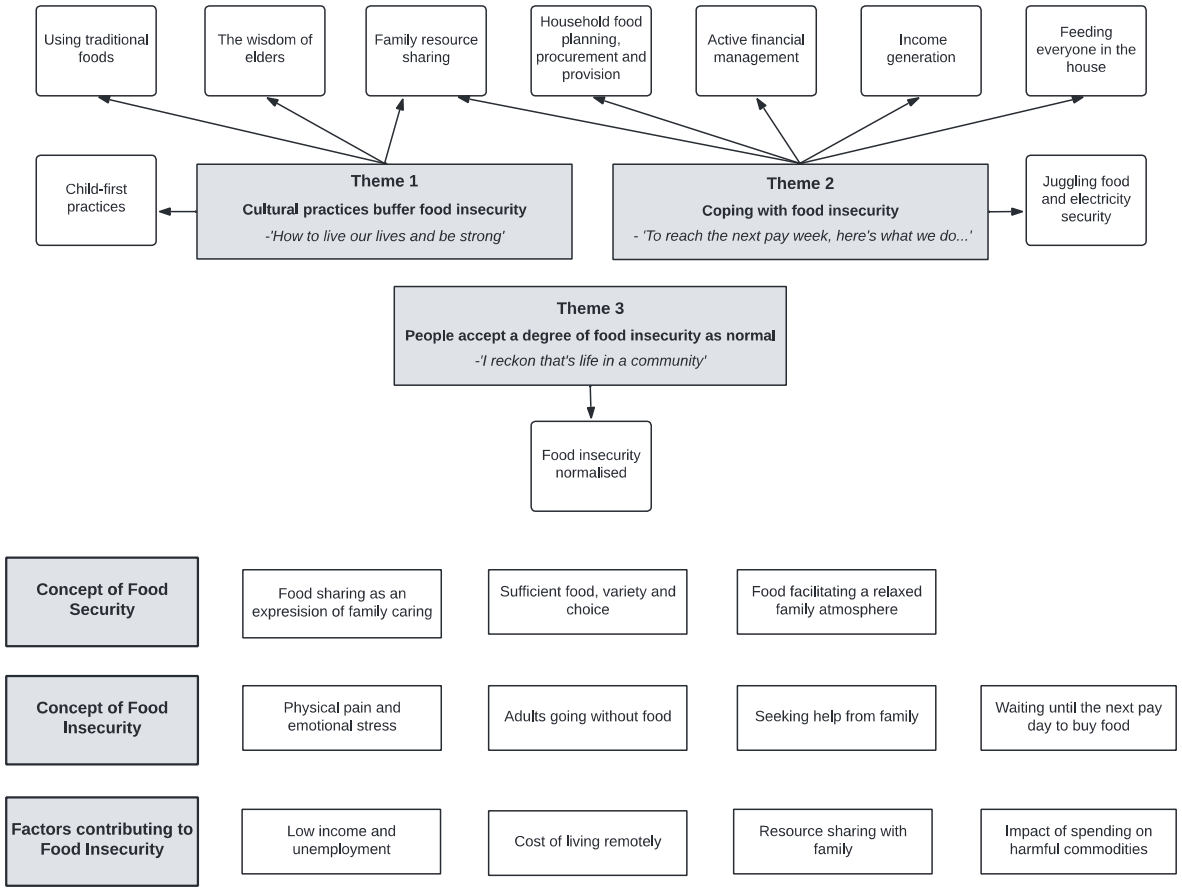

Fig. 1. Summary diagram of key interview themes and sub-themes.

help them for growth…'. Food sufficiency included striving towards a well-stocked household pantry and fridge to accommodate children's desires for extra food (treats or snacks). This was connected to overall family happiness or as one participant said, *'..when they're* [the children] *happy, I'm happy and I don't need to stress and worry ….I can tell them go and get* [food] *out of the fridge..'*The ability for parents to relax without the relentless worry of not being able to afford enough food for everyone was integral to quality family time and connections and described as "*a good feeling*".

Four elements of food insecurity emerged from participant accounts including physical pain and emotional stress, adults going without food, seeking help from family, and having to wait until the next payday to buy food (Fig. 1). Physical pain and emotional stress were recounted as a consequence of hunger with comments such as *'guts are hurting and people are upset'*, 'and *I'm always grumpy when I have no food'*. Running out of food was stressful and sometimes a trigger for arguments. Most adults reported going without food to ensure enough for the children and seeking extended family assistance was an important cultural coping strategy. Reciprocity that underpinned food sharing arrangements was commonplace and is explained in the following quote: *'we usually like have to go ask in-laws and stuff like that for a top up, but it works both ways because if they've* [got] *nothing and we've got it we'll share it ….*' (Participant 7).

The high cost of remote living, combined with other factors such as food sharing with extended family meant that the food purchased often didn't last until the next pay day. Many participants were resigned to the fact that this was the way things worked in remote communities and aside from asking family for help, there was little else they could do except '.. … *wait …until we get a pay…*'.

3.2. Factors influencing food insecurity

Four factors contributing to food insecurity were described by participants and included living on a low income, the costs of living remotely, the levels of resource sharing with family, and the impact of spending on harmful commodities (Fig. 1). Low income and unemployment were omnipresent with the majority of participants either working part time or reliant on government social assistance payments. Regardless, incomes were insufficient to cover living costs such as food and household electricity e.g. due to high use of air conditioning in remote communities. Sharing practices amongst extended family buffered the cost of remote living. Sometimes sharing caused those providing to run short of food themselves, causing family tension. Automatic income deductions (e.g., personal loans, debt repayments or government penalties) resulting in '*short pay*' were common and varied the amount of income received per week '*to do proper shopping for food'*. Accessing what participants perceived as cheaper food at supermarkets in major towns was desired but dependent on reliable transport.

Electricity security (having sufficient pre-paid credit on the household electricity meter) was coupled to food security; namely without electricity for the fridge, purchased fresh food would spoil. Use of air conditioners, especially by children, was closely monitored as it had the potential to significantly impact household electricity credit. Spending on harmful commodities and activities such as alcohol, gambling, and cigarettes also impacted on household food and electricity insecurity in both Central Australian and Cape York interviews, as illustrated in the quote below:

> *'The struggle is because there's alcohol in town ….. and then they haven't got money to buy the fresh stuff, to do their shopping. And they're .. gambling. Some families with kids in the household, it's a struggle. They run out of power; they start getting frustrated…* '(Participant 13).

3.3. The experience of food in/security

Three major themes traversed the participants' experiences of food security/insecurity (Fig. 1) and these are presented below.

3.3.1. Cultural practices buffer food insecurity – 'how to live our lives and be strong'. (Participant 8)

Cultural practices buffered but did not solve the experience of household food insecurity and notably, these practices occurred regardless of whether households were experiencing food insecurity or not. Cultural practices were categorised into four interconnected subthemes.

Family resource sharing during episodes of food insecurity (food, meals, cash, Basics Cards[1] and electricity credit) was commonplace. Participants spoke of regularly asking extended family to share food, both traditional and store bought, when they ran out of food and had no money to buy more as shown below.

> *"… when we don't have enough food I …go ask around family members. ….. I go to my first friend I ask her for.. meat and bread and my friend will give me. I'll go to my second friend, I'll ask for cordial and then I go to my third friend, I will ask for noodle …. I usually go to couple of houses and return home with food…. … that cycle is really good Aboriginal cycle … food wise'* (Participant 2)

Child-first practices involved feeding children first and seeking food from family was often prioritised to securing food for participants' children specifically, with adults eating little food or going without. Participants spoke of placing calls to family to *'help us buy a feed, the kids are hungry'*, or asking for '*four or five Weetabix*[2] *and a little bit of milk'*, and packets of dried noodles for the children. Food requests from extended family were rarely refused with participants describing keeping some food for themselves. Adults shielded children from food insecurity and tended to '*hang back'* at mealtimes until the children had all been fed or as one woman said '*…us adults we don't really mind not having food, long as the kids get fed…*'. A child-first approach influenced households to *save* money and purchase shelf-stable food to allow children to be fed well in the 'off pay' week as one woman said '*…we put it* [food]*away …for the kids …. And just lock it up…*'. (Participant 4).

Community Elders were described by some participants as providing wisdom on culture, childrearing and home management to ensure resilience and support household food security. Advice imparted by mothers, aunties and grandmothers to participants included household budgeting, advice on getting a job, giving up smoking, gambling and drinking, buying food regularly, in bulk and storing food for emergencies.

Traditional foods were regularly used to provide fresh seasonal food, especially meat. Consuming traditional foods meant participants were not solely reliant on food purchased from the community store; or as one participant simply commented*, everything out on country, like the bush food is all free'*. Traditional foods eaten in Cape York included wallaby, wild bullock, turtle, barramundi, black bream, and catfish (fish), mussels, mud crabs, prawns, crayfish, flying fox (fruit bats), scrub turkey, wild pig, magpie goose and eggs. Central Australian participants described eating kangaroo, parenti and goanna (lizards), emu, witchetty grubs, bush onion, tomato and potato.

The ability to routinely access traditional food was reported to hold cultural importance for Aboriginal people and was especially valuable to mitigate episodes of food insecurity, to manage until the next payday or to cater for visiting relatives as explained below:

[1] The government income management scheme pays regular bills from an income management account and the remaining balance transfers to the Basics Card. The Basics Card can be used to buy food, clothes, health and hygiene items and in some cases transport services. https://www.servicesaustralia.gov.au/basicscard (accessed 17 March 2022).

[2] breakfast cereal biscuits.

'.. we might have relatives comes around, …and then come to realise that there's not enough [food]*, and then we have to go out on country and get some food ….'* (Participant 14).

Owning a car was required for accessing traditional foods, given the distances involved in getting to locations where animals such as kangaroos might be found. Participants without a car either borrowed a vehicle or were given food from family members returning from hunting.

3.3.2. Coping with food insecurity-'To reach the next pay week, here's what we do…' (Participant 2)

Routine and comprehensive strategies to cope with episodic food insecurity were evident across all participants including four sub-themes described below.

The majority of participants were aware of, or had used, innovative ways to generate additional income to combat the cost of living remotely. Selling items in the community was common and included sales of home-made take-away meals, small bags of lollies or potato chips (bought in bulk and re-bagged for sale), drinks, clothes, artwork, and other items. Items offered for sale were advertised through word of mouth or in one community via social media. One participant described selling traditional food (turtle) and a drink as per the quote below.

'We.. got sea turtle from a partner's family sent down, so we cooked it all up, sold it for $10 with drinks and people kept coming back and asking for more and more …. So, it's a nice little way to make a bit of extra cash'. (Participant 11)

Gambling was also used by some participants as a way to generate additional income. For one participant the process was somewhat complicated with success dependent on winning the initial card game as she explains:

'…. I'm going to gamble to make the money to buy the sweets ….and then sell, to make the money again to buy the food yeah… extra food, yeah. (Participant 1).

Household food planning, procurement and provision involved constantly managing food in the household to make it stretch until the next pay week and to be able to feed everyone. Thinking and planning for provisioning focused on timing food purchases, for example shopping to synchronise with weekly store deliveries so as not to miss out on certain popular food items.

'.. The truck comes in and it's pretty hard … like people get paid on a Friday, the stuff's [fresh produce] *already gone Tuesday, Wednesday, Thursday, you know? There's none for the Friday, Saturday shopping…'*. (Participant 13)

Co-ordinating food shopping with other adults in the house and their respective pay cycles was used to ensure a consistent 'flow' of food into the home. Planning shopping trips and associated transport to town supermarkets enabled people to stock up on cheaper items, but those without transport were limited to shopping at the community store.

Trying to feed everyone in the house was a common struggle in remote communities and may compromise food security. Some participants mentioned they try to make the food stretch to feed everyone who was staying or visiting, or they may '*…save the food until it's... night and count how many people live in the house*'. Additionally, the arrival of extended family from other communities may exacerbate this as the timing and extent of visits was often unpredictable, putting additional pressure on hosts to provide food.

Food insecurity was linked with constant juggling to afford household electricity. Sufficient electricity was described as critical for the operation of fridges, freezers, and air conditioners. Stories of people purchasing food and not buying power credit for various reasons were common thus risking food spoilage along with the stress and frustration in trying to '*keep the power going*'. Sufficient electricity was important for mothers with young children to keep them sufficiently warm in winter and cool in summer. For one participant, electricity was prioritised over food purchases which contributed to stress about the pre-paid credit running out.

'We did it the other way round [bought electricity before food] *because we had the air cons and my kids they're crazy for air con,..and so they let that run you know…You couldn't explain to them,.. the power will run up quick if we use air con all day every day. …* (Participant 16)

Most participants actively budgeted and managed finances to prioritise feeding the children with carefully planned and prioritised food purchases. The ability to buy food from town supermarkets and stock up the pantry several times a year was helpful. Some participants proudly described their budgeting practices, often self-taught, as they observed other families' *rush into buying things 'cause ..they've got ..money'* and spending all their income without allowing for food purchases.

3.3.3. People accept a degree of food insecurity as normal - '.. I reckon that's life in a community' (Participant 13)

Participant's stories of the high cost of remote living were consistent, as was an awareness of community members who were food insecure. Food costs, access, quality and cultural sharing obligations meant that some participants regularly ran out of food or money for food before the next pay week. High food costs were considered a normal part of remote community life or as one woman said:

'The baby powder is nearly $8. You only pay like $4 in [town supermarket]*…But I reckon that's life, in a community… That's where the struggles are, you know?* (Participant 11)

3.4. Suggestions for improving food security in remote communities

Policy level suggestions addressed key food security determinants such as more affordable public transport options, food and electricity and an increased frequency of government social assistance payments. For example, subsidised flights to major centres were too expensive for families and bus transport to major towns in some communities had ceased as the following quote illustrates:

"A couple of years ago they had a really big bus, that used to take everyone to… Cairns but it broke down, and council couldn't afford to buy another …."(Participant 13)

Community level suggestions focused on ways to improve food access and cost ranging from advocating for changes to the local store, online grocery shopping and alternative providers such as a mobile fruit and vegetable van. A local bus to provide transport to access traditional foods was suggested for participants who did not own cars, along with recreational programs to reduce the persistent stress of food insecurity. One participant suggested a community owned farming operation in Cape York where locals can gain horticultural skills, knowledge and secure employment. Individual level suggestions focussed on individual training and support programs to increase household income. Examples mentioned included support to quit smoking because *"it's really too dear",* household budgeting and financial literacy and computer skills courses (for the goal of online grocery orders i.e., accessing cheaper food) as mentioned below:

"Maybe if people could have access to doing online shopping … if there were computer set up somewhere like community computer that you could use". (Participant 5)

4. Discussion

This study aimed to determine parents' and carers' perceptions of the lived experience of food insecurity in remote communities, including the terminology used, depth of experience, influencing factors, coping strategies, and suggestions to improve food security.

4.1. Terminology

No specific term for either food security or insecurity was reported by the participants, whereas other studies have reported specific terms, for example, Bryce et al.'s (2020) study among remote households on the Anangu Pitjantjatjara Yankunytjatjara Lands noted that the term 'hungry days' was used to refer to days when two or more meals were missed (Bryce et al., 2020) and 'damper week' or 'nothing week' used in a Northern Territory study when money was in short supply and family were relied on to help with money or food (Brimblecombe et al., 2014). The lack of specific terminology in study communities may relate to Aboriginal communities being heterogenous and terminology for experiences may vary across the country, and/or due to differences in methodology with these interviews nested within a larger study and the former studies taking an ethnographic approach.

4.2. Conceptualisation

Conceptual descriptions of food security in the current study were characterised by being able to share food with extended family, having sufficient food variety and choice, and a relaxed family atmosphere. Sharing of resources (e.g., food, money) in Australian Aboriginal culture provides a safety net (Finlayson et al., 2000) and demonstrates strong relationship bonds (Brimblecombe et al., 2014) and occurred regardless of food security status. Some overlap exists between this study and international work such as Domingo et al.'s (2021) work with First Nations communities in Ontario, in terms of the importance of traditional food and cultural food sharing practices (Domingo et al., 2021).

Conceptualisation of food insecurity was characterised by physical pain/emotional stress of hunger, seeking family help and having to wait until the next payday to buy food and these align closely with the literature on physical and mental impacts of food insecurity (Gundersen and Ziliak, 2015; Polsky and Gilmour, 2020, Thomas et al., 2019).

4.3. Food insecurity as a form of trauma

The depth of food insecurity reported could be considered traumatic with some arguing food insecurity creates trauma either as single event or in an ongoing manner (Hecht et al., 2018); with trauma defined as an emotionally painful or distressing experience possibly impacting physical and mental health (Straussner and Calnan, 2014). In the study communities, it is reasonable to surmise that the trauma of repetitive food insecurity was overlaid onto stressors such as inequality, racism (Paradies, 2016), and higher costs of living, all of which may have long term health consequences. Factors such as poverty, low income, unemployment and the costs of living were described by participants as contributing to food insecurity and are consistent with the literature in Australia (Brimblecombe et al., 2014; Bryce et al., 2020; Spurway and Soldatic, 2016). Other contributing factors included resource sharing with family and the use of income towards the purchase of harmful commodities and activities. This is unsurprising as alcohol and cigarette smoking are commonly used ways of coping with life stressors, especially experienced by low socio-economic groups (Krueger and Chang, 2008).

4.4. Normalisation of food insecurity

Episodic food insecurity coinciding with social assistance payments described in this study as a 'normal' part of remote community life, was consistent with the broader food insecurity literature (Brimblecombe et al., 2014; Crotty et al., 1992; Lee et al., 1994; Rowse et al., 1994; Saethre, 2005) as well as urban Aboriginal and Torres Strait Islander families (Browne et al., 2009; Fredericks et al., 2021; McCarthy et al., 2018). The term 'normalising the abnormal', coined by Silvasti (2015) with respect to the provision of food aid to food insecure people (Silvasti, 2015), resonates with the findings of this study. Namely that an issue that would generally be considered 'abnormal' or unacceptable, ie episodic food insecurity and its associated drivers (e.g., inadequate income, high food prices) is considered normal in this context.

4.5. Coping and adapting

Application of innovative coping strategies demonstrates resourcefulness and aligns with general food insecurity literature across vulnerable populations (Booth, 2003, Pollard et al., 2020). Income generation through sales (e.g., lolly/potato chip bags) in order to buy food or electricity credit was common, but absent from the Australian literature and arguably demonstrates a determined effort to ward off food insecurity. Such activities are evidence of a robust informal cash economy – often synonymous with poverty and limited economic opportunities where individuals engage in innovative revenue raising activities that increase household income directly (Roberts, 2009). The extent of coping mechanisms reported is consistent with Christiansen and Boisvert (2000) who suggest food insecurity is an actively "managed process" with foreseeable patterns and people taking action to intervene before it reaches crisis point (Christiansen and Boisvert, 2000).

Other coping mechanisms such as resource sharing and access to traditional food has been consistently reported in studies of Australian Aboriginal and Torres Strait Islander people (Bourke et al., 2018; Jackson et al., 2012; McCarthy et al., 2018; Spurway and Soldatic, 2016) and First Nations people from Canadian remote sub-artic communities (Skinner et al., 2013). Ferguson et al. (2017) reported 89% of Northern Territory study participants consumed traditional foods at least fortnightly and of those who reported to be food insecure (76%), 40 percent obtained traditional food to alleviate food insecurity (Ferguson et al., 2017). This study's findings concur with Power's (2008) notion of 'cultural food security' in remote Aboriginal and Torres Strait Islander communities and aligns with academic calls (Sowerwine et al., 2019) for expanded ways of defining food security that incorporates culturally relevant measures. 'Cultural food security' is an additional dimension of food security beyond individuals, households and communities and asserts the harvesting, sharing and consumption of traditional food are integral to cultural identity and survival (Power, 2008). 'Cultural food security' should be considered as a dimension additional to the existing six dimensions of food security (HLPE, 2020) and indicators may include access to and knowledge of traditional foods (Power, 2008).

4.6. Electricity and food insecurity

A nexus between electricity insecurity and food insecurity was documented in this study and although tensions between food and energy insecurity ('heat or eat') have been well documented internationally (Bhattacharya et al., 2003; Snell et al., 2018) this is new in the Australian literature. Electricity credit for households had to last until next pay day and be able to run basic appliances such as refrigerators and air conditioners in extreme heat conditions. Insufficient household funds for electricity credit may compromise fresh food stored in the refrigerator which can quickly spoil. Cost of living impacts e.g. large electricity bills have been noted in an urban Aboriginal households (McCarthy et al., 2018) but marked differences exist in how electricity is supplied and paid for between urban and remote settings. Electricity security to remote Australian Aboriginal communities remains a concerning issue (Energy Energy Consumers Australia, 2019; Queensland Council of Social Service, 2014) and this was consistent with our study. Arrangements for electricity purchasing and supplies for study communities were highly complex and variable as was consumption and may include pre-paid cards and some government rebates. Factors reported to impact electricity affordability include inefficient appliances and poor quality rental housing (e.g., no insulation or draft proofing) (Mackenzie, 2013; Queensland Council of Social Service, 2014).

Energy insecurity impacts on health with children in moderately or severely energy insecure homes more prone to food insecurity,

hospitalisations, poorer health and developmental issues than children in energy secure homes (Cook et al., 2008). Given this, the health impact of energy insecurity may be an issue for study participants and their children irrespective of its impact on food security. Reliable electricity supplies are critical for daily survival, especially for mothers with young children and require collaborative action across government, industry and community stakeholders (Energy Consumers Australia, 2019; Queensland Council of Social Service, 2014).

4.7. Suggested improvements

Participant suggestions for improving food security are a valuable starting point grounded in reality. These suggestions offer the opportunity for co-creation of tailored, and innovative community owned and driven solutions to improve food security with leadership from all levels of community and government. These may include policy levers and strategies that primarily aim to increase the amount of income available to low income households (e.g., increased social security payments and access to cheaper food or electricity). In addition, access to financial services such as interest free loans, advice and payment plans may assist with buffering the economic 'shocks' that come with living in poverty (Mackenzie and Louth, 2020). These measures help households achieve income stability and predictability, in contrast to the existing experience of periods with and without food related to social assistance payment cycles (Pollard et al., 2019). Community advocacy efforts to improve store foods and prices may be more effective at the government and food manufacturer level, as store owners may have already implemented practices and policies to improve healthy food affordability in remote stores (Ferguson et al., 2018; Lee and Ride, 2018)

4.8. Strengths and limitations

This study builds on foundational and current work in remote Australian food security (Brimblecombe et al., 2018; Brimblecombe et al., 2014; Bryce et al., 2020; Jackson et al., 2012; Rowse et al., 1994; Saethre, 2005) by providing further insight into how food security/insecurity is conceptualised from the perspective of Aboriginal and Torres Strait Islander people, which is critical to the development of feasible and acceptable solutions. The goal of this qualitative research, like most qualitative studies was provide a rich, textural, understanding of a human experience (Myers, 2000). Generalisability, or the degree to which findings from the study can be generalised to other populations experiencing food security (Polit and Hungler, 1991) may be limited. Whilst Aboriginal and Torres Strait Islander communities are highly diverse and non-homogenous (National Health Medical Research Council, 2018), partial generalisations (Myers, 2000) with respect to the experience of food insecurity, for which there are some common contributing factors (Lee and Ride, 2018), may be possible to other remote Aboriginal and Torres Strait Islander communities. A key strength of this research is the mixed composition of the team which included Indigenous and non-Indigenous people working together in all project stages.

Visual methods (such as flash cards or photovoice) are easily accessible, empowering and foster engagement for many people including those with English literacy issues or those experiencing disadvantage (Booth et al., 2018). Phase 2 of the larger study used PhotoVoice to explore participants' experience of food insecurity and proposed solutions for improvement. The use of pictorial flash cards in this qualitative study may have increased participation and engagement.

5. Conclusion

These study findings build on previous research and the similarity of findings offer compelling evidence for socio-political systems to act to uphold the dimensions of food security. Specifically, this study has provided a deeper understanding of the complex challenges facing parents and carers experiencing food insecurity in remote communities. People and families work hard to manage and cope with food insecurity episodes which involve both resourceful methods and accessing traditional foods and cultural practices. Similar to the experience of Aboriginal and Torres Strait Islander people living in an urban environment, episodic food insecurity was considered 'normal' in remote study communities. Food insecurity is a marker of material and persistent household deprivation and was closely linked to electricity insecurity. Our findings highlight community-driven suggestions to inform policy and tailored solutions for families, based on their lived experience. Further work is needed to operationalise these policy level suggestions to improve food security in partnership with key stakeholders from community, state and territory and federal government levels.

Credit aurthor statement

Sue Booth: Methodology, Formal analysis, Investigation, Data Curation, Writing – Original draft preparation, Writing – Review and editing, Project administration.*Caroline Deen:* Methodology, Formal analysis, Writing – Review and editing, Project administration.*Kani Thompson*: Formal analysis, Investigation, Writing – Review & Editing.*Sue Kleve:* Methodology, Formal analysis, Writing – Review and editing, *Ellie Chan*: Methodology, Investigation, Data Curation, Writing- Review & Editing, Visualization, Supervision *(Community Research Assistants)*, Project administration.*Leisa McCarthy* Conceptualisation, Methodology, Formal analysis, Writing – Review & Editing, Funding acquisition.*Emma Kraft:* Investigation, Writing – Review & Editing.*Bronwyn Fredericks*: Conceptualisation, Methodology, Writing - Review & Editing, Visualization, Supervision, Funding acquisition.*Julie Brimblecombe:* Conceptualisation, Methodology, Writing – Review and editing.*Megan Ferguson*: Conceptualisation, Methodology, Resources, Writing - Review & Editing, Visualization, Supervision, Funding acquisition.

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Data availability

The data that has been used is confidential.

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