

Living with food allergy: What this means for children

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Abstract

Health-related knowledge, skills and attitudes that translate to behaviours are important foundations for healthy living. However, deficiencies in any one of these factors have the potential to impact quality of life. This study investigates how Australian children perceive and manage their food allergy as they transition through childhood onto adolescence. To measure this, children aged 12 years and under completed an online survey [under 8 years and 8–12 years] on knowledge, skills and attitudes. Although recruitment involved advertisements to over 700 Australian pre-schools, 44 allergy specialists and multiple representations to the patient support group, Allergy & Anaphylaxis Australia, completion relied on parental notification and/or guidance. Of the 139 participants recruited, 114 commenced the survey with 65 participants under 8 years (58%) and 49 between 8 and 12 years. Results showed participants recognised different ways to keep safe with children under 8 years ($N = 65$) 100% cognisant of the need to check with ‘Mum/Dad’ or teachers if they could safely eat food as well as the importance of not swapping lunches, while there was a slight change in compliance for those aged 8–12 years as three (6.1%, $n = 3/49$) children did not see the necessity of asking an adult/teacher if a food item was safe to eat. Older children were also less likely to tell friends about their food allergy even if they thought they were having an allergic reaction, despite children under 8 years more likely to feel different to friends (38%, $n = 24/64$) compared to those aged 8–12 years (31%, $n = 14/45$). Although both groups disliked parents’ fussing, for children under 8 years, there was a strong association between this and ‘feeling different to friends’. Results from this study highlight the importance of normalising food allergy at home and in the community, so children are confident in telling others about their food allergy.

Keywords

Food allergy, food management, knowledge, skills and attitudes, quality of life, food allergy in children, health knowledge

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Introduction

Food allergy, the result of an immunological response to an allergen in food, can trigger multiple symptoms, some of which can be life-threatening (Sicherer and Sampson, 2018). With no known cure, although some may achieve immunological tolerance, those diagnosed with a food allergy must take positive steps to avoid the allergen. To do this, children must check whether the food is safe to eat. However, this requires reliance on third parties, and this can be challenging for children as they must identify themselves as having a food allergy, which could increase the risk of isolation, bullying and low self-esteem (Flokstra-de Blok et al., 2009; Peniamina et al., 2016; Rocheleau and Rocheleau, 2020; Stensgaard et al., 2017).

International studies show food allergy impacts health-related quality of life (QoL), particularly psychosocial well-being (Flokstra-de Blok et al., 2009; Peniamina et al., 2016; Stensgaard et al., 2017), and with approximately 10% of Australian children reportedly affected by food allergy, this potentially changes many lives (Peters et al., 2017; Tang and Mullins, 2017). For those living with a food allergy, the challenges include knowing when to seek help and how to respond when having an allergic reaction as hospitalisation rates continue to rise (Tang and Mullins, 2017).

Children must also learn to navigate a world where food is more than just what we eat; it defines who we are (Dean et al., 2015; Peniamina et al., 2016). While children living with a food allergy look to responsible adults for guidance and their friends for acceptance, feeling different to friends can increase vulnerability and lead to stigmatisation (Annunziato et al., 2014; Dean et al., 2015; Fong et al., 2017; Rocheleau and Rocheleau, 2020).

Adopting a quantitative research approach, this study incorporated a health knowledge, skills and attitudes (KSAs) framework to explore how Australian children feel about food allergy. Questions included 'how to keep safe' and 'how children perceived food allergy' as it was hypothesised a deficiency in any one of these factors will impact healthy living (Flokstra-de Blok et al., 2009; Peniamina et al., 2016; Stensgaard et al., 2017). This study was an opportunity to advance medical literature and 'tell' the Australian story for those living with a food allergy as the authors believe this is the first comprehensive online survey to give those in regional and remote areas of Australia the same opportunity to participate in a QoL study as metropolitan centres.

Aim

To explore how Australian children perceive food allergy in terms of social segregation and identify whether the 'how to keep safe' message is known and applied.

Methods

Conducted between May and December 2015, this study explored multiple facets of food allergy from a child's perspective.

Recruitment of sample population

Recruitment was externally driven to identify those living in the community with food allergy. Formal distribution channels included letters to over 700 Australian pre-schools across all states and territories (53.8% regional locations) and 44 allergy specialists practising across Australia, primarily in capital cities, requesting onward notification of the survey to parents and patients. Allergy &

Anaphylaxis Australia, the national patient support organisation, also promoted the study through its public and private domains [Facebook and Members Newsletters]. In July 2015, the principal researcher (DS) presented information about the survey on regional radio (Australian Broadcast Commission (ABC) Bega and Orange, New South Wales (NSW) and television news (7Prime and WIN) in the NSW Riverina and Illawarra regions).

Parents were encouraged to log on and read the Participant Information Sheet for additional information, although the child needed to complete the online survey. However, with no requirement to confirm IgE status, participation relied on self-selection and a willingness to engage. For children, this relied on parents notifying and then having them complete the survey.

To overcome potential issues around selection and social desirability biases, several methodological approaches were employed. These included what is collectively known as Dillman's Tailored Design Methods, where promotion of the survey is through follow-ups and highlighting both the importance and confidentiality aspects of the study (Dillman et al., 2009). Questionnaires were also designed to be self-administered without the need for third-party assistance (Larson, 2018; Nederhof, 1985). In addition, we included pre-populated answers to the questions, so children could select what applied to them without the need for parental guidance (Larson, 2018; Nederhof, 1985). By acknowledging there may be parental assistance in helping their child read the question, the survey's preamble gave instructions that all answers were the child's and not what was assumed.

Survey design

Children residing in Australia aged 12 years and under and living with a food allergy completed an online, cross-sectional survey on QoL and KSAs. Hosting the survey on the cloud-based platform SurveyMonkey® (San Mateo, CA, USA), chosen for its ability to retain relevancy, the ease of navigation and the program's risk minimisation strategy of checking registered IP addresses to prevent duplication ensured SurveyMonkey® captured all responses. This recording of IP addresses also permitted the cross-matching of data between parents and children's surveys. Finally, all prospective participants were required to give informed consent (parental agreement).

To measure QoL and KSA, children answered age-appropriate questions, based not only on previous studies but also on pedagogical and educational principles around cognitive development and the ability to apply rational thinking and imagine scenarios (Fischer & Bullock, 1984; Flokstra-de Blok et al., 2009; Stensgaard et al., 2017). While all children were asked questions on social interaction and how they felt about their food allergy, those aged 8–12 years also answered questions on dislikes using pre-populated responses based on one of the researcher's clinical experience and earlier QoL studies (Bollinger et al., 2006; DunnGalvin et al., 2009). Children, 8–12 years, could also provide individual comments using the free format field.

Vocabulary also changed to encourage participation; for example, 'spewed' was used in the under 8 years survey, reverting to 'vomited' for those aged 8–12 years when asked what happened when they ate the allergenic food. The number of questions each group answered was also different, and for those who may have needed parental help, instructions referenced the child's answers and not what they, the parents, thought.

Statistical analysis

Statistical analysis was performed using SPSS version 24.0, SPSS Inc. (USA) and JASP version 0.14.1 (The Netherlands) and included both descriptive and inferential statistics. Significance was

measured at the level of 0.05. For categorical/ordinal data, the following non-parametric tests (Kendall's Tau-*b*, Mann–Whitney *U* test and Somers' *d* test) were run to determine the strength of the association between proportions or the probabilities across the two groups of participants (Kendall, 1938; Mann and Whitney, 1947; Somers, 1962). This analysis included not only identifying differences across school years, age and gender but also the interaction between different social engagement factors as emotions are not experienced in isolation (Coppin and Sander, 2016).

Descriptive statistics were also used to evaluate perceptions. All children answered questions on 'what my food allergy means to me?' while questions in the 8 years and over survey asked children to identify up to four things that they did not like about food allergy. The analysis involved the creation of a multi-dichotomous table, and responses were based on valid percentages.

Missing data

To ensure the accuracy of the data reported, the results presented use valid percentages to account for the number of responses. This approach resulted in different '*n*' values represented throughout the Findings section as all questions were analysed based on the number of responses divided by the number who completed each question.

Findings

Of the prospective study population, we estimate the demographic characteristics represent approximately 0.1% of the Australian food allergy community based on data from the 2016 Australian Census Data and the findings from the HealthNuts study (Australian Bureau of Statistic 2016; Peters et al., 2017).

Age distribution was 65 children aged under 8 years and 49 children aged 8–12 years. For those aged under 8 years, 40 (61.5%, *n* = 40) were either at pre-school or did not attend school so likely needing parental assistance. However, as we did not ask actual ages, we are unaware of how young the children were when completing the survey. Gender was also skewed across both age groups, with high numbers of boys in each age group completing the survey.

The most prevalent allergen was peanut with 4.3% more children aged 8–12 years reporting this compared to those aged 8 years and under (73.5%–69.2%), and this change supports the transition reported in the HealthNuts cohort where egg allergy was the most prevalent in children aged 12 months to peanut allergy by the age of four (Peters et al., 2017). Co-morbidity with other atopic allergic disorders was also high, with 44 children (69.8%, *n* = 63) aged under 8 years reporting eczema and 23 children (50%, *n* = 46) aged 8–12 years reporting hay fever. Though eczema was the most reported allergic disorder by Peters et al. (2017) in the HealthNuts study for those aged 4 years (48.3%, *n* = 70/145), the percentage reported in our study was higher (69.8%, *n* = 44/63), and this difference was significant when a chi-square test was performed ($\chi^2(1) = 7.87$, CI: [6.47%, 33.85%]). However, for the reported condition of asthma, there was no difference between the HealthNuts population (34.5%, *n* = 50/145) and our study (44.4%, *n* = 23/63), even though significant differences returned when co-morbidity to asthma and eczema was compared for those aged 8 years and under ($\chi^2(1)=9.18$, CI: [6.45%, 32.72%]) (Peters et al., 2017).

In addition to allergy status, we were able to cross-reference where children lived to 87 parent questionnaires. The results identified 53 responses (81.6%, *n* = 65) matching children aged under 8 years and 36 responses (73.5%, *n* = 49) for those aged 8–12 years with two parents reporting food-allergic children across different age groups. There were slightly more children (parents) residing in

capital cities compared to regional locations. Table 1 summarises participant characteristics; although as most demographic questions were at the end of the survey, we have incomplete data for five participants.

Cross-matching of data also identified of the 87 parents, 79 reported ownership of an adrenaline auto-injector, and 11 (13.9%, $n = 11/79$) reported using this device in the preceding 12 months. Although hospitalisation rates due to food-induced anaphylaxis continue to rise in Australia, estimated at 0.03% [children aged to 4 years], this is not the 10–14% reported by parents in our study (Tang and Mullins, 2017). With these results, it is indicative that the sample population does not follow a normal distribution of food allergy in the community; instead, it appears to cover children more likely to experience severe reactions and have more co-morbidities than those reported on in the HealthNuts population (Peters et al., 2017). This confirms the need for non-parametric testing.

Identifying ways to keep safe

Responses to questions on ‘how to keep safe’ demonstrate children were able to recognise the steps needed to keep safe. For children under 8 years, they were 100% cognisant of both the need to check with ‘Mum/Dad’ or teachers if they could safely eat food offered to them and the importance of not swapping lunches ($n = 59$). However, for children aged 8–12 years, there was a slight change in compliance as three (6.1%, $n = 3/49$) children did not appear as vigilant when asking if a food item was safe to eat. Of these three, two were close to the upper age limit (11–12 years) as they were either in 6th grade (primary school) and Year 7 (first year of high school).

Perceptions associated with food allergy and how children feel

Children also reported ‘how they felt’ about themselves when living with a food allergy, depicted in Figure 1. Although a higher proportion of children under 8 years also reported feeling different to friends (37.5%, $n = 24/64$) compared to those aged 8–12 years (31.1%, $n = 14/45$) confirming children under 8 years are also astute to the perception of feeling different, distribution was not significant as both groups reported they ‘sometimes’ feel like this. A Mann–Whitney U test confirmed non-significance ($U = 1353.50$, CI: $[-0.274, 0.160]$). Children were also asked if having food allergy meant they missed friend’s birthday parties, and though a Mann–Whitney U test found no significance between age groups for this factor with both groups reporting they ‘sometimes’ feel like this ($U = 1491.00$, CI: $[-0.184, 251]$), but when based on gender, the results were significantly different. Boys were more likely to report missing out on friends’ birthdays compared to girls when Mann–Whitney U test was performed ($U = 1023.50$, CI: $[-0.410, 0.032]$) even though medians were equal.

Measuring the association between the four comparative questions also showed how children perceive themselves when living with a food allergy (Refer to Table 2). For children 8 years and under who reported ‘parental fussing’ (28.1%, $n = 18/64$), 11 (61.1%, $n = 18$) also reported ‘feeling different to friends’. When performing a Somers’ d test, the association between these variables was statistically significant (Somers’ d test, $d = .395$, $p < .001$), thus recognising the potential interplay between this parenting style and how children feel about themselves and the importance of parents normalising behaviour around food. This perception may also account for differences between those who reported ‘missing out on friend’s birthdays’. For those 18 children who reported ‘parental fussing’, 10 (55.5%, $n = 18$) also reported they ‘sometimes’ missed out on such events compared to 6 of the 22 children (27.3%, $n = 22$) who said their parents did not fuss

Table 1: Characteristics of participants including identification of numbers logging on, starting and completing online survey.

Details	Under 8 years, n (%)	8–12 years, n (%)
Logged on (N = 139)	81	58
Started survey (N = 114)	65	49
Completed survey (N = 110)	64 ^a	46
Characteristics (N = 114) ^b		
Male (n = 73)	41 (63.1%)	32 (65.3%)
Female (n = 36)	22 (33.8%)	14 (28.6%)
Unknown (n = 5)	2 (3.1%)	3 (6.1%)
Food allergies (N = 114) ^c	N = 65	N = 49
Peanut	45 (69.2%)	36 (73.5%)
Tree nuts	49 (75.4%)	36 (73.5%)
Egg	34 (52.3%)	21 (42.9%)
Cow's milk	23 (35.4%)	16 (32.7%)
In combination		
Peanut and tree nuts	37 (56.9%)	26 (53.1%)
Peanut, tree nuts and egg	23 (35.4%)	13 (26.5%)
Egg and cow's milk	20 (30.8%)	10 (20.4%)
Co-morbidity	n = 63 ^a	n = 46
Answered 'yes' (n = 83)	54 (85.7%)	29 (63.0%)
Hay fever (allergic rhinitis)	23 (36.5%)	23 (50.0%)
Asthma	28 (44.4%)	18 (39.1%)
Eczema	44 (69.8%)	21 (45.6%)
All 3 co-morbidities	n = 13	n = 12
Male (n = 20)	10	10
Female (n = 5)	3	2
Geographic location ^d	n = 53	n = 36
Capital city	28 (52.8%)	20 (55.6%)
Regional location	25 (47.2%)	16 (44.4%)

^aOne participant completed all survey questions excluding biographical data. For purpose of analysis, they have been included as though finished, even though gender and other allergies unknown.

^bFood allergy community estimated at 0.1% based on approximately 2,800,000 children aged 5–14 years inclusive (2016 ABS Census Data) and findings from the HealthNuts study where it was reported 5.1% of Australian children aged 4 had a probable food allergy.

^cAllergies reported to multiple food means the percentage totals are not cumulative (Peters et al., 2017).

^dGeographic data based on cross-matching with parent's survey (n = 87).

over them. Although this was not significant when a chi-square test measuring comparison of proportions was performed ($\chi^2(1) = 3.199$, CI: [−2.1%, 52.6%]), and indicates other external factors may also influence this decision in receiving and/or accepting birthday invitations, it is a factor worth exploring.

In contrast, while children aged 8–12 years reported 'missing friend's birthday' (15.6%, = 7/45), they were more concerned over whether their friends would make fun of them as 13 (28.9%, n = 45) reported they were worried 'all' or 'some of the time'. From this group, five (11.1%, n = 5/13) also said they would not tell their friends about food allergy even if they thought they were having an allergic

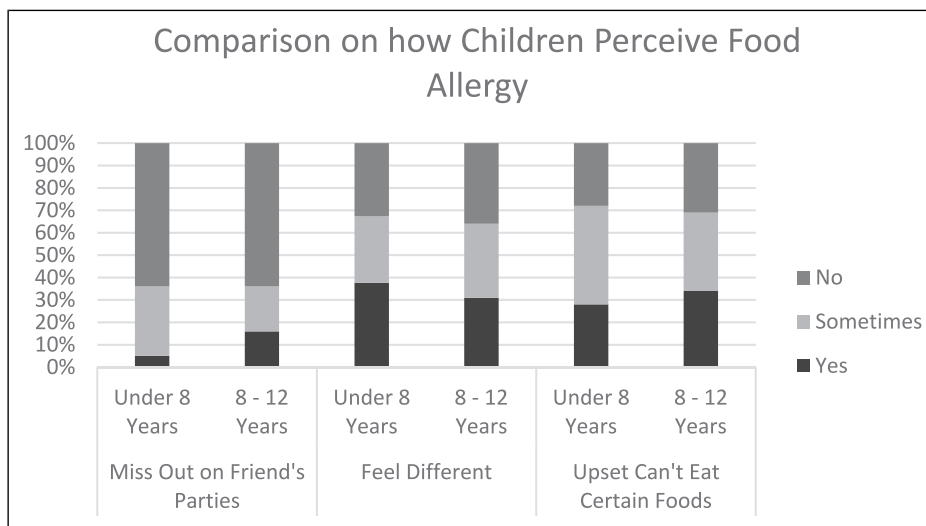


Figure 1. How feelings change across age groups.

Table 2: How children feel about food allergy aligned to social interaction.

<i>n</i> = 108	Kendall's Tau-b	Lower 95% CI	Upper 95% CI
Feel different to friends and get upset about not eating certain foods			
Under 8 years	.328	0.163	0.492
8 to 12 years	.399	0.231	0.567
Feel different to friends and miss out on friend's birthdays			
Under 8 years	.240	0.106	0.374
8 to 12 years	.201	0.027	0.367
Get upset about not eating certain foods and miss out on friend's birthdays			
Under 8 years	.219	0.087	0.351
8 to 12 years	.423	0.262	0.584
Feel different to friends and parental fussing			
Under 8 years	.405	0.276	0.534
8 to 12 years	-.145	-0.303	0.012

reaction. This failure to notify peers highlights the need for further intervention, particularly as four of these five (80%) reported friends had teased them. In our study, this was defined as being laughed at, being part of a dare to eat the food to which they were allergic or having food thrown at them. It is these experiences that may account for why these four children also reported 'feeling different to their friends', 'getting upset about missing out on treats' and 'not being able to eat what everyone else is eating' either 'all' or 'some of the time'. However, it was not only these four who were concerned about 'feeling different to friends' as a Kendall's Tau-*b* test also found a correlation between this and whether children worried about friend's making fun of them ($\tau_b = .480$, $n = 45$, CI: [.348, .612]).

What children aged 8–12 years dislike about their food allergy?

Children aged 8–12 years could also select up to four specific dislikes about food allergy from a list of eight. Forty-five responded to this question, selecting at least one reason. [Supplementary Table 1](#) shows the distribution based on both the total number of responses and participants, with approximately 90% reporting the ‘inability to eat certain foods’ (93.3%, $n = 42/45$) and ‘having to be careful all the time’ (88.9%, $n = 40/45$) as the two most onerous aspects of managing their food allergy.

Children were also given the option to comment using the free format section, and responses included:

1. ‘makes me feel left out’ [Year 3, girl]
2. ‘watching people stuff their faces with things like ice cream, chocolate, etc.’ [Year 4, boy]
3. ‘when I go over to a mates, they have to be very careful all the time. So I feel bad for them cause they can’t eat certain foods around me’ [Year 7, boy]
4. ‘anxiety about having an allergic reaction and possibility of death from anaphylaxis’ [Year 7, boy]

Recognising the impact, the language chosen by these participants shows increasing maturity and the ability to distinguish self from others. With greater awareness of others, there is a noticeable change from being self-centred to self-reflection and the ability to empathise as the boy in Year 7 now feels ‘bad’ that his friends cannot eat certain foods when they are with him. It is these comments that show it is the ‘inability to eat certain foods’ that weighs heavily on children (refer to [Supplementary Table 1](#)), irrespective of whether they are in upper primary/early high school (100%, $n = 21$) or lower primary school (87.5%, $n = 21/24$).

Children also reported a dislike for parental fussing. Although not as prominent as the under 8 years group, this was still a dislike for approximately 25% of children (26.7%, $n = 12/45$). However, while no significant differences across the school grades were identified (Kendall’s Tau- b test, $\tau_b = .242$, $p = .109$, $n = 45$), the dislike was more pronounced, with 66.7% of participants disclosing at Grade 5 or above ($n = 8/12$). Furthermore, 6 from the 12 (50%) also reported ‘feeling different to friends all of the time’, heightening the risk of being teased or bullied, leading to social withdrawal due to stigmatisation.

Discussion

This research highlights both similarities and differences across broad development levels and how children feel about food allergy. The primary aim was to identify if KSA and QoL differences exist across gender and age groups and whether children living with food allergy perceive differences from others in the school community as feelings are shaped by personal experience, beliefs and memories ([Coppin and Sander, 2016](#)). These results show where differences exist. A secondary aim was to identify if knowledge gaps exist and whether children recognised the current educational strategies to keep safe and confirm that children aged 12 years and under can identify ways to stay safe. This is encouraging for parents and health professionals alike who need to build on that knowledge to enhance self-efficacy as the child learns to navigate the world of food allergy. This transition reported by [Sanagavarapu \(2017\)](#) found that children starting school recognised the need to tell teachers if feeling sick after eating food. Although children in our study also replicated this

awareness, a key difference was that when children were offered food at school as it was now more important to check with teachers and [Sanagavarapu \(2017\)](#) only considered if the child declined the food outright. This difference might account for why three (50%) of the six children interviewed stated they would decline, and all six would refer to their parents, perhaps failing to recognise the transitioning of responsibility from parent to teacher in school settings ([Sanagavarapu, 2017](#)).

Whilst education, literacy and knowledge are fundamental in improving health behaviours and outcomes, children also need access to ‘child-centred’ health literacy, which is not only age appropriate but also designed by children to build meaning, empathy and awareness as they learn how to protect against psychosocial stressors ([DeWalt and Hink, 2009](#); [Velardo and Drummond, 2016](#)). To minimise the impact food allergy has on QoL, parents may also need to learn new skills as there is the need to normalise behaviour around food and food allergy ([Gillespie et al., 2007](#); [Rouf et al., 2012](#)). In a study by [Vickers et al. \(2019\)](#), they established that participating in counselling sessions using cognitive behavioural therapy (CBT) could minimise the risk of phobias and anxiety around food as researchers show parents who are more anxious can inadvertently transfer this anxiety to their child ([Bollinger et al., 2006](#); [Gillespie et al., 2007](#); [LeBovidge et al., 2009](#); [Rouf et al., 2012](#); [Sanagavarapu et al., 2016](#); [Vickers et al., 2019](#)). However, it might not only be overt anxiety that influences and negatively impacts behaviour and engagement with friends but also other parenting styles as our results showed a correlation between ‘parental fussing’ and ‘feeling different to friends’ for those aged 8 years and under.

For those aged 8–12 years, there was also a growing dislike of the ‘need to be careful’, and this could reflect, not only cognitive awareness of the dangers but also the need to protect others, as shown in the changing language used by children ([Steinbeis, 2016](#)). When such concerns are coupled with the perception of ‘feeling different to friends’, similarities emerged to that reported by [DunnGalvin et al. \(2009\)](#), who defined food allergy and its impact on cognition, emotions and behaviour. Our study also supports the literature as it highlights the interplay between the need for personal safety and how children perceive themselves, often describing themselves as ‘different’, which can impact self-esteem and self-confidence ([DunnGalvin et al., 2009](#); [Stensgaard et al., 2017](#)). It is these concerns that highlight the need to create a school environment that supports those with a food allergy, so they do not feel inhibited or afraid of telling others, and more importantly, telling a teacher or friend if they think they are having an allergic reaction ([Pistiner and Lee, 2012](#)).

One reason, why children might not come forward is the fear of being bullied, particularly as a US study by [Lieberman et al. \(2010\)](#) found 24% of respondents experienced some form of bullying or harassment because of food allergy. The recent study by [Fong et al. \(2017\)](#) also corroborated this outcome where 23% of participants reported bullying or teasing, specifically because of their food allergy. Although the number who reported teasing was not replicated in our study (11.1%, $n = 5/13$), there were more who were worried their friends would make fun of them (28.9%, $n = 13/45$), and this could exaggerate the high levels reported in the literature for those aged 8–12 years ([Fong et al., 2017](#); [Lieberman et al., 2010](#)). However, neither our study nor the study by [Fong et al. \(2017\)](#) reported the high rates found by [Shemesh et al. \(2013\)](#), where 31.5% of children (251 families) reported bullying due to food allergy. Whether these rates are specific to geographical regions or different levels of resilience or acceptance is an area that warrants further research.

With five children aged 8–12 years disinclined to self-disclose their food allergy status to friends, even if they thought they were having an allergic reaction, this might be a way to protect themselves and avoid stigmatisation ([Dean et al., 2015](#)). To overcome such reticence, educators need to develop educational strategies around the value of community to minimise the risk of being singled out ([Pistiner and Lee, 2012](#); [Russell and Huber, 2013](#)). It is also important to recognise that overcoming

conflict and tension between the need for physical safety and psychological well-being (Dean et al., 2015) can be problematic, particularly if participants feel ashamed about their food allergy (Russell and Huber, 2013).

With more boys recruited in our study this could reflect an actual gender difference or a sampling error as our results (66.9%, $n = 73/109$) differ from that reported in the 2010 Australian HealthNuts population study, where 52.5% were male (Osborne et al., 2010). To account for such a difference, one possible explanation is cultural stereotypes as the media portrays boys as risk-takers (Bates, 2017). To manage such behaviour, mothers may actively seek assistance through online forums, and this may have increased awareness of and participation in the online survey (Aston et al., 2020; Stewart et al., 2011).

Study limitations

While a key strength of the study was exploring multiple topics associated with KSAs and how children manage and perceive food allergy when using an online platform, there are limitations. The primary limitation revolved around self-selection and the inability to determine response rates and the motivations behind why parents encouraged their children to log on and complete the survey. This uncertainty also leads to whether their parents influenced those who participated as they might try to give 'expected' responses to please 'Mum or Dad' (Larson, 2018). Although this could distort the results, it should not outweigh the study's benefits as the recruitment and survey design methods sought to limit such concerns.

A further limitation was no medical confirmation of food allergy. However, with large numbers of participants aged 8 years and over also reporting possession of an adrenaline auto-injector (87.7%, $n = 43/49$), this could serve as a proxy measure to a food allergy diagnosis. Another limitation would be the inability to determine the level of consistency between answers children and their parents provided, which should be addressed in future studies. Finally, with the surveys in English, this may have excluded those from non-English speaking backgrounds. To overcome this perceived limitation when conducting further studies, it would be beneficial to consider strategies to improve participation rates across diverse populations. It may also be useful for future studies to obtain personal details around socio-economic and demographic status, which could influence education and health literacy levels.

Implications for practitioners

With food allergy affecting up to 10% of Australian children, practitioners increasingly recognise its impact on children's QoL (Tang and Mullins, 2017). To keep safe, children need to learn confidence in declaring their food allergies to adults, teachers and friends. Parents also need to trust their child and teach resilience as parental anxiety can impact their food-allergic child's psychosocial health and well-being. Practitioners need to treat food allergy patients and family members holistically as it is not just about food avoidance; it is the need to manage psychological stressors.

Conclusion

This study highlights concerns faced by Australian children living with a food allergy. However, it is more than this; it is a study on how children perceive themselves, internalise risk and view peer

relationships. As children grow, they begin to acquire independence and take on responsibilities, including managing their own food allergy. By identifying how children perceive food allergy and how this translates to day-to-day living, this study recognises the need to design educational strategies around self-confidence, so children with food allergies do not feel inhibited in approaching relevant peers and adults. The results also highlighted the need to normalise behaviours around foods as children perceive social and individual differences early on, with parental fussing correlated to how children aged 8 years and under feel about themselves.

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Author Contributions

DS developed the idea of the study in consultation with CHK, MDS and TV. DS and CHK developed the study design and questions. DS, facilitated by CHK, was responsible for notification and awareness of survey via the medical fraternity, childcare providers, the food allergy community and Allergy & Anaphylaxis Australia. DS performed the research, analysis and drafted the manuscript. CHK, MDS and TV critically reviewed and gave approval of the submitted manuscript version.

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Supplemental Material

Supplemental material for this article is available online.

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Supplementary Table 1: How 8 to 12 years feel about food allergy.

Feelings	n	% of Responses* (n=164)	% of Cases (n=45)
Can't Eat Certain Food	42	25.6	93.3
Having to be Careful All the Time	40	24.4	88.9
Can't Try New Food	30	18.3	66.7
Having Medical Tests	15	9.1	33.3
Mum/Dad Fussing All the Time	12	7.3	26.7
Carrying Epi-pen	12	7.3	26.7
Going to Hospital	9	5.5	20.0
Going to Doctors	4	2.4	8.9

* Multi-dichotomous responses