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The Role of Food Banks in Addressing Food Insecurity: A Systematic Review

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Abstract Food banks play a major role in the food aid sector by distributing donated and purchased groceries directly to food insecure families. The public health implications of food insecurity are significant, particularly as food insecurity has a higher prevalence among certain population groups. This review consolidates current knowledge about the function and efficacy of food banks to address food insecurity. A systematic review was conducted. Thirty-five publications were reviewed, of which 14 examined food security status, 13 analysed nutritional quality of food provided, and 24 considered clients' needs in relation to food bank use. This review found that while food banks have an important role to play in providing immediate solutions to severe food deprivation, they are limited in their capacity to improve overall food security outcomes due to the limited provision of nutrient-dense foods in insufficient amounts, especially from dairy, vegetables and fruits. Food banks have the potential to improve food security outcomes when operational resources are adequate, provisions of perishable food groups are available, and client needs are identified and addressed.

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Introduction

Food insecurity occurs whenever the availability of nutritionally adequate and safe foods, or the ability to acquire acceptable food in a socially acceptable way, is limited or is uncertain [1]. Food insecurity typically affects those who are most socioeconomically disadvantaged. It may be transient, in that people move in and out of food insecurity as their circumstances change; however, increasingly, people are experiencing chronic food insecurity [2, 3].

In high-income countries where public assistance fails to meet community need, food aid services, such as food banks, community kitchens, soup vans, and subsidised community markets have been established to bridge the food security gap [4–7]. These services, often termed 'emergency food aid', are typically intended as short-term solutions for those who are economically, geographically and/or socially disadvantaged [8–10]. At the centre of emergency food aid efforts are food bank programs. The term 'food bank' can refer to one of two types of service: a large redistributors of rescued food to smaller charities that provide cooked and/or uncooked food to food insecure populations, or a service that provides grocery items directly to clients [4, 11]. For the purpose of this review, food banks will be referred to as the latter, direct services only, which are sometimes called 'food pantries' or 'food shelves', as the former 'food banks' rarely work directly with community members in need. While food banks and other forms of food aid have traditionally been seen as a source of supplemental food and not a solution to achieving food security [12], there is increasing evidence to suggest

that some people are coming to rely on food banks as their only source of food [2, 4, 13, 14].

As food banks are a major component of food aid services in developed countries, there is a strong need for research to identify the role of these services in addressing food insecurity [8, 15, 16]. While there is some literature that has identified food banks as a valuable source of food assistance for food insecure populations [17, 18], because of limited choice, and poor nutritional quality and quantity of donated food, there is some concern relating to the ability of food banks to prevent or remedy food insecurity and hunger [19, 20]. This review aims to identify the role of food banks in promoting food security and nutritional choices to those in need.

There are three main objectives to this review:

1. To investigate if food banks are providing sufficient food to negate hunger and reduce food insecurity.
2. To investigate if food bank programs are meeting the nutritional needs of clients.
3. To identify if food banks are meeting client needs to maximise food security outcomes.

Method and Approach

A systematic search was undertaken to identify relevant articles. Key search terms (foodbank*, "food bank*", AND Australia, "food bank*" AND "food insecur*", "food bank", "food bank" AND "food secur*", "food bank*" AND nutri*, "food pantr*", "food pantr*" AND "food secur*", "food shel*", "food shel*" AND "food insecur*") were applied using relevant research databases (Informit, PubMed, Scopus, Medline, CINAHL, Global Health, Academic Search Complete and Science direct). The first two authors reviewed titles and abstracts of articles published in English to identify studies which presented primary data focused on food banks (as defined by this review). The reference lists of articles were also examined to identify additional potentially relevant studies. Additional inclusion criteria were that the article had to report the food security status of food bank clients, the nutritional quality of foods being distributed and/or consumed by food bank clients, and/or client needs in relation to foods being distributed. No temporal restrictions were applied to the literature search as all research relating to food bank use has been conducted within the previous 25 years.

Results

The search identified 1166 potentially relevant articles, of these, 774 were duplicates. Abstracts of the unique 392 papers were read, with 326 discarded based on title or abstract; the full text of the remaining 66 papers were reviewed. Of these, 37 did not meet the inclusion criteria; the remaining 29 were included in this review. An additional six articles were identified through searches of reference lists (see Fig. 1), leaving a final sample of 35 articles included in this review.

The majority of articles (n = 33) were cross-sectional studies [2, 6, 8, 11, 13, 14, 16, 21–47], one was longitudinal [25], and one was a randomised controlled trial [38]. Five studies were mixed methods [11, 28, 29, 31, 32], two were qualitative [16, 26], and the remaining 28 were quantitative studies. Data were collected via focus group (n = 3), direct observation (n = 1), self-completed (n = 6) or person-assisted surveys (n = 15), structured interviews (n = 7), 24-h diet recalls (n = 7), or food basket audits (n = 5; see Table 1).

Most studies (n = 31) were an investigation of an existing food bank, however, two studies introduced a change to the environment under investigation and evaluated the results. Martin et al. [38] used a randomised controlled design to determine the effectiveness of a food bank intervention in promoting food security and found a decrease in food insecurity as a result of case management and food bank choice. Flynn et al. [34] implemented a 6 week cooking and grocery shopping program and found an increase in the consumption and purchase of fresh fruit and vegetables. Two other studies undertook an evaluation of an existing program. Christner and Cotugna [31] evaluated a school pantry program and found that it was not being used to its full potential because of a number of

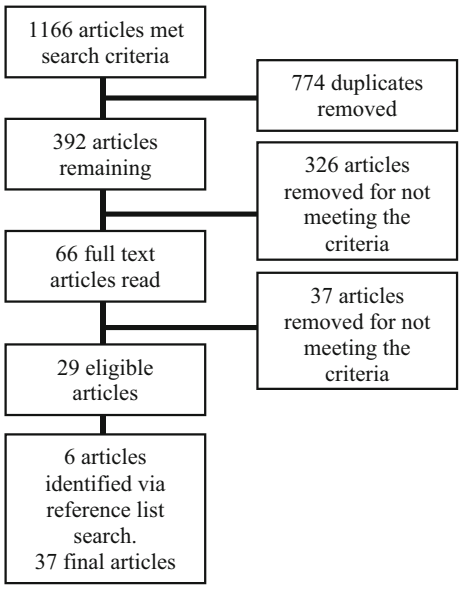

Fig. 1 Flow chart of articles meeting search criteria, number of articles excluded, and final number of articles meeting inclusion criteria for review

Table 1 Summary of included studies

References	Study design	Participant characteristics	Study location	Methods and measures	Main findings
Akobundu et al. [21]	Cross-sectional	133 recipients of food assistance (female = 71 %)	USA, Massachusetts	Client interviews and basket audit measuring nutritional quality	Food provided is insufficient to meet the nutritional needs of users for one week. Foods were of adequate nutrition density for fibre, protein, iron and folate but low for vitamin A and C
Azurdia et al. [29]	Cross-sectional	Program users (n = 52), program volunteers (n = 15), program coordinators (n = 2)	Canada, Ottawa	Surveys with clients, focus groups and surveys with volunteers and coordinators around client needs	Users, coordinators and volunteers all report high satisfaction with the program, however, fresh fruit and vegetables, more food items and more options were all highlighted as areas for improvement
Bell et al. [30]	Cross-sectional	69 recipients of food assistance (female = 46)	USA, New York	Client interviews including 24-h food recall, anthropomorphic measures, haemoglobin levels	Participants were either overweight or underweight. Many clients did had inadequate intake of protein, iron, folate, calcium, zinc and vitamins A, C, D and E. the study also found a high proportion of anaemia in women
Campbell et al. [11]	Cross-sectional	137 food banks surveyed. Of these staff from six were interviewed (n = 19)	USA	Food bank surveys and staff interviews to investigate nutritional intake client needs and choices	Food banks are moving toward a focus on providing food with more nutritional quality, however, the level of commitment to this varied across the sample
Christner and Cotugna [31]	Cross-sectional	43 recipients of food assistance (female = 38)	USA, Delaware	Client and coordinator interviews and surveys about the role of the food bank in hunger	Users were found to not be using the food bank as much or as frequently as was available
Daponte et al. [2]	Cross-sectional	400 interviews with households living in poverty (female = 240)	USA, Pennsylvania	Structured client interviews measuring nutritional need	Most clients were long term users who reported difficulty in feeding their families
Duffy et al. [32]	Cross-sectional	96 clients, and 120 food needy non clients	USA, Alabama	Client, and food needy non clients were interviewed using a structured interview around their needs and food security	Most clients and needy clients were food insecure. Most clients were long term clients, and most were satisfied with the food bank
Duffy et al. [33]	Cross-sectional	55 female only receivers of food assistance	USA, Alabama	Structured client interviews measuring diet quality, 24-h food recall, and food security	Diet quality was poor, most clients were overweight or obese, and most were food insecure
Flynn et al. [34]	Cross-sectional	63 participants who had been involved in the cooking program (female = 53)	USA, Rhode Island	Food bank implemented cooking and shopping program, food security was measured	Variety and number of fruits and vegetables increased in participants. Grocery recepts showed a decrease in meat and carbohydrates purchased
Gany et al. [22]	Cross-sectional	47 food banks	USA, New York	Food bank survey measuring the ease with which clients could contact and access the food bank, food security was measured	Food banks were unable to meet client needs. Food banks were limited in the amount of food they provided and the nutrition of food provided
Greder et al. [35]	Cross-sectional	997 participants who received food assistance (female = 532)	USA, Iowa	Surveys with community members about food insecurity and food bank use	Many of the participants were food insecure and using food banks regularly

Table 1 continued

References	Study design	Participant characteristics	Study location	Methods and measures	Main findings
Greger et al. [36]	Cross-sectional	97 households who receive food assistance and 22 food bank directors	USA, Wisconsin	Analysis of food, via basket audit, and client surveys	Almost all clients stated that the received the food that they needed. Many wanted to receive more meat. Less than one half of the clients reported that they knew how to prepare the food that they received
Holben [23]	Cross-sectional	528 participants who receive food assistance	Canada, British Columbia	Client surveys measuring nutritional intake and food security	Most clients were food insecure. Fruit, vegetable and dairy intake were lower than recommendations
Irwin et al. [9]	Cross-sectional	Basket audit only	Canada, Ontario	Basket audit of nutritional quality	Most hampers did not meet nutritional guidelines. Hampers were found to contain only 1.6 days worth of energy per person, despite being provided for 3 days
Jessri et al. [37]	Cross-sectional	1025 participants who receive food assistance (female = 615)	Canada, Alberta	Basket audit of food bank hampers	Hampers provided adequate energy, however, the fat and animal protein contents were low. Some micronutrients were also low
Loopstra and Tarasuk [6]	Cross-sectional	371 low income families	Canada, Toronto	Structured interviews with clients and non-client to identify food security and need	The food banks were unable to meet food security needs, meaning that many potential clients are not using them
Martin et al. [38]	RCT	228 participants who had received some food assistance (female = 136)	USA, Connecticut	Survey with client investigating needs, choices and food security	Allowing users to choose their own food, be provided with motivational interviewing and increased referral opportunities significantly improved food security
McKay and Dunn [13]	Cross-sectional	56 participants who had received some food assistance (female = 24)	Australia, Melbourne	Structured client interviews to investigate nutritional intake and food security	Most clients found to be food insecure and reliant on food bank for most meals
Neter et al. [39]	Cross-sectional	251 recipients of food assistance	Netherlands	Client survey measuring food insecurity and health	Most participants were found to be food insecure
O'Reilly et al. [40]	Cross-sectional	21 participants who had received some food assistance (female = 6)	Australia, Melbourne	Structured client interviews, including 24-h diet recall and basket audit, to determine nutritional vulnerability	Clients obtained less than the minimum requirements in the vegetables, legumes and meats groups. A high level of nutritional vulnerability was identified in this group
Remley et al. [16]	Cross-sectional	20 participants who had received some food assistance	USA, Ohio	Client focus groups to measure needs	The ability to choose specific foods was important for clients of this food bank
Robaina and Martin [41]	Cross-sectional	212 participants who had received some food assistance (female = 125)	USA, Connecticut	Client interviews to investigate nutritional intake, food security and anthropometric measures	Half of clients were food insecure and were reliant on food aid for regular meals
Rochester et al. [24]	Cross-sectional	35 food bank staff	USA, Minnesota	Staff survey to identify barriers and resources	Food sourcing was a problem, with many reporting that donors were not donating healthy foods

Table 1 continued

References	Study design	Participant characteristics	Study location	Methods and measures	Main findings
Rush et al. [42]	Cross-sectional	77 participants who had received some food assistance (female = 41)	Canada, Ontario	Client interviews, including 24-h diet recall to investigate nutritional intake and food security	Most clients experienced some form of food insecurity. Fruit, vegetable, legume and dairy intake was low
Starkey and Kuhnlein [43]	Cross-sectional	428 participants who had received some food assistance (female = 245)	Canada, Québec	Structured client interviews including 24-h recall	Participants did not meet the requirements for dairy, and vegetables and fruit
Starkey et al. [14]	Cross-sectional	490 participants who had received some food assistance (female = 234)	Canada, Québec	Structured client interviews including 24-h recall, to investigate nutritional intake and food security	Food bank users were not experiencing shortages of food. Some micronutrients were found to be lower than the population
Starkey et al. [25]	Longitudinal	428 participants who had received some food assistance (female = 245)	Canada, Québec	Structured client interviews to investigate nutritional intake	Micronutrient intake was compromised for food bank users
Tarasuk and Beaton [44]	Cross-sectional	153 participants who had received some food assistance	Canada, Toronto	Structured client interviews, including 24-h recall, investigating food insecurity	Most clients were experiencing food insecurity, and many reported some level of food deprivation
Tarasuk et al. [45]	Cross-sectional	340 food assistance providers	Canada	Structured client interviews with staff to investigate need	Most agencies reported that clients needed more than agencies provided
Tarasuk and Eakin [26]	Cross-sectional	Staff of 15 food banks (n = 29)	Canada, Ontario	Interviews and observation of staff around client needs	Limited, variable and mostly uncontrollable food supply to food banks. Food given may be insufficient to meet the needs of those seeking assistance
Teron and Tarasuk [27]	Cross-sectional	102 participants who had received some food assistance	Canada, Toronto	Client surveys of quality, quantity and safety of the food they received. Basket audit for nutrition content	Many clients received less than 3 days worth of food. Nutrient content varied across the sample
Verpy et al. [28]	Cross-sectional	31 participants who had received some food assistance, and 64 donors to the food bank	USA, Minnesota	Client and donor focus groups around need	Clients reported a lack of choice, the safety of the food provided, the need for non-food items, and problems with actually obtaining food
Willows and Au [48]	Cross-sectional	Basket audit only	Canada, Alberta	Basket audit of nutritional quality	All hampers met the minimum recommended serving for each food group for 4 days, but were low in fat and protein. Calories from fat were low in hampers for adults only
Wood et al. [47]	Cross-sectional	103 participants who had received some food assistance (female = 73)	USA, Washington	Clients surveys of food insecurity	Most households were found to be food insecure. Food security status was correlated with other measures of risk including low income, and children eating less than they should
Wood et al. [46]	Cross-sectional	103 participants who had received some food assistance (female = 73)	USA, Washington	Client surveys for coping strategies and food insecurity	Clients used strategies that included pawning goods, getting cash advances, or were part of a welfare program

structural problems, while Azurida et al. [29], in an investigation of a university food bank program, found satisfaction at all levels, but suggest improvements in communication.

Fourteen studies examined food security, 13 analysed nutritional intake, and 24 considered clients' needs and choices in relation to food bank use. The majority of studies (n = 26) recruited food bank clients. Two studies also recruited non-food bank clients, five recruited food bank volunteers and/or managers or staff, while one study recruited food bank donors (those who donate food to food banks). Of the 26 studies that included food bank clients, two specifically sought out refugee or new arrival populations, while the remainder of studies included participants who were general cliental of the food bank. Most of the studies were conducted in the USA (n = 18) or Canada (n = 14), while a smaller number were conducted in Australia (n = 2), one was conducted in The Netherlands. There was a peak in the research into food bank practices and use in the late 1990s and a resurgence that began in 2010.

Food security was specifically examined in 14 of the included studies. Food security was most commonly measured using the United States Department of Agriculture (USDA) food security survey module (n = 13) [6, 13, 23, 32–35, 38, 39, 41, 44, 46, 47], only one study used an alternative food security measurement tool, the Radimer/Cornell [42] questionnaire for food security. Those studies that employed the USDA tool to measure food security found that half of all respondents were food insecure [6, 13, 23, 32–35, 38, 39, 41, 44, 46, 47]. Four studies also found participants to be experiencing food security with hunger, the highest level of food security identified by this tool [6, 13]. In using the Radimer/Cornell questionnaire for food security, Rush et al. [42] found a low level of household level food security (16.9 %), but that individual hunger was high (44.2 %), indicating that, for households with children, parents were going hungry in order for their children to have enough to eat.

Twenty-four hour diet recall questionnaires were used in 8 of the 16 studies analysing nutritional intake [25, 30, 32, 33, 40, 42–44], 7 studies used a food basket audit [9, 21, 27, 36, 37, 40, 48], and 2 studies used the food block frequency screener [38, 41].

The studies using 24-h diet recall found that almost all participants were consuming less than the required amount of fruit, vegetables, milk and meat or meat alternatives [25, 30, 32, 33, 40, 42, 43], with many also finding a deficiency in the consumption of legumes [33, 40, 43]. Of the studies included in this review, almost all diet recalls (n = 6) were conducted the day clients presented to a food bank, which may have influenced the source, quantity and quality of food eaten the day before if they felt their food situation was desperate enough to visit the food bank that day. These factors need to be taken into consideration when applying these results to the average nutritional and caloric intake among food bank clients. Two studies made attempts to improve the reliability of food basket audits by conducting the audits on several days across the month [14, 25], however, these two papers report on the same dataset, making any meaningful conclusions about this method difficult to ascertain.

In their review of the actual food provided by the food banks, one study found the food provided to be adequate [48], while others found that the requirements for milk, meat and meat alternatives and micronutrients, including vitamin A and C, were not being met [36, 37], and were not a sufficient quantity of food for 1 week [8, 21, 27]. While food basket audits are more likely to represent the nutritional quality and quantity of food bank provisions compared to diet recalls, the transferability of food basket audits is problematic for food banks as produce is variable and therefore may not accurately represent the food banks under examination, let alone food banks in general.

Twenty-four articles investigated client needs and choices at food banks. This research, by and large, found that clients wanted a greater range of foods, especially more fruits, vegetables, dairy and meats. Clients also requested more culturally appropriate foods, particularly those who were newly arrived or from migrant communities, and more consistency across food items and quantities, especially for staple items and special needs food, such as age and health appropriate foods [22, 28, 29]. Several of these studies also found that clients wanted easier and more regular access to food bank services, including more information about the service, more flexible opening hours and more regular visits [6, 16, 22, 29]. Culturally and linguistically diverse populations reported having greater difficulty accessing services, communicating their needs, receiving information, using unfamiliar foods and participating in nutritional workshops [16, 22]. This is especially problematic as increasing hunger is associated with recent migration [13, 40, 42]. These studies typically used either interviews and/or questionnaires [2, 6, 11, 13, 14, 22, 23, 26, 29–31, 34–36, 39, 41, 44, 45], researcher observations [22] or focus groups [16, 28] to gain an understanding of what food bank clients needed. Focus groups gathered data across different language groups in the included studies, with both Azurdia et al. [29] and Remley et al. [16] employing bilingual moderators; the remainder of studies excluded non-English speaking participants.

Five studies reported on the perspectives of staff and volunteers of the food banks about how they could meet client needs [11, 24, 26, 29, 45]. Many of the concerns raised by staff were that they were unable to provide nutritionally sound foods to the populations that they serve.

Campbell et al. [11], found that food bank staff felt they should only provide healthy foods but were unable to do so due to inconsistent donations, high cost of healthier foods and limited storage. In other studies, staff acknowledged that a lack of resources was the greatest challenge to improving food security, in addition to not having sufficient quality food, funding, adequate refrigeration and storage [6, 24]. In these studies, staff made it clear that such resources were imperative if food banks are to be relied upon to address individual food security needs, both in the short term and long term [26]. Stronger networks, funding and policies to support food assistance programs were suggested to support the development of needs-driven models. Considering that the more nutrient dense and expensive items tended to be missing in hampers, many of these studies recommended working directly with donors to specifically target these food when donating [6, 8, 13, 28].

Discussion

This review has investigated the role of food banks in addressing the food security and nutritional needs of recipients. While food banks have long been seen as a safety net for those in short term crisis, they are increasingly being used by those experiencing long term deprivation, with many food bank recipients using food banks as frequently as they are able, yet, many remain food insecure [7, 13, 38, 40, 41]. The shift and increase in need and use is problematic as, as this review shows, food banks are not able to ameliorate short- or long-term food insecurity, nor are they able to meet nutritional requirements of those in need. This finding is concerning, given the literature suggests a link between food insecurity and poor health outcomes [33, 49], and is especially concerning for those clients who are solely reliant on the food banks as their primary source of food [13, 38, 40, 41].

While food banks may not be able to resolve all client needs, they do have a role to play in reducing the impact of food insecurity. This review has found three key reasons that food banks are facing difficulties in resolving these client needs: (1) The number of food bank clients is increasing; (2) donations are not increasing with demand, or donations received are not appropriate; (3) food bank staffs are not highly enough trained around nutrition to provide advice and education to clients.

In the past two decades, the number of people in need of food assistance in advanced western economies has increased [50, 51]. The number of people in Australia who are in need to food assistance has reached 2 million, an increase of 9 % from the previous year [51], while one in seven people in the USA [52] and almost 2 million individuals in Canada use the service of a food bank each year [53]. This increased need is related to changes in the welfare system, the global financial crisis, and increased unemployment. While cash assistance, for example in the form of food stamps, has decreased, food assistance has increased, with community food banks that provide food to be prepared at home representing the most common way to respond to those in need [7].

Sourcing food that is of high nutritional quality and is of sufficient quantity is a challenge for food banks. Several studies have investigated the ways that food banks source their food, with a mismatch being reported between the need of food and the food supplied [18, 54]. Food banks are limited in their capacity to provide a range of food because of inconsistent donations, high cost of healthier foods and limited storage [11]. This may be a result of much of their food being sourced through unsolicited community donations; as such, a streamlined and direct approach to formally sourcing and distributing food, while also improving policies to reinforce the provision of healthier options, has been recommended [24, 54]. However, without a systematic approach to the collection of surplus foods, problems with providing foods that meet the nutritional requirements of clients will remain.

Finally, the need for nutritional education among staff to improve the provision and support for healthier options is a clear challenge for food banks in seeking to provide nutritionally adequate foods [6, 28, 33]. For staff, the greatest barrier to providing a nutritionally adequate diet for those using the service was a lack of resources, knowledge, and support from operators and donors [6, 11, 24]. Also described as problematic by staff were inadequate quantities of donated food or funding to purchase additional supplies, and a lack of adequate refrigeration and storage, making the acquisition and storage of fresh produce challenging [6, 11, 24]. This leaves staff (usually volunteers) unable to fulfil the nutritional needs of clients, a particular problem for those with specific needs or diets.

Limitations

Several limitations within the studies reviewed have been identified. Missing and unreported data were apparent in several studies. Remley et al. [16] did not explain how participants were recruited, Teron and Tarasuk [27] did not discuss all their data, and Tarasuk and Beaton [44] did not provide results from their 24-h diet recall, while Bell et al. [30] made recommendations in their study for future practice that were not based on the results from their study. Poor response rates were especially prominent in the study conducted by Azurdia et al. [29], where not all survey questions were completed. In contrast, participant withdrawal was relatively low in the longitudinal study and the

RCT; only 12.6 % of participants were lost to follow ups in Starkey et al. [25] and there were no reported dropouts in the study by Martin et al. [38].

Conclusions

This review is the first of its kind to investigate the role of food banks in alleviating food security and meeting the nutritional needs of clients. Many food banks were found to be providing an inadequate quantity of food to last the period between visits to the food bank, restricted to anywhere between once a week to once a month or more. As a result, the majority of food bank clients remained food insecure between visits.

The findings of this review suggest that the food bank practices that were the best at meeting client needs and improving food security were those that provided culturally appropriate and suitable foods in ways that clients perceived as dignifying. Suitable foods were those considered to be safe, nutritious and accommodating for special dietary needs. Considering the high reliance on donations for food provisions, educating staff and donors on appropriate foods to source and distribute can improve the capacity of a food bank to reduce food insecurity. Operational barriers to using food banks—such as a lack of resources, limited opening hours and lack of information about services—also need to be overcome to ensure food bank programs are inclusive and accessible.

Compliance with Ethical Standards

Conflict of interest The authors declare no conflicts of interest.

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