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Designing an Impactful Food Prescription Program to Address Food Insecurity in Canadian Communities: A Literature Review

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Abstract
Food insecurity is a prevalent issue among Canadian families. Increasing cost of food and fresh produce may be considered a key factor to a rise seen in food insecure families in Canada from 2021 to 2022. Social prescribing initiatives, specifically food prescription programs, are a potential way for clinicians to address food insecurity. Five research studies from communities across Canada were analyzed to find similarities and differences in design and outcomes. Key outcomes included participating individuals perceiving being less food insecure and establishing strong social connections within their communities due to the food prescription program. Accessibility was identified as an issue for many participants and should be addressed in any future food prescription programs that are established in Canadian communities.

Keywords: food insecurity; social prescribing; food prescription programs; accessibility; Canadian

Introduction

Food insecurity is understood to be a state where there is inadequate diet quality and/or insufficient quantities of food. The United Nations World Food Programme estimated that in 2023, between 713 and 757 million people experienced some level of food insecurity [1]. In Canada, conversations around food insecurity specifically focus on food insecurity in households due to financial difficulties [2]. In 2022, Stats Canada found that 18% of families in Canada reported being food insecure at some point in the previous 12 months, which was a 2% increase from 2021 [3]. Food insecurity was defined on three levels: marginally food insecure, moderately food insecure, and severely food insecure. Marginal food insecurity - defined as experiencing worry over running out of food or a limited food selection due to financial reasons - affected 5% [3]. Approximately half of food insecure families -8% - reported being moderately food insecure, defined as having compromised quantity and/or quality of food due to financial reasons [3]. Another 5% of Canadian families reported severe food insecurity, where family members reduced food intake, missed meals, and sometimes went days without food [3]. The rise in food insecurity may be linked to a rise in food costs, as food inflation rose from 1.0% in January 2021 to 8.8% in June 2022, as the Canadian economy suffered from rising inflation after the COVID-19 pandemic [3].

Food insecurity has been linked with poor nutritional intake and poor diet quality. Fruit and vegetable intake is lower in younger children who are part of food-insecure households when compared to children in food-secure households. In food insecure households, energy gained through consumption of ultra-processed foods (those high in added fats/sugars) was significantly higher than food-secure households [4]. Food insecurity has also been linked to premature death. An analysis of all premature deaths occurring among Canadian adults in 2017 showed adults who experienced severe food insecurity and lived nine years less than adults who were not experiencing severe food-insecurity [5]. The association between severe food insecurity and premature deaths was especially pronounced when the cause of death was infectious disease, unintentional injury, or suicide [5]. This suggests that food security and the lack thereof could be a determinant of health outcomes.

Social prescribing is a healthcare practice that acts to link patients in a primary healthcare setting with support programs that exist in their community. It allows doctors a non-medical treatment option that can co-exist with medical treatments. Common examples of social prescribing programs include physical activity such as dance classes, activities focused on forging new relationships and social connections, and programs that provide access to health information or advice [6]. In Canada, social prescribing is not a nationwide systemic practice, but rather local initiatives established to address a specific need within a community. This is in part due to the decentralization of the Canadian healthcare system, with 13 different provincial and territorial jurisdictions involved in healthcare delivery and funding. As the organization and delivery of healthcare programs is determined at a provincial/territorial level, an attempt to integrate a new practice such as social prescribing across all

of Canada would require approval from 13 separate healthcare organizations [7].

Food prescription programs (FPPs) are social prescribing programs that address food insecurity or inadequate diet as a potential cause of poor health outcomes. Typically, FPPs are designed to target food insecure individuals or individuals diagnosed with a diet-related health condition such as type II diabetes. They typically consist of “prescriptions” or monetary vouchers that can be used to purchase fresh fruits and vegetables [8]. FPPs in the United States have shown improvements in dietary behaviour, BMI, and blood pressure levels of participating individuals [8]. FPPs have potential to improve fruit and vegetable consumption and reduce food insecurity levels in affected individuals - however, barriers such as social stigma/beliefs, transportation costs, and nutritional literacy often need to be addressed within a community for a FPP to be effective [9]. Different elements must be considered when designing an FPP. This paper looks to find and the similarities and differences between Canadian FPPs to determine what common elements lead to a successful initiative. Identified elements could be used to design an effective FPP to address food insecurity in Canadian communities.

Methods

Searches for relevant literature were conducted on popular scientific databases, such as GoogleScholar and Science Direct. A search was also conducted on the Government of Canada Public Health Agency of Canada database. Search queries used keywords of “food prescription,” “food insecurity,” and “food prescribing” alongside terms “Canada” or “Canadian.” Of the papers returned by the searches, all were screened to ensure they included at least one of each keyword category above, either in the title or in the abstract. The resulting 24 papers were then filtered to exclude any papers published prior to 2005, any papers that were secondary in nature (i.e. literature reviews or meta-analyses), and any papers where the studies took place in a non-Canadian community. After filtering, five papers were analyzed. General overview of each paper is summarized in Table 1.

Table 1. Overview of Studies. Tabular summation of the location and focus of the research studies analyzed. Table was created in MS Word.

	Johnson et al [10]	Brubacher et al [11]	Heasley et al [12]	Olstad et al [14]	Lange [13]
Location of Study	North Simcoe, Ontario, Canada	Guelph, Ontario, Canada	Guelph, Ontario, Canada	Alberta, Canada	Regina and North Battleford, Saskatchewan, Canada
Focus	To explore the experiences of participants recruited for a local FPP.	To examine how FPP participation impacted participants’ interactions with existing supports and food assistance programs	To evaluate the impacts of a pilot fresh food FPP.	To investigate FPP effectiveness via impact on glycosylated haemoglobin, food insecurity, diet quality, and other clinical and patient-reported outcomes	To assess the experiences of participants accessing a Saskatchewan-based FPP

Results

Several design elements of the FPPs were similar across the papers analyzed. These are summarized in Table 2. All studies but Johnson et al [10] recruited participants via a family physician or healthcare worker. Johnson et al [10], Brubacher et al [11], Heasley et al [12], and Lange [13] used a screening tool to target individuals who were food insecure; Olstad et al [14] specifically targeted individuals who were type II diabetic. Johnson et al [10], Brubacher et al [11], and Heasley et al [12] made use of a pre-established food program in the local community when designing and conducting the FPP. Brubacher et al [11], Heasley et al [12], and Lange [13] conducted a one-on-one interview with participants before and/or after the study to gain an understanding of the participants perspective on food insecurity, the study, and the FPP. Johnson et al [10] conducted a group interview with participants after the study, and Heasley et al [12] used both one-on-one interviews and a survey conducted before and after the study to gain an understanding of the participants perspective. All papers but Johnson et al [10] used or planned to use a pick-up method for the participants to receive their food. This was done either as a pick-up method where participants arrived at a predetermined location to receive a food package; or as a grocery store method, where participants used food vouchers at a grocery store or an establishment designed to resemble a

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grocery store run by the community food program. Johnson et al [10] opted to deliver pre-ordered food packages to participants. Heasley et al [12] did pivot from a pick-up method to delivery due to the COVID-19 pandemic; it was not planned.

Table 2. Design elements of FPPs. Tabular representation of how the FPP was designed to operate in the research studies analyzed. Table was created in MS Word.

	Johnson et al [10]	Brubacher et al [11]	Heasley et al [12]	Olstad et al [14]	Lange [13]
Recruitment via healthcare worker		✔	✔	✔	✔
Screening for food insecurity	✔	✔	✔		✔
Used pre-established food program	✔	✔	✔		
One-on-one interview		✔	✔		✔
Group interview	✔				
Survey			✔		
Pick up (food package)					✔
Pick up (grocery store)		✔	✔	✔	
Delivery of food package	✔		✔*		

*Switched to delivery method due to the COVID-19 pandemic Of the papers analyzed, all but Olstad et al [14] included results from the study. Olstad et al [14] published a proposal for a study on the applicability of an FPP. The study is likely still underway, as no results have been published yet. A search was conducted to see if results had been published, but nothing was found.

Across the four studies, three key themes of participant feedback have been identified.

Theme 1: Control & Dignity

Across all papers, participants expressed appreciation for how respected they felt by the FPP workers. Participants often compared their experience with the FPPs with that of using a food bank. They noted that at food banks they often felt judged or faced stigma for using the food bank; they often felt that food banks only provided them with second-rate food (e.g. rotten, expired). Participants who were part of programs where a grocery store style (Brubacher et al [11], Heasley et al [12]) was incorporated expressed they appreciated having control over what food they were taking home. These sentiments were not expressed to the same degree by participants of programs where a delivery package style was used (Johnson et al [10]). Participants who were recently new to Canada across several studies expressed that the ability to choose their produce was especially important to them. Some participants in the study conducted by Heasley et al who experienced both a grocery store style of distribution and a delivery package (due to the COVID-19 pandemic) expressed a preference for the grocery store style, as they felt less produce went to waste when they had control over selection. The design of a grocery store style distribution also had participants expressing they felt less shame in using the service, as it was akin to buying food in a normal sense.

Theme 2: More Than Just Food

Across all papers it was heavily noted that participants felt the FPP offered them more than a regular guarantee of fresh food. Participants noted feeling more connected with their community - the delivery of produce from the FPP had participants preparing fresh meals with their children/family members and swapping produce items with neighbours and community members to prevent food waste. This led to new/better social connections being established for participants.

Participants also expressed feeling more in control over their health and health conditions, as receiving fresh produce allowed them more choice over their meal preparation than receiving canned or prepared food would.

A heavily expressed sentiment among all participants was that they felt more financially stable, as the food prescription program allowed them to cover other expenses with the money that would have otherwise gone to buying food. Some of the FPPs even offered a carry-over aspect to the food vouchers, where any monetary value not used up by the end of one week would be added to the next. This led to

participants feeling more confident, as they did not have to consistently worry about having enough money to cover the next week, or worry about wasting money or produce.

Theme 3: Accessibility & Connection to Culture

Two critiques of the FPP were regularly brought up in all studies. First, there were often barriers that prevented the program from being fully accessible; difficulty getting to the food pick-up spot or harsh weather/health caused participants to miss a week of participation. Sometimes limited options in food choice due to dietary restrictions led to participants consuming less than the recommended intake of fruits/vegetables.

Second, many participants noted that they wished to see more diversity in the options of food - specifically mentioning wanting to see more fresh produce that was connected to their cultures that may not be available to them at regular grocery stores. Participants also expressed a desire to see educational content included with the produce, such as recipes and ideas on how to prepare healthy meals with the fruits and vegetables they were receiving.

Some other themes include; participants feeling a connection to their primary care physician/health care worker who recommended them to the program, participants appreciating the degree of privacy offered to them when programs incorporated a food voucher that resembled a gift card, participants expressing the food prescription program had better quality produce than that of food banks/other social programs, and participants expressing dissatisfaction with pre-selected produce boxes.

Discussion

Of the four papers that provided results and participant feedback, all four only collected data on a qualitative/emotional level; that is, how participants felt about the FPPs and their experience with it. No data was reported on physical health outcomes of participants - i.e. blood pressure, blood glucose levels, BMI scores, or other clinical factors. Data on physical health could potentially strengthen the argument for the effectiveness and success of FPPs if a physical improvement in health were shown alongside emotional improvements.

Key benefits from the FPPs included regular social interactions, perceived better health, and more financial flexibility for participants. The FPPs improved social relationships for participants, either by allowing them to establish new relationships with volunteers of the program or strengthen existing relationships with family members/neighbours through cooking and sharing of the fresh produce. Participants also felt better about their personal health as they were consuming more fruits and vegetables than they otherwise would have and had control over what produce they were consuming and how it was prepared. Participants felt more financially stable, as they were able to use finances that would have otherwise gone towards food for things like medications and home improvements. When designing future FPPs, if possible, a carry-over feature for participants should be offered to ensure a feeling of financial stability. The overall positive experiences of participants in all FPPs shows that these programs help individuals suffering from food insecurity with improving many qualities of their life, not just the nutritional aspect. Stress has an impact on cardiovascular health, aging processes, immune function, and injury healing [15] so the FPP reducing stress over finances and personal health helps improve participants' health outcomes further. A lack of social relationships have also been suggested to impact physical health and premature mortality [16], so the social aspect of an FPP, whether it be the participants interacting with volunteers or their own community, also serves to improve participants’ health outcomes.

A theme of respect and control raises a strong counterpoint to the potential argument that FPPs are equivalent to food banks. Participants noted preferring the FPP to a food bank, as they were treated with more respect, did not feel shamed or belittled for needing food assistance, and given more control over what products they received. Additionally, participants felt that the quality of the produce they were receiving from the FPP was superior to what they would receive from a food bank, and that they were less likely to waste food when the FPP gave them control over what produce they received.

Accessibility echoed across all studies as a place for improvement. Studies that employed a grocery store method of distribution had participants reporting they sometimes were unable to make it to the store and thus were unable to benefit from the fresh produce being offered. The same issue arose with studies that used a pick-up food bag method of distribution, with other factors such as weather and scheduling issues also causing participants to miss their goods. The study that used a delivery method of distribution did not encounter these accessibility issues - however, participants desired more control over what products they were receiving and did not speak of the same social benefits that participants in studies with a pick-up method reported. Future FPPs may want to consider a hybrid pick-up/delivery option to improve accessibility.

In 1984, Thomas & Penchansky [17] developed a model of healthcare accessibility that could be considered in the context of a food prescription program. In this model, five dimensions are considered to decide if a healthcare service is accessible or not: (1) Availability - are the resources that this service requires (ex. volunteers, fresh produce, physical store space) available? (2) Geographic accessibility - is this service geographically available to patients/participants? (3) Accommodation - can this service be modified to accommodate people with differing needs? (4) Affordability - are patients/participants able to financially afford to use this service? (5) - Acceptability - do patients/participants find the service acceptable for the distance traveled/cost/wait time? For a FPP to address these dimensions, it would need to be centered within the community it was serving, staffed, able

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to perform both in-person services (i.e. as a grocery store style) and delivery of food packages, and stocked with produce that participants wanted. Due to the nature of FPPs being free to participants, the affordability dimension can be considered a negligible factor - unless, of course, there was some fee participants needed to pay to be able to access the program, such as bus fare.

After considering the feedback from participants, it is apparent that FPPs fill in a necessary gap for individuals dealing with food insecurity, and act to provide them with more than nutritional enrichment by reducing stress over financial and health conditions and improving social relationships. While experiences have been overall positive, issues such as accessibility and variety could be addressed in future FPPs. For example, some participants expressed a desire to connect with their culture through food - a request form could be incorporated into a food prescription program where participants could suggest produce items for the program to stock. It is also imperative that any FPP be established in a central community location and be easily accessible. A hybrid method of participants choosing either a pick-up or delivery method of their produce may help address many of the accessibility challenges.

FPPs are a key example of the importance of social prescribing programs, which act to tie together healthcare and community programs in the interest of improving health outcomes. Other social programs have been run in Canada to attempt to improve food insecurity but did not have as great an impact on food behaviours. For example, the Healthy Foods North program [18] was a year-long intervention campaign run in the Canadian territories. It worked to improve dietary quality among Inuit and Inuvialuit communities in Nunavut and the Northwest Territories by incentivizing local grocery stores to stock healthier food options and holding community events such as cooking classes. An improvement in psychosocial behaviour towards food was improved, but food consumption behaviour was not impacted significantly [18]. This could be due to the high costs of food in the Canadian north. A review on the Nutrition North program - a federal program that aimed to improve food access to northern Canadian communities through subsidies provided to local retailers to reduce food costs - showed no change in food prices between April 2011 and 2013, with food remaining 50% more expensive in the community of Nunavik, QC than it is in the rest of Quebec [19]. Both Healthy Foods North and Nutrition North show that an FPP where food insecure families are afforded vouchers with which to buy produce would be beneficial for northern communities.

One example of an FPP in a northern community is a program run in Bethel, Alaska where participants received vouchers valued at USD $45 once every three months that could be redeemed for fresh, frozen, and canned food that do not have added salt or sugar [20]. Notably, the vouchers were also redeemable for a direct-delivery fresh produce box from a local farm that used innovative practices that allowed them to grow produce not otherwise available in the north, such as strawberries, carrots, and potatoes [20]. The FPP also worked to integrate recipes for traditional dishes of the Indigenous community native to Bethel into their program. This is a fitting example of how an FPP can be integrated into a deserving community and address food insecurity in a non-medical way.

Conclusions

Social prescribing, and more specifically FPPs, are a small but growing effort to address food insecurity levels in Canada. This literature review found five research projects within Canadian communities where an FPP was implemented, and participants were asked to provide feedback. All FPPs were viewed in a positive light, and participants reported feeling less food insecure after the program had concluded. However, issues remain, specifically pertaining to accessibility of the FPP for participants. If these accessibility challenges were addressed, the establishment of FPPs within Canadian communities could be a great option for clinicians to help food insecure patients address their health.

List of Abbreviations

FPP: food prescription program

Conflicts of Interest

The author declares that they have no conflicts of interest.

Ethics Approval and/or Participant Consent

As this study only reviewed currently published literature research, no ethics approval was required.

Authors' Contributions

LKW: made contributions to the design of the study, collected and analysed data, drafted the manuscript, and gave final approval of the version to be published.

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