

Food Safety and Diversity in the COVID-19 Era: Experiences of Public Health and Settlement Officials with New Immigrants

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Abstract Canada has a diverse socio-cultural population, 21.5% of which is comprised of immigrants born outside of the country, a figure now reaching 49.5% in big cities, such as Toronto. This diversity is also reflected in the food culture. While traditional foods carry immense importance for retaining immigrants' socio-cultural and ethnic identities, the safe handling of cultural foods has been a concern for public health authorities in recent decades. Food handling training programs provided by public health and settlement agencies play a crucial role in educating new immigrants about critical aspects of food safety in households and commercial establishments. Little knowledge is available about main issues related to food safety and how COVID-19 has influenced the related outreach programs of different service agencies. Our study, the first of its kind, identifies knowledge gaps regarding public health risks among recent immigrants regarding food safety practices in light of the COVID-19 pandemic. Factors that lead to a decline in access to food safety knowledge among immigrants are identified. Responses of 14 public health and settlement workers working with different immigrant communities were collected through a qualitative online survey. Data were thematically analyzed using NVivo software. Results show that while food safety training and outreach programs are quite beneficial and build on new immigrants' background knowledge about the critical aspects of food safety, food safety outreach programs offered by different service agencies have been significantly reduced as a result of COVID-19. COVID and related health restrictions also worsened the financial challenges faced by new immigrants due to the closure of many foodservice businesses. Results also reveal that food safety infractions among newcomers are mainly due to language barriers and financial constraints. To meet the desired food safety learning targets, there is a need for developing culturally appropriate food safety training for different immigrant groups.

Keywords: *new immigrants, environmental health, food safety concerns, food safety knowledge, cultural food practices, COVID-19, food safety training*

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1. Introduction

Foodborne illnesses result from the consumption of foods contaminated with different disease-causing organisms. Food poisoning outbreaks due to unsafe food handling practices have been reported at both the household and commercial levels. Household food safety infractions are associated with unsafe food handling in the home kitchen [1]. Multiple reasons for food-borne illness have been identified, such as the absence of food safety information, use of contaminated foods, not following recommended preparation temperatures, under-cooking foods, and unsafe handling of different types of food at home [2]. In commercial food establishments, foodborne

illnesses may result from unsafe food behaviours, such as workers' poor hygiene practices, the use of contaminated raw food, and unsafe food preparation practices [3].

Traditional foods worldwide have been associated with different food safety risks in various regions of the world due to their unique preparation and storage methods [4,5]. Among immigrants, traditional foods and cooking practices are essential for identity retention and group membership. When going through a cultural dislocation, newcomers tend to share this knowledge with younger generations. Food also plays a crucial role in adapting to a new set of norms and a new culture [6]. These contradictory tendencies are reflected in intergenerational tensions and knowledge gaps within immigrant families. Some studies have shown that food safety and dietary practices change after immigrants settle into their new

country [7]. This change is attributed to the difference in language, cultural values, and food practices, as well as shifts in personal preferences after relocating to the new society [8].

Different minority groups, including immigrants, can also experience poor access to major supermarkets that provide a variety of fresh, culturally appropriate, and safe foods due to cost and location. As a result, immigrants and minorities tend to procure food from small, local convenience stores and ethnic food shops. Often owned by newcomer immigrants themselves, these establishments may vary in food safety conditions due to limited resources and infrastructure, inadequate food refrigeration and storage facilities, and a lack of food safety knowledge on the part of operators and food handlers [9]. Unsafe food handling practices and changes in the dietary patterns of immigrants in their new country have been linked with factors such as a lack of understanding of various foods, compromised financial resources, an inability to afford better quality foods, and unsafe food handling practices [10,11].

Food safety training by public health authorities plays a key role in reducing potential food safety infractions. These programs aim to increase the level of food safety knowledge of employees working in the food and beverage industry and ultimately improve their food handling behaviours [12]. A meta-analysis of five food safety training programs established that they effectively increase knowledge and attitudes about food safety practices [13]. Food safety training studies have aimed to increase the knowledge levels and attitudes of food handlers after receiving this training [14].

Food safety training is considered an effective strategy for improving food handlers' knowledge and work-related practices [15]. To minimize the risk of food-borne hazards, Elobeid et al. [16] recommended mandatory food safety training for food service employees. This training helps new immigrants with the safe handling of different kinds of foods. Immigrants from Africa and Asia showed increased knowledge and positive food safety behaviour after participating in cooking classes and discussion maps designed to increase food safety knowledge [7].

In Canada, various public health agencies and other organizations, such as the Canadian Partnership for Consumer Food Safety Education's Fight BAC program, provide training on safe food handling to new immigrants. These programs enable newcomers to get hands-on training in safe food processing, which ultimately empowers them to become financially independent [17]. There is a knowledge gap around how COVID-19 has affected the food safety outreach programs aimed at new immigrants.

The COVID-19 pandemic has affected immigrant communities more than the other segments of society in the United States due to poor socio-economic status [18]. Literature shows that outreach and training programs involving hands-on activities in health and other skills development sectors have been adversely affected by COVID-19. Data has shown an impact on cardiology training programs and related patient care, leading to fewer opportunities for skill development [19]. Hayashi et al. [20] reported a decrease in the efficiency of technical vocational and educational training (TVET) delivery due to COVID-19 and the absence of hands-on training.

The present study aids in understanding the factors that facilitate and hinder food safety practices among new immigrants through examining the experiences of public health and settlement officers in Canada. Another aspect explores how COVID-19 has impacted these service agencies that work with new immigrants since this training plays an essential role in the social and economic well-being of new immigrants by enabling them to open their own food business ventures.

2. Methodology

The study was conducted by collecting responses from public health and settlement officers working in the Greater Toronto Area (GTA), using an online questionnaire with closed and open-ended questions. Approval of Ryerson ethic's board was sought before initiating the study.

2.1. Conceptual Framework

This study builds on previous research on challenges faced by different immigrant communities related to food safety in a new cultural setup and how outreach activities offered by different public health and settlement agencies are helping in knowledge improvement.

Studies have testified to the fact that language barriers play a key role in shaping dietary patterns and making unsafe food choices among immigrant communities during the course of their resettlement in a new country [21]. Harris et al. [22] also indicated that a lack of understanding of the language and pre-learned cultural beliefs about certain traditional foods contribute to food safety infractions in restaurants with ethnic operators as compared to restaurants operated by non-ethnic workers.

Woh et al. [23], while observing the basic knowledge and food handling practices of immigrant workers associated with the food business in Malaysia, reported that workers were unable to understand the key points of food safety training due to language barriers, which led to unsafe food handling practices such as not wearing a proper uniform while preparing food and picking up food without using chopsticks, resulting in major food safety outbreaks. Sufficient evidence on how language barriers shape household food safety choices and practices in immigrant communities is needed.

Vahabi and Damba [24] identified inadequate financial resources as barriers to gaining access to food for Spanish and Portuguese immigrants in Toronto. Unstable economic conditions have also been associated with poor dietary choices by African Americans, Hispanics, and Asians in the United States [25]. However, convincing literature showing how a lack of financial resources leads to unsafe food choices by immigrants is lacking.

Dharod et al. [26] reported that refugees face social isolation, poor physical activity, and financial hardships upon resettlement in the United States. Settlement training and skills training, such as the programs offered by public health and settlement agencies, are imperative for new immigrants to integrate into their new country and culture. Food safety training, culture-specific TV programs, and relevant printed materials have helped in improving food

safety practices among Hispanic Americans [27]. Literature is focused on conducting impact assessments of food safety training and outreach programs available to immigrant communities. The response of immigrant communities in the absence of training and outreach programs in unusual circumstances, such as the COVID-19 pandemic, has not been reported on so far.

The current study aims to explore the gaps and identify the main barriers linked to food safety practices from the Canadian perspective. We examine how the lack of affordability and inability to understand the language lead to new immigrants making unsafe food choices. The present study also explores the impact of COVID-19 on food safety training. The study questionnaire incorporated the gaps identified in previous studies to investigate the food safety choices of new immigrants and the role of training and outreach programs in increasing food safety knowledge.

2.2. Questionnaire Development

The survey questionnaire was developed on the basis of the reference framework and previous studies on new immigrants' food safety practices [11,28]. Relevant COVID-19 questions were also incorporated in the study instrument. The online questionnaire was comprised of 18 questions, including 12 open-ended and six close-ended questions. The survey was based on four main topics regarding new immigrants: 1) existing food safety knowledge; 2) effects of income and cultural values on food safety choices; 3) concerns regarding food safety during COVID-19; and 4) impact of COVID-19 on food safety preferences. The survey questionnaire was pre-tested with four public health professionals to determine the understandability of the research instrument. The inclusion criteria for study participants were working as a public health professional or in a settlement agency operating in the GTA and being specifically involved in outreach programs for new immigrants. Invitations to participate contained detailed information about the study along with a link to the survey, and were sent via email to public health officers, settlement agency workers, and those involved in peer nutrition networks.

2.3. Study Participants

The goal of the study was to gain insights into the factors that shape the food safety practices of new immigrants and how COVID-19 has affected the provision of food safety training to new immigrants. The study investigated changes in food habits and practices, as well as challenges associated with accessing the information on food safety following immigration to Canada. Study participants, therefore, included workers associated with different public health and settlement agencies, language instructors, and dieticians working with immigrants in different capacities. The study group represented a diverse set of experiences in working with immigrant communities. Participants' work experience with immigrant communities ranged between 0 and 25 years, and 43% of the respondents had experience greater than 10 years. The remaining 67% had less than 10 years of experience working with different immigrant communities.

2.4. Data Collection

The study data was collected through an online survey from February 2021 to June 2021 utilizing the Google Forms and then transferred to Excel for analysis. Data was thematically analyzed using NVivo9™ qualitative data management software.

3. Results

The questionnaire covered topics such as sources of food safety information for new immigrants, main concerns of immigrant communities during the COVID-19 pandemic, factors that affect the exchange of food safety information, and the effect of COVID-19 on the exchange of food safety information. The four main themes and sub-themes that transpired from the survey are given in Table 1.

Table 1. Themes and sub themes from the study

| Theme | Sub themes |
|---|---|
| Language barriers | "Not understanding English"; "lack of language skill"; "language proficiency" |
| Financial constraints | "Financial concerns"; "cost of food"; "low income" |
| Improvement in preconceived food safety knowledge | "Resources provided by public health officers"; "food handler certification course" |
| Reduced outreach activities due to COVID-19 | "Pandemic created a big barrier"; "lack of social interaction" |

3.1. Language Barriers

Language barriers emerged as a main reason behind the lack of understanding of food safety practices among new immigrants. The public health and settlement officers surveyed reported that one of the biggest challenges faced by new immigrants in understanding and applying food safety knowledge in routine practices is the inability to understand the language. In response to the question around "new immigrants' top 2-3 concerns related to Food Safety while they adjust to the new environment and culture," respondents pointed to language barriers as a big obstacle to understanding the Canadian standards and Ontario regulations.

New immigrants from different ethnic communities have different preset social and cultural values. The exchange of food safety information between newcomers is therefore important for different immigrant communities to be able to maintain a healthy food environment. The language barrier affects this exchange of food safety knowledge among new immigrants. The majority of public health and settlement officers (n=11) identified language barriers as the main reason for poor communication amongst different immigrant communities about important aspects of food safety.

Study participants also designated the language barrier as the biggest hurdle in the proper dissemination of knowledge. According to one of the survey participants working as a public health officer with 12 years of experience, "they tend not to ask questions during training and inspections, [and it's] sometimes hard to understand if they received the proper message."

One food handler trainer with three years of experience indicated that the language barrier leads to “the lack of understanding of [a] few products. Therefore, they do not know how to keep / store them and cook with them.” New immigrants also find training materials hard to understand. Study participants identified a need for “simplified material” for easier understanding. Finally, 13 (n=13) out of 14 survey respondents (92.9%) considered the language barrier to be the biggest challenge faced by new immigrants in understanding food premises regulations and practicing food safety.

3.2. Financial Constraints

Lack of enough financial resources appeared as one of the biggest concerns for new immigrants while making choices about safe food during the course of their adjustment to their new environment and culture. A large number of participants (n=7) indicated that a lack of financial resources leads to the purchasing of unsafe food. According to one of the survey participants with 25 years of experience working as a registered dietician, “new immigrants prefer unsafe fresh food over frozen food due to cost factors.”

In response to the question, “Do you think new immigrants consider food safety practices as a part of their everyday cooking and grocery shopping?” participants listed “affordability,” “cost of food items,” “less financial resources” and “reliance on the food banks” to be the main reasons for compromising on food quality to meet daily nutritional needs. In addition to this, a “lack of enough financial resources” to access good quality food was also reported as affecting the food safety preferences of new immigrants.

A majority of study participants (n=11) had observed changes in the income levels of new immigrants during the COVID-19 pandemic that affected their food safety practices. Unstable financial conditions had also changed their preference for specific foods (including fresh fruits, vegetables, and meat/meat products), overall changing their dietary patterns. The change in the food preferences of new immigrants as a result of COVID-19 is shown in Figure 1. A majority (79%) of the study participants had observed changes in newcomers’ food preferences during the COVID-19 pandemic. These shifts in food preference can be attributed to changes in financial circumstances related to COVID-19.

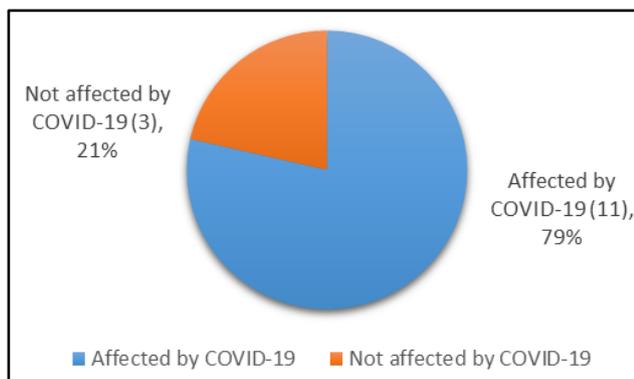


Figure 1. Change in food preferences of new immigrants due to unstable financial conditions as a result of COVID-19

The COVID-19 pandemic has significantly affected the opening of new food business ventures by new immigrants. A majority of the respondents (n=12) agreed that the opening of new food ventures has “significantly decreased” and been “reduced.” Participants observed that many food outlets operated by new immigrants have closed down since the onset of the pandemic due to related financial impacts. One settlement worker with one year of experience with newcomers stated that, “During [the] pandemic small food shops were closed – they lost their businesses and couldn’t re-open it because of the financial situation.” Our study results are a testament to the fact that losses in economic activities due to COVID-19 have added to the financial burdens experienced by immigrants.

3.3. Improvement in Preconceived Food Safety Knowledge

Survey results revealed that new immigrants have some background knowledge about handling different foods from their home country. According to 87.5% of the survey participants, new immigrants have a medium level of prior knowledge about the food safety practices required to maintain a healthy lifestyle. From the results, it can be inferred that a majority of new immigrants have some existing background knowledge about food safety practices. Despite having some previous food safety knowledge, however, new immigrants find it difficult to operate commercial food establishments in their new country of residence. Our results indicate that pre-learned food safety practices sometimes make it difficult for newcomers to learn and comply with the requirements of food premises regulations. According to one of the study participants with 15 years of experience working as a public health officer, a “better understanding of [the] Canadian regulatory system is required” to comply with food premises regulations. Food safety training improves such previously learned food safety information. Another study contributor with two years of experience working as a settlement worker stated that “Many people tend to follow their upbringing practices, especially with food. I think providing new options/alternative types of food/vegetables could encourage for change with an opportunity to correct some food handling practices.”

Immigrants moving into a new society and culture depend on social integration for their successful adjustment to the new country. Most survey participants (85.7%) rated the information resources provided by different public health units and formal training programs, such as food handling certification courses, as the most viable sources of information needed by new immigrants. In addition to these two community resources, written material including brochures and leaflets, social media, workplace networks, and radio programs and commercials were listed as effective sources of information about different resources that discuss food safety.

Food safety training is essential for imparting food safety knowledge to new immigrants while they settle in their new culture and society. A majority of the study participants indicated that “food handler courses” and “trainings” play a vital role in creating awareness about food safety knowledge among newcomers. Study participants also highlighted a need to provide training

courses and materials in multiple languages to ensure easy understanding of food safety information among different immigrant groups. Provision of training in one's own language was pointed to as the key factor that leads to more effective food safety training. A majority of the survey participants (n=13) stated that the resources provided by public health inspectors, food safety training courses, and community interaction during training activities are helpful for new immigrants in gaining access to food safety knowledge.

3.4. Reduced Outreach Activities due to COVID-19

The above themes all point to outreach activities as one of the most important ways to impart information to new immigrants. All of the survey participants reported a significant decrease in food safety outreach activities as a result of the COVID-19 pandemic. Multiple reasons for the reduction in outreach activities were reported by the representatives of public health and settlement agencies. Due to the social distancing restrictions, in-person training and outreach activities were very limited during the first year of the pandemic in Ontario. Programs and training solely emphasizing COVID-19 related issues were focused on by the government. Lack of staffing and staff deployment to pandemic response efforts were the main reasons cited for the reduced outreach activities. One public health inspector with 12 years of experience working with newcomers stated, "The services we provide to new immigrants were affected a lot, [with] reductions because of the time commitments of public health staff to the Covid response."

According to our findings, the absence of in-person training and outreach activities significantly affected and reduced the success of food safety training objectives. Study participants reported that COVID-19 reduced interaction opportunities with new immigrants. One public health officer with over 15 years of experience stated that "COVID-19 has resulted in [a] reduction in educational initiatives (course); [and a] reduction in compliance inspections." In the absence of in-person training sessions, the study participants reported using different web applications such as Google Meet and Zoom to meet with different immigrant groups. However, language barriers and financial constraints played a role in how information technology was used, and this negatively impacted the effective communication of food safety knowledge. Participants reported that it was difficult for them to properly communicate food safety knowledge to new immigrants through virtual training sessions and that training objectives were compromised. One of the survey participants working as a registered dietician stated that "the best way to train new immigrants about different aspects of food safety would be in a community kitchen setting where they can share cultural foods and food preferences and learn about food safety at the same time. These types of social interactions are not currently possible in a pandemic. We are not currently able to run any such programs." This statement was supported by other participants who had observed a similar pattern with reduced outreach activities, citing the lack of mobility, the inability to use and/or access a computer and/or the

internet, and the cancellation of food safety training courses as contributing factors.

In the presence of social distancing protocols, participants had also observed an increase in the requests for inspections of home-based food business ventures. A public health officer with 15 years of experience in inspections and food handler training observed that the pandemic has negatively affected the outreach programs for all. "I was surprised with new Middle Eastern/Shawarma places that have opened up during the pandemic in our area. Well-versed in food safety, the operators have pivoted their concepts to take out only and have been resourceful with the food safety certifications. There have been a few home-based business requests. Although we are trying to encourage new businesses for people to make a living, we are unable to approve in-home businesses due to lack of staffing and the health and safety involved in going into people's homes." As evident from this participant's statement, COVID-19 has significantly affected the provision of required inspections for home-based business approvals. Failure to obtain these necessary approvals due to COVID-19 has also added to the financial difficulties of new immigrants.

4. Discussion

This study was designed to study the main factors that facilitate and hinder the communication and practice of food safety knowledge among immigrant communities. The survey investigated immigrants' learning opportunities and practices around food safety during the COVID-19 pandemic and the impact of COVID-19 on the exchange of food safety knowledge among new immigrants. The present study is a foundational investigation focused on the impact of COVID-19 on food safety training in general and more specifically in Canada.

The study's results show that language barriers and financial constraints are the main factors that obstruct the transmission of food safety knowledge to new immigrants. Previous findings [21] have also indicated language barriers as one of the main influences on immigrants' dietary choices during their settlement in a new country. Studies have also established the language barrier as one of the most significant factors leading to less understanding of food safety knowledge among immigrant workers [23]. An inability to understand English has led to less understanding of food safety regulations and the critical points necessary for food safety for various ethnic communities in the United States and Canada [11,29].

Our results also reveal that the lack of understanding of food safety regulations in food establishments operated by new immigrants is mainly due to language barriers. This fits with the results of previous studies that have found that food outlets operated by different ethnic communities generally fail to follow food safety protocols due to language barriers and a lack of food safety knowledge [22].

This study also found that "cost and affordability" are the main factors leading to unsafe food choices. New immigrants face financial burdens during the course of their settlement in a new country. Less financial resources and economic instability are the main repercussions of

immigrating to a foreign land [30]. Lack of affordability forces new immigrants to make unsafe food choices. Previous studies have also indicated that immigrants' unstable economic conditions lead to them making low-quality dietary choices [31]. Chalerm Sri et al. [32] observed that food safety knowledge and economic conditions played a vital role in shaping the food safety choices of elderly people in Thailand.

Food safety courses offered by public service agencies in Canada play a key role in increasing new immigrants' knowledge about safe food handling in their new culture and environment. Our findings show that food safety training facilitates the exchange of food safety knowledge among new immigrants. Ratnapradipa et al. [33] reported a similar pattern of increases in food safety knowledge among Eastern European refugees in the United States. Husian et al. [34] also observed an improvement in the food safety knowledge of food handlers after food safety training courses. A study [35] conducted in the food service establishments of Universiti Kebangsaan Malaysia (UKM) pointed out the need for food safety training to increase the food safety knowledge of workers. The consistent findings of research in this area illustrate the importance of food safety training programs, particularly for newcomers.

Unfortunately, the onset of the COVID-19 pandemic significantly reduced community outreach and training activities. There is considerable evidence that outreach activities in the health sector have been significantly reduced due to the pandemic [36]. Yet, there is no relevant literature assessing the impact of COVID-19 on food safety training.

The present investigation marks a pioneering effort to estimate how COVID-19 has affected the food safety training of new immigrants. Our study shows a significant decrease in food safety training due to the pandemic, with program reductions occurring partly because of a lack of mobility and access to community kitchens. Social distancing measures have also factored into this decrease in programming. Previous studies on food safety concerns during the COVID-19 pandemic were focused on investigating the transmission of the COVID-19 virus through food intake [37], marking a need to expand research in this area.

The food business is an essential source of revenue generation for the newcomers in Canada. According to Restaurants Canada, almost half of all Canadian restaurants are run by immigrants. Food businesses suffered a major blow during the first half of the pandemic and almost 800,000 workers lost their job during that period [38]. Our findings also indicate a decrease in food business operations during the pandemic, partially because COVID-19 has significantly reduced the sales and proceeds of small businesses. The Government of Canada has reported the closure of 56% of food and drink establishments in the country during the pandemic thus far [39]. A similar pattern of small food business closures has been observed in the United States [40]. The closure of commercial scale food establishments has led to the increase in the demand for home-based food businesses, generating potential economic activity for small business owners.

As mentioned by various study participants, home-based food business inspection services have been in demand during the COVID-19 pandemic, showing a trend in the increase of small home-based business. A trend of increased sales in the area of home-based meals has also been reported by the United States Chamber of Commerce [41]. Increases in the demand for home-based food have opened up new ventures in entrepreneurship for newcomers in Canada. As such, home-based businesses can improve economic opportunities for newcomers.

5. Conclusion

Food safety training plays a critical role in increasing the food safety knowledge and attitudes of new immigrants in Canada. Language barriers and financial difficulties have been among the main obstacles for newcomers in terms of understanding food safety knowledge and its applications, both at home and in the workplace. The onset of the COVID-19 pandemic significantly reduced the specialized food safety handling training available to newcomers to Canada, resulting in a marked reduction in the opening of new food outlets operated by new immigrants. This has further exacerbated the financial difficulties experienced by this population. Due to COVID-19 restrictions and a financial recession, an increased trend in the opening of home-based food businesses by new immigrants to meet their financial needs has also been observed during the pandemic. Decision-makers will need to increase the frequency of in-person courses to address the current challenges in accessing food handler training during the pandemic. For the effective implementation of food safety training courses, culturally appropriate materials should be developed for immigrants coming from different ethnic backgrounds. Further studies are warranted to more deeply understand the food safety practices of different ethnic groups.

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