



Health-wellness resources on Canadian immigrant service provider organizations' websites: A content, navigability, usability, and credibility analysis towards service & asset mapping

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ABSTRACT

Background: Immigrant service provider organizations (SPOs) are often immigrants' first point of contact to Canadian systems, such as job, education, health and social care, and housing. Prior research emphasizes the health literacy potential of websites as information infrastructures that can reduce information poverty and improve health outcomes. Yet, whether health-wellness resources are present on immigrant SPOs' websites in a user-friendly manner remains unexplored.

Methods: We identified the presence of health-wellness resources on SPOs' websites and analyzed those contents to understand their typology. We also ascertained the navigability, usability, and credibility of those websites regarding the health-wellness resources.

Results: Among the 1453 SPO websites identified, only 289 (35.9%) had health-wellness information in their web-contents. Of the websites with health-wellness contents, "lifestyle and wellness resources" were present on 86.5% and "healthcare system resources" were present on 80.6% of the websites. Regarding "navigability", zero to two mouse clicks were required to access health-wellness resources on 94.8% of the websites; however, more than one language option was very limited, available on less than a quarter of websites.

Conclusions: As immigrants continue to seek information online, immigrant SPOs' websites hold value in increasing the health literacy and health-wellness of immigrants. This research assessed the current state of immigrant SPOs' websites as information infrastructures and reveals areas for improvement. We recommend SPOs add resources for obtaining healthcare card, accessing primary care, sexual and reproductive, parenting, senior's health, mental wellbeing, and women's health information to their websites. We also recommend websites accommodate ethnic language option to improve navigability for immigrants.

Introduction

Immigrants make up almost a quarter of the Canadian population (Statistics Canada, 2018). The health of immigrants can be an important general measure of the country's population health and contributes to the cost and adequacy of Canada's healthcare system (Gushulak et al., 2011). Previous research has established that upon arrival, immigrants have better health than Canadian residents, a phenomenon known as the 'healthy immigrant effect' (Gushulak et al., 2011; McDonald and Kennedy, 2004; Pottie et al., 2008; Newbold, 2009). However, with increased duration of residence, immigrants' health declines below that of non-immigrant Canadians (Gushulak et al., 2011; McDonald and

Kennedy, 2004; Pottie et al., 2008). Immigrants are also twice as likely to face barriers to healthcare access when compared to Canadian-born residents (Gushulak et al., 2011). Differences in culture and communication, a lack of information about health-wellness, as well as unfamiliarity with the Canadian healthcare system have all been identified as substantial barriers to health-wellness for immigrants (Ahmed et al., 2016). Existing literature calls for modern and culturally relevant solutions for educating immigrants about health-wellness (Ahmed et al., 2016). Immigrant service provider organizations (SPOs) are government agencies and community-based organizations that offer supports to immigrants in an attempt to mitigate resettlement barriers (Ontario Council of Agencies, 2018). Among other supports, SPOs offer language

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classes, career guidance, and health-wellness resources (Ontario Council of Agencies, 2018; Caidi and Allard, 2005). As immigrant SPOs are often the first point of contact immigrants have with Canadian society, they offer an important opportunity for benefiting the resettlement experience of immigrants (Ontario Council of Agencies, 2018).

Approximately 70% of Canadians go online to search for health-wellness resources (Haight et al., 2014). Between immigrant and non-immigrant Canadians who have access to the internet, immigrants have a higher level of online activity (Haight et al., 2014). For many immigrants, online platforms have become extensions of offline social networks and can provide access to culturally and linguistically relevant health information or support that might be available through face-to-face communication (Haight et al., 2014). Existing literature emphasizes that online health-wellness resources that are user-friendly can enable health literacy and lead to positive health-related decision making, health behaviours, and ultimately health outcomes (Hesse et al., 2010; Devine et al., 2016; Fox and Rainie, 2002; Sawesi et al., 2016; Laranjo et al., 2015). The websites of immigrant SPOs are key to immigrant health literacy because they have both the audience and the platform to target gaps in health outcomes (Chan et al., 2018). Given that immigrant SPOs are often the first point of contact immigrants have with Canadian systems and that online resource hold potential in improving the health literacy and health outcomes of immigrants, it is important to assess whether health-wellness resources present on immigrant SPOs' websites are offered in a user-friendly manner.

The objectives of this research project were to identify the presence of health-wellness resources on immigrant SPOs' websites as well as to ascertain the navigability, usability, and credibility of immigrant SPOs' websites that offer health-wellness resources. Altogether, this project answers the research question: are health-wellness resources present on Canadian immigrant SPOs' websites in a navigable, usable, and credible manner?

Theoretical framework

This study has been guided by Chatman's theory of information poverty to organize thinking about why and how immigrants have difficulty in obtaining important resources for health-wellness that for other groups are easily accessible (Caidi and Allard, 2005). Information poverty pertains to a situation in which individuals or groups within a given context do not have the required skills, abilities, or material means to obtain, interpret, or apply information (Hasler and Ruthven, 2011; Britz, 2004). Information infrastructures influence information poverty by molding the availability of information for individuals or groups (Britz, 2004). Information infrastructures can include the Internet as well as SPOs, both of which act as gatekeepers to resources (Britz, 2004). In health-wellness, information poverty can lead to health illiteracy among individuals or groups (Hasler and Ruthven, 2011). Information platforms not tailored to the health needs of minority groups, such as immigrants, can exclude them from health literacy and lead to disparities in health outcomes (Hasler and Ruthven, 2011; Britz, 2004; Santos et al., 2018). Research emphasizes that information needs not addressed in situations of information poverty tend to be the needs most crucial to the health of individuals (Hasler and Ruthven, 2011). The ability of online platforms to reduce information poverty and in turn, enhance health literacy has also been emphasized by research (Hasler and Ruthven, 2011; Britz, 2004; Santos et al., 2018). This project contributes a key first step to alleviating information poverty among immigrants by mapping the current health-wellness resources on immigrant SPOs' websites, which are a critical information infrastructure.

Methods

Sample description

Information about the 1453 immigrant SPOs listed on Immigration,

Refugees and Citizenship Canada (IRCC) newcomer services webpage was extracted to a Microsoft Excel document on January 28, 2020. We used the IRCC list as it is used by immigrants to Canada to locate SPOs near them, by location. After removing duplicate website links and websites with inactive links, we were left with 804 eligible websites. We further excluded websites of immigrant SPOs that offered no health-wellness resources. The resulting 289 websites were the sample from which detailed data were collected. The process of identifying, screening, and including websites for the sample is depicted in Fig. 1.

Data extraction

Data about each immigrant SPO's contents, navigability, usability, and credibility were extracted by AK using Microsoft Excel, including organization name, location, and website link. In addition to utilizing existing literature on evaluating websites, a pilot data collection of 25 randomly selected immigrant SPOs' websites was done to formulate the coding template for the four focus areas of the research question: presence of health-wellness resources, navigability of websites offering health-wellness resources, usability of websites offering health-wellness resources, and credibility of websites offering health-wellness resources. The coding template was expected and found to be an iterative process; changes were made according to what was found on the immigrant SPOs' websites as data collection occurred.

Coding guide: type of health-wellness resources present on websites

The focus area of "presence" was divided into three categories and eleven sub-categories (Fig. 2). Categories and sub-categories were primarily generated by the pilot data collection which revealed the common health-wellness needs of immigrants. The three categories were: lifestyle and wellness resources, healthcare system resources, and other specific resources. The category of lifestyle and wellness resources was further divided into three sub-categories: nutrition, physical activity, and mental health. The category of healthcare system resources was divided into three sub-categories as well: obtaining a healthcare card, accessing primary care, and navigating the healthcare system. Lastly, the category of other specific resources was further divided into five sub-categories: sexual health, reproductive/parenting health, senior health, youth health, and substance use. The sub-categories under the focus area of presence were coded according to whether the resource appeared on the website in the form of an informational webpage, informational digital file, event/program/service, or external link.

Coding guide: navigability, usability, and credibility of websites

The focus area of "navigability" was divided into two categories (Fig. 2). Categories were generated from a review of the existing literature (Devine et al., 2016; Kim et al., 1999; Ribisl et al., 2003; Klein et al., 2010) and updated to better reflect current websites as a result of the pilot data collection. The categories were: number of mouse clicks required to navigate to health-wellness resources and the number of language options available to navigate the website. The category of number of mouse clicks was coded according to decreasing navigability: whether zero, one to two, or three or more mouse clicks were required to navigate to health-wellness resources. The category of number of language options was also coded according to decreasing navigability: whether four or more, two to three, or one language option was available to navigate the website.

The focus area of "usability" was divided into seven categories (Fig. 2). Categories were generated from a review of the existing literature (Devine et al., 2016; Kim et al., 1999; Klein et al., 2010; Chow et al., 2014) and updated to be more reflective of current websites as a result of the pilot data collection. The categories were: site map/menu, return to homepage from every page, headings or sub-headings, high contrast between website background and text, search bar, site

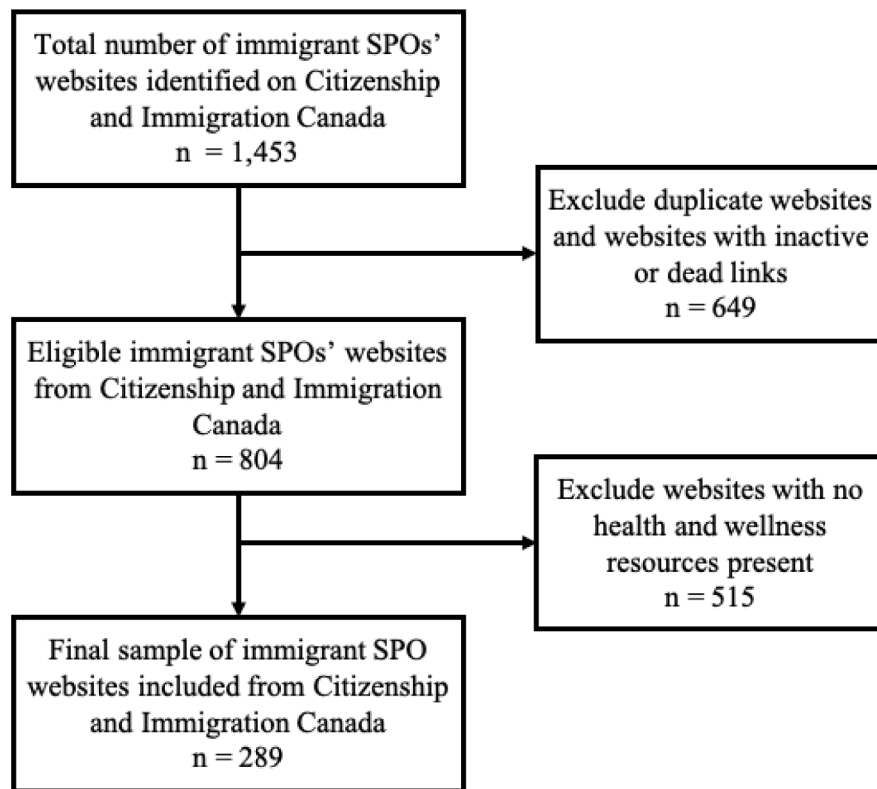


Fig. 1. Process of identifying, screening, and including websites of immigrant SPOs as sourced from IRCC's newcomer services webpage, in Canada, 2020.

logo/name on every page, and large font size. The categories under the focus area of usability were coded according to whether or not they were present on the website.

The focus area of "credibility" was divided into three categories and ten sub-categories (Fig. 2). Categories for the focus area of credibility were generated from a review of the existing literature (Devine et al., 2016; Kim et al., 1999; Klein et al., 2010; Kaicker et al., 2013) and updated to be more reflective of current websites as a result of the pilot data collection. The categories were: authority, reliability, and relevance. The category of authority was further divided into three sub-categories: authoritative domain name (.gov, .org, .edu), street address, and contact web form. The category of reliability was further divided into three sub-categories: distinction between advertising and non-advertising content, disclosed funding source, and authorship/references. Lastly, the category of relevance was further divided into four sub-categories: date content created, date content updated, date currency (less than 5 years) and no date. The categories under credibility were coded according to whether or not they were present on the website.

Analysis

Content analysis is a systematic means of describing and quantifying the content of communication (Petch, 2004). Content analysis involves calculating the frequency with which each category or sub-category appears in the sample (Petch, 2004; Elo and Kyngäs, 2008). We used a directed approach of content analysis in this study (Hsieh and Shannon, 2005). A directed approach allows using both deductive and inductive coding categories. The initial coding categories in our study were generated from a review of the existing literature as well as pilot data collection, however, new coding categories were added as recognized as such approach contributes to the expansion of the understanding of the phenomenon (Hsieh and Shannon, 2005). Existing literature indicates that concerns of reliability and validity for content analysis methods

arise primarily from ambiguity of coding rules (Petch, 2004). To offset this, we made sure to keep a running list of rules by which categories and sub-categories for each focus area were given a certain code as data was collected (Devine et al., 2016; Petch, 2004; Elo and Kyngäs, 2008). A running list of key words and phrases that were synonymous with categories and sub-categories was also kept for consistency (Petch, 2004).

The number of immigrant SPOs' websites across each province and territory was calculated. For the focus area of presence, the frequency with which each sub-category was present on the sampled websites was calculated. The frequency with which each health-wellness sub-category was present on the sampled websites in the form of an informational webpage, informational digital file, event/program/service, or external link was also calculated for the focus area of presence. For the focus areas of navigability, usability, and credibility, the frequency with which each category or sub-category was present on the sampled websites of immigrant SPOs was calculated.

Asset mapping is a strategy for inventorying and visually mapping resources available in a defined boundary (Arriero and Griffin, 2018). According to the results generated from the content analysis, we presented a comparison of the number of immigrant SPOs' websites with health-wellness resources present with the total population, immigrant population, and total immigrant SPOs' websites in each province and territory across Canada (Fig. 3).

Results

Basic descriptive information

We identified 1453 immigrant SPOs from the IRCC list. Over half of these organizations were from Ontario (794, 54.6%), followed by British Columbia (234, 16.1%), and Quebec (216, 14.9%). The lowest number of SPOs were from Nunavut (1, 0.1%), Yukon (2, 0.1%), and Newfoundland and Labrador (3, 0.2%). Among the 1453 SPO webpages identified, only 289 (35.9%) had some sort of health-wellness related

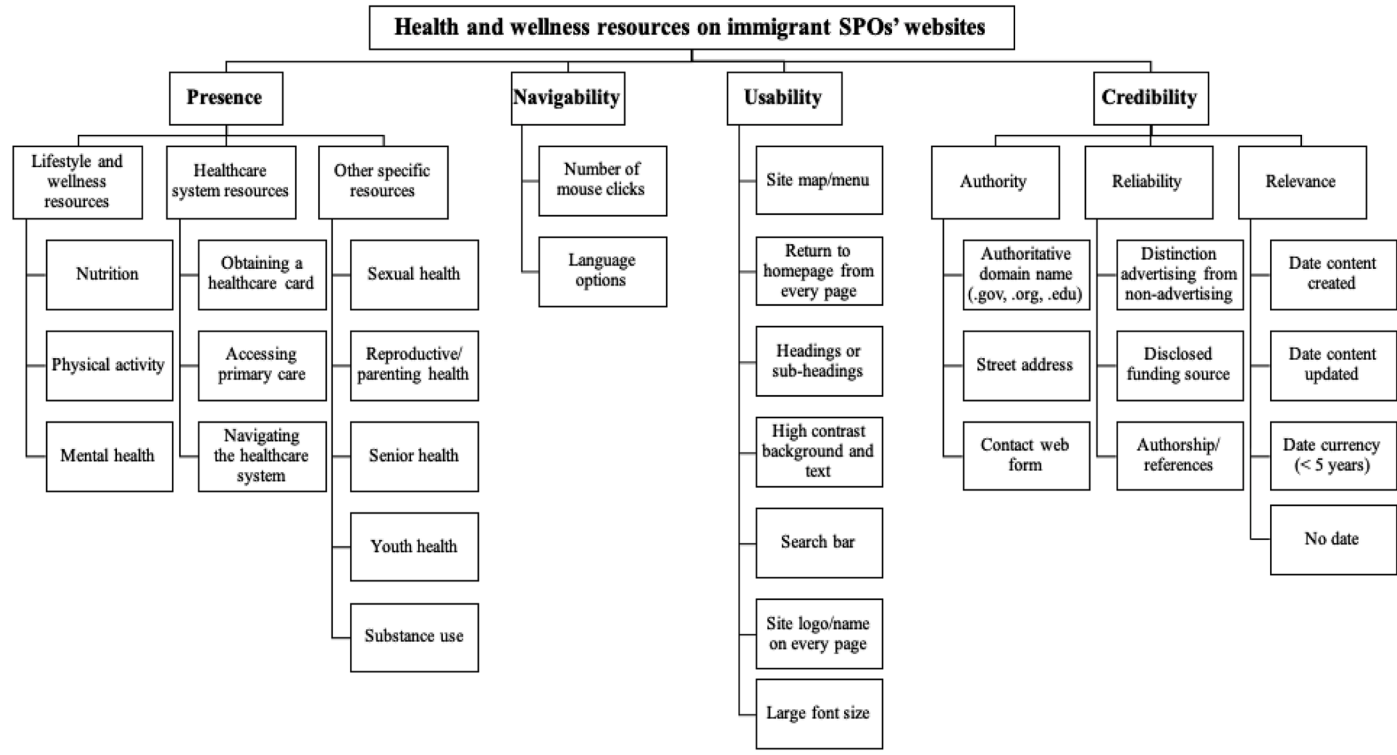


Fig. 2. Final coding template for the four focus areas of the research question: presence of health-wellness resources, navigability of website with health-wellness resources present, usability of website with health-wellness resources present, and credibility of website with health-wellness resources present.

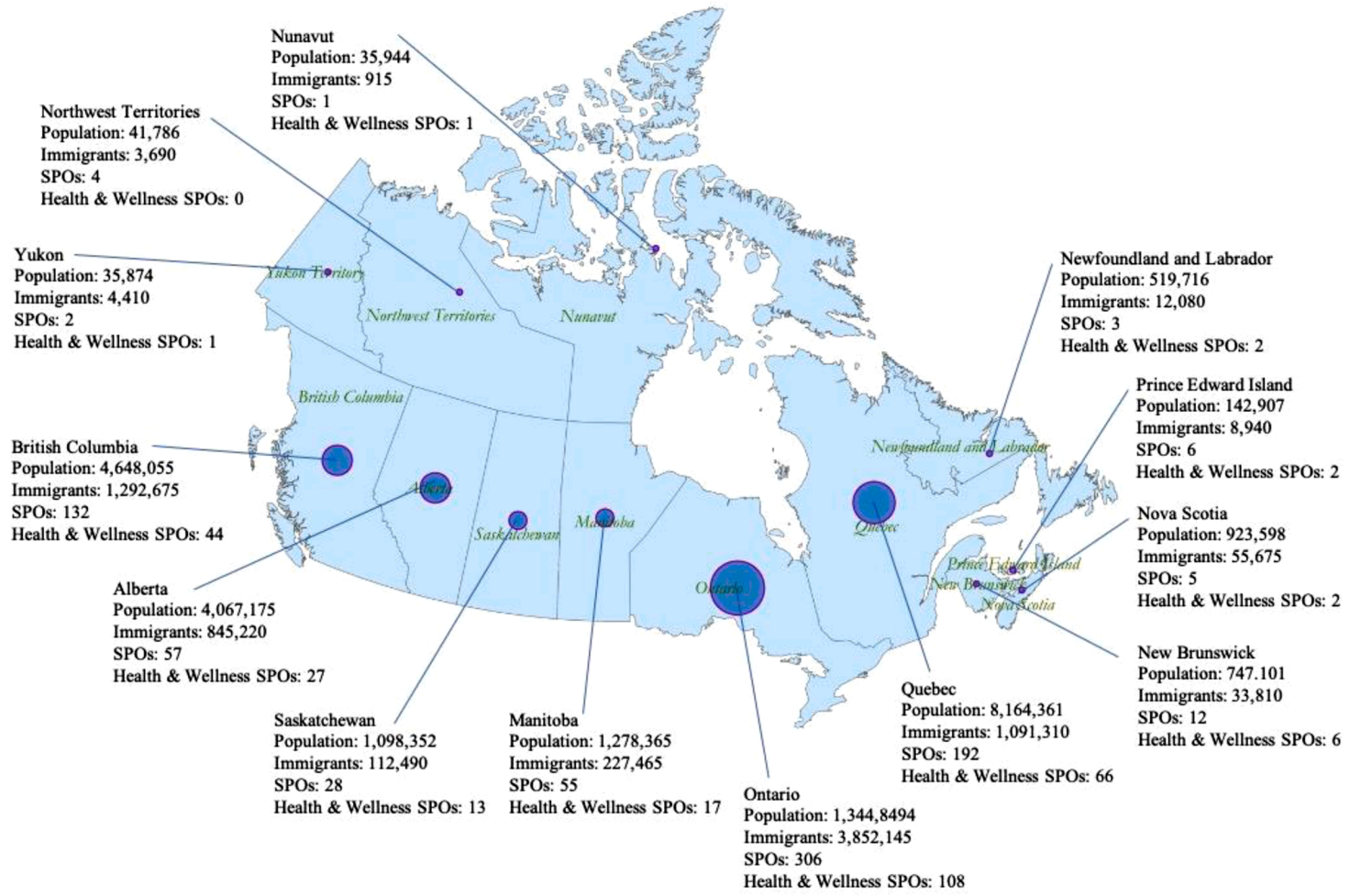


Fig. 3. Total population, immigrant population, total immigrant SPOs' websites, and immigrant SPOs' websites with health-wellness resources present across provinces and territories in Canada, 2020.

information in their website contents. Among those, over a third were from Ontario (37.4%), followed by Quebec (22.8%), and British Columbia (15.2%) (Fig. 3). The four Atlantic provinces of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island altogether had 12 (4.2%) of the sampled websites (Fig. 3). Of the territories, none of the sampled immigrant SPOs' websites were from the Northwest Territories, and 1 (0.44%) was from each of Nunavut and Yukon (Fig. 3).

Type of health-wellness resources present on websites

Fig. 4 depicts the frequency *N* (%) of the presence of health-wellness resources on immigrant SPOs' websites. Lifestyle and wellness resources were present on 86.5% of the sampled websites, healthcare system resources were found on 80.6%, and other specific resources were present on 77.2% (Fig. 4). Five of the eleven sub-categories were present on over half, or a majority, of the sampled websites: nutrition, physical activity, mental health, navigating the healthcare system, and youth health. In contrast, six sub-categories were present on less than half, or a minority, of the sampled websites: obtaining a healthcare card, accessing primary care, sexual health, reproductive/parenting health, senior health, and substance use (Fig. 4). Under the focus area of presence, sub-categories were present on almost all of the sampled websites in the form of an event/program/service (Table 1).

Navigability, usability, and credibility of websites

Table 2 shows the frequency (*N* and%) of the presence of categories and sub-categories for navigability, usability, and credibility on websites that offered health-wellness resources. Under the focus area of "navigability", only zero to two mouse clicks were required to access health-

Table 1

Frequency (*N* and%) of different formats through which health-wellness resources were present on immigrant SPOs' websites in Canada, 2020.

Formats	Present on websites (<i>N</i> = 289)	Present on websites (%)
Informational webpage	15	5.2
Informational digital file	11	3.8
Event/program/service	280	96.9
External link	20	6.9

wellness resources on a 94.8% of the sampled websites (Table 2). However, more than one language option was only available on less than a quarter of websites (Table 2).

Under the focus area of "usability", over 90% of the sampled websites had six of the seven usability sub-categories present, excluding the sub-category of a search bar (Table 2). However, the sub-category of a search bar was still present on almost half of websites.

Under the focus area of "credibility", five sub-categories were present at very low frequencies. These were: authorship/references, distinction between advertising and non-advertising content, date content created, date currency (less than 5 years), and date content updated (Table 2). Very low frequencies were found because these five sub-categories were not applicable to the sampled websites that offered health-wellness resources in the form of an event/program/service, which was an overwhelming 96.9% of the sampled websites (Table 1). Of the remaining four applicable credibility sub-categories, only an authoritative domain name (.gov, .org, .edu) was present on a minority of the sampled websites (Table 2).

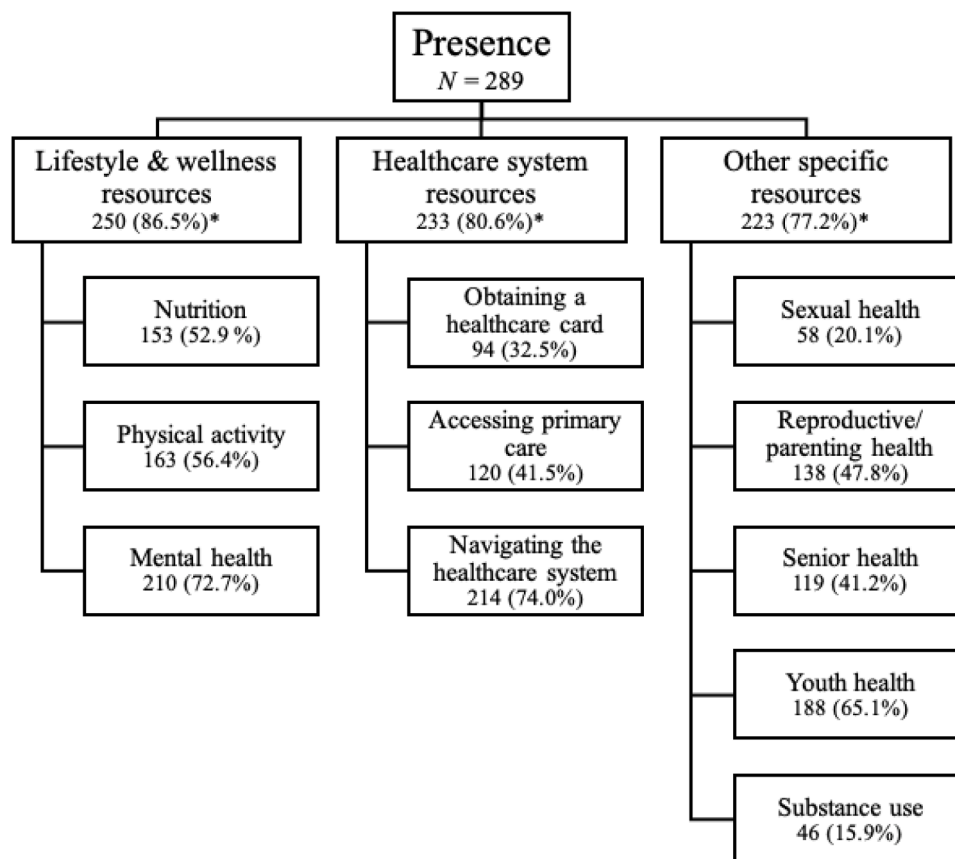


Fig. 4. Frequency *N* (%) of the presence of health-wellness resources on immigrant SPOs' websites in Canada, 2020. Note: Health-wellness categories (*) do not sum to 100%, as they were inclusive to the presence of any combination of their sub-categories.

Table 2

Frequency (*N* and%) of the presence of categories and sub-categories for navigability, usability, and credibility on websites that offered health-wellness resources in Canada, 2020.

Categories and sub-categories	Present on websites (<i>N</i> = 289)	Present on websites (%)
Navigability		
Mouse Clicks to Access Resource		
Zero clicks required	10	3.5
One to two clicks required	264	91.3
Three or more clicks required	15	5.4
Language Options		
Four or more	5	1.7
Two to three	60	20.8
One	224	77.5
Usability		
Site map/menu	268	92.7
Return to homepage from every page	284	98.3
Site logo/name on every page	287	99.3
Heading or subheading	288	99.7
Search bar	135	46.7
Large font size	278	96.2
High contrast between background and text	286	99.0
Credibility		
Authority		
Authoritative domain name (.gov, .org, .edu)	96	33.2
Street address	284	98.3
Contact web form	147	50.9
Reliability		
Disclosed funding source	215	74.4
Distinction between advertising and non-advertising content	3	1.0
Authorship/references	7	2.4
Relevance		
Date content created	2	0.7
Date content updated	1	0.3
Date currency (≤ 5 years)	2	0.7

Discussion

In this study, we used content analysis to describe the health-wellness resources that are present on immigrant SPOs' websites, and to describe the user-friendliness of immigrant SPOs' websites that offer health-wellness resources. We found that SPOs' websites that offered health-wellness resources were user-friendly.

However, of the 804 eligible immigrant SPOs' websites listed on IRCC, only 289 (35.9%) offered health-wellness resources. Though immigrant SPOs are meant to mitigate resettlement barriers, many SPOs focus on supports for immediate and emergency needs, such as language classes and career guidance, rather than conceiving settlement as a longer-term process where supports for health-wellness often fall (Caidi and Allard, 2005). Research indicates that the most significant barriers to successful resettlement are those in longer-term stages, which should encourage immigrant SPOs to support health-wellness (Mwarigha, 2002). Our findings provide valuable insight into the current state of immigrant SPOs' websites, which helps determine areas to sustain and areas for improvement in alleviating information poverty faced by immigrants.

There were categories and sub-categories of the four focus areas that were found to be present on the majority of the sampled immigrant SPOs' websites and therefore indicated areas that immigrant SPOs are generally doing well on and should sustain. Five of the eleven health-wellness resource sub-categories were present on majority of the websites. These were resources for nutrition, physical activity, mental health, navigating the healthcare system, and youth health. We found that a majority of websites required only zero to two mouse clicks to navigate to health-wellness resources and had all eleven usability sub-categories present. A majority of websites also had three of the four applicable credibility sub-categories present. These were the presence of

a street address, disclosed funding source, and contact web form. Our finding that usability and credibility are areas to sustain for immigrant SPOs' websites parallels the findings of prior research that examined the user-friendliness of websites and other technological platforms in disseminating health-wellness resources (Sawesi et al., 2016; Steele et al., 2007).

However, when resources for health-wellness are not easily obtainable for immigrants, navigating through new health systems when resettling can be demotivating (Caidi and Allard, 2005). Categories and sub-categories of the four focus areas present on a minority of the sampled websites revealed areas that immigrant SPOs can improve. We found six out of the eleven health-wellness resource sub-categories were present on a minority of the websites. These were resources for obtaining a healthcare card, accessing primary care, sexual health, reproductive/parenting health, senior health, and substance use. Websites as information infrastructures that cater to immigrants have to be particularly careful in addressing as many health needs as possible because immigrants are a minority group vulnerable to information poverty. Research emphasizes that needs not addressed in situations of information poverty tend to be the needs most crucial to health outcomes (Hasler and Ruthven, 2011). If unmet, these crucial needs are likely key contributors to the decline in health immigrants experience when they resettle (McDonald and Kennedy, 2004). We also found that a minority of websites had more than one language option to navigate the website and an authoritative domain name (.gov, .org, .edu). The need for more than one language option to navigate websites targeted towards immigrants as an area for improvement has been found by others studying websites of immigrant SPOs as well. Research examining inclusivity of LGBTQ immigrants on immigrant SPOs' websites found less than a quarter of websites were viewable in languages other than English (Giwa and Chaze, 2018). Immigrants tend to have mother tongues other than English; providing more language options would be an important positive change in improving the navigability of immigrant SPOs' websites as information infrastructures (Giwa and Chaze, 2018).

Canada's population growth rate is driven primarily by immigration (Statistics Canada, 2019). Though some provinces support high rates of immigration by providing proportional numbers of immigrant SPOs, others have room for improvement. The Atlantic provinces, Ontario, Quebec, and Alberta reported their highest recorded population growth rates in 2018/2019 (Statistics Canada, 2019). The number of websites from Ontario, Quebec, and Alberta are reflective of their high population growth rates; we found 70% of the immigrant SPOs' websites offering health-wellness resources were from one of these three provinces. In contrast, we found less than 5% of immigrant SPOs' websites offering health-wellness resources were from the Atlantic provinces.

A limitation of this research project is its applicability. Different countries have different immigrant populations, different needs and supports for immigrants, as well as different healthcare systems. As our project studied immigrant SPOs' websites in the context of Canadian immigrants and systems, our findings would mostly be applicable across Canada. However, our findings may be transferable to other contexts. Immigrants SPOs can survey their own websites for their navigability, usability, credibility, or for the kinds of health-wellness resources they have present and which resources could be added. Future research that assesses the websites of immigrant SPOs in other countries could help overcome this limitation by providing points for comparison between countries.

The findings of this research project identify areas in which immigrant SPOs can improve their role as information infrastructures for health-wellness resources. Sharing our findings with immigrant SPOs as well as with IRCC will help in co-identifying ways to implement our findings. We recommend SPOs add resources for obtaining healthcare card, accessing primary care, sexual and reproductive, parenting, senior's health, mental wellbeing, and women's health information to their websites. We also recommend websites accommodate ethnic language option to improve navigability for immigrants. Optimizing

immigrant SPOs' websites as vehicles of health-wellness information is an area that should be improved in order to better immigrant health literacy.

CRedit authorship contribution statement

TCT conceived of the paper. AK collected the data. NC and MZIC contributed to the analysis of the data. AK and TCT drafted the paper. All authors provided critical input across multiple drafts.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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